QUESTION BANK

MCA

SEMESTER V

VOL. II

FOR PRIVATE CIRCULATION

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ADVANCED DATABASE MANAGEMENT SYSTEMS

MCA 307

ADVANCED DATABASE MANAGEMENT SYSTEMS- MCA 307
MCA V

UNIT - I

I **Test Your Skills:**
(a) **State Whether the Following Statements are True or False:**

1 In 3NF Relation should not have a non-key attribute functionally determined by another non-key attribute.
2 Every relation is 3NF is also in BCNF.
3 If X > Y, then Y→ X (Y functionally determines X)
4 A relation schema R is in 3NF if every nonprime attribute A in R is fully functionally dependent on the primary key of R.
5 Second normal farm is based on the concept of full functional dependency.
6 The transitivity inference rule of functional dependency states:
   $(X\rightarrow Y, Z\rightarrow Y)\models X\rightarrow Z$.
7 The normal form of a relation refers to the lowest normal form condition that it meets.
8 Normalization of data helps in reducing insertion, deletion and updation anomalies.
9 The normalization is carried out in practice so that the resulting designs are of high quality.
10 If a relation is in BCNF then it is also in 3NF.
11 The granularity of data item in a database can affect the performance of concurrency control and recovery.
12 In optimistic concurrency control technique the three phases are in the order: validation phase, read phase, write phase.
13 Shadow paging is recovery technique in a database.
14 A schedule S is called serial if, for every transaction T participating in the schedule, all the operations of T are executed non-consecutively in the schedule.
15 A schedule S of n transactions is serializable if it is equivalent to some serial schedules of the same n transactions.
16 A binary lock can have three states.
17 A transaction is either performed in entirety or not performed at all.
18 The changes applied to the database by a committed transaction may be lost because of some failure.
19 The isolation is enforced by the concurrency control subsystem of DBMS.
20 The read set of a transaction is the set of items it writes.

Ans. (1)(T), (2)(F), (3)(F), (4)(F), (5)(T), (6)(F), (7)(F), (8)(T), (9)(T), (10)(T), (11)(T), (12)(F), (13)(T), (14)(F), (15)(T), (16)(F), (17)(T), (18)(F), (19)(T), (20)(F)

(b) **Multiple Choice Questions:**

1 If every non-key attribute is functionally dependent on the primary key, then the relation will be in:
   (a) First normal form

(b)   Second normal form
(c)   Third normal form
(d)   Fourth normal form

2   Given the functional dependencies
$X \rightarrow W$; $X \rightarrow Y$; $Y \rightarrow Z$ and $Z \rightarrow PQ$
Which of the following doesn't hold well?
(a) $X \rightarrow Z$
(b) $W \rightarrow Z$
(c) $X \rightarrow WY$
(d)   None of the above

3   Relations produced from an E-R model will always be in
(a)   First normal form
(b)   Second normal form
(c)   Third normal form
(d)   Fourth normal form

4   Third normal form is inadequate in situation where the relation
(a)   Has multiple candidate keys
(b)   Has candidate keys that are composite
(c)   Has overlapped candidate keys
(d)   None of the above

5   An attribute of one table matching the primary key of another table, is called as
(a)   Foreign key
(b)   Secondary key
(c)   Candidate key
(d)   Composite key

6   If a relation scheme is in BCNF, then it is also in
(a)   First normal form
(b)   Second normal form
(c)   Third normal form
(d)   Fourth normal form

7   A primary key when combined with a foreign key create
(a)   Parent child relationship between the tables that connect them.
(b)   Network model between the tables that connect them.
(c)   Many-to-many relationship between the tables that connect them.
(d)   None of the above.

8   The set of permitted value for each attribute is called its
(a)   Attribute set
(b)   Attentive range
(c)   Domain

(d)   Group

9   The airline reservation system, the enables are date, flight number, place of departure, destination, type of plane & seats available. The primary key is
(a)   Flight number
(b)   Flight number + place of departure
(c)   Flight number+ date
(d)   Flight number + destination

10   A functional dependency of the form X$\rightarrow$Y is trivial if
(a)   YC= X
(b)   Y C X
(c)   X C =Y
(d)   X C Y and Y C X

11   The concept of locking can be used to solve the problem of
(a)   Lost update
(b)   Uncommitted dependency
(c)   Inconsistent data
(d)   Deadlock

12   In transactions, in ACID property A stands for
(a)   Atomicity
(b)   Acidity
(c)   Alphabetically
(d)   None of the above.

13   Assume transaction A holds a shared lock R. If transaction B also requests for a shared lock on R.
(a)   It will result in a deadlock situation.
(b)   It will immediately be granted.
(c)   It will immediately be rejected.
(d)   It will be granted as soon as it is released by A.

14   A schedule S of n transactions is serializable if it is equivalent to some
(a)   Serial schedule of the same n transactions.
(b)   Non-serial schedule of the same n transactions.
(c)   Serial schedule of different n transactions.
(d)   Non-serial schedule of different n transactions.

15   In two-phase locking protocol.
(a)   All unlocking operations precede the first lock operation.
(b)   All locking operations precede the first unlock operation.
(c)   Locking and unlocking takes place simultaneously.
(d)   None of the above.

16   Transaction timestamp is:
        (a)   Not unique for each transaction
        (b)   Larger for older transaction
        (c)   Unique identifier assigned to each transaction.
        (d)   None of the above.
17   The granularity of a database item can be chosen to be
        (a)   A whole file
        (b)   A database record
        (c)   The whole database
        (d)   All of the above.

18   If the complete execution of the transaction(s) takes the database from one consistent
        state to the other then that property of transaction is called:
        (a)   Isolation
        (b)   Durability
        (c)   Consistency preservation
        (d)   None of the above

19   Which of the following is not the state that the transaction undergoes?
        (a)   Failed
        (b)   Active
        (c)   Partially committed
        (d)   Non active

20   Timestamp can be generated by:
        (a)   Counter
        (b)   Current date/time
        (c)   None of the above
        (d)   Both (a) and (b)

21   Which of the following is the formal process for deciding which attributes should be
        grouped together in a relation?
        (a)   Normalization
        (b)   Performance Tuning
        (c)   Optimization
        (d)   None of the above

22   Who developed normalization process?
        (a)   C.J. Date
        (b)   E.F. Codd
        (c)   Donald Chamberlain
        (d)   Collin White

23   Who developed the BCNF?
        (a)   Boyd and Cromwell
        (b)   Date and Codd

(c)   Date and White

(d)   Boyce and Codd

24   What is the expansion of BCNF?
- (a)   Boyd-Cromwell Normal Form
- (b)   Boyce-Codd Normal Form
- (c)   Boyd-Codd Normal Form
- (d)   All of the above

25   Which of the following is the result of a transitive dependency?
- (a)   Insertion anomaly
- (b)   Modification anomaly
- (c)   Deletion anomaly
- (d)   All of the above

26   Which of the following is true?
- (a)   Normalized data is the best representation of data.
- (b)   Data stored non-redundantly will be accessed faster than data stored many times.
- (c)   Normalized tables are the best way to store data.
- (d)   All of the above

27   How many inference rules are there for functional dependencies?
- (a)   4
- (b)   5In t
- (c)   6
- (d)   7

28   Which property ensures that each functional dependency is represented in some individual relations resulting after decomposition?
- (a)   Dependency preservation property
- (b)   Fully Functional dependency
- (c)   Lossless Join
- (d)   None of the above

29   Every relation in BCNF is also in
- (a)   3NF
- (b)   2NF
- (c)   1NF
- (d)   None of the above

30   A table that contains one or more repeating groups is in which normal form?
- (a)   1NF
- (b)   2NF
- (c)   3NF
- (d)   Unnormalized Form

31   The DBMS acts as an interface between what two components of an enterprise-class database system?
      (a)   Database application and the database
      (b)   Data and the database
      (c)   The user and the database application
      (d)   Database application and SQL

32   Which of the following products was an early implementation of the relational model developed by E.F. Codd of IBM?
      (a)   IDMS
      (b)   DB2
      (c)   dBase-II
      (d)   R:base

33   The following are components of a database except _____ .
      (a)   user data
      (b)   Metadata
      (c)   Reports
      (d)   Indexes

34   An application where only one user accesses the database at a given time is an example of a(n) _____ .
      (a)   single-user database application
      (b)   multiuser database application
      (c)   e-commerce database application
      (d)   data mining database application

35   An on-line commercial site such as Amazon.com is an example of a(n) _____ .
      (a)   single-user database application
      (b)   multiuser database application
      (c)   e-commerce database application
      (d)   data mining database application

36   SQL stands for _____ .
      (a)   Structured Query Language
      (b)   Sequential Query Language
      (c)   Structured Question Language
      (d)   Sequential Question Language

37   Because it contains a description of its own structure, a database is considered to be _____ .
      (a)   Described
      (b)   metadata compatible
      (c)   self-describing
      (d)   an application program

38   The following are functions of a DBMS except _____ .
      (a)   creating and processing forms
      (b)   creating databases
      (c)   processing data
      (d)   administrating databases

39   Helping people keep track of things is the purpose of a(n) _____ .
      (a)   Database
      (b)   Table
      (c)   Instance
      (d)   Relationship

40   A DBMS that combines a DBMS and an application generator is _____ .
      (a)   Microsoft's SQL Server
      (b)   Microsoft's Access
      (c)   IBM's DB2
      (d)   Oracle Corporation's Oracle

Ans. (1)(c), (2)(b), (3)(c), (4)(a, b, c), (5)(a), (6)(c), (7)(a), (8)(c), (9)(c), (10)(a),
      (11)(a, b, c), (12)(a), (13)(b), (14)(a), (15)(b), (16)(c), (17)(d), (18)(c), (19)(d), (20)(d)
      (21)(a), (22)(b), (23)(d), (24)(b), (25)(d), (26)(d), (27)(c), (28)(a), (29)(a), (30)(d),
      (31)(a), (32)(b), (33)(c), (34)(a), (35)(c), (36)(a), (37)(c), (38)(a), (39)(a), (40)(b)

(c)   Fill in the Blanks:

1   Normalization of data helps in _____redundancy.
2   An attribute of relation schema R is called as _____attribute of R if it is a member
      of some candidate key of R.
3   A relation schema R is in _____ if whenever a nontrivial functional
      dependency X → A holds in R, then X is a super key of R..
4   In 1NF Relations should have no _____attributed or nested attributes.
5   A functional dependency X → Y is a _____if some attribute A ∈ X can be
      removed from X and the dependency still holds.
6   A functional dependency is the property of the _____.
7   The normal form of a relation refers to the _____ normal form it meets.
8   Normalization process was first proposed by _____.
9   The process of storing the join of higher normal form relations as a base relation, which
      is in lower normal form is known as_____.
10   The multi-valued attributes that are themselves composite are called
      _____attributes.
11   Transaction processing systems are systems with large databases and hundreds of
      _____users that are executing database transactions.
12   The size of a data item is called its_____.
13   A transaction is _____preserving if its complete execution takes(s) the database
      from one consistent state to another.
14   In two-phase locking in shrinking phase, during which existing locks can be _____but
      no new locks can be acquired.

15   The main goal of recovery is to ensure the _____property of a transaction.
16   A serial schedule shows _____ processing because no interleaving of operations from different transactions is permitted.
17   A timestamp is a unique _____ generated by the system
18   Locking data item prevents multiple transactions from _____ the item concurrently.
19   LOCK(X) = _____then the item X cannot be accessed by a database operation that requests the item.
20   _____operation sets the LOCK(X) to 0.

Ans.   (1)(minimizing), (2)(prime), (3)(BCNF), (4)(non-atomic), (5)(partial dependency), (6)(semantics), (7)(highest), (8)(Codd), (9)(Denormalization), (10)(Nested), (11)(concurrent), (12)(granularity), (13)(consistency), (14)(released), (15)(atomicity), (16)(Inefficient), (17)(identifier), (18)(accessing), (19)(!), (20)(unlock_item(X))

II   Short Answer Type Questions:

1   What is a functional dependency?
2   What are the possible sources of information that defines the functional dependencies that hold among the attributes of a relation schema?
3   What is meant by the closure of a set of functional dependencies? Illustrate with an example.
4   What is a minimal set of functional dependencies? Does every set of dependencies have a minimal equivalent set? Is it always unique?
5   What does the term unnormalized relation refer to?
6   What undesirable dependencies are avoided when a relation is in 2NF?
7   Define Boyce-Codd normal form. How does it differ from 3NF? Why is it considered a stranger form of 3NF?
8   What is meant by the attribute presentation condition on decomposition?
9   What is the dependency presentation property for decomposition? Why is it important?
10   Why is a multivalued dependency? What type of constraint does it specify? When does it arise?
11   Define fourth normal form. When is it violated? Why is it useful?
12   Define fifth normal form. Why 5NF is also called project-join normal form (PJNF).
13   Consider the following database relation containing the attributes:
      Book-Id, Subject-Category-of-book, Name-of-author and Nationality-of-author.
      What is the highest normal form satisfied by the relation.
14   Let R = (ABCDEF) be a relation scheme with the functional dependencies
      C→F, E→A, EC→D, A→B. What is the key for R?
15   Consider a relation R (A, B, C, D, E) with the following dependencies:
      AB→C, CD→E, DE→ B
      Is AB a candidate key of this relation? If not, is ABC? Explain your answer.

16   Consider the following; F = {A→C, AC→D, E→AD, E→H} and G = {A→CD, E→AH}. Check whether they are equivalent.
17   Consider the following functional dependencies in a database.

Date-of-birth $\rightarrow$ Age
Age $\rightarrow$ Eligibility
Name $\rightarrow$ Roll-Number
Course-Number $\rightarrow$ Instructor
Roll-Number $\rightarrow$ Name
Course-Number $\rightarrow$ Course-Name

State the highest normal form of the:
Relation (Roll-number, Name, Date-of-Birth, Age)

18   What is meant by the concurrent execution of database transactions in a multiuser system?
19   Discuss why concurrency control is needed and give examples.
20   Discuss the different types of failures. What is meant by catastrophic failure?
21   Discuss the actions taken by the read-item and write-item operations on a database.
22   What is the system log used for? What are transaction commit points, and why are they important?
23   What is a schedule? Define the concepts of recoverable, cascade less, and strict schedules, and compare them in terms of their recoverability.
24   Draw a state diagram, and discuss the typical states that a transactions goes through during execution.
25   What is the difference between conflict equivalence and view equivalence?
26   What is serial schedule? What is a serializable schedule?
27   What is the difference between the constrained write and the unconstrained write assumptions? Which is more realistic?
28   Define the violations caused by each of the following dirty read, nonrepeatable read and functions.
29   What is the two-phase locking protocol? How does it guarantee serializability?
30   What are some variations of the two-phase locking protocol? Why is strict or rigorous two-phase locking often preferred?
31   Compare binary locks to exclusive/shared locks. Why is the latter type of locks preferable?
32   Discuss the problems of deadlock and starvation, and the different approaches to dealing with these problems.
33   Describe the wait-die and would-n-wait protocols for deadlock prevention.
34   Describe the cautions waiting, no waiting and timeout protocols for deadlock prevention.
35   What is a predicate lock?
36   What is a phantom record?
37   Discuss the problem that a phantom record can cause for concurrency control.
38   When are batches used?
39   What are intention locks?
40   What is multiple granularity locking? Under what circumstances is it used?
41   What type of locks are needed for insert and delete operations.
42   What is a timestamp? How does the system generate timestamps?
43   What are UNDO-type and RE DO- type log entries?
44   Describe the write ahead logging protocol.
45   Describes the UNDO and REDO operations, and the recovery techniques that use each.

46   Identify three typical lists of transactions that are maintained by the recovery subsystem.
47   What are the advantages of DBMS over traditional file system?
48   What are the characteristics of DBMS?
49   What are the components of DBMS?
50   What are the users involved in managing of DBMS?
51   What is the difference between a candidate key and the primary key for a given relation? What is a superkey?
52   What is a foreign key constraint? Why are such constraints important? What is referential integrity?
53   What are the three data anomalies that are likely to occur as a result of data redundancy? Can data redundancy be completely eliminated in database approach? Why or why not?
54   What is Weak Entity set?
55   What is system catalog or catalog relation? How is better known as?

III   Long Answer Type Questions:

1   Define first, second, and third normal forms when only primary keys are considered. How do the general definitions of 2NF and 3NF, which consider all keys of a relation, differ from those that consider only primary key?
2   Prove that any relation schema with two attributes is in BCNF.
3   Determine all 4NF violations for the relation schema R(X, Y, Z, W) with multivalued dependencies $X\rightarrow\rightarrow Y$ and $X\rightarrow\rightarrow Z$.
4   Prove that a functional dependency satisfies the formal definition of multivalued dependency.
5   An instance of a relation schema R (ABC) has distinct values for attribute A. Can you conclude that A is a candidate key for R.?
6   Explain Oracle & Architecture.
7   Explain shared Database Access Mechanism in detail in Oracle 8 Architecture.
8   Explain oracle software structure.
9   Explain database storage and database protection.
10   (a)   Discuss the purpose of normalization & normalization process. What are the normal forms? Explain with suitable example.
      (b)   What is transaction? Explain acid properties of transaction.

11   (a)   Define concurrent access of database. What are the reasons for which concurrency control is required? List the rule of serializability. Write suitable example for mentioning reason of concurrency method.
      (b)   What is transaction? Explain acid properties of transaction.

12   (a)   What is dead lock? Explain dead lock handling techniques with appropriate examples.
      (b)   How can the database be recovered through Shadow Paging Scheme.

13   Write short notes on (Any Two):
      (a)   Data Warehousing

(b)   Distributed Database
(c)   Object Oriented Database Management System
(d)   DBA

14   Discuss the timestamp ordering protocol for concurrency control.   How does strict timestamp ordering differ from basic timestamp ordering?

15   Discuss two multi-version techniques for concurrency control.

16   What is a certify lock?   What are the advantages and disadvantages of using certify locks?

17   How do optimistic concurrency control techniques differ from other concurrency control techniques?

18   Discuss the typical phases of an optimistic concurrency control method.

19   How does the granularity of data items affect the performance of concurrency control? What factors affect selection of granularity size for data items?

20   What is the system log used fro? What are the typical kinds of entries in a system log?

21   What are checkpoints, and why are they important, what are transaction commit points, and why are they important?

22   How are buffering and caching techniques used by the recovery subsystem?

23   Describe the shadow paging recovery technique. Under what circumstances does it not requires a log?

24   What is the difference between the UNDO / RE and UNDO/NO-REDO algorithms for recovery with immediate update?   Develop the outline for an UNDO/NO-REDO algorithm.

25   Discuss the immediate update technique of recovery technique in both single-user and multi-user environments.   What are the advantages and disadvantages of immediate update?

26   How can recovery handle transaction operations that do not affect the database, such as the printing of reports by a transaction?

27   What are the before image (BFIM) and after image (AFIM) of a data item? What is the difference between in-place updating and shadowing, with respect to their handling of BFIM and AFIM?

28   Computer Sciences Department frequent fliers have been complaining to Dane County Airport officials about the poor organization at the airport. As a result, the officials decided that all information related to the airport should be organized using a DBMS, and you have been hired to design the database. Your first task is to organize the information about all the airplanes stationed and maintained at the airport. The relevant information is as follows:
1) Every airplane has a registration number, and each airplane is of a specific model.
2) The airport accommodates a number of airplane models, and each model is identified by a model number (e.g., DC-10) and has a capacity and a weight.
3) A number of technicians work at the airport. You need to store the name, SSN, address, phone number, and salary of each technician.
4) Each technician is an expert on one or more plane model(s), and his or her expertise may overlap with that of other technicians. This information about technicians must also be recorded.

5) Traffic controllers must have an annual medical examination. For each traffic controller, you must store the date of the most recent exam.
6) All airport employees (including technicians) belong to a union. You must store the union membership number of each employee. You can assume that each employee is uniquely identified by a social security number.
7) The airport has a number of tests that are used periodically to ensure that airplanes are still airworthy. Each test has a Federal Aviation Administration (FAA) test number, a name, and a maximum possible score.
8) The FAA requires the airport to keep track of each time a given airplane is tested by a given technician using a given test. For each testing event, the information needed is the date, the number of hours the technician spent doing the test, and the score the airplane received on the test.

Draw an ER diagram for the airport database. Be sure to indicate the various attributes of each entity and relationship set; also specify the key and participation constraints for each relationship set. Specify any necessary overlap and covering constraints as well (in English).

The FAA passes a regulation that tests on a plane must be conducted by a technician who is an expert on that model. How would you express this constraint in the ER diagram? If you cannot express it, explain briefly.

29   Construct an ER Model for Student Administration System. Students who apply for a course are registered in the system. Short listed candidates are called for interview and their marks recorded. Selected candidates are admitted.
30   Explain how basic retrievals and modifications are done in a database using QBE language.
31   Discuss the methods of implementing join queries.
32   Draw the ER diagram for Library Management System.

UNIT - II

I   Test Your Skills:
(a)   State Whether the Following Statements are True or False:

1   Data is also called metadata.
2   In DBMS, data files are the files that store the database information.
3   The external schema defines how and where the data are organized in a physical data storage.
4   A collection of data designed for use by different users is called a database.
5   In a database, data integrity can be maintained.
6   The data in a database cannot be shared.
7   The DBMS provides support languages used for the definition and manipulation   of   the data in the database.
8   Data catalog and data dictionary are the same.
9   Using database redundancy can be reduced.
10   Metadata is also known as data about data.

11   Structured query language (SQL) and query by example (QBE) are the examples of fourth generation language.
12   A feature of relational database is that a single database can be spread across several tables.
13   The primary difference between the different data models lies in the methods of expressing relationships and constraints among the data elements.
14   The plan (or formulation of scheme) of the database is known as schema.
15   The physical schema is concerned with exploiting the data structures offered by a DBMS in order to make the scheme understandable to the computer.
16   Object-oriented data model is a logical data model that captures the semantics of objects supported in object-oriented programming.
17   Using a set of files is better than using a database.
18   Data redundancy means multiple copies of the same data item.
19   A transaction cannot update a record, delete a record, modify a set of records and so on.
20   DBMS manage concurrent databases access and prevents from the problem of loss of information or loss of integrity.
21   When analyst starts with data mining, he or she has some prior knowledge of what he or she is looking for.
22   Pattern discovery is an outcome of data mining.
23   OLAP predicts the future and data mining analysis the past.
24   Data mining algorithms need small amount of data.
25   Data mining flourishes on integrated and cleaned data.
26   Data mining does not fits well in the data warehouse environment.
27   Data mining picks up where OLAP leaves off.
28   Genetic algorithm is an interactive process.
29   Data mining has no application in retail industry.
30   Decision tree technique helps in risk assessment.

Ans.   (1)(T), (2)(T), (3)(F), (4)(T), (5)(T), (6)(F), (7)(T), (8)(T), (9)(T), (10)(T), (11)(T), (12)(T), (13)(T), (14)(T), (15)(T), (16)(T), (17)(F), (18)(T),19(T), 20(T), (21)(F), (22)(T), (23)(F), (24)(F), (25)(T), (26)(F), (27)(T), (28)(T), (29)(F), (30)(T)

(b)   Multiple Choice Questions:

1   Which of the following is related to information?
    (a)   Data
    (b)   Communication
    (c)   Knowledge
    (d)   All of these.

2   Data is:
    (a)   A piece of fact
    (b)   Metadata
    (c)   Information
    (d)   None of these.

3   Which of the following is element of the database?
        (a)   Data
        (b)   Constraints and schema
        (c)   Relationships
        (d)   All of these.

4   What represent a correspondence between the various data elements?
        (a)   Data
        (b)   Constraints
        (c)   Relationships
        (d)   Schema

5   Which of the following is an advantage of using database system?
        (a)   Security enforcement
        (b)   Avoidance of redundancy
        (c)   Reduced inconsistency
        (d)   All of these.

6   Which of the following is characteristic of the data in a database?
        (a)   Independent
        (b)   Secure
        (c)   Shared
        (d)   All of these.

7   Relationships could be of the following type:
        (a)   One-to-one relationship
        (b)   One-to-many relationships
        (c)   Many-to-many relationships
        (d)   All of these.

8   In a file-oriented system there is:
        (a)   Data inconsistency
        (b)   Duplication of data
        (c)   Data independence
        (d)   Al of these.

9   In a database system there is:
        (a)   Increased productivity
        (b)   Improved security
        (c)   Economy of scale
        (d)   All of these.

10   VDL is used to specify:
        (a)   Internal schema
        (b)   External schema

(c)   Conceptual schema

(d)   None of these.

11   The DML provides following functional access to the database:

(a)   Retrieve data and/or records

(b)   Add (or insert) records

(c)   Delete records from database files

(d)   All of these

12   4GL has the following components inbuilt in it:

(a)   Query languages

(b)   Report generators

(c)   Spreadsheets

(d)   All of these.

13   Which of the following is database element?

(a)   Data

(b)   Constraints and schema

(c)   Relationships

(d)   All of these.

14   What separates the physical aspects of data storage from the logical aspects of data representation?

(a)   Data

(b)   Schema

(c)   Constraints

(d)   Relationships

15   What scheme defines how and where the data are organized in a physical data storage?

(a)   External

(b)   Internal

(c)   Conceptual

(d)   None of these.

16   Which of the following schemas defines the stored data structures in terms of the database model used?

(a)   External

(b)   Conceptual

(c)   Internal

(d)   None of these

17   Which of the following schemas defines a view or views of the database for particular users?

(a)   External

(b)   Conceptual

(c)   Internal

(d)   None of these

18   A collection of data designed to be used by different people is called.
(a)   Database
(b)   RDBMS
(c)   DBMS
(d)   None of these

19   Which of the following is an object-oriented feature?
(a)   Inheritance
(b)   Abstraction
(c)   Polymorphism
(d)   All of these

20   In ……………technique, data splits at decision points based on entropy
(a)   Cluster detection
(b)   Decision trees
(c)   Link analysis
(d)   All of the above

21   Association   of   unknown   instances   with   known   instances   is   a   process
of………….technique
(a)   Memory based reasoning
(b)   Link analysis
(c)   Neural network
(d)   Genetic algorithm

22   Which technique is based on linking of variables
(a)   Cluster detection
(b)   Decision trees
(c)   Link analysis
(d)   All of the above

23   Forward propagation network is a structure of……………..
(a)   Memory based reasoning
(b)   Link analysis
(c)   Neural network
(d)   Genetic algorithm

24   Data mining applications include
(a)   Customer segmentation
(b)   Market basket analysis
(c)   Risk management
(d)   All of the above

25   Fraud detection is an application of

(a)   Data warehousing
(b)   Data mining
(c)   Both I and ii
(d)   None of the above

26   …………….is a best source of data for a data mining operation
(a)   OLAP
(b)   Data warehouse
(c)   OLTP
(d)   None of the above

27   …………….uncovers relationships and patterns in the existing data
(a)   Data mining
(b)   Data warehouse
(c)   OLAP
(d)   None of the above

28   …………….steps comprise the knowledge discovery process
(a)   3
(b)   4
(c)   5
(d)   6

29   Data mining is
(a)   Data driven
(b)   User driven
(c)   Both I and ii
(d)   None of the above

30   OLAP is
(a)   Data driven
(b)   User driven
(c)   Both I and ii
(d)   None of the above

31   Which of the following is an advantage of a database?
(a)   Reduction in Redundancy
(b)   Avoidance of inconsistency
(c)   Security enforcement
(d)   All of the above

32   Which of the following is an example of a database application?
(a)   Computerized library systems
(b)   ATMs
(c)   Flight reservation systems
(d)   All of the above

33   DBMS stands for_____?
      (a)   Data blocking and Management Systems
      (b)   Database Management Systems
      (c)   Database Business Management Systems
      (d)   None of the above

34   What is the name of the system database that contains descriptions of the data in the database?
      (a)   Metadata
      (b)   Data dictionary
      (c)   Table
      (d)   None of the above

35   IMS stands for _____
      (a)   Information Management System
      (b)   Internal Mechanical Security
      (c)   International Managers Society
      (d)   None of the above

36   Which of the following is the oldest database model?
      (a)   Hierarchical
      (b)   Network
      (c)   Relational
      (d)   Object Oriented

37   Which category of users need not be aware of the presence of the database system?
      (a)   DBA
      (b)   Naive
      (c)   Casual
      (d)   Application Programmers

38   The different classes of relations created by the technique for preventing modification anomalies are called:
      (a)   normal forms.
      (b)   referential integrity constraints.
      (c)   functional dependencies.
      (d)   None of the above is correct.

39   A relation is in this form if it is in BCNF and has no multivalued dependencies:
      (a)   second normal form.
      (b)   third normal form.
      (c)   fourth normal form.
      (d)   domain/key normal form.

40   The primary key is selected from the:
      (a)   composite keys.
      (b)   determinants.

(c)   candidate keys.
(d)   foreign keys.

41   In the relational model, relationships between relations or tables are created by using:
(a)   composite keys.
(b)   determinants.
(c)   candidate keys.
(d)   foreign keys.

42   A relation is considered a:
(a)   Column.
(b)   one-dimensional table.
(c)   two-dimensional table.
(d)   three-dimensional table.

43   For some relations, changing the data can have undesirable consequences called:
(a)   referential integrity constraints.
(b)   modification anomalies.
(c)   normal forms.
(d)   transitive dependencies.

44   If attribute A determines both attributes B and C, then it is also true that:
(a) $A \rightarrow B$.
(b) $B \rightarrow A$.
(c) $C \rightarrow A$.
(d) $(B,C) \rightarrow A$.

45   One solution to the multivalued dependency constraint problem is to:
split the relation into two relations, each with a single theme.
(a)   change the theme.
(b)   create a new theme.
(c)   add a composite key.

46   When the values in one or more attributes being used as a foreign key must exist in
another set of one or more attributes in another table, we have created a(n):
(a)   transitive dependency.
(b)   insertion anomaly.
(c)   referential integrity constraint.
(d)   normal form.

47   In a one-to-many relationship, the entity that is on the one side of the relationship is
called a(n) _____ entity.
(a)   Parent
(b)   Child
(c)   Instance
(d)   Subtype

Ans.   (1)(a), (2)(a), (3)(d), (4)(c), (5)(d), (6)(d), (7)(d),(8)(d),(9)(d),(10)(d),(11)(b), (12)(d),
       (13)(d), (14)(d), (15)(a), (16)(b), (17)(b), (18)(a), (19)(b), (20)(d), (21)(a), (22)(b),
       (23)(b), (24)(d), (25)(d), (26)(b), (27)(d), (28)(a), (29)(b), (30)(b), (31)(d), (32)(d),
       (33)(b), (34)(b), (35)(a), (36)(a), (37)(b), (38)(a), (39)(c), (40)(c), (41)(d), (42)(c),
       (43)(b), (44)(a), (45)(a), (46)(c), (47)(a)

(c)   Fill in the Blanks:

1   Data is raw_____where information is _____.
2   Two important languages in the database system are (a) _____and (b) _____.
3   To access information from a database, one needs a _____.
4   SQL stands for_____.
5   The four components of data dictionary are (a) _____(b)_____,
     (c)_____ (d) _____.
6   The two types of data dictionaries are (a)_____and (c)_____.
7   CODASYL stands for_____
8   LPTF stands for _____
9   In mid-1960s, the first general purpose DBMS was designed by Charles Bachman at
     General Electric, USA was called _____.
10   First recipient of the computer science equivalent of the Nobel Prize, called Association
     of Computing Machinery (ACM) Turning Award, for work in the database area, in 1973
     was _____.
11   When the DBMS does a commit, the change made by the transaction is made
     _____.
12   Relational data model stores data in the form of a _____
13   A subschema is a _____of the schema.
14   The conceptual/internal mapping defines the correspondence between the
     _____view and the _____.
15   Information Management System (IMS) was developed jointly by _____ and
     _____.
16   In Relational Model, rows are referred to as _____ and columns are referred to as
     _____.
17   In the hierarchical model the relationship between records is expressed as _____.
18   In the Relational Model, the number of columns in a table is termed as ___
19   The domain in the relational model is said to be atomic if the elements of the domain
     consist of _____ units.
20   OLAP is _____driven.
21   Knowledge discovery process in data mining uncovers _____ and_____not
     readil known to exist.
22   _____is the best source of data for a data mining operation.
23   Cluster   detection,   decision   trees   and   memory   based   reasoning   are
          major_____techniques.
24   If knowledge discovery is one aspect of data mining then _____is the other.
25   Infrastructure of data warehouse is _____.
26   Link analysis technique mines _____and discover knowledge.
27   Associations are _____between items.

23

Ans. (1)(Fact, Processed data), (2)(DDL, DDM), (3)(DBMS), (4)(Structured Query language), (5)(entity, attribute, relationships, key), (6)((a) Active data dictionary, (b) passive data dictionary), (7)(Conference of Data Systems Languages), (8)(List processing task force), (9)(integrated data store), (10)(Bachman), (11)(Permanent), (12)(Table), (13)(Inherits), (14)(Conceptual, Stored database), (15)(IBM, North American Aviation), (16)(records/tuples, attributes), (17)(parent-child), (18) (degree), (19)(indivisible), (20)(User), (21)(Relationship Patterns), (22)(Data Warehouse), (23)(Data Mining), (24)(Prediction), (25)(Robust), (26)(Relationship), (27)(Affinities)

II   Short Answer Type Questions:

1   What is database system? Explain.
2   What is the meaning of data independence and data integrity?
3   Explain operational data, schemes and instances.
4   Explain Data models.
5   What is database management system? Why do we need a DBMS?
6   What is data dictionary? Explain its function with a neat diagram.
7   What are the components of data dictionary?
8   What is entity and attribute? Give some examples of entities and attributes in a manufacturing environment.
9   Why are relationships between entities important?
10   What is the difference between a data definition language and a data manipulation language?
11   What do you mean by redundancy? What is the difference between controlled and uncontrolled redundancy? Illustrate with examples.
12   Define the following terms:
     (a)   Data   (b)   Database System
     (c)   DBMS   (d)   Data Independence
     (e)   DBA   (f)   Data Integrity
13   Who is DBA? What are the responsibilities of a DBA?
14   Discuss advantages and disadvantages of file-oriented system.
15   Discuss the advantages and disadvantages of a DBMS.
16   Explain the difference between external, internal and conceptual schemas.
17   What is a data model?
18   What is logical data independence and why is it important?
19   What is the difference between physical data independence and logical data independence?
20   Describe the structure of a DBMS.
21   Describe the main components of a DBMS.
22   What is a transaction?
23   What do you mean by a data model? Describe the different types of data models used.
24   Define the following terms:
     (a)   Data independence
     (b)   Query processor
     (c)   DDL processor
     (d)   DML processor

(e)   Run time database manage.
25   How is traditional file processing approach different than DBMS approach? Explain.
26   What do you mean by generalization and specialization?   Explain with a suitable diagram.
27   What are the problems with E-R models ?
28   Write short note on data mining.
29   Is dataware house a prerequisite for data mining?
30   Briefly describe the cluster detection technique.
31   Name three common application of link analysis technique.
32   How is data mining different from OLAP.
33   What is market basket analysis? Give two examples of this application in business.
34   State the similarities in neural networks and genetic algorithms.
35   State the differences in neural networks and genetic algorithms.
36   What is market Basket analysis. Give examples of applications in business.
37   Explain the term stored procedure, and give examples why stored procedures are
          useful.
38   Why does a DBMS interleave the actions of different transactions instead of
          executing transactions one after the other?
39   What must a user guarantee with respect to a transaction and database consistency? What should a DBMS guarantee with respect to concurrent execution of several transactions and database consistency?
40   Explain the strict two-phase locking protocol.
41   Explain the need for cursors.

III   Long Answer Type Questions:

1   Describe the three-tier ANSI-SPARC architecture. Why do we need mapping between different schema levels? How do different schema definition languages support this architecture?
2   Discuss the advantages and characteristics of the three-tier-architecture.
3   Discuss the concept of data independence and explain its importance in a database environment.
4   Explain the difference between external, conceptual and internal schemas. How are these different schema layers related to the concepts of physical and logical data independence?
5   Describe in detail the different types of DBMS.
6   (a)   Make an ER diagram for a library system? Clearly mention all the entities their attributes and the relationship among the entities.
       (b)   Map this ER model into corresponding relational model.
7   How does the concept of object identity in the object-oriented model differs from the concept of entity in the entity-relationship model, and tuple equality in the relationship model?
8   What are the software components in a client-server DBMS? Compare the two-tier and three-tier client server architecture.
9   What are the differences among hierarchical, network and relational data model?
10   Explain   the   following   with   their   advantages   and   disadvantages:
       (a)   Hierarchical database model

(b)   Network database model
(c)   Relational database model
(d)   E-R data models
(e)   Object-oriented data model.

11   Describe the basic features of the relational data model. Discuss their advantages, disadvantages and importance of the end-user and the designer.

12   A university has an entity COURSE with a large number of courses in its catalog. The attributes of COURSE include COURSE-NO, COURSE-NAME and COURSE-UNITS. Each course may have one or more different courses as prerequisites or may have no prerequisites. Similarly, a particular course may be a prerequisite for any number of course, or may not be a pre-requisite for any other course. Draw an E-R diagram for this situation.

13   A company called M/s ABC Consultants Ltd. has an entity EMPLOYEE with a number of employees having attributes such as EMP-ID, EMP-NAME, EMP-ADD and EMP-BDATA. The company has another entity PROJECT that has several projects having attributes such as PROJ-ID, PROJ-NAME and START-DATE. Each employee may be assigned to one or more projects, or may be assigned to a project. A project must have at least one employee assigned and may have any number of employees assigned. An employee's billing rate may vary by project and the company wishes to record the applicable billing rate (BILL-RATE) for each employee when assigned to a particular project.
By making additional assumptions, if so required, draw an E-R diagram for the above situation.

14   Draw an E-R diagram for an enterprise or an organization you are familiar with.

15   What is meant by the term client/server architecture and what are the advantages and disadvantages of this approach?

16   Differentiate between schema, subschema and instances.

17   An organization purchases items from a number of suppliers. Suppliers are identified by SUP-ID. It keeps track of the number of each item type purchased from each supplier. It also keeps a record of supplier's addresses. Supplied items are identified by ITEM-TYPE and have description (DESC). There may be more than one such address for each supplier and the price charged by each supplier for each item type is stored.
Identify the entities and relationships for this organization and construct an E-R diagram.

18   Define data mining. Explain the knowledge discovery process.

19   Explain the major data mining techniques.

20   What are the applications of data mining? Discuss.

21   Write note on application of data mining in retail industry.

22   Describe how decision trees work. Choose an example and explain how this knowledge discovery process works.

23   What are the basic principles of genetic algorithm? Give an example. Using example illustrate how this technique works.

24   The data warehouse is the best source of data for a data mining operation. Comment.

25   OLAP is user driven. Comment.

26   Consider the following schema:
Suppliers(sid: integer, sname: string, address: string)

Parts(pid: integer, pname: string, color: string)

Catalog(sid: integer, pid: integer, cost: real)

The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL:

i.   Find the pnames of parts for which there is some supplier.

ii.   Find the snames of suppliers who supply every part.

iii.   Find the snames of suppliers who supply every red part.

iv.   Find the pnames of parts supplied by Acme Widget Suppliers and no one else.

v.   Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).

vi.   For each part, find the sname of the supplier who charges the most for that part.

vii.   Find the sids of suppliers who supply only red parts.

viii.   Find the sids of suppliers who supply a red part and a green part.

ix .   Find the sids of suppliers who supply a red part or a green part.

x.   For every supplier that only supplies green parts, print the name of the supplier and the total number of parts that she supplies.

xi.   For every supplier that supplies a green part and a red part, print the name and price of the most expensive part that she supplies.

27   Consider the following relational schema and briefly answer the questions that follow:

Emp(eid: integer, ename: string, age: integer, salary: real)

Works(eid: integer, did: integer, pct time: integer)

Dept(did: integer, budget: real, managerid: integer)

1.   Define a table constraint on Emp that will ensure that every employee makes at least $10,000.

2.   Define a table constraint on Dept that will ensure that all managers have age > 30.

3.   Define an assertion on Dept that will ensure that all managers have age > 30. Compare this assertion with the equivalent table constraint. Explain which is better.

4.   Write SQL statements to delete all information about employees whose salaries exceed that of the manager of one or more departments that they work in. Be sure to ensure that all the relevant integrity constraints are satisfied after your updates.

28   Consider the following relations with underlined primary keys.

Product(P_code, Description, Stocking_date, QtyOnHand, MinQty, Price, Discount, V_code)

Vendor(V_code, Name, Address, Phone)

Here a vendor can supply more than one product but a product is supplied by only one vendor. Write SQL queries for the following :

(i)   List the names of all the vendors who supply more than one product.

(ii)   List the details of the products whose prices exceed the average product price.

(iii)   List the Name, Address and Phone of the vendors who are currently not supplying any product.

29   Consider the following relations:
      Physician (rgno, phyname, addr, phno)
      Patient (ptname, ptaddr)
      Visits(rgno, ptname, dateofvisit, fees-charged)
      Answer the following in SQL :
      (i)   Define the tables. Identify the keys and foreign keys.
      (ii)   Create an assertion that the total fees charged for a patient cannot be more than
              Rs.1000/- assuming that patients can visit the same doctor more than once.
      (iii)   Create a view Patient_visits(name, times) where name is the name of the patient
              and times is the number of visits of a patient.
      (i)   Display the ptname, ptaddr of the patient(s) who have visited more than one
              physician in the month of May 2000 in ascending order of ptname
30   What do you understand by transitive dependencies? Explain with an example any two
      problems that can arise in the database if transitive dependencies are present in the
      database.
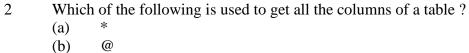
Unit III

I   Test Your Skills:

(a)   State Whether the Following Statements are True or False:

1   In 1980 Dr. E.F. Codd was working with Oracle Corporation.
2   Cardinality of a table means the number of columns in the table.
3   In the RDBMS terminology, an attribute means a column or a field.
4   A candidate key is an attribute that uniquely identify a row in a table.
5   The foreign key and the primary key should be defined on the same underlying domain.
6   Superkey is an attribute, or set of attributes, that uniquely identifies a tuple within a
      relation.
7   A table cannot have more than one attribute, which can uniquely identify the rows.
8   Having clause is equivalent of WHERE clause and is used to specify the search criteria or
      search condition when GROUP BY clause is specified.
9   The DISTINCT keyword is illegal for MAX and MIN.
10   The transaction control statements manage all the changes made by the DML statement.
11   Foreign key in a relation is one arbitrarily chosen from the set of candidate keys of that
      relation.
12   NULL values are sometimes permitted in primary key attributes.
13   Some information is useless.
14   NULL values are sometimes permitted in foreign key attributes.
15   Data independence means each piece of data in the database is independent of other
      pieces.
16   In nested queries, one SELECT statement is written inside another.
17   If HAVING is specified, ORDER BY clause is specified.
18   HAVING clause is used to eliminate groups just as WHERE is used to eliminate rows.
19   ALTER TABLE command enables us to delete columns from a table.
20   In SQL, it is not possible to create local or global temporary tables within a transaction.

Ans. (1)(F), (2)(T), (3)(T), (4)(F), (5)(T), (6)(T), (7)(F), (8)(T), (9)(T), (10)(T), (11)(F), (12)(F), (13)(T), (14)(F), (15)(F), (16)(F), (17)(T), (18)(F), (19)(T), (20)(F)

(b)   Multiple Choice Questions:

1   Who developed SEQUEL?
     (a)   Dr. E.F. Codd
     (b)   Chris Date
     (c)   D.Chamberlain
     (d)   None of these

2   Which of the following is used to get all the columns of a table ?
     (a)   *
     (b)   @
     (c)   %
     (d)   #

3   The first commercial RDBMS is:
     (a)   INGRESS
     (b)   DB2
     (c)   ORACLE
     (d)   None of these.

4   Which of the following is not a DCL statement?
     (a)   Rollback
     (b)   Grant
     (c)   Revoke
     (d)   None of these

5   Which of the following is the result of a select statement?
     (a)   Trigger
     (b)   Index
     (c)   Table
     (d)   None of these

6   Which of the following clause specifies the table or tables from where the data has to be retrieved?
     (a)   Where
     (b)   Table
     (c)   From
     (d)   None of these

7   How many tables can be joined to create a view?
     (a)   1
     (b)   2
     (c)   Database dependent

(d)   None of these

8   Which of the following can be used to get those items that fall within a range?
(a)   IN
(b)   BETWEEN
(c)   DISTINCT
(d)   LIKE

9   Which of the following constitutes a basic set of operations for manipulating relational data?
(a)   Predicate calculus
(b)   Relational algebra
(c)   Relational calculus
(d)   None of the above

10   Which of the following is not a relational algebraic operation that is not form the set theory?
(a)   UNION
(b)   INTERSECTION
(c)   CARTESIAN PRODUCT
(d)   SELECT

11   Which of the following is not a relational algebraic operation that is developed specifically for the relational databases?
(a)   SELECT
(b)   UNION
(c)   JOIN
(d)   PROJECT

12   Which is the symbol used to denote the SELECT operation?
(a)   Sigma
(b)   Rho
(c)   Pi
(d)   None of the above

13   Which of the following operations need the participating relations to be union compatible?
(a)   UNION
(b)   INTERSECTION
(c)   DIFFERENCE
(d)   All of the above

14   What will be the number of columns of CARTESIAN PRODCUT if the participating relations have 5 and 7 columns respectively?
(a)   5
(b)   12

(c)   35

(d)   None of the above

15   What will be the number of columns of CARTESIAN PRODCUT if the participating relations have 5 and 20 rows respectively?
(a)   5
(b)   20
(c)   25
(d)   100

16   Which of the following is the operation that is used if we are interested in only certain attributes or columns of a table?
(a)   SELECT
(b)   PROJECT
(c)   UNION
(d)   JOIN

17   Which of the following is not a procedural language?
(a)   Relational Algebra
(b)   SQL
(c)   Relational calculus
(d)   None of the above

18   Who developed QBE?
(a)   C.J. Date
(b)   E.F. Codd
(c)   M.M. Zloof
(d)   None of the above

19   What is the expansion of QBE?
(a)   Query by Example
(b)   Query by Experiment
(c)   Question before evaluation
(d)   None of the above

20   Who developed Structured English Query Language?
(a)   E.F. Codd
(b)   D. Chamberlain
(c)   Chris Date
(d)   None of the above

21   Which of the following is the first commercial RDBMS?
(a)   DB2
(b)   INGRESS
(c)   ORACLE
(d)   None of the above

22 Which of the following is IBM's first RDBMS?
    (a)   DB2
    (b)   IMS
    (c)   SQL/DS
    (d)   None of the above

23. The ____ is used as a temporary storage area for ORDER BY or GROUP BY operations, as well as for index-creation functions.
    (a)   sort cache
    (b)   SQL cache
    (c)   data cache
    (d)   optimizer mode

24. The DBMS processes queries in three phases; the first is ____.
    (a)   parsing
    (b)   analyzing
    (c)   execution
    (d)   fetching

25. Generally, what will provide the best database client performance in terms of CPU speed?
    (a)   single processor
    (b)   multiple processors
    (c)   the slowest processor
    (d)   the fastest processor

26. Working with data in the data cache is many times faster than working with data in the data files because ____.
    (a)   there is no network access involved
    (b)   the DBMS doesn't have to wait for the hard disk to retrieve the data
    (c)   the DBMS can optimize queries against the cache
    (d)   the data cache contains only a few records from each table

27. When creating a database, in order to optimize performance, put high-usage tables in their own ____.
    (a)   data caches
    (b)   data spaces
    (c)   table caches
    (d)   table spaces

28. Database statistics are stored in the system catalog in specially designated ____.
    (a)   indexes
    (b)   rows
    (c)   table spaces
    (d)   Tables

29. To optimize queries, use simple columns or literals as operands in a conditional expression and avoid the use of conditional expressions with _____ whenever possible.
    (a)   the WHERE clause
    (b)   functions
    (c)   the GROUP BY clause
    (d)   Indexes

30. The architecture of a DBMS is represented by the _____ and structures used to manage a database.
    (a)   tables
    (b)   queries
    (c)   processes
    (d)   Logs

31. The _____ is a shared, reserved memory area that stores the most recently accessed data blocks in RAM.
    (a)   table space
    (b)   extends
    (c)   data cache
    (d)   SQL cache

32. Index _____ is a measure of how likely an index will be used in query processing.
    (a)   statistics
    (b)   connectivity
    (c)   sparsity
    (d)   selectivity

33. A(n) _____ is a logical grouping of several data files that store data with similar characteristics.
    (a)   table space
    (b)   extends
    (c)   data cache
    (d)   SQL cache

34. The majority of current database performance problems are related to _____.
    (a)   not having enough memory on the database server
    (b)   poorly written SQL code
    (c)   improper use of table space
    (d)   old statistics

35 Which type of entity represents a logical generalization whose actual occurrence is represented by a second, associated entity?
    (a)   Supertype entity
    (b)   Subtype entity
    (c)   Archetype entity
    (d)   Instance entity

36   Which of the following is the preferred way to recover a database after a transaction in progress terminates abnormally?
      (a)   Rollback
      (b)   Rollforward
      (c)   Switch to duplicate database
      (d)   Reprocess transactions

37   Concurrency control is important for which of the following reasons?
      (a)   To ensure data integrity when updates occur to the database in a multiuser environment
      (b)   To ensure data integrity when updates occur to the database in a single-user environment
      (c)   To ensure data integrity while reading data occurs to the database in a multiuser environment
      (d)   To ensure data integrity while reading data occurs to the database in a single-user environment

38   The transaction log includes which of the following?
      (a)   The before-image of a record
      (b)   The after-image of a record
      (c)   The before and after-image of a record
      (d)   The essential data of the record

39   Which of the following is **not** true of SQL views?
      (a)   Oracle views cannot use the ORDER BY clause in view definitions.
      (b)   Oracle views are created using the standard SQL-92 CREATE VIEW command.
      (c)   Oracle views can by queried.
      (d)   The SQL-92 standard does not allow the use of the ORDER BY clause in view definitions.

40   Which of the following is NOT an Oracle-supported trigger?
      (a)   BEFORE
      (b)   DURING
      (c)   AFTER
      (d)   INSTEAD OF

41   What is the type of Oracle backup in which all uncommitted changes have been removed from the datafiles?
      (a)   Full backup
      (b)   Consistent backup
      (c)   Inconsistent backup
      (d)   Differential backup

42   Which of the following is true concerning a procedure?
      (a)   You do not create them with SQL.
      (b)   They do not need to have a unique name.
      (c)   They include procedural and SQL statements.

(d)   They are the same thing as a function.

43   A CASE SQL statement is which of the following?
(a)   A way to establish an IF-THEN-ELSE in SQL.
(b)   A way to establish a loop in SQL.
(c)   A way to establish a data definition in SQL.
(d)   All of the above.

44   Which of the following statements is true concerning routines and triggers?
(a)   Both consist of procedural code.
(b)   Both have to be called to operate.
(c)   Both run automatically.
(d)   Both are stored in the database.

Ans.   (1)(d), (2)(a), (3)(a), (4)(a), (5)(c), (6)(c), (7)(a), (8)(c), (9)(b), (10)(d), (11)(b), (12)(a), (13)(d), (14)(b), (15)(d), (16)(b), (17)(c), (18)(c), (19)(a), (20)(b), (21)(d), (22)(c), (23)(a), (24)(a), (25)(d), (26)(b), (27)(d), (28)(d), (29)(b), (30)(c), (31)(c), (32)(d), (33)(a), (34)(b), (35)(c), (36)(a), (37)(a), (38)(d), (39)(a), (40)(b), (41)(b), (42)(c), (43)(a), (44)(a)

(c)   Fill in the Blanks:

1   The relational model is based on the core concept of _____.
2   Degree of the table means the number of _____ in a table.
3   A domain is a set of _____values.
4   The smallest unit of data in the relational model is the individual _____.
5   A _____ is set of possible data values.
6   A table can have only one _____ key.
7   Tuple relational calculus was originally proposed by _____ in _____.
8   SQL was first implemented on a relational database called _____.
9   DROP operation of SQL is used for _____Tables from the schema.
10   The _____clause specifies a summary query.
11   _____ is Oracle's Command Line interpreter.
12   The NUMBER data type is used to store _____ and_____ numbers.
13   The RAW/LONG RAW data types are used to store _____ data.
14   The _____ data type is a Unicode-only type.
15   _____ is used to store variable length alphanumeric data.
16   Oracle uses_____ to store address of each rows of the table.
17   _____ data type is used to represent date and time.
18   The argument p stands for _____ and s stands for _____ in NUMBER data type.
19   _____ holds unstructured binary data.
20   The VARCHAR data type can hold up to _____ characters.
21   The precision of NUMBER data type ranges from ___ to ___ .
22   Character expressions placed within the insert into statement must be enclosed in _____ quotes.
23   VARCHAR is defined _____ standard and VARCHAR2 is defined by _____.
24   RAW data type can have a maximum length of _____bytes.

25   LONG data can be used to store arrays of binary data in _____format.
26   _____is much faster than varchar/varchar2.
27   The standard format for date is _____
28   LONG can be used to store of length up to _____
29   _____values cannot be used in subqueries, functions and expressions.
30   The default value for CHAR data type is ___.
31   The maximum length of data that can be stored by CHAR is _____characters

Ans.   (1)(Relation and set theory), (2)(Number of columns), (3)(Legal or atomic values), (4)(Field), (5)(Field), (6)(Primary), (7)(Dr. Codd, 1972), (8)(System R), (9)(Deleting), (10) (Group by),   (11) (SQL * Plus), (12)(fixed, floating point), (13)(binary), (14)(NCHAR), (15)(VARCHAR), (16)(ROWID), (17)(DATE), (18)(precision, scale), (19)(BLOB), (20)(4000), (21)(1,38), (22)(Single), (23)(ANSI, Oracle),(24)(255), (25)(ASCII), (26)(CHAR), (27)(DD-MON-YY), (28)(2GB), (29)(LONG), (30)(1), (31)(2000)

II   Short Answer Type Questions:

1   Why null values are introduced in the database?
2   What primary characteristics should OID posses?
3   Define the referential integrity constraints in Relational Databases.
4   Why we may choose to define a view?
5   Why can we have only one primary index on a file but several secondary Indexes?
6   What is the retention option in a Network Model?
7   Explain union compatibility of sets?   Name the operations for which the condition must be checked.
8   Name the situation in which DBMS approach is not suitable.
9   If a tablespace has a default pctincrease of zero what will this cause (in relationship to the smon process)?
10   If a tablespace shows excessive fragmentation what are some methods to defragment the tablespace?
11   How can you tell if a tablespace has excessive fragmentation?
12   If following appears on a status report:
       redo log space requests 23
       redo log space wait time 0
       What does it signify? What if redo log space wait time is high? How can you fix this?
13   What can cause a high value for recursive calls? How can this be fixed?
14   If you see a pin hit ratio of less than 0.8 in the estat library cache report is this a problem? If so, how do you fix it?
15   If you see the value for reloads is high in the estat library cache report is this a matter for concern?
16   You look at the dba_rollback_segs view and see that you have a large number of wraps is this a problem?
17   Why are I/O costs important in a DBMS?
18   What is the role of the buffer manager in a DBMS? What is the role of the disk space manager? How do these layers interact with the file and access methods layer?

19   What is an index on a file of records? What is a search key for an index? Why do we need indexes?
20   What is the difference between a clustered index and an unclustered index? If an index contains data records as 'data entries,' can it be unclustered?
21   What is lock thrashing and when does it occur?

III   Long Answer Type Questions:

1   Write SQL statements to perform the following operations on the EMPLOYEE data file of M/s KLY System Ltd., of Table

Table - EMPLOYEE file of M/s KLY System Ltd.

EMPLOYEE							
EMP-NO	EMP-LNAME	EMP-FNAME	SALARY	COUNTRY	BIRTH-CITY	DEPT	TEL.NO.
106519	Mathew	Thomas	4000	India	Mumbai	DP	2431322
112233	Smith	John	4500	Italy	Rome	MFG	2423206
123456	Kumar	Rajeev	6000	India	Delhi	DP	2427982
123243	Martin	Jose	3500	India	Jamshedpur	HR	2437981
109876	Singh	Abhishek	4800	USA	NewYork	MFG	2147008
111222	Parasar	Alka	5100	USA	New Jersey	HR	2145063
165243	Kumar	Avinash	6500	UK	London	MFG	2407841

(a)   Get employee's number, employee's name, and telephone number for all employees of DP Department.
(b)   Get employee's number, employee's name, department and telephone number for all employees of Indian origin.
(c)   Add 250 in the salary of employees belonging to USA.
(d)   Remove all records of employees getting salary of more than 6000.
(e)   Add new employee details, whose details are as follows: employee no.: 106520, last name: Joseph, first name: Gorge, Salary: 8200, country: AUS, birth place: Melbourne, department: DP, and telephone no.: 334455661

2   Consider the following relational schema
        Account (account-number, branch-name, balance)
        Loan (Loan-number, branch-name, balance)
        Depositor (Customer-name, Account-number)
        Borrower (Customer-name, Loan-number)
        Write queries in SQL for the following:
        (a)   Find all loan numbers for loan made at Bombay branch.
        (b)   Find all customers who have both a loan and an account at the bank.
        (c)   Find the average account balance at each branch.
        (d)   Find the number of depositors at each branch.
3   (a)   How is traditional file processing approach different than DBMS approach? Explain.
        (b)   Why can we have only one primary index on a file but several secondary indexes?

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(c)   Define the terms: DDL, DML and DCL.

4   A tablespace has a table with 30 extents in it. Is this bad? Why or why not?

5   How do you set up tablespaces during an Oracle installation?

6   You see multiple fragments in the SYSTEM tablespace, what should you check first?

7   What are some indications that you need to increase the SHARED_POOL_SIZE parameter?

8   What is the general guideline for sizing db_block_size and db_multi_block_read for an application that does many full table scans?

9   What is the fastest query method for a table?

10   Explain the use of TKPROF? What initialization parameter should be turned on to get full TKPROF output?

11   When looking at v$sysstat you see that sorts (disk) is high. Is this bad or good? If bad, how do you correct it?

12   When should you increase copy latches? What parameters control copy latches?

13   Where can you get a list of all initialization parameters for your instance? How about an indication if they are default settings or have been changed?

14   Describe hit ratio as it pertains to the database buffers. What is the difference between instantaneous and cumulative hit ratio; which should be used for tuning?

15   Discuss row chaining, how does it happen? How can you reduce it? How do you correct it?

16   When looking at the estat events report you see that you are getting busy buffer waits. Is this bad? How can you find what is causing it?

17   If you see contention for library caches how can you fix it?

18   If you see statistics that deal with "undo" what are they really talking about?

19   Explain how data retrieval, insertion and deletion are done using B tree and B+ tree indices.

20   Explain static hash function. What is the need for dynamic hash function?

21   Discuss the alternatives available for quick processing of multiple key access queries.

22   Discuss the various strategies for processing a three way join query.

23   Discuss the 2PC(2 Phase commitment) Protocol, and its significance.

Unit IV

I   Test Your Skills:

(a)   State Whether the Following Statements are True or False:

1   With failure transparency, all of the actions of a transaction are committed or none of them are committed.

2   Each site (or node) in a distributed system is subject to the same types of failure as in a centralized system..

3   Replication may use either synchronous or asynchronous distributed database technologies, although asynchronous technologies are more typical in a replicated environment.

4 Synchronization for pull replication is less disruptive and occurs only when needed by each site, not when a central master site thinks it is best to update.

5 With asynchronous technology, if any copy of a data item is updated anywhere on the network, the same update is immediately applied to all other copies or it is aborted.

6 Databases that are stored on computers at multiple locations and are not interconnected by a network are known as distributed databases

7 An increasingly popular option for data distribution as well as for fault tolerance of any database is to store a separate copy of the database at each of two or more sites.

8 Asynchronous technology can result in unsatisfactorily slow response time because the distributed DBMS is spending considerable time checking that an update is accurately and completely propagated across the network.

9 A distributed unit of work allows various statements within a unit of work to refer to multiple remote DBMS locations.

10 The purpose of timestamping is to avoid the use of locks.

11 Data replication is favored where most process requests are read-only and where the data are relatively static.

12 The cost to perform a snapshot refresh may depend on whether the snapshot is simple or complex.

13 The semijoin approach saves network traffic.

14 In a semijoin, only the joining attribute is sent from one site to another, and then only the required rows are returned.

15 The problem of concurrency control is more complex in a distributed database.

Ans. (1)(T), (2)(T), (3)(T), (4)(T), (5)(F), (6)(F), (7)(T), (8)(F), (9)(T), (10)(T), (11)(T), (12)(T), (13)(T), (14)(T), (15)(T)

(b)   Multiple Choice Questions:

1 A distributed database has which of the following advantages over a centralized database?
   (a)   Software cost
   (b)   Software complexity
   (c)   Slow Response
   (d)   Modular growth

2 An autonomous homogenous environment is which of the following?
   (a)   The same DBMS is at each node and each DBMS works independently.
   (b)   The same DBMS is at each node and a central DBMS coordinates database access.
   (c)   A different DBMS is at each node and each DBMS works independently.
   (d)   A different DBMS is at each node and a central DBMS coordinates database access.

3 A transaction manager is which of the following?
   (a)   Maintains a log of transactions
   (b)   Maintains before and after database images

(c)   Maintains appropriate concurrency control
(d)   All of the above

4   Location transparency allows for which of the following?
(a)   Users to treat the data as if it is at one location
(b)   Programmers to treat the data as if it is at one location
(c)   Managers to treat the data as if it is at one location
(d)   All of the above.

5   A heterogeneous distributed database is which of the following?
(a)   The same DBMS is used at each location and data are not distributed across all nodes.
(b)   The same DBMS is used at each location and data are distributed across all nodes.
(c)   A different DBMS is used at each location and data are not distributed across all nodes.
(d)   A different DBMS is used at each location and data are distributed across all nodes.

6   Some of the columns of a relation are at different sites is which of the following?
(a)   Data Replication
(b)   Horizontal Partitioning
(c)   Vertical Partitioning
(d)   Horizontal and Vertical Partitioning

7   Which of the following is true concerning a global transaction?
(a)   The required data are at one local site and the distributed DBMS routes requests as necessary.
(b)   The required data are located in at least one nonlocal site and the distributed DBMS routes requests as necessary.
(c)   The required data are at one local site and the distributed DBMS passes the request to only the local DBMS.
(d)   The required data are located in at least one nonlocal site and the distributed DBMS passes the request to only the local DBMS

8   A homogenous distributed database is which of the following?
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(c)   A different DBMS is used at each location and data are not distributed across all nodes.
(d)   A different DBMS is used at each location and data are distributed across all nodes.

9   Replication should be used when which of the following exist?
(a)   When transmission speeds and capacity in a network prohibit frequent refreshing of large tables.

(b)   When using many nodes with different operating systems and DBMSs and database designs.

(c)   The application's data can be somewhat out-of-date.

(d)   All of the above.

10   Storing a separate copy of the database at multiple locations is which of the following?
     (a)   Data Replication
     (b)   Horizontal Partitioning
     (c)   Vertical Partitioning
     (d)   Horizontal and Vertical Partitioning

11   A distributed database is which of the following?
     (a)   A single logical database that is spread to multiple locations and is interconnected by a network
     (b)   A loose collection of file that is spread to multiple locations and is interconnected by a network
     (c)   A single logical database that is limited to one location.
     (d)   A loose collection of file that is limited to one location.

12   A semijoin is which of the following?
     (a)   Only the joining attributes are sent from one site to another and then all of the rows are returned.
     (b)   All of the attributes are sent from one site to another and then only the required rows are returned.
     (c)   Only the joining attributes are sent from one site to another and then only the required rows are returned.
     (d)   All of the attributes are sent from one site to another and then only the required rows are returned.

13   Which of the following is a disadvantage of replication?
     (a)   Reduced network traffic
     (b)   If the database fails at one site, a copy can be located at another site.
     (c)   Each site must have the same storage capacity.
     (d)   Each transaction may proceed without coordination across the network.

14   A distributed database can use which of the following strategies?
     (a)   Totally centralized at one location and accessed by many sites
     (b)   Partially or totally replicated across sites
     (c)   Partitioned into segments at different sites
     (d)   All of the above

15   Which of the following is not one of the stages in the evolution of distributed DBMS?
     (a)   Unit of work
     (b)   Remote unit of work
     (c)   Distributed unit of Work
     (d)   Distributed request

16   A distributed database is which of the following?
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        (c)   Vertical Partitioning
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        (c)   Vertical Partitioning
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(c) The application's data can be somewhat out-of-date.
(d) All of the above.

30 A transaction manager is which of the following?
(a) Maintains a log of transactions
(b) Maintains before and after database images
(c) Maintains appropriate concurrency control
(d) All of the above.

31 Using the SQL GROUP BY phrase with a SELECT statement can help detect which of the following problems?
(a) The multivalue, multicolumn problem
(b) The inconsistent values problem
(c) The missing values problem
(d) The general-purpose remarks column problem

32 What SQL command will allow you to change the table STUDENT to add the constraint named GradeCheck that states that the values of the Grade column must be greater than 0?
(a) ALTER TABLE STUDENT ALTER CONSTRAINT GradeCheck (Grade > 0);
(b) ALTER TABLE STUDENT ADD CONSTRAINT GradeCheck (Grade > 0);
(c) ALTER TABLE STUDENT ADD CONSTRAINT GradeCheck CHECK (Grade > 0);
(d) None of the above is correct.

33 The NOT EXISTS keyword will be true if:
(a) any row in the subquery meets the condition.
(b) all rows in the subquery fail the condition.
(c) both of these two conditions are met.
(d) neither of these two conditions is met.

34 Changing cardinalities in a database is:
(a) a common database design task.
(b) a rare database design task, but does occur.
(c) a database design task that never occurs.

(d)   is impossible to do, so a new database must be constructed and the data moved into it.

35   Which one of the following sorts rows in SQL?
(a)   SORT BY
(b)   ALIGN BY
(c)   ORDER BY
(d)   GROUP BY

36   The SQL keyword(s) _____ is used with wildcards.
(a)   LIKE only
(b)   IN only
(c)   NOT IN only
(d)   IN and NOT IN

37   If a relationship has a cascade updates constraint, then if _____ in the parent table is changed, then the same change will automatically be made to any corresponding foreign key value.
(a)   the primary key
(b)   any alternate key
(c)   a surrogate key
(d)   a foreign key

38   For every relationship, how many possible types of actions are there when enforcing minimum cardinalities?
(a)   Two
(b)   Three
(c)   Four
(d)   Six

39   In creating a procedure, you may get a message if you have compile errors. Which of the following is true?
(a)   The line numbers reported match the line numbers you see in your text editor.
(b)   SQL*Plus will automatically show the errors to you.
(c)   To see the errors, enter SHOW ERRORS in SQL*Plus.
(d)   If there are no syntax errors, you will receive the message "NO ERRORS."

40   Which of the following is not true about indexes?
(a)   Indexes are created to enforce uniqueness on columns.
(b)   Indexes are created to enable fast retrieval by column values.
(c)   Columns that are frequently used with equal conditions in WHERE clauses are good candidates for indexes.
(d)   Indexes are created with the ALTER TABLE command.

Ans.   (1)(d), (2) (a), (3)(d), (4)(d), (5)(d),(6)(c), (7)(b), (8)(b), (9)(c), (10)(a), (11)(a) (12)(c), (13)(c), (14)(d), (15)(a), (16)(a), (17)(a), (18)(c), (19)(d), (20)(d), (21)(b) (22)(d), (23)(d),

(24)(c), (25)(b), (26)(c), (27)(a), (28)(a), (29)(c), (30)(d), (31)(b), (32)(c), (33)(b), (34)(a), (35)(c), (36)(a), (37)(a), (38)(d), (39)(c), (40)(d)

II   Short Answer Type Questions:

1. What is distributed database? Explain with a neat diagram.
2. What are the main advantages and disadvantages of distributed databases?
3. Differentiate between parallel and distributed databases.
4. What are the desired properties of distributed databases?
5. What do you mean by architecture of a distributed database system? What are different types of architectures? Discuss each of them with neat sketch.
6. What is client/server computing? What are its main components?
7. Discuss the benefits and limitations of client/server architecture of the DDBS.
8. What are the various types of distributed databases? Discuss in detail.
9. What are homogeneous DDBSs? Explain in detail with an example.
10. What are heterogeneous DDBSs? Explain in detail with an example.
11. What do you mean by distributed database design? What strategies and objectives are common to most of the DDBMSs?
12. What is a fragment of a relation? What are the main types of data fragments? Why is fragmentation a useful concept in distributed database design?
13. What is horizontal data fragmentation? Explain with an example.
14. What is vertical data fragmentation? Explain with an example.
15. What is mixed data fragmentation? Explain with an example.
16. Consider the following relation
EMPLOYEE (EMP, NAME, ADDRESS, SKILL, PROJ-ID)

    EQUIPMENT (EQP-ID, EQP-TYPE, PROJECT)

    Suppose that EMPLOYEE relation is horizontally fragmented by PROJ-ID and each fragment is stored locally at its corresponding project site. Assume that the EQUIPMENT relation is stored in its entirely at the Tokyo location. Describe a good strategy for processing each of the following queries:
    (a) Find the join of relations EMPLOYEE and EQUIPMENT.
    (b) Get all employees for projects using EQP-TYPE as "Welding machine".
    (c) Get all machines being used at the Mumbai Project.
    (d) Find all employees of the project using equipment number 110.
17. For each of the strategy of the previous question, state how your choice of a strategy depends on:
    (a) The site at which the query was entered.
    (b) The site at which the result is desired.
18. What is data replication? Why is data replication useful in DDBMSs? What typical units of data replicated?
19. What is data allocation? Discuss.
20. Write short notes on the following:
    (a) Distributed Database
    (b) Data Fragmentation

   (c) Data Allocation
   (d) Data Replication
   (e) Two-phase Commit
   (f) Three-phase Commit
   (g) Timestamping
   (h) Distributed Locking
   (i) Semi-JOIN
   (j) Distributed Deadlock.
21. Contrast the following terms:
   (a) Distributed database and parallel database.
   (b) Homogeneous database and heterogeneous database.
   (c) Horizontal fragmentation and vertical fragmentation.
   (d) Distributed data independence and distributed transaction atomicity.
22. What do you mean by data replication? What are its advantages and disadvantages?
23. What is distributed database query processing? How is it achieved?
24. What is semi-JOIN in a DDBS query processing? Explain with an example.
25 What is the difference between a homogeneous and a heterogeneous DDBS? Under what circumstances would such systems generally arise?
26. Discuss the issues that have to be addressed with distributed database design.
27. What is middleware system architecture? Explain with a neat sketch and an example.
28. What is an embedded SQL? Explain with the help of an example.
29 What are the steps in query processing?
30 What is Authorization and Authentication in Oracle?
31 Define strict two phase locking protocol.
32 Explain atomicity of a transaction.

III Long Answer Type Questions:

1 Explain the advantages & disadvantages of distributed database.
2 Explain in detail DDBMS Architecture.
3 Explain about Architectural Models for DDBMS.
4 Explain about DBMS Standardization? Give Examples.
5 What are the distribution design issues? Explain with examples.
6 Explain Fragmentation with suitable examples.
7 Explain allocation model.
8 Explain views in centralized DBMSs with examples.
9 Explain the failures in DDBMS.
10 Explain by means of a diagram the interface between the local recovery manager & buffer manager.
11 Draw a diagram for fully memory hierarchy managed by LRM and BM.
12 Draw a diagram of state transactions in 3PC protocols.
13 Explain briefly about network partitioning.
14 Explain general architecture of a parallel database system & shared memory architecture.

15   Explain through diagrams the following
16   Shared disk architecture.
17   Shared nothing architecture.
18   Hierarchical architecture.
19   Cache-only memory architecture.
20   Explain about parallel execution for hierarchical architecture.
21   How do we achieve concurrency control in a distributed database system? What should be the characteristics of a good concurrency control mechanism?
22   How do we achieve recovery control in a distributed database system?
23   What is distributed locking? What are its advantages and disadvantages?
24   Differentiate between deadlock and time stamping.
25   Explain the functioning of two-phase and three-phase commit protocols used in recovery control of distributed database system.
26   Describe how a typical lock manager is implemented. Why must lock and unlock be atomic operations? What is the difference between a lock and a latch? What are convoys and how should a lock manager handle them?
27   Contrast the timestamps assigned to restarted transactions when timestamps are used for deadlock prevention versus when timestamps are used for concurrency control.
28   How does the recovery manager ensure atomicity of transactions? How does it ensure durability?
29   Discuss the various concurrency control protocols.
30   What is serializability? What are its types? What is a serializable schedule? Give examples.

QUESTION BANK

MULTIMEDIA TECHNOLOGIES

MCA 313

QUESTION BANK
MULTIMEDIA TECHNOLOGIES - MCA - 313
MCA -V

UNIT – I

I   **Test Your Skills:**
(a)   **State Whether the Following Statements are True or False:**

1   Non linearity is the capability of jumping from one position to another without delay.
2   Integrity is a characteristic of multimedia.
3   For building a multimedia application a minimum of 6 MB RAM is required.
4   Editing software's are used to manipulate media components to suit the developer's requirements.
5   Authoring software's are used to disintegrate the edited media.
6   A (n) bitmap graphic is composed of a grid of dots.
7   In multimedia project, a storyboard details the text, graphics, audio, video, animation, interactivity and other that should be used in each screen of the project.
8   In TV transmission, picture signal is frequency modulated
9   Adding animation to objects on your slides not only controls the flow of information, but adds interest to your presentation.
10   Images included in many software titles are called clipart's.

Ans.   (1)(T), (2)(T), (3)(F), (4)(T), (5)(F), (6)(T), (7)(T), (8)(F), (9)(T), (10)(T)

(b)   **Multiple Choice Questions:**

1   Multimedia is
       (a)   Combination of text, art, sound
       (b)   Art only
       (c)   Text only
       (d)   Sound only

2   CD-ROM refers to
       (a)   Compact disk Read only memory
       (b)   Collaborative disk read only memory
       (c)   None of the above
       (d)   Compact disk referred only memory

3   A multimedia Team consists of:
       (a)   Artist
       (b)   Interface designer
       (c)   Script writer
       (d)   All of the above

4   To build multimedia application we require

(a) Hardware
(b) Software
(c) Talent and Skill
(d) All of the above

5   A prototype satisfies:
(a) Minimal Requirements
(b) All requirements
(c) No Requirement
(d) All of the above.

6   Which category for changing SmartART Graphics colors is NOT correct?
(a) Accent
(b) Colorful
(c) Format
(d) Primary Theme Colors

7   Which of these is not likely to be the responsibility of a multimedia project?
(a) Create interfaces
(b) Ensure the visual consistency of the project
(c) Structure content
(d) Create budgets and timelines for the project
(e) Select media types for content.

8   MIDI stands for:
(a) Musical Instrument Digital Interface
(b) Musical Instrument Digital Instruction
(c) MP3 Instrument Digital Interface
(d) Musical Instrument Design Interface
(e) Multimedia Instrument Digital Interface.

9   Metal Molds for mass-producing CDs are known as:
(a) Father
(b) Mothers
(c) Sons
(d) Sisters
(e) Brothers.

10   In the top level Domains, .nom specifies:
(a) Commercial entities
(b) Personal sites
(c) non government organizations
(d) cooperatives
(e) online companies and business.

11   Interleaving the audio and video segments of a video clip together in a data file is:
        (a)   Flare
        (b)   Flattening
        (c)   Hot Spot
        (d)   Helical Scan
        (e)   Father

12   Multimedia represents_____ tool
        (a)   Card Based
        (b)   Page Based
        (c)   Time Based
        (d)   Icon Based
        (e)   Event Driven.

13   Space between lines:
        (a)   Leading
        (b)   Kerning
        (c)   Extrude
        (d)   Expanded
        (e)   Font Mapping.

14   The visual representation of a project that includes a table of contents as well as a chart of
        the logical flow of the interactive interface is often called
        (a)   A master layout
        (b)   A navigation map
        (c)   A workflow diagram
        (d)   A prototype
        (e)   A synthesizer.

15   ITC Franklin Gothic specifies:
        (a)   Style
        (b)   Visual Effect
        (c)   Color
        (d)   Font
        (e)   Dimension.

16   Hardware that creates sound from a mathematical representation
        (a)   Sound Synthesizer
        (b)   Stampers
        (c)   Speaker
        (d)   Sons
        (e)   Set top box.

17   _____ refers to any type of application or presentation that involves more than
        one type of media, such as text, graphics, video, animation, and sound.
        (a)   An executable file

(b)   Desktop publishing
(c)   Multimedia
(d)   Hypertext

18   One of the disadvantages of multimedia is:
(a)   cost
(b)   adaptability
(c)   usability
(d)   relativity

19   The text color in a presentation should contrast with the _____ color.
(a)   CPU
(b)   frame
(c)   stack
(d)   background

20   Images included in many software titles are called _____.
(a)   clipart
(b)   popups
(c)   .jpg files
(d)   .tiff files

21   A smaller version of an image is called a:
(a)   clipart
(b)   bitmap
(c)   portable network graphic
(d)   thumbnail

22   The process of planning your multimedia presentation is known as a:
(a)   design
(b)   storyboard
(c)   development
(d)   layout

23   In slide _____ view, you see the entire presentation displayed in miniature. This view is used to arrange the slides in your presentation, as well as, to add animations, transitions and timing.
(a)   arranger
(b)   creator
(c)   shaper
(d)   sorter

24   The slide _____ controls text characteristics, background color and special effects, such as shadowing and bullet style.
(a)   presentation
(b)   master

(c)   show
(d)   sorter

25   Designed to create a particular look, a _____ contains color schemes, slide and title masters with custom formatting and fonts styles.
(a)   template
(b)   presentation
(c)   slide
(d)   background

26   Adding _____ to objects on your slides not only controls the flow of information, but adds interest to your presentation.
(a)   background
(b)   transition
(c)   animation
(d)   popups

27   The _____ master controls the format and placement of the titles and text you type on slides, as well as, background items and graphics you want to appear on every slide.
(a)   slide
(b)   copyright
(c)   layout
(d)   design

28   The first slide in a presentation is usually reserved for the _____.
(a)   introduction
(b)   author
(c)   master
(d)   title

29   _____ is the special effect used to introduce each slide in a slide presentation.
(a)   Animation
(b)   Bulleting
(c)   Transition
(d)   Mapping

30   Notes that include the slide as well as key comments and points you may want to emphasis while you present your slide show are know as:
(a)   speaker handouts
(b)   speaker notes
(c)   student notes
(d)   cheat sheet

31   Which of the following is NOT a video file extension?
(a)   MP4
(b)   AVI

(c)   QT
(d)   JPG
(e)   MOV

32   A multimedia file
     (a)   is same as any other regular file
     (b)   must be accessed at specific rate
     (c)   stored on remote server can not be delivered to its client
     (d)   none of the mentioned

33   In which type of streaming multimedia file is delivered to the client, but not shared?
     (a)   real-time streaming
     (b)   progressive download
     (c)   compression
     (d)   none of the mentioned

34   Which one of the following is the characteristic of a multimedia system?
     (a)   high storage
     (b)   high data rates
     (c)   both (a) and (b)
     (d)   none of the mentioned

35   The delay that occur during the playback of a stream is called
     (a)   stream delay
     (b)   playback delay
     (c)   jitter
     (d)   event delay

36   CineBlitz multimedia server supports
     (a)   real time clients
     (b)   non-real time clients
     (c)   both (a) and (b)
     (d)   none of the mentioned

37   Multimedia system require hard real time scheduling
     (a)   to ensure critical tasks will be serviced within timing deadlines
     (b)   to deliver the media file to the client
     (c)   to minimize the delay
     (d)   for security

38   Video is represented as a series of images formally known as:
     (a)   pics
     (b)   Shots
     (c)   frames
     (d)   snaps

39   Multimedia files stored on a remote server are delivered to a client across the network using a technique known as:
      (a)   download
      (b)   streaming
      (c)   flowing
      (d)   leaking

40   The two types of streaming techniques are:
      (a)   progressive download
      (b)   regular download
      (c)   real time streaming
      (d)   virtual time streaming

41   In which type of streaming multimedia file is delivered to the client, but not shared?
      real-time streaming
      (a)   progressive
      (b)   download
      (c)   compression
      (d)   none of the mentioned

42   Which one of the following is the characteristic of a multimedia system?
      (a)   high storage
      (b)   high data rates
      (c)   both (a) and (b)
      (d)   none of the mentioned

43   In Real Time Interactive Audio Video, data are stored in buffer at a possibly variable
      (a)   Pixels
      (b)   Packets
      (c)   Rates
      (d)   Bytes

44   Purpose of dividing picture into blocks is to decrease number of
      (a)   Channels
      (b)   Pixels
      (c)   Calculations
      (d)   Frames

45   For speech, we need to compress digitize signals at
      (a)   128 Khz
      (b)   256 Khz
      (c)   64 Khz
      (d)   1152 Khz

46   Perceptual encoding is based on science of
      (a)   Frames

     (b)   Music
     (c)   Rhythm
     (d)   psychoacoustics

47   Primary Colors for Color TV are
     (a)   Blue, White, Black
     (b)   Red, Green, Yellow
     (c)   Red, Green, Black
     (d)   Red, Green, Blue

48   Multimedia system require hard real time scheduling
     (a)   to ensure critical tasks will be serviced within timing deadlines
     (b)   to deliver the media file to the client
     (c)   to minimize the delay
     (d)   for security

49   Real time streaming protocol is used
     (a)   to control streaming media servers
     (b)   for establishing and controlling media sessions between endpoints
     (c)   to provide real time control of playback of media files from the server
     (d)   all of the mentioned

50   If the swap space is simply a large file, within the file system, _____ used to create it, name it and allocate its space.
     (a)   special routines must be
     (b)   normal file system routines can be
     (c)   normal file system routines cannot be
     (d)   swap space storage manager is

Ans.   (1)(a), (2)(a), (3)(d), (4)(d), (5)(a), (6)(c), (7)(d), (8)(a), (9)(c), (10)(b), (11)(b), (12)(c), (13)(a), (14)(b), (15)(d), (16)(a), (17)(c), (18)(a), (19)(d), (20)(a), (21)(d), (22)(c), (23)(d), (24)(b), (25)(a), (26)(c), (27)(d), (28)(d), (29)(c), (30)(b), (31)(d), (32)(b), (33)(a), (34)(c), (35)(c), (36)(c), (37)(a), (38)(c), (39)(b), (40)(a, c), (41)(a), (42)(c), (43)(c), (44)(c), (45)(c), (46)(d), (47)(d), (48)(a), (49)(d), (50)(b)

(c)   Fill in the Blanks:

1   ODA refers to _____
2   _____is an application of Multimedia.
3   _____is referred to as how fast a particle oscillates in the path of wave.
4   DVD refers to _____
5   _____depicts artificial or imaginary scenarios.
6.   When a program assigns 8 bits to a pixel, that pixel can display one of up to _____ different shades of gray.
7   RGB stands for_____
8   DAT is acronym for_____

Ans.   (1)(open document architecture), (2)(Entertainment), (3)(Frequency), (4)(Digital Versatile Disk), (5)(Animation), (6)(256), (7)(Red, Green, Blue), (8)(Digital Audio Tape)

II   Short Answer Type Questions:

1   Discuss the uses of multimedia.
2   Define Multimedia.
3   Discuss some of the characteristic of a multimedia application.
4   Describe some of the important criteria required for promoting multimedia technology.
5   Distinguish between
        (i)   Image and graphics
        (ii)   Video and animation
6   What is meant by a multimedia presentation?
7   Distinguish between author and audience.
8   State the responsibilities of a multimedia designer?
9   What is the role of a project manager in developing multimedia application?
10   Why are multimedia projects most frequently performed by teams?
11   Discuss ODA.
12   Write short note on Multimedia Hardware.
13   Write short note on authoring tools.
14   Write short note on CD ROM.
15   Whose responsibility is it to ensure hat the team operates effectively.
16   What is the role of testing and feedback stage in improving the quality of presentation?
17   Discuss the main consideration for the final delivery phase for CD-ROM based distribution and a web based distribution.
18   Write short note on Multimedia Highway.
19   Distinguish between multimedia production and playback.
20   Discuss why multimedia skill set is different from other skill set.
21   Define FDA
22   Explain the role of audio and video specialist in a MM team
23   Distinguish between card and page based authoring tool.
24   What is pixmap?
25   What is resolution?
26   What is horizontal retrace of the electron beam?
27   List out the merits and demerits of DVST?
28   What are the key characteristics of a Multimedia System?
29   Briefly describe eight hardware or software features that a Multimedia System should possess.
30   Define term Media Games.
31   List and describe the major multimedia hardware peripherals

III   Long Answer Type Questions:

1   Discuss in detail the steps involved in creating a multimedia presentation.
2   Explain any five uses of multimedia in detail.
3   Discuss in detail the stages in a MM project.

4   What does a multimedia team comprise of? Describe in detail are the members involved.

5   You are a team leader who has been given six months to produce a MM title that will demonstrate your company's capabilities. Write a brief outline describing the timeline and the possible costs associated with the four stages of project. Justify your estimates.

6   Locate three websites and locate the credits. How many members were on the team? What were their titles? How many team members performed more than one role? What tasks were outsourced?

7   Contact a local multimedia development company. Ask them what kinds of products they develop and whether they would describe two projects they have recently completed.

8   Explain the concept of frequency domain analysis in detail. Also state its importance.

9   Explain in detail the various phases involved in the testing phase.

10   "There are various kinds of hardware and software's required for making a good MM presentation" Comment.

11   Give a comparative study of various authoring tools. Also include their application areas.

12   How Video controller is used?

13   What key features of Quicktime have led to its adoption and acceptance as an international multimedia format?

14   What is multimedia? What are its application areas? Discuss the role of multimedia technology in the field of education?

UNIT – II

I   Test Your Skills:

(a)   State Whether the Following Statements are True or False:

1   In lossy compression, there is no loss of bits.
2   Cell Animation is a type of animation.
3   Huffman coding is a lossless compression technique.
4   RTF refers to rich text format.
5   JPEG refers to Joint Picture Experts Group.
6   In animation, movements can draw attention.
7   In animation, a key frame is a frame in which the artwork differs from that of the previous frame
8   Codec is any acronym for coder-decoder
9   A graphic image file name is tree.eps
10   Audio compression can be used for Speech or Music.

Ans.   (1)(F), (2)(T), (3)(T), (4)(F), (5)(F), (6)(T), (7)(T), (8)(T), (9)(F), (10)(T)

(b)   Multiple Choice Questions:

1   CODEC refers to
     (a)   Coder Decoder
     (b)   A Software System
     (c)   A Multimedia Application
     (d)   None of the above

2   Text can be a
       (a)   Unformatted Text
       (b)   Formatted Text
       (c)   Hypertext
       (d)   All of the Above.

3   A digital camera converts
       (a)   Digital image to real image
       (b)   Real image to digital
       (c)   Digital to analog
       (d)   Real to analog

4   IN CMYK model, the primary colors are
       (a)   Cyan, Magenta and Yellow
       (b)   Chrome, Magenta, Yellow
       (c)   Cyan, Marigold and Yellow
       (d)   None of the Above.

5   Loudness is measured in
       (a)   Decibel
       (b)   Hertz
       (c)   Ampere
       (d)   Watt

6   Pixels are:
       (a)   Dots of ink from an inkjet printer.
       (b)   Dots on a computer screen arranged in rows.
       (c)   Points of light used by a cordless, wireless, optical mouse.
       (d)   Points on the end of a PDA handheld device

7   A bit can contain one of two possible values:
       (a)   0 or 1.
       (b)   0 or 256.
       (c)   1 or 2.
       (d)   A or B.

8   The density of pixels on a screen is known as:
       (a)   Resolution
       (b)   Pixility
       (c)   Pixel depth
       (d)   "jaggies"

9   In _____, Gugliemo Marconi sent his first wireless radio transmission at
       Pontecchio, Italy.
       (a)   1890
       (b)   1895

(c)   1990
(d)   1898

10   _____ can be incorporated into a multimedia project in the form of photographs
or designs.
(a)   Graphics
(b)   Sound
(c)   Moving images
(d)   None of the above

11   Graphics that contain movement are often referred to as _____.
(a)   Animation
(b)   Motion
(c)   Premier Adobe
(d)   Flash

12   _____is principally comprised of tone, line and (sometimes) an awareness
of 'perspective' (the illusion of three-dimensional space).
(a)   Diagram
(b)   Chatting
(c)   Drawing
(d)   None of the above

13   A _____ has length, width, tone, and texture.
(a)   Point
(b)   Colour
(c)   Line
(d)   None of the above

14   _____refers to the surface quality of an actual or represented substance.
(a)   Drawing
(b)   Mass
(c)   Shading
(d)   Texture

15   _____is the degree of purity of a hue.
(a)   Saturation
(b)   Chroma
(c)   Shade
(d)   None of the above

16   _____ is the color of nature, fertility and life.
(a)   White
(b)   Yellow
(c)   Dark blue
(d)   Green

17   The _____model is based on the light-absorbing quality of ink printed on paper.
    (a)   RGB model
    (b)   HSB model
    (c)   CMYK
    (d)   None of the above

18   _____is the design and use of typefaces as a means of visual communication from calligraphy to the ever-developing use of digital type.
    (a)   Typing
    (b)   Typology
    (c)   Typography
    (d)   Extreme kerning

19   _____refers to scaling the size of type in a non-uniform manner by making alterations in character shapes and spacing.
    (a)   Optical scaling
    (b)   Tracking
    (c)   Kerning
    (d)   None of the above

20   _____ is the art of writing script in such a way as to express the beauty of what is being written in the formation of the letters themselves.
    (a)   TrueType
    (b)   Calligraphy
    (c)   TTF
    (d)   Legibility

21   _____ is used to create eye movement and direction.
    (a)   Symmetry
    (b)   Balance
    (c)   Rhythm
    (d)   None of the above

22   _____ is a matter of relationships namely relationships of height, width, depth and surrounding space.
    (a)   Unity
    (b)   Proportion
    (c)   Emphasis
    (d)   Rhythm

23   The amount of open space around an object creates a factor called _____.
    (a)   Design
    (b)   Harmony
    (c)   Scale
    (d)   Gravity

24   _____ is defined as the number of pixels displayed per unit of printed length in an image and is typically measured in pixels per inch.
   (a)   Image resolution
   (b)   Image size
   (c)   Monitor resolution
   (d)   Output resolution

25   JPG compression analyzes images in blocks of _____pixels in size and selectively reduces the detail within each block.
   (a)   8X16
   (b)   16X16
   (c)   8X8
   (d)   4X4

26   The number of pixels or dots displayed per unit of length on the monitor, usually measured in _____.
   (a)   lines per meter (lpm)
   (b)   dots per meter (dpm)
   (c)   dots per centimetre(dpc)
   (d)   dots per inch (dpi)

27   JPEG stands for
   (a)   Joint Photographic Experts Grade
   (b)   Joint Photo Experiment Group
   (c)   Joint Photographic Enlarge Group
   (d)   Joint Photographic Experts Group

28   _____ formats is a cross-platform format used for time-based data, such as video and audio.
   (a)   Raw
   (b)   QuickTime Movie
   (c)   Scitex Continuous Tone
   (d)   PIXAR

29   Which of the following statements are true?
   i. The concept of animation is a key component of news media.
   ii. GIF (Graphics Interchange Format) is another software product that can be utilized to program animation.
   iii. A network that generates a hotspot basically consists of a wireless router and handset.
   iv. All wireless networks generate RF waves and hotspots.
   (a)   i and iii
   (b)   i, ii and iii
   (c)   ii and iv
   (d)   ii and iii

30   _____signifies space whereby objects are located in front of one another and
       _____ signifies space whereby modelling is done with light and dark shades.
       (a)   Overlap, Shading
       (b)   Linear perspective, Shading
       (c)   Shading, Overlap,
       (d)   Overlap, Linear perspective

31   A media file containing audio or video is downloaded and stored on the client's local file
      system in :
      (a)   progressive download
      (b)   regular download
      (c)   real time streaming
      (d)   virtual time streaming

32   Progressive download is most useful for:
      (a)   short video clips
      (b)   long video clips
      (c)   extremely long and high quality videos
      (d)   None of these

33   The media file is streamed to the client but is only played and not stored by the client in:
      (a)   progressive download
      (b)   regular download
      (c)   real time streaming
      (d)   virtual time streaming

34   Real time streaming is most useful for :
      (a)   short video clips
      (b)   long video clips
      (c)   extremely short and low quality videos
      (d)   None of these

35   The faster the frames are displayed:
      (a)   the rougher the video appears
      (b)   the smoother the video appears
      (c)   it gets blurry
      (d)   None of these

36   The ability to move around within a media stream is known as:
      (a)   buffering
      (b)   random access
      (c)   access
      (d)   sequential access

37   The two types of real time streaming are:
      (a)   live streaming
      (b)   dead streaming
      (c)   static streaming
      (d)   on demand streaming

38   Once a file is compressed: (choose all that apply)
      (a)   it has a better quality
      (b)   it takes up less space for storage
      (c)   it can be delivered to the client more quickly
      (d)   None of these

39   Compression ratio is the ratio of :
      (a)   the original file size to the size of the compressed file
      (b)   the number of pixels in a frame of the original size to those in a frame of the
            compressed file
      (c)   compressed file size to the original file size
      (d)   None of these

40   Lossy and lossless are classifications of:
      (a)   multimedia storage systems
      (b)   files
      (c)   compression algorithms
      (d)   All of these

41   A video consists of a sequence of
      (a)   Frames
      (b)   Signals
      (c)   Packets
      (d)   Slots

42   If frames are displayed on screen fast enough, we get an impression of
      (a)   Signals
      (b)   Motions
      (c)   Packets
      (d)   Bits

43   To receive signal, a translator is needed to decode signal and encode it again at a
      (a)   High Quality
      (b)   Lower Quality
      (c)   Same Quality
      (d)   Bad Quality

44   Session Initiation Protocol (SIP), is very
      (a)   Independent
      (b)   Flexible
      (c)   Important
      (d)   Layered

45   Session Initiation Protocol (SIP), is very
      (a)   Independent
      (b)   Flexible

(c) Important

(d) Layered

46   Most common compression technique that is used to create CD-quality audio is based on perceptual encoding technique is called
(a) Predictive Encoding
(b) Perceptual Encoding
(c) MPEG
(d) JPEG

47   In Audio and Video Compression, each frame is divided into small grids, called picture elements or
(a) Frame
(b) Packets
(c) Pixels
(d) Mega Pixels

48   Streaming stored audio/video, files are compressed and stored on a
(a) IP
(b) Server
(c) Domain
(d) Internet

49   Live streaming is still using Transmission Control Protocol (TCP), and multiple unicasting instead of
(a) Unicasting
(b) Multicasting
(c) Layered Control
(d) Protocol Control

50   In Video Compression, an independent frame that is not related to any other frame is called
(a) B-Frame
(e) C-Frame
(f) I-Frame
(g) P-Frame

Ans.   (1)(a), (2)(d), (3)(b), (4)(a), (5)(a), (6)(d), (7)(b), (8)(a), (9)(a), (10)(a), (11)(a), (12)(c), (13)(c), (14)(d), (15)(a), (16)(d),(17)(c), (18)(c), (19)(a), (20)(b), (21)(c), (22)(b), (23)(c), (24)(a), (25)(c), (26)(d), (27)(d), (28)(b), (29)(c), (30)(a), (31)(a), (32)(a), (33)(c), (34)(b), (35)(b), (36) (b), (37)(a, d), (38)(b, c), (39)(a), (40)(c), (41)(a), (42)(b), (43)(b), (44)(b), (45)(b), (46)(b), (47)(c), (48)(b), (49)(b), (50)(c)

(c)   Fill in the Blanks:

1   _____is the maximum displacement of a particle in the path of wave.
2   Frequency is measured in _____.

3   RGB model comprises of _____, _____and _____colors.
4   Compression techniques are broadly classified into _____and _____.
5   MIDI refers to _____.
6   If sound effects are added using the _____ task pane, the sound becomes a part of an animation effect.
7   When text is highlighted to create a hyperlink, the Insert Hyperlink dialog box is used to _____.
8   Appropriate movie file formats include _____.
9   JPEG is an acronym for _____ and is a file format for _____.
10   Another name for 2D animation_____.
11   EPS is an acronym for _____.
12   FPS stands for_____.

Ans.   (1)(Amplitude), (2)(hertz), (3)(Red, Green and Blue), (4)(Lossy and Lossless), (5)(Musical Instrument Digital Interface), (6)(Custom Animation), (7)(choose the particular location of the slide, file, or web site for the link), (8)(JPEG), (9)(Joint Photographic Experts Group; Graphic images), (10)(Cell animation), (11)(Encapsulated Post Script), (12)(Frame per second)

II   Short Answer Type Questions:

1   What is meant by font? Differentiate between bitmap font and vector font.
2   How can text be inserted within an application.
3   Define animation. Give some practical uses of it.
4   Write short note on hypertext.
5   What is digital audio?
6   How can we prepare digital audio files?
7   Distinguish between MIDI and digital audio.
8   Write short note on bitmap software.
9   Write short note on color models.
10   Define sound. Also discuss the nature of sound waves.
11   Discuss the characteristics of sound.
12   Write short note on Psycho-acoustics.
13   Write a short note on MIDI.
14   Write short note on High Definition TV.
15   Define tweening with the help of an example.
16   Describe the types of animation.
17   Differentiate between compression and decompression with the help of a practical example.
18   Distinguish between Lossy and Lossless compression.
19   Explain any one Lossless compression technique.
20   Discuss differences among multimedia interactive multimedia, hypertext and hypermedia.
21   Discuss a few features present in dream weaver.
22   What is Flash? Discuss its practical application.
23   Write a short note on GIF file format.

24   How can we convert a digital signal to signal? Explain.
25   Give the advantages and disadvantages of digital representation.
26   Give the advantages and disadvantages of analog representation.
27   Write a short note on digital camera.
28   Briefly explain the various color models.
29   Explain the various color models in detail.
30   Huffman's coding for the symbol A with probability 0.3, B with 0.15, C with 0.1, D with 0.25 and E with 0.2. What will be the number of bits required to represent all the symbols together?
31   What does Nyquist's Sampling Theorem state?
32   Why is data compression necessary for Multimedia activities?
33   What is the principle of animation? What are the various animation techniques? Write in brief.

III   Long Answer Type Questions:

1   Define Animation. Discuss in detail the techniques of animation.
2   Explain in detail the JPEG compression scheme.
3   Explain Huffman encoding in detail taking an example.
4   Discuss the construction and working principal behind digital camera.
5   What is meant by Run length Encoding?
6   Why is PCT necessary in JPEG compression? Does it lead to data compression?
7   Explain MPEG in detail.
8   Explain Delta modulation. Discuss its merits and demerits.
9   Compare CD digital audio and digital audio tape with merits and demerits.
10   Define sound. Give its fundamental characteristic. Differentiate between musical sound and noise. What is white noise? How is sound represented as wave?
11   We can convert an analog signal to digital signal. Comment
12   Distinguish between LZ and LZW compression method.
13   Discuss the various file formats used to represent images.
14   What is Cell Animation? How is it related to Tweening?
15   Briefly explain how the LZW Transform operates. What common compression methods utilise this transform?
16   How is a basic MIDI message structured? How is a MIDI message used to control how musical notes are played and also what instrument sounds the note?

UNIT - III

I   Test Your Skills:
(a)   Multiple Choice Questions:

1   A Local area network can be connected to other LAN's to form:
        (a)   A Wide Area Network
        (b)   Transmission Control Protocol
        (c)   Internet Service Provider
        (d)   Web Hosting Company

2	DNS stands for
   (a)	Domain Name System
   (b)	Digital numbering System
   (c)	Device Nomenclature System
   (d)	Digital Neighborhood System

3	Which of these is not a top level domain?
   (a)	com
   (b)	edu
   (c)	gov
   (d)	cis

4	Which part of URL http://www.company.com/home.html represents the second level address?
   (a)	http
   (b)	www
   (c)	com
   (d)	Home.html

5	The protocol used for logging on and working from remote computers is
   (a)	ftp
   (b)	telnet
   (c)	smtp
   (d)	usenet

6	Web pages are written in
   (a)	MPEG
   (b)	TCP/IP
   (c)	HTML
   (d)	MIME

7	HTTP stands for
   (a)	Help Text Translation Protocol
   (b)	How to talk protocol
   (c)	Hypertext Transfer Protocol
   (d)	High Technology Transmission Protocol

8	The levels of a domain name are separated by
   (a)	A period
   (b)	@ symbol
   (c)	Forward slashes
   (d)	Space

9	_____mode uses up to _____shades of gray.
   (a)	Grayscale , 526
   (b)	Grayscale , 256

(c)   Bitmap, 512

(d)   Lab, 512

10   State True (T) or False (F) i. Kerning and tracking can also be applied to text to create special text effects for headlines, subheads, newsletter nameplates, and logos. ii. Exaggerated tracking can produce an effective and eye-catching title.

(a)   i -T , ii-F

(b)   i -T , ii-T

(c)   i -F , ii-F

(d)   i -F , ii-T

11   The 12 bit scanner divides the scanned density range into smaller steps, 4096 steps in _____ bits instead of 256 steps in_____ bits.

(a)   10, 7

(b)   11, 8

(c)   12, 8

(d)   12, 7

12   Which of the following statements are true? i. The GIF file format supports 8-bit images (up to 1056 colors). ii. GIF images can be used to create simple animations iii. GIFs use a lossless compression scheme iv. GIFs are saved with a .gbf extension.

(a)   i and iii

(b)   i, ii and iii

(c)   ii and iv

(d)   ii and iii

14   IM is an acronym for _____and a _____is a web space that is developed by a group of people.

(a)   Instant Merging, wiki

(b)   Instant Messaging, bookmarking

(c)   Instant Messaging, wiki

(d)   Inner Mesh, WEC

15   Select the various elements of drawing from the following.

i)   Point

ii)   Line

iii)   Shapes

iv)   Memory device

v)   Plane

vi)   Input device

(a) i, ii, iii, v

(b) i, ii, vi

(c) i, ii, v, vi

(d) i, ii, iii, iv, v and vi

16   State True (T) or False (F) i) Color Yellow is favored by well-balanced people. ii) Red, white and some green and Purples are considered to be warm colors.
(a) i -T , ii-F
(b) i -T , ii-T
(c) i -F , ii-F
(d) i -F , ii-T

17   State True (T) or False (F) i) The earlier forms of writings were on stone and cave walls comprising of cuneiforms images. ii) PostScript Type 12 fonts are considered the industry standard and are the most reliable when printing to high-end digital devices such as image setters and digital presses.
(a) i -T , ii-T
(b) i -F , ii-F
(c) i -T , ii-F
(d) i -F , ii-T

18   State whether the following statements are True (T) or False (F) a) Common tools used for drawing upon a two-dimensional surface include pencil, colored pencils, graphite, charcoal, compressed charcoal, ink, pastel, wax crayon and oil pastel. b) Points are not used in drawings to give shadow and shading effects. c) Drawings is more or less based on the usage of line. d) Drawing is the act of creating a representation of any subject by the use of lines and/or value.
(a) a-T, b-F, c-T, d-F
(b) a-T, b-F, c-T, d-T
(c) a-F, b-T, c-F, d-T
(d) a-T, b-T, c-F, d-F

19   State whether the following statements are True (T) or False (F) a) The life of the fonts lies in type caces and texts b) Users can permanently customize the kerning information for a font using a font editor kerning utility. c) Custom kerning data is preserved when fonts are embedded in an word document. d) Type 3 fonts are the original non Adobe Post Script font description standard.
(a) a-T, b-F, c-T, d-F
(b) a-T, b-F, c-T, d-T
(c) a-F, b-T, c-F, d-T
(d) a-T, b-T, c-F, d-F

20   State whether the following statements are True (T) or False (F) a) Image resolution and pixel dimensions are not interdependent b) The amount of detail in an image depends on its pixel dimensions. c) Most desktop laser printers have a resolution of 1200 dpi and image setters have a resolution of 800 dpi or higher. d) Most ink jet printers have an approximate resolution of 300 to 600 dpi and produce good results when printing images up to 150 ppi.
(a) a-T, b-F, c-T, d-F
(b) a-F, b-F, c-T, d-T
(c) a-T, b-T, c-F, d-F

(d) a-F, b-T, c-F, d-T

21   A _____ displays a list of commands and usually appears in the toolbar at the top of
      the screen.
      (a)   view
      (b)   menu
      (c)   kit
      (d)   list

22   Slide and title masters contain _____ that reserve spaces for text and footers such
      as date, time and slide number.
      (a)   reservations
      (b)   placeholders
      (c)   spaces
      (d)   documents

23   Changing the appearance of your slide _____ can alter the slide's color, shade,
      pattern, or texture.
      (a)   background
      (b)   foreground
      (c)   watermark
      (d)   design

24   A _____ is a series of slides displayed in a particular sequence.
      (a)   placeholder
      (b)   layout
      (c)   template
      (d)   slide show

25   Quick access to frequently used commands can be found in the _____ toolbar.
      (a)   view
      (b)   drawing
      (c)   kit
      (d)   menu

26   A _____ can be added to your presentation and then used to go to a variety of
      locations ---- for example, a web address, an e-mail address, a custom show or document,
      just to name a few.
      (a)   menulink
      (b)   hyperlink
      (c)   toollink
      (d)   slidelink

27   The _____ master controls the format and placement of the titles and text you type on
      slides, as well as, background items and graphics you want to appear on every slide.
      (a)   slide

(b)   copyright
(c)   layout
(d)   design

28   The first slide in a presentation is usually reserved for the _____.
(a)   introduction
(b)   author
(c)   master
(d)   title

29   _____ is the special effect used to introduce each slide in a slide presentation.
(a)   Animation
(b)   Bulleting
(c)   Transition
(d)   Mapping

30   Notes that include the slide as well as key comments and points you may want to emphasis while you present your slide show are known as:
(a)   speaker handouts
(b)   speaker notes
(c)   student notes
(d)   cheat sheet

31   The branch of physics that studies sound
(a)   Acoustics
(b)   Auditory
(c)   Biometrics
(d)   Linguistics

32   Sound pressure is measured in
(a)   Bauds
(b)   Bits
(c)   Decibels
(d)   Watts

33   The process of removing blank spaces from the front of recording is called_____.
(a)   Digital Signal Processing
(b)   Resampling
(c)   Splicing
(d)   Trimming

34   The process of drawing a series of frames between keyframes is called_____.
(a)   Morphing
(b)   Storyboarding
(c)   Tweening
(d)   Tweaking

35   _____ is the study of movement and motion structures that have joints
(a)   Cel-animation
(b)   Kinematics
(c)   Morphing
(d)   Tweaking

36   _____is a popular effect in which one image transforms into another.
(a)   Inverse kinematics
(b)   Morphing
(c)   Tweaking
(d)   Tweening

37   Which of the following multimedia element places the highest performance demand on the computer?
(a)   Animation
(b)   Sound
(c)   Text
(d)   Video

38   Which is a communication system that spans great distances?
(a)   LAN
(b)   MAN
(c)   Single User PCs
(d)   WAN

39   Which of the following is a feature of a 3-D modeling tool?
(a)   Autotrace
(b)   Eyedropper tool
(c)   Lathe and Extrude
(d)   Thesaurus

40   In a multimedia project with a _____structure, users navigate sequentially from one frame to another.
(a)   Composite
(b)   Hierarchical
(c)   Linear
(d)   Non-linear

41   _____ is a standard to allow telephones on the public telephone network to talk to computers connected to the Internet.
(a)   SIP
(b)   H.323
(c)   Q.991
(d)   None of the above

42   When there is more than one source, the _____ identifier defines the mixer.
(a)   synchronization source

(b)   contributor

(c)   timestamp

(d)   none of the above

43   _____ is the protocol designed to handle real-time traffic on the Internet.

(a)   TCP

(b)   UDP

(c)   RTP

(d)   none of the above

44   Jitter is introduced in real-time data by the _____.

(a)   error caused during transmission

(b)   delay between packets

(c)   both a and b

(d)   none of the above

45   In a real-time video conference, data from the server is _____ to the client sites.

(a)   Unicast

(b)   multicast

(c)   broadcast

(d)   none of the above

46   An RTP packet is encapsulated in _____.

(a)   a UDP user datagram

(b)   a TCP segment

(c)   an IP datagram

(d)   none of the above

47   A _____ changes the format of a high-bandwidth video signal to a lower quality narrow-bandwidth signal.

(a)   timestamp

(b)   sequence number

(c)   translator

(d)   none of the above

48   _____ is used to compress video.

(a)   MPEG

(b)   JPEG

(c)   either a or b

(d)   none of the above

49   Real-time traffic needs the support of _____.

(a)   Broadcasting

(b)   multicasting

(c)   both a and b

(d)   none of the above

50   _____ are used to number the packets of a real-time transmission.
        (a)   Timestamps
        (b)   Playback buffers
        (c)   Sequence numbers
        (d)   none of the above

Ans.   (1)(a), (2)(a), (3)(d), (4)(d), (5)(b), (6)(c), (7)(c), (8)(c), (9)(b), (10)(b), (11)(c), (12)(d),
        (13)(d), (14)(c), (15)(a), (16)(c), (17)(c), (18)(b), (19)(c), (20)(d), (21)(b), (22)(b),
        (23)(d), (24)(d), (25)(d), (26)(b), (27)(d), (28)(d), (29)(c), (30)(b), (31)(a), (32)(c),
        (33)(a), (34)(c), (35)(b), (36)(a), (37)(a), (38)(d), (39)(a), (40)(c), (41)(b), (42)(a), (43)(c),
        (44)(b), (45)(b), (46)(a), (47)(a),(48)(a), (49)(b), (50)(c)

(b)   Fill in the Blanks:

1   The predecessor to the Internet, create by the Advanced Research Projects Agency, was
        known as the _____.
2   The set of four numbers separated by periods that points to a domain is _____.
3   IRC stands for_____
4   Commercial & business use of Internet was not permitted until_____
5   When a stream of data is sent over the Internet by a computer, it is first broken down into
        packets by _____.
6   POP, a protocol used for receiving mails stand for _____.
7   The two most popular browsers in terms of number of users are _____ &_____.

Ans.   (1)(ARPANET), (2)(IP Address), (3)(Internet Relay Chat), (4)(1992), (5)(TCP), (6)(Post
        Office Protocol), (7)(Firefox & IE)

II   Short Answer Type Questions:

1   Define Internet. Also discuss its history.
2   What are the services provided only Internet.
3   Describe how DNS manages the identities of computers connected to the Internet.
4   Define bandwidth & discuss how bandwidth limitations govern the delivery of
        multimedia over Internet.
5   What is World Wide Web?
6   Discuss the protocols used on Internet.
7   Describe what the different parts of URL
        http://www.secondlevel.toplevel/filename.filetype represent.
8   List the most common top level domains, and describe what categories they are
        associated with.
9   Define server and browser and discuss their purpose.
10   Discuss the uses and limitations of HTML.
11   What are the various tools that are available for editing HTML pages?
12   What are search engines?
13   List several advanced media types that are used on the web.
14   Explain the terminology WYSIWYG.
15   Which file type's sound quality independent on client's computer setup?

16   Describe the limitations of World Wide Web for delivering multimedia.
17   Explain GIF and PNG Images.
18   List & describe the most important tags for multimedia in HTML.
19   What are the two most common graphics file formats in use on the Web today? Discuss what each is best suited for, its limitations & its capabilities.
20   Define CGI.
21   Explain VRML.
22   What will a browser do if a background image is smaller than the browser window?
23   Briefly explain the history of Internet.
24   Write a short note on Internetworking.
25   Distinguish between DSL, ADSL and SDSL
26   Discuss the various types of services provided by internet.
27   Write a short note on web browsers.
28   Write a short note on web servers.
29   Explain multimedia on Internet.
30   Give a definition of a Multimedia Authoring System.
31   List three distinct models of color used in multimedia. Explain why there are a number of different color models exploited in multimedia data formats.

III   **Long Answer Type Questions:**

1   How to create dynamic web pages. Explain in detail.
2   What will a browser do if a background image is smaller than the browser window?
3   What do you understand by the term virtual reality?
4   How is animation used on Web? Also discuss the techniques of animation.
5   What is meant by WWW? Also discuss the tools used for WWW.
6   In how many ways can we establish a connection to the internet? Discuss in detail.
7   What is VRML? Distinguish between HTML and VRML. Also state the various formats supported by VRML.
8   What is HTML? How can you design pages using it? State the difference between static and dynamic HTML.
9   Define plug ins and delivery vehicles.
10   Suppose we have 24 bits per pixel available for a color image. We also note that humans are more sensitive to red and green than to blue, by a factor of approximately 1.5. How may we design a simple color representation to make use of the bits available?
11   What extra information is multimedia good at conveying with respect to conventional media
12   Briefly explain why we need to have less than 24-bit color representations (typically down to 8-bit) and why this is sometimes a problem. Give one example where 8-bit color representation has an advantage in terms of image/video processing?
13   Briefly explain the basic approach of entropy coding algorithms. Give two examples of entropy coding algorithms.
14   What two broad classes of data compression techniques are applied to video compression? How does each class type typically get applied in video compression methods?

UNIT - IV

I   Test Your Skills:

(a)   Multiple Choice Questions:

1   The building blocks of project management are:
   (a)   Budgets
   (b)   Tasks
   (c)   Time
   (d)   Pre-Requisites

2   The best point to do focus group testing is with the
   (a)   Concept
   (b)   Prototype
   (c)   Beta
   (d)   Gold Master

3   A proof of concepts on pilot should probably include all of these except.
   (a)   Artwork
   (b)   Interface Design
   (c)   Navigation
   (d)   Performance Checks

4   Which of the following is not a method typically used by project management software?
   (a)   CPM
   (b)   PERT
   (c)   Gantt Charts
   (d)   Feasibility Assessment Review Technique.

5   The first part of a proposal should be the
   (a)   Executive Summary
   (b)   Budget
   (c)   Timeline
   (d)   Project Plan.

6   Photoshop CS3 is part of the Adobe Suite.
   (a)   Creative
   (b)   Web
   (c)   Image
   (d)   Office

7   When you point to many objects in the Photoshop window, such as a tool or button, Photoshop displays
   (a)   Menu Icon
   (b)   Marker
   (c)   Data point
   (d)   Tool tip

8   A shortcut menu sometimes is known as a(n) ____ menu.
   (a)   Embedded
   (b)   Online
   (c)   Sensitive
   (d)   Context

9   When you have a print copy of a picture that you wish to use in Photoshop, rather than a digital file stored on your computer, it sometimes is necessary to digitize the picture using
   (a)   Scanner
   (b)   Printer
   (c)   Blotter
   (d)   Either a or b

10   As shown in the accompanying figure, the Photoshop ____ consists of a variety of components to make your work more efficient and photo documents more professional.
   (a)   Window
   (b)   Matrix
   (c)   View
   (d)   Docking station

11   When ____ follows a menu command, clicking that command will display a dialog box.
   (a)   A Bullet
   (b)   An ellipsis
   (c)   A check mark
   (d)   A red asterisk

12   A(n) ____ separates a file name and its extension.
   (a)   Period
   (b)   Ampersand
   (c)   Apostrophe
   (d)   Comma

13   ____ files can contain both bitmap and vector graphics.
   (a)   BMP
   (b)   EPS
   (c)   GIF
   (d)   All of above

14   ____ is a standard format used by photo hardware devices that supports many different color modes, and one that can be used on the Web.
   (a)   Tiff
   (b)   Raw
   (c)   JPG
   (d)   EPS

15   ____ allows you to focus on certain parts of a photo.

(a) Resolution
(b) Editing
(c) Dithering
(d) Zooming

16 The colored box in the Navigator palette is called the ____.
(a) Palette menu button
(b) Magnification box
(c) Proxy view area
(d) Zoom slider

17 Your installation of Photoshop may display rulers at the ____ of the document window.
(a) Bottom and left
(b) Top and left
(c) Top and right
(d) Bottom and right

18 If you make a mistake while dragging the cropping area and want to start over, you can press the ____ key, which cancels the selection.
(a) ESC
(b) F1
(c) ALT
(d) Ctrl

19 Photoshop keeps track of all your edits in the ____ palette.
(a) Tracking
(b) Edit
(c) History
(d) Redo

20 A ____ is a decorative edge on a photo or a portion of a photo.
(a) Resolution
(b) Montage
(c) Selection
(d) Border

21 A ____ is an individual dot of light that is the basic unit used to create digital images.
(a) Pica
(b) Pixel
(c) Point
(d) Link

22 ____ modes are the ways in which pixels in an image are affected by a color.
(a) Fill
(b) Monochrome
(c) Selection

(d)   Blending

23   Photoshop uses a mathematical process called _____ when it changes the number of
        pixels.
        (a)   Interpolation
        (b)   Extrapolation
        (c)   Concatenation
        (d)   Development

24   The _____ process adds new pixels to a photo to match those already there.
        (a)   Editing
        (b)   Resampling
        (c)   Pixeling
        (d)   Formatting

25   The _____ format is a compressed graphic format designed to minimize file size and
        electronic transfer time.
        (a)   Tiff
        (b)   EPS
        (c)   GIF
        (d)   All of above

26   Photoshop keeps track of all edits in the _____ palette.
        (a)   Family Tree
        (b)   Edits
        (c)   Marquee
        (d)   History

27   Many photographers and graphic artist use the _____ when placing the focus of interest.
        (a)   Rule of seconds
        (b)   Rule of thirds
        (c)   Rule of fourths
        (d)   Rule of fifths

28   Rulers display on the _____ of the document window.
        (a)   top and left sides
        (b)   top and right sides
        (c)   bottom and left sides
        (d)   bottom and right sides

29   The _____ palette is used to change the view of artwork using a thumbnail display.
        (a)   Thumbnail
        (b)   Menu
        (c)   Navigator
        (d)   Zoom

30   A photo edit of shrinking is considered in the _____ category of edits.
    (a)   Resize and Focus
    (b)   Enhancements and Layering
    (c)   Color
    (d)   Correction

31   LCD are commonly used in
    (a)   Calculators
    (b)   Portable
    (c)   Laptop computers
    (d)   All of these

32   LCD is an _____ device
    (a)   Emissive
    (b)   Non emissive
    (c)   Gas discharge
    (d)   None of these

33   Plasma panel is an __ device
    (a)   Emissive
    (b)   Non emissive
    (c)   Expensive
    (d)   None

34   Plasma device converts
    (a)   Electrical energy into light
    (b)   Light into electrical energy
    (c)   Light into graphical energy
    (d)   None of these

35   Plasma panel have_____ resolution
    (a)   High
    (b)   Good
    (c)   Both a & b
    (d)   Low

36   Plasma panel are also called
    (a)   Liquid crystal display
    (b)   Gas discharge display
    (c)   Non emissive display
    (d)   None of these

37   The basic graphical interactions are
    (a)   Pointing
    (b)   Positioning
    (c)   Both a & b

(d)   None

38   The image is passed repeatedly to the monitor _____in order to maintain a steady picture
        on the screen
        (a)   25 times a second
        (b)   30 times a second
        (c)   30 or more times a second
        (d)   None of these

39   To store black and white images ,black pixels are represented by_____ in the frame
        buffer and white pixels by_____
        (a)   Zero and one
        (b)   One and Zero
        (c)   Both a & b
        (d)   None of these

40   A 16*16array of black and white pixels could be represented by_____
        (a)   64bytes
        (b)   32bytes
        (c)   128bytes
        (d)   96bytes

41   The display controller converts 0s and 1s into_____
        (a)   TV monitor
        (b)   Video signal
        (c)   Electronics signal
        (d)   None of these

42   _____ audio/video refers to the broadcasting of radio and TV programs through the
        Internet.
        (a)   Interactive
        (b)   Streaming live
        (c)   Streaming stored
        (d)   none of the above

43   _____ audio/video refers to the use of the Internet for interactive audio/video
        applications.
        a)   Interactive
        b)   Streaming live
        c)   Streaming stored
        d)   none of the above

44   _____ is not suitable for interactive multimedia traffic because it retransmits packets
        in case of errors.
        a)   UDP
        b)   TCP
        c)   both a and b

d)   none of the above

45   When f_s is the signal frequency and f_i is the intermediate frequency, then image frequency f_{si} is given by

(a) $f_{si} = f_s - 2f_i$

(b) $f_{si} = f_s + 2f_i$

(c) $f_{si} = \dfrac{f_s + f_i}{2}$

(d) $f_{si} = \dfrac{f_s - f_i}{2}$

46   It is known that noise phase modulates the FM wave. As the noise side band frequency approaches the carrier frequency, the noise amplitude
(a)   will increase
(b)   will decrease
(c)   will remain constant
(d)   will reduce to negligible value

47   In a radio receiver with simple AGC
(a)   the highest AGC voltage is produced between stations
(b)   the faster the AGC time constant, the more accurate the output
(c)   an increase in signal strength produces more AGC
(d)   the audio stage gain is normally controlled by AGC

48   In a communication system, noise is most likely to affect the signal
(a)   at the transmitter
(b)   in the channel
(c)   in the information source
(d)   at the destination

49   In a radio receiver, if the intermediate frequency is too high
(a)   Selectivity will be poor
(b)   Tracking difficulties will be least
(c)   Adjacent channel rejection will improve
(d)   All of the above will occur

50   In a radio receiver, the local oscillator is tuned to a frequency
(a)   lower than the incoming frequency
(b)   higher than the incoming frequency
(c)   equal to incoming frequency
(d)   any of the above

Ans.   (1)(b), (2)(c), (3)(a), (4)(c), (5)(d), (6)(a), (7)(d), (8)(d), (9)(a), (10)(a), (11)(b), (12)(a), (13)(b), (14)(c), (15)(d), (16)(c), (17)(b), (18)(a), (19)(c), (20)(d), (21)(b), (22)(d), (23)(a), (24)(b), (25)(c), (26)(d), (27)(a), (28)(a), (29)(b), (30)(a), (31)(d), (32)(b),

(33)(a), (34)(a), (35)(c), (36)(b), (37)(c), (38)(c), (39)(b), (40)(b), (41)(b), (42)(b), (43)(a), (44)(b), (45)(b), (46)(b), (47)(c), (48)(b), (49)(a), (50)(b)

(b)   **Fill in the Blanks:**

1   A protocol is sometimes called a proof of concept or _____
2   When a project reaches the delivery stages, it is said to be_____.
3   A prototype in which most of the features are working, and it is distributed to a wide arena of testers is called _____.
4   _____provide graphic representations of task relationships, showing what tasks must be completed before others can commence.
5   _____depict all the tasks along a timeline.
6   The graphic outline that describes each page of a project in exact detail is called_____.
7   The structures actually realized by a user while navigating the projects context is known as _____.
8   In a _____ design, users navigate freely through the content.
9   _____ is the phase where your multimedia project is actually rendered.
10   Collections of media generally granted unlimited use is called_____.
11   Works come under _____as soon as they are created & presented in fixed forms.
12   A standard document that lists licensing fee for different uses, formats & markets is called_____.
13   One or more of the files in your project can be compressed into a single file, called an _____.
14   _____releases are typically circulated among a select group of mock internal users for testing.
15   A CD-ROM that contains both Macintosh files & PC files on the same CD is a _____.
16   Photoshop is kind _____ of image-editing application
17   Bevel and emboss is an example of _____
18   Create transparency on a layer by using _____

Ans.   (1)(Feasibility Study), (2)(Completed), (3)(Beta Stage), (4)(Flowchart), (5)(Scheduling), (6)(Navigation Map), (7)(Depth Structure), (8)(non-linear), (9)(Production), (10)(Clip art), (11)(Copyright Protection), (12)(rate card), (13)(archive), (14)(alpha), (15) (Hybrid), (16)(raster or pixel based), (17)(Layer Style), (18)(alpha channels, black hides white reveals)

II   **Short Answer Type Questions:**

1   List the testing stages involved in preparing a project for delivery. What type of testers should be part of each stage's testing team
2   List the benefits & capabilities of file compression & archiving software.
3   Describe the two methods of copying CD-ROMs.
4   Discuss the drawbacks & benefits of methods of copying CD-ROMS.
5   Cite two primary methods for delivering a project.
6   List the various CD-ROM formats.

7   Describe the tracking process that is used to control project development process.
8   List the four different types of MM structures.
9   Discuss the relationship between programs content, its interface & its usability.
10   List the primary tasks that go into producing a MM project.
11   List & briefly discuss the stages of a MM project.
12   Describe the various technically management & creative obstacles to accurately predict the time & resources.
13   Briefly explain what a proposal is.
14   What is the most limiting technological factor in determining the feasibility of project?
15   Compare & contrast CD & DVD.
16   Briefly Explain Wireless Communication.
17   How can we represent data?
18   Give a few concepts that affect the user interface.
19   Give the various advantages and disadvantages associated with the delivering phase.
20   Explain reliability and low cost in context of CD-ROM
21   Give the various methods for archiving of project files.
22   Write the names of two input devices for cognitive graphics applications. Describe use of each.
23   Differentiate between "generative graphics" and "cognitive graphics"? Write two uses of each.
24   How skills and training is required in multimedia system?
25   How is data written on a CD.? Explain the principle

III   Long Answer Type Questions:

1   Explain in detail the working of a Digital Radio.
2   What are the various phases involved in assembling and delivering a project.
3   Explain in detail Multimedia Conferencing.
4   Explain the working of CD-ROM.
5   What is meant by Interactive Television?
6   Explain in detail the various phases involved in Planning and costing phase of project development.
7   What is "graphics importing"? Explain how this feature helps in creation of multimedia applications.
8   What is clip art? How does it help in creation of multimedia applications?
9   What is MIDI? How does it help in creation of multimedia applications?
10   What is an audio clips library?
11   How does it help in creation of multimedia applications?
12   Explain the various steps of multimedia production.
13   Explain linear predictive coding?
14   Explain the production life cycle of multimedia project

QUESTION BANK

SOFTWARE QUALITY MANAGEMENT

MCA

QUESTION BANK
SOFTWARE QUALITY MANAGEMENT - MCA 333
MCA V

UNIT - I

I **Test Your Skills:**
(a) **State Whether the Following Statements are True or False:**

1 There is no need to assess customer satisfaction when trying to determine the quality of a piece of software.
2 The goal of quality assurance is to provide management with the data needed to determine which software engineers are producing the most defects.
3 Software quality might be defined as conformance to explicitly stated requirements and standards, nothing more and nothing less.
4 People who perform software quality assurance must look at the software from the customer's perspective.
5 Quality control is a corrective process.
6 Control Charts is a statistical technique to assess, monitor, and maintain the stability of a process.
7 Staff development plan describes how the skills and experience of the project team members will be developed.
8 Cost of quality = Prevention Cost + Appraisal cost + Failure cost
9 Requirement and Analysis, Design, Development or Coding, Testing and Maintenance is called as Software Development Life Cycle (SDLC)
10 Configuration Management Plan describes the Configuration Management procedures and structures to be used.
11 Product Risk affects the quality or performance of the software.
12 Business Risk affects The Organization developing or Procuring the software.
13 Stratification is a Technique used to analyze/divide a universe of data into homogeneous groups(strata).
14 Automation Testing should be done before starting manual testing. Earlier a defect is found the cheaper it is to fix it.
15 Software Testing is a process of evaluating a system by manual or automatic means and verify that it satisfies specified requirements or identity differences between expected and actual results.

Ans. (1)(F), (2)(F), (3)(F), (4)(T), (5)(T), (6)(T), (7)(T), (8)(T), (9)(T), (10)(T), (11)(T), (12)(T), (13)(T), (14)(F), (15)(T)

(b) **Multiple Choice Questions:**

1 ISO 9000 is a series of standards for quality management system and has:
   (a) 2 related standards
   (b) 5 related standards
   (c) 10 related standards
   (d) 25 related standards

2   Software quality is defined as
        (a)   Conformance to user specified requirements.
        (b)   Achievement of extremely low defect rates.
        (c)   Production of software with high reliability
        (d)   None of the above

3   SQA stands for
        (a)   Software quality added
        (b)   Software quality audit
        (c)   Software quality assurance
        (d)   None of the above

4   Quality costs may be divided into costs associated with
        (a)   Prevention, appraisal and failure
        (b)   People, process and product
        (c)   Customers, developers and maintenance
        (d)   All of the above

5   Variation control in the context of software engineering involves controlling variation in the
        (a)   Process applied
        (b)   Resources expended
        (c)   Product quality attributes
        (d)   All of the above

6   A key concept of quality control is that all work products
        (a)   Are delivered on time and under budget
        (b)   Have complete documentation
        (c)   Have measurable specifications for process outputs
        (d)   Are thoroughly tested before delivery to the customer

7   Which of these activities is not one of the activities recommended to be performed by an independent SQA group?
        (a)   Prepare SQA plan for the project
        (b)   Review software engineering activities to verify process compliance
        (c)   Report any evidence of noncompliance to senior management
        (d)   Serve as the sole test team for any software produced

8   Software safety is a quality assurance activity that focuses on hazards that
        (a)   Affect the reliability of a software component
        (b)   May cause an entire system to fail
        (c)   May result from user input errors
        (d)   Prevent profitable marketing of the final product

9   The ISO quality assurance standard that applies to software engineering is
        (a)   ISO 9000:2004

(b)   ISO 9001:2000
(c)   ISO 9002:2001
(d)   ISO 9003:2004

10   Which of the following is not a section in the standard for SQA plans recommended by IEEE?
(a)   Budget
(b)   Documentation
(c)   Reviews and audits
(d)   Test

11   Six Sigma methodologies define three core steps.
(a)   Analyze, improve, control
(b)   Analyze, design, verify
(c)   Define, measure, analyze
(d)   Define, measure, control

12   "Quality is defined by the customer" is
(a)   An unrealistic definition of quality
(b)   A user-based definition of quality
(c)   A manufacturing-based definition of quality
(d)   A product-based definition of quality
(e)   The definition proposed by the American Society for Quality Control

13   Which of the following is not one of the major categories of costs associated with quality?
(a)   Prevention costs
(b)   Appraisal costs
(c)   Internal failures
(d)   External failures
(e)   None of the above, they are all major categories of costs associated with quality

14   ISO 9000 seeks standardization in terms of
(a)   Products
(b)   Production procedures
(c)   Suppliers' specifications
(d)   Procedures to manage quality

15   Total Quality Management emphasizes
(a)   The responsibility of the Quality Control staff to identify and solve all quality-related problems
(b)   A commitment to quality that goes beyond internal company issues to suppliers and customers
(c)   A system where strong managers are the only decision makers
(d)   A process where mostly statisticians get involved

16   A successful TQM program incorporates all of the following except
      (a)   Continuous improvement
      (b)   Employment involvement
      (c)   Benchmarking
      (d)   centralized decision making authority

17   "Kaizen" is a Japanese term meaning
      (a)   A fool proof mechanism
      (b)   Just-in-time (JIT)
      (c)   A fishbone diagram
      (d)   Setting standards
      (e)   Continuous improvement

18   The philosophy of zero defects is
      (a)   Unrealistic
      (b)   Prohibitively costly
      (c)   An ultimate goal; in practice, 1 to 2% defects is acceptable
      (d)   Consistent with the commitment to continuous improvement

19   Quality Circles members are
      (a)   Paid according to their contribution to quality
      (b)   External consultants designed to provide training in the use of Quality tools
      (c)   Always machine operators
      (d)   All trained to be facilitators
      (e)   None of the above, all of the statements are false

20   The process of identifying other organizations that are best at some facet of your
      operations and then modeling your organization after them is known as
      (a)   Continuous improvement
      (b)   Employee empowerment
      (c)   Benchmarking
      (d)   Copycatting
      (e)   Patent infringement

21   A quality loss function utilizes all of the following costs except
      (a)   The cost of scrap and repair
      (b)   The cost of customer dissatisfaction
      (c)   Inspection, warranty, and service costs
      (d)   Sales costs
      (e)   Costs to society

22   Among the tools of TQM, the tool ordinarily used to aid in understanding the sequence of
      events through which a product travels is a
      (a)   Pareto chart
      (b)   Flow chart
      (c)   Check sheet

(d)   Taguchi map

23   A fishbone diagram is also known as a
      (a)   cause-and-effect diagram
      (b)   poka-yoke diagram
      (c)   Kaizen diagram
      (d)   Taguchi diagram

24   If a sample of parts is measured and the mean of the measurements is outside the control limits the process is
      (a)   In control, but not capable of producing within the established control limits
      (b)   Out of control and the process should be investigated for assignable variation
      (c)   Within the established control limits with only natural causes of variation
      (d)   Monitored closely to see if the next sample mean will also fall outside the control limits
      (e)   None of the above

25   A quality circle holds a brainstorming session and attempts to identify the factors responsible for flaws in a product. Which tool do you suggest they use to organize their findings?
      (a)   Ishikawa diagram
      (b)   Pareto chart
      (c)   Process chart
      (d)   Control charts

26   When a sample measurement falls inside the control limits, it means that
      (a)   Ach unit manufactured is good enough to sell
      (b)   The process limits cannot be determined statistically
      (c)   The process output exceeds the requirements
      (d)   If there is no other pattern in the samples, the process is in control

27   Which of the following is true regarding control charts?
      (a)   Values above the upper and lower control limits indicate points out of adjustment.
      (b)   Control charts are built so that new data can be quickly compared to past performance data
      (c)   Control charts graphically present data
      (d)   Control charts plot data over time
      (e)   All of the above are true

28   Which type of risk factor is most likely to cause problems for a software project developing commercial software?
      (a)   Inadequate user documentation
      (b)   Litigation expense
      (c)   Low productivity
      (d)   Cancellation of project

29   *Defect prevention* is defined as:
      (a)   Finding and fixing errors after insertion
      (b)   Finding and fixing errors before release but after insertion
      (c)   Finding and fixing errors after release
      (d)   Avoiding defect insertion

30   *Product quality* is defined as:
      (a)   Delivering a product with correct requirements
      (b)   Delivering a product using correct development procedures
      (c)   Delivering a product which is developed iteratively
      (d)   Delivering a product using high quality procedures

31   Which of the following is NOT a main reason to undertake software quality assurance activities?
      (a)   Reduce software personnel turnover
      (b)   Legal liability
      (c)   Insistence by the user on a satisfactory software quality assurance programme
      (d)   Marketing reasons

32   Which type of risk factor is most likely to cause problems for a software project which develops military software?
      (a)   Unused or unusable software
      (b)   Legal expenses
      (c)   Excessive paperwork
      (d)   High maintenance costs

33   The main goal of quality assurance is:
      (a)   Set coding standards.
      (b)   Improve software project management
      (c)   Reduce the technical and programmatic risks in developing the software
      (d)   Specify corrective actions.

34   Software interoperability is:
      (a)   The ability of a software system to work on different hardware platforms.
      (b)   The ability of a software system to work under different operating systems.
      (c)   The ability of a software system to exchange information with other software systems and to use the exchanged information.
      (d)   The ability to replace a software system with another software system that has similar functionality

35   With respect to software metrics, which statement is NOT true?
      (a)   A *indirect measure* focuses on attributes of a project which can be measured by examining a process, product or resource
      (b)   A *direct measure* focuses on attributes of a project which can be measured by examining a process, product or resource
      (c)   *External attributes* are always measured indirectly

(d)   *Lines of code* is a *direct* measurement

36   Which of the following statements is NOT true?
      (a)   Coding standards address naming of constants.
      (b)   Coding standards address the number of errors encountered per 1000 lines of code.
      (c)   Coding standards address layout of code text.
      (d)   Coding standards address the use of program comments.

37   Which of the following statements is NOT true?
      (a)   A good design methodology should provide a clear division of design from implementation
      (b)   A good design methodology should not promote a top-down decomposition strategy.
      (c)   A good design methodology should encourage phased development of the software
      (d)   A good design methodology should help to minimise future maintenance.

38   *Formal Reviews* seek to:
      (a)   Identify system faults, but not to attribute blame or seek solutions
      (b)   Identify system faults, attribute the source of errors, but not seek solutions
      (c)   Identify system faults attribute the source of errors and seek solutions
      (d)   Identify system faults; seek solutions, but not to attribute blame

39   Which form of software development model is most suited to a system where all the requirements are known at the start of a project and remain stable throughout the project?
      (a)   Waterfall model
      (b)   Incremental model
      (c)   Evolutionary model
      (d)   Spiral model

40   Which of the following statements is NOT true?
      (a)   Requirements must be testable
      (b)   Requirements must be concerned with system functionality only
      (c)   Requirements must be complete
      (d)   Requirements must be unambiguously stated

41   Quality Management in software engineering is also known as
      (a)   SQA
      (b)   SQM
      (c)   SQI
      (d)   SQA and SQM

42   Quality also can be looked at in terms of user satisfaction which includes
      (a)   A complaint product
      (b)   Good quality output

(c)   Delivery within budget and schedule
(d)   All of the mentioned

43   Inspections and testing are what kinds of Quality Costs?
(a)   Prevention
(b)   Internal Failure
(c)   External Failure
(d)   Appraisal

44   According to Pareto's principle, x% of defects can be traced to y% of all causes. What are the values of x and y?
(a)   60, 40
(b)   70, 30
(c)   80, 20
(d)   No such principle exists

45   What is Six Sigma?
(a)   It is the most widely used strategy for statistical quality assurance
(b)   The "Six Sigma" refers to six standard deviations
(c)   It is the most widely used strategy for statistical quality assurance and the "Six Sigma" refers to six standard deviations
(d)   A Formal Technical Review(FTR) guideline for quality walkthrough or inspection

46   Which of the following is not a core step of Six Sigma?
(a)   Define
(b)   Control
(c)   Measure
(d)   Analyse

47   Non-conformance to software requirements is known as
(a)   Software availability
(b)   Software reliability
(c)   Software failure
(d)   None of the mentioned

48   What kind of quality cost is incurred when an error is detected in a product prior to shipment?
(a)   Prevention
(b)   Internal Failure
(c)   External Failure
(d)   Appraisal

49   The degree to which the design specifications are followed during manufacturing is known as
(a)   Quality of design

(b)   Quality of conformance
(c)   Quality of testing
(d)   None of the mentioned

50   According to ISO 9001, inspection and testing comes under which management responsibility?
(a)   Process control
(b)   Document control
(c)   Control of non-conforming products
(d)   Servicing

Ans.   (1)(b), (2)(a), (3)(c), (4)(a), (5)(d), (6)(d), (7)(d), (8)(b), (9)(b), (10)(a), (11)(c), (12)(e), (13)(e), (14)(d), (15)(b), (16)(d), (17)(e), (18)(d), (19)(e), (20)(c), (21)(d), (22)(b), (23)(a), (24)(b), (25)(a), (26)(d), (27)(e), (28)(a), (29)(b), (30)(d), (31)(c), (32)(b), (33)(c), (34)(b), (35)(a), (36)(c), (37)(b), (38)(c), (39)(a), (40)(c), (41)(a), (42)(d), (43)(d), (44)(c), (45)(c), (46)(b), (47)(c), (48)(b), (49)(a), (50)(a)

(c)   Fill in the Blanks:

1   The five views of quality are _____, _____, _____, _____ and _____.
2   Six Sigma comprises of two processes _____and _____.
3   ISO is an _____
4   The ISO standard specifies _____ elements of a quality system.
5   _____is a practice of developing software that is maintained in the highest quality state throughout the entire development process.
6   CCTA stands for_____.
7   _____ standards should be in place to ensure that changes to requirements are implemented in a safe and orderly way.
8   The organization as part of its monitoring and control policy may have a _____ in place which dictates that certain statistics have to be collected at various stages of a project.
9   The products handed over to the clients at the end of projects are called as _____.
10   The relationship between program design and program specification can be portrayed in _____.
11   _____ times is the time between start and end of a task.

Ans.   (1)(Product-based, value-based, manufacturing, user-based, transcendent), (2)(DMAIC, DMADV), (3)(International Organization for Standardization), (4)(20), (5)(Zero Defect Software Development), (6)(Central Computing and Telecommunication Agency), (7)(Change control and configuration management), (8)(measurement programme), (9)(deliverables), (10)(Product Flow Diagram), (11)(Elapsed).

II   Short Answer Type Questions:

1   How was ISO term derived?
2   What constitutes the software quality system? Explain.

3   Define the term software quality.
4   Define Zero Defect Software Development.
5   What is Software Quality Control?
6   What do you understand by the term Software Quality Assurance?
7   What are the different views of quality? Explain.
8   Write a short note on FURPS.
9   What are audits?
10   Why Software Quality Assurance is said to be a set of preventive activities?
11   Define Software Quality. List and explain quality attributes.
12   What are the elements of software quality system? Discuss any three in detail.
13   Write short note on Boehm Model
14   What is the role of CMM
15   Explain about software quality assurance for a software
16   Explain Process and Product Metrics
17   Define cost of quality. Differentiate between prevention, appraisal and failure cost.
18   State the parameters on which defects can be classified?
19   Write short note on SPICE.

III   Long Answer Type Questions:

1   Discuss the major activities of SQA.
2   Discuss the elements of the ISO 9000 standards.
3   What is Capability Maturity Model? Discuss.
4   Discuss the basic rules of Zero defect software development.
5   Discuss the Software Quality attributes in detail.
6   Describe the McCall software quality model. How many product quality factors are defined and why?
7   Explain the Boehm software quality model with the help of a block diagram.
8   Discuss the relationship between quality factors and quality criteria in McCall's software quality model.
9   What is ISO-9126 with McCall software quality model and highlight few advantages of ISO-9126?
10   Differentiate between Software Quality Assurance, Software Quality Control and Testing.
11   Explain Six Sigma in detail.
12   Differentiate between CMM and ISO.
13   Explain Dromey's Quality model in detail.
14   Explain the relationship of Software quality assurance with SDLC.
15   What is Software Quality Assurance (SQA)? Explain software quality assurance life cycle with the help of a diagram.
16   What SQA tasks should be performed to prevent, detect and remove defects from software?
17   Consider the following Library Information System (LIS) software:
- The Librarian can create new member records by entering member's name and address. LIS assigns a unique membership number to each new library member. The Librarian can also delete a membership by entering the membership number.

- LIS registers each book issued to a member. When a member returns a book, LIS deletes the book from the member's account and makes the book available for future issue.
- When a member returns an overdue book, the LIS software computes the penalty charge and prints a bill towards the fine payable by the member.
- A member can input either the name of a book or the name of the author of the book, and query about the availability of the book. If available, LIS displays the following: the rack number in which the book is located, the number of copies of the books available for issue and the number of copies of the book already issued out.

List and explain the steps carried out to ensure that design and testing has been correctly carried out (according to software quality assurance program) and standards are followed.

18   Explain software quality and various view on quality with neat diagram

19   McCall suggests that simplicity, modularity, instrumentation and self descriptiveness are software quality criteria that are internal characteristics that promote external quality testability.
      (I)   Explain each of the above four criteria.
      (II)   Describe the possible measures for each of the criteria.
      Describe the possible ways in which the measures could be assessed.

20   A premier company namely "Hi-Tech solution" located in 10 cities in India and 2 in USA. It is an ISO certified organization. The product of company is dealing with e-Governance, disaster management and data back up solutions. Kindly illustrate different aspects of quality management and accreditations of Hi Tech solution from your perspective. Justify how this company is declared to be a quality oriented firm

21   What is Software Quality Assurance (SQA)? Explain software quality assurance life cycle with the help of a diagram.

22   What SQA tasks should be performed to prevent, detect and remove defects from software?

23   Explain the elements of software quality system

24   What is the role of CMM?

25   Explain the elements of software quality management in detail?

26   Differentiate between Software Quality Assurance and Software Quality Control?

27   Explain the Cost of Quality.

UNIT – II

I   Test Your Skills:
(a)   State Whether the Following Statements are True or False:

1   Alpha testing is done by developer.
2   Verification is checking the product with respect to specification.
3   Boundary Value Analysis is a type of white box testing.
4   The DD path graph is known as decision to decision path graphs.
5   Testing is a positive activity.
6   The purpose of software reviews is to uncover errors in work products so they can be removed before moving on to the next phase of development.
7   In any type of technical review, the focus of the review is on the product and not the producer.

8   Sample driven reviews only make sense for very small software development projects.

9   Software Testing is a process of evaluating a system by manual or automatic means and verify that it satisfies specified requirements or identity differences between expected and actual results.

10   Path Tested = Number of Path Tested / Total Number of Paths.

11   Maintenance Plan predicts the maintenance requirements of the system, maintenance costs and effort required.

12   Validation plan describes the approach, resources and schedule used for system validation.

13   Types of quality tools are Problem Identification Tools and Problem Analysis Tools.

14   Production and operation managers are responsible for producing the goods or services that the organization intends to offer to its customers or constituents.

15   Quality circles work best as part of total quality control.

Ans. (1)(F), (2)(T), (3)(F), (4)(T), (5)(F), (6)(T), (7)(T), (8)(F), (9)(T), (10)(T), (11)(T), (12)(F), (13)(T), (14)(T), (15)(F)

(b)   **Multiple Choice Questions:**

1   Software mistakes during coding are known as
- (a)   Failures
- (b)   Defects
- (c)   Bugs
- (d)   Errors

2   Test suite is
- (a)   Set of test cases
- (b)   Set of inputs
- (c)   Set of outputs
- (d)   None of the above

3   Cyclomatic complexity is denoted by
- (a) $V(G)=e-n+2p$
- (b) $V(G)=\pi+1$
- (c) $V(G)=$number of regions of the graph
- (d)   all of the above

4   Which one is not the verification activity?
- (a)   Reviews
- (b)   Path testing
- (c)   Walkthroughs
- (d)   Acceptance testing

5   Site for alpha testing is
- (a)   Software company
- (b)   Installation place

     (c)   Anywhere

     (d)   All of the above

6   In data flow testing, objective is to find
     (a)   All dc-paths that are not du-paths
     (b)   All du-paths
     (c)   All du-paths that are not dc-paths
     (d)   All dc-paths

7   Which of the following are objectives for formal technical reviews?
     (a)   Allow senior staff members to correct errors
     (b)   Assess programmer productivity
     (c)   Determining who introduced an error into a program
     (d)   Uncover errors in software work products

8   Regression testing is known as
     (a)   The process of retesting the modified parts of the software
     (b)   The process of testing the design documents
     (c)   The process of reviewing the SRS
     (d)   None of the above

9   At the end of a formal technical review all attendees can decide to
     (a)   Accept the work product without modification
     (b)   Modify the work product and continue the review
     (c)   Reject the product due to stylistic discrepancies
     (d)   Reject the product due to severe errors
     (e)   Both (a) and (d)

10   A review summary report answers which three questions?
     (a)   Terminate project, replace producer, and request a time extension
     (b)   What defects were found, what caused defects, who was responsible
     (c)   What was reviewed, who reviewed it, what were the findings
     (d)   None of the above

11   White Box Techniques are also called as :-
     (a)   Structural Testing
     (b)   Design Based Testing
     (c)   Error Guessing Technique
     (d)   Experience Based Technique

12   What is an equivalence partition (also known as an equivalence class)?
     (a)   A set of test cases for testing classes of objects.
     (b)   An input or output ranges of values such that only one value in the range becomes a test case.
     (c)   An input or output ranges of values such that each value in the range becomes a test case.

(d)   An input or output ranges of values such that every tenth value in the range becomes a test case.

13   Exhaustive Testing is
(a)   Is impractical but possible
(b)   Is practically possible
(c)   Is impractical and impossible
(d)   Is always possible

14   Which of the following is the task of a Tester?
i.   Interaction with the Test Tool Vendor to identify best ways to leverage test tool on the project.
ii.   Prepare and acquire Test Data
iii.   Implement Tests on all test levels, execute and log the tests.
iv.   Create the Test Specifications
(a)   i, ii, iii is true and iv is false
(b)   ii, iii, iv is true and i is false
(c)   i is true and ii, iii, iv are false
(d)   iii and iv is correct and i and ii are incorrect

15   What can static analysis NOT find?
(a)   The use of a variable before it has been defined
(b)   Unreachable ("dead") code
(c)   Memory Leaks
(d)   Array bound violations

16   _____is testing's first goal.
(a)   Bug prevention.
(b)   Testing.
(c)   Execution.
(d)   Analyses

17   _____ is the independent examination of a work product.
(a)   Boundary value analysis.
(b)   Coverage Analysis.
(c)   Bug.
(d)   Audit

18   _____ is a fault in a program.
(a)   Boundary value analysis
(b)   Coverage Analysis
(c)   Bug
(d)   Audit

19   The sudden and complete failure of a computer system is called _____.
(a)   Boundary value analysis

(b)   Crash

(c)   Bug

(d)   Audit

20   _____ is the discrepancy between a computed and observed value.

(a)   Error

(b)   Coverage Analysis

(c)   Bug

(d)   Audit

21   _____ is a chronological record of all relevant details about the execution of a test.

(a)   Test Item

(b)   Test Log

(c)   Test Case

(d)   Fault Report

22   _____ matrix records the relationship between two or more products.

(a)   Test.

(b)   Log.

(c)   Traceability.

(d)   Fault Report.

23   Name the process that confirms that the software meets its technical specification.

(a)   Test

(b)   Validation

(c)   Verification

(d)   Acceptance

24   _____ are defined to be the variance between the expected result and actual result when the software is put to operation.

(a)   Defect.

(b)   Coverage Analysis.

(c)   Bug.

(d)   Audit

25   Software _____ is defined as the probability of failure free operations for a specified period of time in a specific environment.

(a)   Testing.

(b)   Reliability.

(c)   Verification.

(d)   Acceptance.

26   Name an evaluation technique to assess the quality of test cases.

(a)   Mutation analysis.

(b)   Validation.

(c)   Verification.

(d)   Performance analysis.

27   _____ does look at the implementation details.
    (a)   Unit testing.
    (b)   Loop testing.
    (c)   Functional testing.
    (d)   Structural testing.

28   In _____, the program or system is treated as a black box.
    (a)   unit testing.
    (b)   Loop testing.
    (c)   Functional testing.
    (d)   Stress testing.

29   Test should be conducted for every possible _____.
    (a)   dat(a)
    (b)   Case.
    (c)   Variable.
    (d)   All the above.

30   The _____ associated with testing will be called test factors.
    (a)   Test phase.
    (b)   Test result.
    (c)   Risk.
    (d)   Test dat

31   _____ relates to the effort needed to the make changes to the software.
    (a)   Functionality.
    (b)   Maintainability.
    (c)   Reliability.
    (d)   Efficiency.

32   Which of the following statements is NOT true?
    (a)   A good design methodology should provide a clear division of design from implementation.
    (b)   A good design methodology should not promote a top-down decomposition strategy.
    (c)   A good design methodology should encourage phased development of the software.
    (d)   A good design methodology should help to minimize future maintenance.

33   Formal Reviews seek to _____.
    (a)   Identify system faults, but not to attribute blame or seek solutions.
    (b)   Identify system faults, attribute the source of errors, but not seek solutions.
    (c)   Identify system faults, attribute the source of errors and seek solutions.
    (d)   Identify system faults, seek solutions, but not to attribute blame.

34   Which form of software development model is most suited to a system where all the requirements are known at the start of a project and remain stable throughout the project?
(a)   Waterfall model.
(b)   Incremental model.
(c)   Evolutionary model.
(d)   Spiral model.

35   _____ relates to the ability of the software to be transferred to a different environment.
(a)   Portability.
(b)   Maintainability.
(c)   Reliability.
(d)   Efficiency.

36   Which of the following statements is NOT true?
(a)   Requirements must be testable.
(b)   Requirements must be concerned with system functionality only.
(c)   Requirements must be complete.
(d)   Requirements must be unambiguously stated.

37   Which of the following is NOT part of a software quality assurance plan?
(a)   Reference documents.
(b)   Configuration Action.
(c)   Supplier Control.
(d)   Customer Control.

38   Who is NOT usually present in a technical review?
(a)   User.
(b)   Quality Enginer
(c)   The programming tools supplier.
(d)   Specialist with knowledge of the application.

39   COCOMO is _____.
(a)   Constructive Common Model.
(b)   Constructive Cost Model.
(c)   Constructive Collaborative Model.
(d)   Constructive Comparative Model.

40   The expectancy theory of motivation will focus on _____.
(a)   Instrumentality.
(b)   Reliability.
(c)   Reward.
(d)   Assignment specification.

41   Size and Complexity are a part of
(a)   Product Metrics

(b)   Process Metrics
(c)   Project Metrics
(d)   Cost Metrics

42   Cost and schedule are a part of
(a)   Product Metrics
(b)   Process Metrics
(c)   Project Metrics
(d)   Assignment specification

43   Number of errors found per person hours expended is an example of
(a)   Measurement
(b)   Measure
(c)   Metric
(d)   Cost

44   According to Crosby, it is less costly to
(a)   Let the customer find the defects.
(b)   Detect defects than to prevent them.
(c)   Prevent defects than to detect them.
(d)   Ignore minor defects

45   Cost of quality is
(a)   Prevention costs
(b)   Appraisal costs
(c)   Failure costs
(d)   All of the above

46   Which of the following metrics involves defects reported by client
(a)   Test efficiency
(b)   Test effectiveness
(c)   Test Coverage
(d)   None of the above

47   Detecting a defect at which of the following stage is most economical?
(a)   Design
(b)   Build
(c)   Testing
(d)   Deployment

48   What kind of quality cost is incurred when an error is detected in a product prior to Shipment ?
(a)   Prevention
(b)   Internal Failure
(c)   External Failure
(d)   Appraisal

49   Dynamic process is an example of
        (a)   Validation
        (b)   Verification
        (c)   Quality Assurance
        (d)   Quality Control

50   Non-Functional Software testing done to check if user interface is easy to use &
        understand
        (a)   Usability Testing
        (b)   Security Testing
        (c)   Unit testing
        (d)   Block Box Testing

Ans.   (1)(c), (2)(a), (3)(d), (4)(d), (5)(a), (6)(c), (7)(d), (8)(a), (9)(e), (10)(c), (11)(a), (12)(b),
        (13)(a), (14)(b), (15)(c), (16)(a), (17)(d), (18)(c), (19)(b),   (20)(a), (21)(b), (22)(c),
        (23)(c), (24)(a), (25)(b), (26)(a), (27)(d), (28)(c), (29)(d),   (30)(c) (31)(b), (32)(b),
        (33)(c), (34)(a), (35)(a), (36)(c), (37)(c), (38)(c), (39)(b), (40)(a), (41)(a), (42)(c),
        (43)(c), (44)(c), (45)(d), (46)(b), (47)(a), (48)(b), (49)(a), (50)(b)

(c)   Fill in the Blanks:

1   Beta testing is carried out by_____.
2   For a function of two variables _____test cases will be generated by robustness testing.
3   Worst case testing for a function of n variables generates _____test cases.
4   The decision tables in which all entries are binary are called _____decision tables.
5   Testing tools can be classified as _____and _____testing   tools.
6   Evaluation methods can be classified as _____, _____ and _____.
7   Effort = _____.
8   _____ formulated Function point analysis.
9   UFP indicates _____.
10   _____ is refined by Barry Boehm and his co-workers.
11   Size/effort = _____.

Ans.   (1)(Users), (2)(13), (3)(5^n),(4)(limited entry), (5)(dynamic/static), (6)(quantitative,
        qualitative, hybrid) (7) system size X productivity rate. (8) Allan Albrecht (9) unadjusted
        function points (10) COCOMO IV (11) productivity rate.

II   Short Answer Type Questions:

1   When the roles of software testing start in software life cycle? When can planning for
        software testing start?
2   Differentiate between validation and verification.
3   Will exhaustive testing guarantee that the program is 100% correct? Justify.
4   Why does software testing need extensive planning?
5   Who could test well, developer or independent tester? Justify your answer.

6	White Box testing is complementary to black box testing, not alternative why? Give a example to prove this statement.
7	Why does software fail after it has passes from acceptances testing? Explain.
8	What is the meaning of term evaluation?
9	Differentiate between quantitative and qualitative evaluation.
10	What are configuration audits?
11	Define the term walkthroughs.
12	What are inspections?
13	What is hybrid evaluation?
14	What are test stubs and drivers?
15	Explain usefulness of decision table during testing.
16	Explain smoke testing.
17	Difference between alpha and beta testing.
18	Differentiate between static and dynamic testing tools
19	Differentiate between test case, test suit and test be(d)
20	Describe what all tests are performed under system testing?
21	Differentiate between walkthroughs and inspections.
22	What is the use and importance of graph matrix? Explain with the help of an example.
23	Explain in detail cyclomatic complexity. Explain how it is used in deriving the logical complexity of a program.
24	Write short note on McCall Model?

III   Long Answer Type Questions:

1	Explain Boundary Value Analysis method as applied to determine black box test cases.
2	Compare Functional and Glass Box testing.
3	Describe the equivalence class testing method in detail.
4	Explain the usefulness of decision table during testing. Is it really effective? Justify.
5	Discuss cause effect graphing technique with an example.
6	What are the various levels of testing? Explain.
7	Explain mutation testing in detail.
8	Explain data flow testing with the help of an example.
9	What are various debugging approaches? Discuss them with the help of examples.
10	Discuss the importance of path testing during structural testing.
11	Discuss the different types of evaluation methods in detail.
12	What is the role of evaluation in various phases of SDLC?
13	Discuss the various types of reviews in detail.
14	What are the different types of configuration audits? Discuss.
15	Explain about software quality assurance for a software.
16	What does software audit review means? Discuss the objectives and participants
17	Explain the typical change management procedure with help of block diagram?
18	What are different views of quality as specified by Gravin?
19	What is the importance of documentation in maintaining the quality of software?

UNIT - III

I   Test Your Skills:
(a)   State Whether the Following Statements are True or False:

1   Identification of software configuration items is the first activity of SCM.
2   Defect amplification models can be used to illustrate the costs associated with using software from its initial deployment to its retirement
3   Once a software engineering work product becomes a baseline it cannot be changed again.
4   Modern software engineering practice suggests that a software team maintain SCI's in a project database or repository.
5   The handling of change requests is known as change management.
6   Many data repository requirements are the same as those for a typical database application.
7   The ability to track relationships and changes to configuration objects is one of the most important features of the SCM repository.
8   Change control is not necessary if a development group is making use of an automated project database tool.
9   SCI standards take a formal view and do not address guidelines for applying change management in agile environments.
10   Change management for Web Applications is best handled in agile manner.
11   Quality of design encompasses requirements and specifications of the system.
12   Misinterpretation of customer communication is a sample of possible cause defects.
13   Software safety is equivalent to software reliability.
14   Non-conformance to software requirement is known as Software Failure.
15   Six Sigma is the most widely used strategy for statistical quality assurance and the "Six Sigma" refers to six standard deviations.

Ans.   (1)(T), (2)(F), (3)(F), (4)(T), (5)(T), (6)(T), (7)(T), (8)(F), (9)(F), (10)(T), (11)(T), (12)(T), (13)(F), (14)(T), (15)(F)

(b)   Multiple Choice Questions:

1   SCM is done to
       (a)   Identify elements of software configuration
       (b)   Control changes made on SCIs
       (c)   Ensure that changes have been properly made
       (d)   All of the above

2   How many activities are there in SCM ?
       (a)   2
       (b)   4
       (c)   5
       (d)   3

3   Which of these are valid software configuration items?
       (a)   Software tools

(b)   Documentation
(c)   Executable programs
(d)   Test data
(e)   All of the above

4   Which of the following is not considered one of the four important elements that should exist when a configuration management system is developed?
(a)   Component elements
(b)   Human elements
(c)   Process elements
(d)   Validation elements

5   Which configuration objects would not typically be found in the project database?
(a)   Design specification
(b)   Marketing data
(c)   Organizational structure description
(d)   Test plans
(e)   Both (b) and (c)

6   Which of the following tasks is not part of software configuration management?
(a)   Change control
(b)   Reporting
(c)   Statistical quality control
(d)   Version control

7   When software configuration management is a formal activity, the software configuration audit is conducted by the
(a)   Development team
(b)   Quality assurance group
(c)   Senior managers
(d)   Testing specialists

8   The primary purpose of configuration status reporting is to
(a)   Allow revision of project schedules and cost estimates by project managers
(b)   Evaluate the performance of software developers and organizations
(c)   Make sure that change information is communicated to all affected parties
(d)   None of the above

9   Which of the following is not a type of coding defect?
(a)   Initialisation defects
(b)   Error handling defects
(c)   Incomplete Requirements
(d)   Code documentation defects

10   _____ standards should be in place to ensure that changes to requirements are implemented in a safe and orderly way.

(a)   Change control and configuration management
(b)   Time control and configuration management
(c)   Access control and configuration management
(d)   Quality control and configuration management

11   The main goal of quality assurance is to _____.
(a)   Set coding standards.
(b)   Improve software project management.
(c)   Reduce the technical and programmatic risks in developing the software.
(d)   Specify corrective actions.

12   With respect to software metrics, which statement is NOT true?
(a)   A indirect measure focuses on attributes of a project which can be measured by process, product or resource.
(b)   A direct measure focuses on attributes of a project which can be measured by examining a process, product or resource.
(c)   External attributes are always measured indirectly.
(d)   Lines of code is a direct measurement.

13   Defect prevention is defined as _____.
(a)   Finding and fixing errors after insertion.
(b)   Finding and fixing errors before release but after insertion.
(c)   Finding and fixing errors after release.
(d)   Avoiding defect insertion.

14   _____ relates to the effort needed to the make changes to the software.
(a)   Functionality.
(b)   Maintainability.
(c)   Reliability.
(d)   Efficiency.

15   _____ is used to test user-friendliness.
(a)   Usability Testing.
(b)   System Testing.
(c)   Interoperability Testing.
(d)   Regression Testing.

16   _____ is to ensure that the unchanged system segments function properly.
(a)   System testing.
(b)   Stress testing.
(c)   Regression testing.
(d)   Alpha testing.

17   Testing should indicate the cost to test _____ the cost of undetected defects.
(a)   plus.
(b)   negative.

(c) positive.
(d) minus.

18 _____ are defined to be the variance between the expected result and actual result when the software is put to operation.
(a) Defect.
(b) Coverage Analysis.
(c) Bug.
(d) Audit

19 Defect Management process does not include _____.
(a) Defect prevention.
(b) Deliverable base-lining.
(c) Management reporting.
(d) Prevention reporting.

20 _____ is the mechanical or algorithmic cause of error.
(a) Faults.
(b) Coverage analysis.
(c) Bug.
(d) Defect.

21 Each time a defect gets detected and fixed, the reliability of a software product
(a) Increases.
(b) Decreases.
(c) remains constant.
(d) Cannot say anything.

22 ……………………. is the process, which controls the changes made to a system, and manages the different versions of the evolving software product.
(a) Software management
(b) Configuration management
(c) Version management
(d) Release management

23 Which of the following process ensures that versions of systems and components are recorded and maintained?
(a) Codeline
(b) Configuration control
(c) Version
(d) Workspace

24 Which of the following process is concerned with analyzing the costs and benefits of proposed changes?
(a) Change management
(b) Version management

(c) System building

(d) Release management

25 Which of the following is not a Version management feature?
(a) Version and release identification
(b) Build script generation
(c) Project support
(d) Change history recording

26 Which method recommends that very frequent system builds should be carried out with automated testing to discover software problems?
(a) Agile method
(b) Parallel compilation method
(c) Large systems method
(d) All of the mentioned

27 Which of the following is not a build system feature?
(a) Minimal recompilation
(b) Documentation generation
(c) Storage management
(d) Reporting

28 Which of the following is a collection of component versions that make up a system?
(a) Version
(b) Code line
(c) Baseline
(d) None of the above

29 Which of the following is a configuration item?
(a) Design specification
(b) Source code
(c) Test specification
(d) Log information
(e) All of the mentioned

30 Which of the following is a part of system release?
(a) Electronic and paper documentation describing the system
(b) Packaging and associated publicity that have been designed for that release
(c) An installation program that is used to help install the system on target hardware
(d) All of the mentioned

31 A sequence of baselines representing different versions of a system is known as
(a) System building
(b) Mainline
(c) Software Configuration Item(SCI)
(d) None of the above

32   Which of the following term is best defined by the statement "The creation of a new code line from a version in an existing code line"?
(a)   Branching
(b)   Merging
(c)   Code line
(d)   Mainline

33   User Acceptance testing is
(a)   White box testing
(b)   Black box testing
(c)   Gray box testing
(d)   None of the above

34   Error guessing is a
(a)   Test verification techniques
(b)   Test execution techniques
(c)   Test control management techniques
(d)   Test data management technique

35   Histogram refers to
(a)   Bar chart
(b)   Run chart
(c)   Pareto diagram
(d)   Correlation diagram

36   Pareto principle advocates
(a)   20-80 rule
(b)   80-20 rule
(c)   40-60 rule
(d)   60-40 rule

37   Which one is not Structural Testing?
(a)   Regression
(b)   Parallel
(c)   Acceptance
(d)   Stress

38   Testing comes under which category of cost of quality?
(a)   Preventive
(b)   Appraisal
(c)   Failure
(d)   None of the above

39   According to Crosby, it is less costly to
(a)   Let the customer find the defects.

(b)   Detect defects than to prevent them.
(c)   Prevent defects than to detect them.
(d)   Ignore minor defects

40   Cost of quality is
(a)   Prevention costs
(b)   Appraisal costs
(c)   Failure costs
(d)   All of the above

41   What is the verification process in software development?
(a)   The probability that undesirable things will happen such as loss of human life or large financial losses.
(b)   The process of monitoring the software to ensure full compliance with established standards and procedures
(c)   The process of trying to discover every conceivable fault or weakness in a work product.
(e)   The process of evaluating a system or component to determine whether or not the products of a given development phase satisfy the conditions imposed at the start of that phase.

42   Reporting Discrepancies as incidents is a part of which phase:
(a)   Test Analysis and Design
(b)   Test Implementation and execution
(c)   Test Closure Activities
(d)   Evaluating exit criteria and reporting

Ans.   (1)(d), (2)(d), (3)(e), (4)(d), (5)(e), (6)(c), (7)(b), (8)(c), (9)(c), (10)(a), (11)(c), (12)(a), (13)(b), (14)(b), (15)(a), (16)(c), (17)(a), (18)(a), (19)(b), (20)(d), (21)(a), (22)(b), (23)(b), (24)(a), (25)(b), (26)(a), (27)(c), (28)(c), (29)(e), (30)(d), (31)(a), (32)(a), (33)(b), (34)(d), (35)(a), (36)(b), (37)(c), (38)(b), (39)(c), (40)(b), (41)(d), (42)(b)

(c)   Fill in the Blanks:

1   SCM stands for _____

2   _____ is the process of finding the activity or process which causes the defects and find out ways of eliminating or reducing the effect of that by providing remedial measures.

3   _____defects occur due to improper data sequence.

4   Two key concepts involved in modeling defects are the levels of _____and _____.

5   _____ is any flaw or imperfection in a software work product or software process.

6   A basic configuration object is a _____ created by a software engineer during some phase of the software development process.

7   A new _____ is defined when major changes have been made to one or more configuration objects.

Ans.   (1)(Software Configuration Management), (2)(Root Cause Analysis), (3)(Data flow), (4)(priority, severity), (5)(software defect), (6)(unit of information), (7)(version)

II   Short Answer Type Questions:

1   How SDLC and SCM are different?
2   What are the major causes of defect?
3   Discuss various types of coding defects.
4   What is Root Cause Analysis?
5   Why there is a need for defect prevention?
6   Explain defect analysis.
7   Discuss the importance of SCM.
8   Define the term baseline.
9   What are the major types of discrepancies that can be identified in reports?
10   Define the term configuration item.
11   Differentiate between discrepancies caused by requirements errors and caused by development errors.
12   Explain the typical change management procedure with help of block diagram.
13   How will you assure that a defect is addressed and closed?
14   Write short note on Version control
15   Define Regression Testing
16   Define Stress Testing
17   Define Recovery
18   Explain software evaluation at different phases of SDLC
19   Explain the role of Version Control in configuration management
20   Explain the role of Change management in configuration management
21   Explain the concept of Instances in configuration management
22   What is Six Sigma?
23   Explain CMM Model?

III   Long Answer Type Questions:

1   What are the different roles in SCM?
2   What are the major activities of SCM?
3   Illustrate the goals of Software Configuration management.
4   Discuss the lifecycle of defects discovered during testing.
5   What are the various defect detection techniques? Explain.
6   Explain the change control process in detail.
7   What are the major goals of Change Control procedure?
8   Explain that software evolves throughout the life cycle by means of requirements changes (including new product) and discrepancy correction.
9   Explain how SCM and SEI Capability Maturity Model are interrelate (d)

10 Explain the relationship between configuration management, quality assurance and the customer.
11 Explain the typical change management procedure with help of block diagram?
12 What is Software Quality Assurance (SQA)? Explain software quality assurance life cycle with the help of a diagram.
13 Explain defect analysis life cycle in details
14 Explain categorization of defect in detail.
15 Explain Configuration Management Planning
16 Explain the concept of software inspection, walkthrough, review and audit process?
17 Explain different maturity levels of CMM?
18 Differentiate between re-testing and regression testing. What are the major test plan elements?
19 Define Cyclomatic complexity. What are various ways of calculating it? Explain with an example.

UNIT - IV

I   Test Your Skills:

(a)   State Whether the Following Statements are True or False:

1   The Fixed bugs are again re-tested by the testing team.
2   Most programmers are cavalier about controlling the quality of the software they write.
3   Defect repairs are taken when the project has deviated from the planned scope, schedule, cost, or quality requirements.
4   Essential Complexity is the cyclomatic complexity after structured programming constructs have been removing (d)
5   In modified cyclomatic each case statement is counted in switch.
6   Staff development plan describes how the skills and experience of the project team members will be developed.
7   Cost of quality = Prevention Cost + Appraisal cost + Failure cost.
8   Requirement and Analysis, Design, Development or Coding, Testing and Maintenance is called as Software Development Life Cycle (SDLC).
9   Configuration Management Plan describes the Configuration Management procedures and structures to be used.
10 Product Risk affects the quality or performance of the software.
11 Business Risk affects The Organization developing or Procuring the software.
12 Stratification is a Technique used to analyze/divide a universe of data into homogeneous groups (strata).
13 Automation Testing should be done before starting Manual testing
14 Earlier a defect is found the cheaper it is to fix it.
15 Software Testing is a process of evaluating a system by manual or automatic means and verify that it satisfies specified requirements or identity differences between expected and actual results.

Ans.   (1)(T), (2)(T), (3)(F), (4)(T), (5)(F), (6)(T), (7)(F), (8)(T), (9)(T), (10)(T), (11)(F), (12)(T), (13)(F), (14)(T), (15)(F)

(b)   Multiple Choice Questions:

1   The approach/document used to make sure all the requirements are covered when writing test cases
        (a)   Test Matrix
        (b)   Checklist
        (c)   Test bed
        (d)   Traceability Matrix

2   Executing the same test case by giving the number of inputs on same build called as
        (a)   Regression Testing
        (b)   Retesting
        (c)   Ad hoc Testing
        (d)   Sanity Testing

3   Control Charts is a statistical technique to assess, monitor, and _____the stability of a process.
        (a)   Maintain
        (b)   Process
        (c)   Demand
        (d)   Increase

4   To check whether we are developing the right product according to the customer requirements are not. It is a static process
        (a)   Validation
        (b)   Verification
        (c)   Quality Assurance
        (d)   Quality Control

5)   To check whether we have developed the product according to the customer requirements are not. It is a Dynamic process.
        (a)   Validation
        (b)   Verification
        (c)   Quality Assurance
        (d)   Quality Control

6   _____describes how the skills and experience of the project team members will be developed.
        (a)   Staff development plan
        (b)   Staff removal plan
        (c)   Quality management plan
        (d)   Quality assurance Plan

7   It is a set of levels that defines a testing maturity hierarchy
     (a)   TIM (Testing Improving Model)
     (b)   TMM (Testing Maturity Model)
     (c)   TQM (Total Quality Management)

8   A Non-Functional Software testing done to check if the user interface is easy to use and understand
     (a)   Usability Testing
     (b)   Security Testing
     (c)   Unit testing
     (d)   Block Box Testing

9   The review and approved document (i.e. Test plan, System Requirement Specification's) is called as
     (a)   Delivery Document
     (b)   Baseline Document
     (c)   Checklist

10   What are the Testing Levels?
     (a)   Unit Testing
     (b)   Integration Testing
     (c)   System Testing and Acceptance Testing.
     (d)   All the above

11   Cost of quality = Prevention Cost + Appraisal cost + _____
     (a)   Failure cost
     (b)   Maintenance cost
     (c)   Error Cost
     (d)   HR cost

12   A useful tool to visualize, clarify, link, identify, and classify possible cause of a problem. This is also called as "fishbone diagram" what is this?
     (a)   Pareto Analysis
     (b)   Cause-and-Effect Diagram

13   It measures the quality of processes used to create a quality product.
     It is a system of management activities,
     It is a preventive process, It applies for entire life cycle & Deals with Process.
     (a)   Validation
     (b)   Verification
     (c)   Quality Assurance
     (d)   Quality Control

14   Variance from product specifications is called?
     (a)   Report
     (b)   Requirement

(c)   Defect

15   Verification is
(a)   Process based
(b)   Product based
(c)   Both
(d)   None

16   White box testing is not called as_____
(a)   Glass box testing
(b)   Closed box testing
(c)   OPen box testing
(d)   Clear box testing

17   Name the events that will be analyzed, Count the named incidents, Rank the count by frequency using a bar chart & Validate reasonableness of the analysis is called as
(a)   Pareto Analysis
(b)   Cause and Effect Diagram
(c)   SWOT Analysis
(d)   Pie Charts

18   Retesting of a single program or component after a change has been made?
(a)   Full Regression Testing
(b)   Unit Regression
(c)   Regional Regression
(d)   Retesting

19   Requirement and Analysis, Design, Development or Coding, Testing and _____is called as Software Development Life Cycle (SDLC)
(a)   Maintenance
(b)   Feedback
(c)   Analysis
(d)   Elicitation

20   The testing which is done by going through the code is known as,
(a)   Unit Testing
(b)   Black Box testing
(c)   White box Testing
(d)   Regression testing

21   Configuration Management Plan describes the Configuration Management procedures and _____to be used.
(a)   Structures
(b)   Process
(c)   People
(d)   Hardware

22   This type of testing method attempts to find incorrect or missing functions, errors in data structures or external database access, interface errors, Performance errors and initialization and Termination errors. It is called as
(a)   White Box Testing
(b)   Grey Box Testing
(c)   Black Box Testing
(d)   Open Box Testing

23   Phase Definition. It will come under
(a)   CMM Level 1
(b)   CMM Level 2
(c)   None

24   Software testing which is done without planning and Documentation is known as
(a)   Adhoc Testing
(b)   Unit Testing
(c)   Regression testing
(d)   Functional testing.

25   Acceptance testing is known as
(a)   Beta Testing
(b)   Grey-Box testing
(c)   Test Automation
(d)   White box testing

26   Retesting the entire application after a change has been made called as?
(a)   Full Regression Testing
(b)   Unit Regression
(c)   Regional Regression
(d)   Retesting

27   Boundary value analysis belongs to which testing method?
(a)   Black Box testing
(b)   White Box testing

28   It measures the quality of a product
It is a specific part of the QA procedure; it is a corrective process,
It applies for particular product & Deals with the product.
(a)   Validation
(b)   Verification
(c)   Quality Assurance
(d)   Quality Control

29   What are the Types of Integration Testing?
(a)   Big Bang Testing
(b)   Bottom up Testing

     (c)   Top Down Testing
     (d)   All the above

30   Product Risk affects the _____or performance of the software.
     (a)   Quality
     (b)   Hardware
     (c)   Software
     (d)   Cost

31   A metric used to measure the characteristic of documentation and code called as
     (a)   Process metric
     (b)   Product Metric
     (c)   Test metrics

32   Which is non-functional software testing?
     (a)   Unit Testing
     (b)   Block box testing
     (c)   Performance Testing
     (d)   Regression testing

33   The process that deals with the technical and management issues of software development called as?
     (a)   Delivery Process
     (b)   Testing Process
     (c)   Software Process

34   Executing the same test case on a modified build called as
     (a)   Regression Testing
     (b)   Retesting
     (c)   Ad hoc Testing
     (d)   Sanity Testing

35   Which is Black-Box Testing method?
     (a)   Equivalence partitioning
     (b)   Code coverage
     (c)   Fault injection

36   Informing to the developer which bug to be fix first is called as
     (a)   Severity
     (b)   Priority
     (c)   Fix ability
     (d)   Traceability

37   What are the Testing Levels?
     (a)   Unit Testing
     (b)   Integration Testing

(c)   System Testing and Acceptance Testing.

(d)   All the above

38   Variance from product specifications is called?
- (a)   Report
- (b)   Requirement
- (c)   Defect
- (d)   Analysis

39   Verification is
- (a)   Process based
- (b)   Product based
- (c)   Cost based
- (d)   Analysis based

40   Beta testing is done at
- (a)   User end's
- (b)   Developer's end
- (c)   Programmer's end
- (d)   Developer's end

41   Which of the following is black box testing?
- (a)   Basic path testing
- (b)   Boundary value analysis
- (c)   Code path analysis
- (d)   None of the mentioned

42   Which of the following is not used in measuring the size of the software?
- (a)   KLOC
- (b)   Function Points
- (c)   Size of module
- (d)   Line of Count

43   Reporting Discrepancies as incidents is a part of which phase:
- (a)   Test Analysis and Design
- (b)   Test Implementation and execution
- (c)   Test Closure Activities
- (d)   Evaluating exit criteria and reporting

44   The approach/document used to make sure all the requirements are covered when writing test cases
- (a)   Test Matrix
- (b)   Checklist
- (c)   Test bed
- (d)   Traceability Matrix

45   Executing the same test case by giving the number of inputs on same build called as
    (a)   Regression Testing
    (b)   Retesting
    (c)   Ad hoc Testing
    (d)   Sanity Testing

46   Unit testing will be done by
    (a)   Testers
    (b)   End Users
    (c)   Customer
    (d)   Developers

47   The degree to which the design specifications are followed during manufacturing is known as
    (a)   Quality of design
    (b)   Quality of conformance
    (c)   Quality of testing
    (d)   None of the mentioned

48   The name of the testing which is done to make sure the existing features are not affected by new changes
    (a)   Recursive testing
    (b)   White box testing
    (c)   Unit testing
    (d)   Regression testing

49   Which Software Development Life cycle model will require to start Testing Activities when starting development activities itself
    (a)   Waterfalls model
    (b)   Spiral Model
    (c)   V-model
    (d)   Linear model

50   Defects are less costly if detected in which of the following phases
    (a) Coding
    (b) Design
    (c) Requirements Gathering
    (d) Implementation

Ans.   (1)(d), (2)(b), (3)(a), (4)(b), (5)(a), (6)(a), (7)(b), (8)(a), (9)(b), (10)(d), (11)(a), (12)(b), (13)(c), (14)(c), (15)(a), (16)(b), (17)(a), (18)(b), (19)(a), (20)(c), (21)(a), (22)(c), (23)(b), (24)(a), (25)(a), (26)(a), (27)(a), (28)(d), (29)(d), (30)(a), (31)(b), (32)(c), (33)(c), (34)(a), (35)(a), (36)(b), (37)(d), (38)(c), (39)(a), (40)(a), (41)(b), (42)(b), (43)(d), (44)(c), (45)(d), (46)(b), (47)(a), (48)(b), (49)(a), (50)(b)

(b)   **Fill in the Blanks:**

1   _____ defects are the requirements given by the client but not implemented by the developer.
2   The defect can be _____or _____by the development team.
3   The two major approaches of defect classification are _____ and
     _____.
4   A _____defect is defined as anything outside of customer specifications.
5   _____actions are proactive in nature.
6   Number of unique paths through a body of code are known as _____

Ans.   (1)(Missing), (2)(authorized, unauthorized), (3)(Orthogonal Defect Classification, Defect
        Origins, Types, and Modes), (4)(Six Sigma), (5)(preventive), (6)(path count)

II   Short Answer Type Questions:

1   What are the major classifications of defects?
2   What are the major causes of defect?
3   Differentiate among corrective actions, preventive actions and defect repair.
4   What is program unit complexity?
5   What is defect tracking?
6   What is Software Quality Program Plan?
7   What are defect ratios?
8   What is customer satisfaction index?
9   What is Traceability Matrix from Software Testing perspective?
10   Define the term CAPA.
11   Define cost of quality. Differentiate between prevention, appraisal and failure costs.
12   Explain structure metrics in detail
13   Explain in detail about the Rayleigh model
14   Explain the concept of Traceability
15   Explain the concept of Recording.
16   What is role of Software Quality Program Planning
17   What is Software Quality System Plan,
18   Explain the need of Software Documentation?
19   Explain configuration management and its components. Why it is required during
     modification?
20   Define defect detection efficiency.
21   What is clean room software engineering?

III   Long Answer Type Questions:

1   Explain bug life cycle in detail.
2   Discuss the major approaches of defect classification in detail.
3   Discuss various six sigma defect metrics.
4   Discuss the template of Software Quality Program Plan.
5   How a quality plan is different from a test plan?
6   Explain the different defect metrics.

7   Discuss various types of traceability matrix.
8   Discuss various steps to create traceability matrix.
9   Discuss various steps for the implementation of CAPA.
10   Differentiate between corrective actions and preventive actions.
11   What is the importance of defect trend analysis? Perform defect trend analysis based on the following data using quality tools (make suggestions for process improvement based on the following data :)

Defect identifier	Method	Source	Severity	Priority
D1	Inspection	Design	1	Emergency
D2	Acceptance testing	code	2	Low
D3	Regression testing	Design	3	Medium
D4	Inspection	Analysis	1	Emergency
D5	Audit	Analysis	2	Medium
D6	Walkthrough	Analysis	1	High
D7	Inspection	Design	1	Emergency
D8	Audit	Code	4	Medium
D9	Inspection	Design	2	Emergency
D10	Inspection	Design	1	Emergency
D11	Walkthrough	Design	1	High
1 implies defect is more severe and 4 imply defect is least severe				

12   What kind of analysis can be performed on the defect data? Explain.
13   Explain in detail about CASE tools.
14   Explain the defect removal effectiveness.
15   Explain the contents of Software Quality Program Plan in detail?
16   Describe the ways of identifying the requirement for corrective action
17   Describe the ways of implementing the correcting the corrective action.
18   Explain in brief the error reporting procedure?
19   Why defect prevention is crucial to the software process? What are different steps of software defect prevention?
20   Explain the importance of traceability metrics?