

**Deptt. of Governance Reforms,  
Punjab State  
e-Governance Society**

**Post: Asstt. District IT Manager (ADITM)  
(27 -10-2024) (Evening)  
Question Booklet & Answer Key**

- Which of the following represents the life-cycle of software development?
  - Analysis → Design → Coding → Testing → Operation and Maintenance
  - Design → Analysis → Coding → Testing → Operation and Maintenance
  - Design → Analysis → Coding → Testing
  - Analysis → Design → Coding → Operation and Maintenance
- If requirements are frequently changing, which software model is best suited?
  - Water Fall Model
  - Spiral Model
  - Prototype Model
  - Capability Maturity Model
- Consider the following C-program fragment involving integers M, k and n:

```

int M, k, n;
scanf("%d", &n);
M=1; k=0;
while(k < n)
{
    M=3*M;
    k=k+1;
}

```

Which of the following is a loop invariant, that is, true at the beginning of each execution of the loop and at the completion of the loop?

- $M = 2k + 1$
  - $M = (2k + 1) \times 3^k$
  - $M = 3^k$
  - $M = 3^{k+1}$
- Consider the following definition of a recursive function in C:

```

int strange(int list[], int first, int last)
{
    if(first == last)
        return list[first];
    else
        return list[first] + strange(list, first + 1, last);
}

```

Given the declaration: `int beta[10] = {2, 5, 8, 9, 13, 15, 18, 20, 23, 25};`

What is the value returned by `strange(beta, 4, 7)`?

- 27
  - 33
  - 55
  - 66
- Which of the following is a characteristic of an overloaded method in an object oriented programming?
    - it must have a fixed number of parameters
    - it could never be a constructor
    - it shares a name with another method in the same class
    - it shares a name with another method in the different class and it always returns void
  - Which of these is TRUE of the relationship between objects and classes in C++?
    - A class is an instance of an object.
    - An object is the ancestor of its subclass.
    - An object is an instance of a class.
    - An object is the descendant of its superclass.
  - Defining a class C++ so that the implementation of the data and methods of the class are not known to the programmers who use the class is called:
    - Data Binding
    - Polymorphism
    - Encapsulation
    - Inheritance

8. Which of the following is not a Storage Class in 'C' ?  
A) auto                      B) class                      C) external                      D) register

9. Suppose that you have the following function in C++:

```
void mystery(int& one, int two)
{
    int temp
    temp = one;
    one = two;
    two = temp;}

```

What are the values of x and y after the following statements is executed? (Assume that variables are properly declared.)

```
x = 10; y = 15;
mystery(x, y);
```

- A) x = 10; y = 10              B) x = 15; y = 10              C) x = 10; y = 15              D) x = 15; y = 15
10. Which of the following statements regarding parameter passing between functions in 'C' is NOT TRUE?  
A) When an argument is passed by value, a copy of the argument's value is made and passed to the called method.  
B) Pass-by-value can improve performance.  
C) Pass-by-reference can weaken security.  
D) With pass-by-value, changes to the called method's copy do not affect the original variable's value in the calling method.
11. When analyzing a real-world problem for eventual implementation as an object-oriented system, it is typical to...  
I. First write a main function, focusing on the control flow, and then keep refining the algorithm in a top-down fashion.  
II. First look for objects in the real world whose behavior and relationships the system should model.  
III. First look for templated classes in the standard library which can solve the problem.  
Which of the above statements are TRUE?  
A) I only                      B) II only                      C) III only                      D) All of I, II, and III

12. Which two of the following statements are true about constructors in C++?

- I. A constructor has no return type and is therefore a void method.  
II. A constructor has the same name as the class.  
III. A class can have more than one constructor.  
IV. Constructors are called like any other method.  
A) III and IV only              B) I and II only              C) II and III only              D) I and IV only

13. Consider the following database table:

```
create table test (  
    one integer,  
    two integer,  
    primary key (one),  
    unique (two),  
    check (one >= 1 and <=10),  
    check (two >=1 and <=5)  
);
```

How many data records/ tuples at most can this table contain?

- A) 5                      B) 10                      C) 15                      D) 50
14. The employee information in a company is stored in the relation:  
*Employee (name, sex, salary, deptName)*  
Consider the following SQL query:  
*select deptName from Employee where sex = 'M' group by deptName  
having avg(salary) > (select avg (salary) from Employee)*  
It returns the names of the department in which:  
A) The average salary is more than the average salary in the company  
B) The average salary of male employees is more than the average salary of all male employees in the company  
C) The average salary of male employees is more than the average salary of employees in the same department.  
D) The average salary of male employees is more than the average salary of employees in the company

**Directions for Q.No. 15 & 16:**

Consider the following Lecturer relation with the given attributes and data types. Assume that the attributes are stated in the order that they were specified in the create table statement. Salary and allowance are monthly income for a lecturer.

*Lecturer(EmpNo CHAR(03), Name VARCHAR(50), Salary REAL, Allowance REAL, Category VARCHAR(25), DateJoined DATE)*

15. Which of the following SQL statements display the name and annual income for each lecturer?  
A) SELECT Name, (Salary + Allowance) \* 12 FROM Lecturer;  
B) SELECT Name, "Annual Income" FROM Lecturer WHERE "Annual Income" = Salary \* 12 + Allowance;  
C) SELECT Name , "Annual Income" FROM Lecturer GROUP BY Name HAVING "Annual Income" = Salary \* 12 + Allowance;  
D) SELECT Name, Salary + Allowance as Annual Income FROM Lecturer;
16. Which of the following SQL statements would display all Lecturers' names and hired dates in chronological order with the person on staff with the longest service, listed first?  
A) SELECT Name, DateJoined FROM Lecturer ORDER BY Name, DateJoined;  
B) SELECT Name, DateJoined FROM Lecturer ORDER BY Name, DateJoined ASC  
C) SELECT Name, DateJoined FROM Lecturer ORDER BY DateJoined DESC;  
D) SELECT Name, DateJoined FROM Lecturer ORDER BY DateJoined ASC;

17. In the context of the DROP and TRUNCATE commands in SQL, which of the following is/are true?  
 I. DROP removes the table or database completely  
 II. TRUNCATE only removes the data, preserving the table structure  
 III. Both DROP and TRUNCATE delete the database completely.  
 A) I                                      B) I and II                                      C) II and III                                      D) I, II and III
18. In computer networking, from what has the term 'DHCP' been derived?  
 A) Dynamic Host Configuration Protocol                      B) Dynamic Host Communication Protocol  
 C) Digital Host Configuration Protocol                      D) Digital Host Communication Protocol
19. The \_\_\_\_\_ is responsible for mapping IP addresses to unique URLs such as *www.google.com*.  
 A) Internet Relay Protocol                                      B) Internet Protocol System  
 C) Domain Name System                                      D) Hypertext Transfer Protocol
20. In computer networking, communication between a computer and a keyboard involves \_\_\_\_\_ transmission.  
 A) Simplex      B) Half-duplex                                      C) Full-duplex                                      D) Automatic
21. Which of the following statements is FALSE?  
 A) In asynchronous data transmission, start/stop bits are appended to the beginning and end of each message.  
 B) A LAN is designed for "long-haul" data communication.  
 C) One of the tasks in designing a computer network is to analyze the workload at each location.  
 D) The use of a gateway normally implies a requirement for a protocol conversion.
22. In computer networks, the mechanism with which several users can share a medium without interference is:  
 A) Frequency modulation                                      B) Amplitude modulation  
 C) Multiplexing                                      D) TCP/IP
23. A fully connected network topology is a network topology in which there is a direct link between all pairs of nodes. Given a fully connected network with  $n$  nodes, express the number of direct links as a function of  $n$ .  
 A)  $\frac{n(n+1)}{2}$                                       B)  $\frac{(n+1)}{2}$                                       C)  $\frac{n}{2}$                                       D)  $\frac{n(n-1)}{2}$
24. In computer networking, the *ping of death* is:  
 A) An ICMP echo request flood that disables a host  
 B) An ICMP echo reply flood that disables a host  
 C) An extremely large ICMP echo request message that disables a host  
 D) A probing of a network using ping that finds a critical weakness in the security of the Network
25. What is a Virtual Private Network (VPN)?  
 A) a secured connection for remote access to a local area network  
 B) a secured private cloud for a single user  
 C) a virtual network device for private purposes  
 D) an operating system for private network systems
26. You are designing a link layer protocol for a link with bandwidth of  $1 \text{ Gbps}$  ( $10^9 \text{ bits/seconds}$ ), over a fiber link with length of  $800 \text{ km}$ . Assume the speed of light in this medium is  $200,000 \text{ km/seconds}$ .  
 What is the transmission delay for a 2,000 byte frame in this link?  
 A)  $4 \mu\text{s}$                                       B)  $8 \mu\text{s}$                                       C)  $16 \mu\text{s}$                                       D)  $32 \mu\text{s}$

27. Multiprogramming permits the UNIX Operating System to overlap the execution of \_\_\_\_\_ processes with that of \_\_\_\_\_ processes.
- A) Background, Foreground                      B) Parent, Child  
 C) I/O Bound, CPU Bound                        D) Critical, Non-critical
28. \_\_\_\_\_ refers to the technology in which some space in hard disk is used as an extension of main memory.
- A) Cache memory    B) Paging    C) Virtual memory    D) Associative memory
29. A measure of the number of processes completed per time unit is called:
- A) Throughput    B) Waiting time    C) Response time    D) CPU utilization
30. In CPU scheduling, “starvation” refers to:
- A) The situation where adequate system resources are not allocated.  
 B) The situation where a process is blocked because of I/O operations.  
 C) The situation where a ready to run process is waiting indefinitely for CPU.  
 D) The situation where main memory and external memory are almost full.
31. An unsolicited e-mail message sent to many recipients at once is a \_\_\_\_\_.
- A) Worm                      B) Trojan horse                      C) spyware                      D) spam

32. Consider the following table definition in HTML:

```
<html>
<table border=1>
<tr>
  <td rowspan=3> DCSA </td>
  <td colspan=2> UIET </td>
</tr>
<tr>
  <td> GIGO </td>
  <td rowspan=2> YACC </td>
</tr>
<tr>
  <td> <td> MIPS </td>
</tr>
</table>
</html>
```

The number of rows in each column and the number of columns in each row are:

- A) (2,3,3) and (1,3,2)                      B) (1,3,2) and (1,3,2)  
 C) (1,3,2) and (2,2,3)                      D) (1,3,2) and (2,3,3)
33. Cookies were designed as a response to which problem in the original design of HTML and HTTP?
- A) Lack of privacy and confidentiality in viewing web-pages  
 B) Inequality of information between clients and servers  
 C) The open and distributed nature of the Internet  
 D) Persistence of state between web-sessions

34. Consider the MS-EXCEL spreadsheet given below:

|   | A | B | C  | D  |
|---|---|---|----|----|
| 1 |   | 5 | 10 | 50 |
| 2 |   |   | 15 | 50 |
| 3 |   |   | 20 | 50 |
| 4 |   |   |    |    |

Which of the following formulas should be entered into the cell D1 so that when it is copied into the cells D2 and D3, it gives the correct values as shown in the range D1:D3?

- A)  $B1 * \$C\$1$                       B)  $\$B\$1 * C1$                       C)  $B1 * C1$                       D)  $\$B\$1 * \$C\$1$
35. What does the following MS-EXCEL formula do?  
=SUM (Sheet1:Sheet4!D18)
- A) It adds data from all D18 cells in sheet1, sheet2, sheet3 and sheet4  
B) It adds data from cell D18 of sheet1 and cell D18 of Sheet4  
C) It adds all data in the range A1:D18 in sheet1, sheet2, sheet3 and sheet4  
D) It adds data from cell A1 of Sheet1 and cell D18 of Sheet4
36. Given below are two statements:  
Statement I: Compared to word processors, simple text-editors such as Notepad and Emacs have limited editing features.  
Statement II: Files created with simple text editors cannot be opened with word processors.  
In the light of the above statements, choose the correct answer from the options given below:  
A) Both Statements I and Statement II are true.  
B) Both Statements I and Statement II are false.  
C) Statement I is true but Statement II is false.  
D) Statement I is false but Statement II is true.
37. In MS-WORD, what is gutter margin?  
A) Margin that is added to the left margin when printing  
B) Margin that is added to right margin when printing  
C) Margin that is added to the binding side of page when printing  
D) Margin that is added to the outside of the page when printing
38. In Microsoft PowerPoint, presentation designs regulate the formatting and layout for the slide and are commonly called \_\_\_\_\_.  
A) Design plates                      B) Templates                      C) Placeholders                      D) Blueprints
39. Enhancements, upgrades, and bug fixes are carried out during the \_\_\_\_\_ step in the SDLC.  
A) Maintenance and Evaluation                      B) Problem/Opportunity Identification  
C) Design                      D) Development and Documentation
40. The .NET Framework provides a run-time environment called \_\_\_\_\_, which runs the code and provides services that make the development process easier.  
A) ASP.NET Applications                      B) CLR  
C) WinForm Applications                      D) Web Services Description Language
41. Mark the correct opposite of the given word out of the given options:  
Insolent  
A) Solvent                      B) Rude                      C) Polite                      D) Tough

42. Select the correct meaning of the given idioms:  
*A fly on the wheel*  
 A) a person who overestimates her/his importance  
 B) a person who cautions the people  
 C) a person who is hostile to all  
 D) a person who entertains others
43. The theme of National Technology Day 2024 was :  
 A) National Technology for National Well Being  
 B) From Schools to Startups; Igniting Young Minds to Innovate  
 C) Indigenous Technologies for Viksit Bharat  
 D) Science & Technology for a Sustainable Future
44. India's rank in Press Freedom index 2024 out of 180 countries is :  
 A) 141                      B) 149                      C) 159                      D) 161
45. In a row of girls, there are 16 girls between Pinki and Tina. Pinki is thirty-second from the left end of the row. If Pinki is nearer than Tina to the right end of the row, then how far away is Tina from the left end of the row?  
 A) 14<sup>th</sup>                      B) 16<sup>th</sup>                      C) 15<sup>th</sup>                      D) None of these
46. There are two sets of figures namely the Problem figures containing five figures 1, 2, 3, 4 and 5 and the Answer figures (A), (B), (C) and (D). You have to select one figure from the Answer figures which will continue the same series as given in the Problem figures.

| Problem Figures |       |       |       |       | Answer Figures |       |       |       |
|-----------------|-------|-------|-------|-------|----------------|-------|-------|-------|
| ○ □ P ( S △     | P T ↑ | ( S △ | ↑ ● ○ |       | ( S △          | △ S ( | ( S △ | □ ( S |
| ( S △           | □ P T | ( S △ | T ↑ ● | ( S △ | ○ ●            | ○ ●   | ● ○   | ○ ●   |
| 1               | 2     | 3     | 4     | 5     | A)             | B)    | C)    | D)    |

47. Point S is 15m west of point R. Point R is 30 m south of point Q. Point P is 20 m West of point Q. Point U is 15 m south of point P. Point T is 35 m North of point S. If point V is exactly between point Q and R, then how far and in which direction is point U with respect to V.  
 A) 15m Northeast                      B) 15m East                      C) 10m Northwest                      D) 20m West
48. Three statements are given in following question, followed by three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements, disregarding commonly known facts.

**Statements :**

- Nail polish is a cosmetic
- No cosmetic is powder
- Some powders are medicine

**Conclusions:**

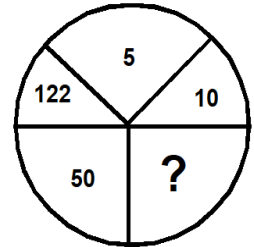
- I. Some powder are cosmetics
- II. Some medicines are nail polishes
- III. Some cosmetics are nail polishes

- A) Only I follows                      B) Only II follows
- C) Only III follows                      D) Only II and III follow



49. Replace the missing number (?) in the figure from the given responses:

- A) 25      B) 27      C) 23      D) 26



50. Present age of Satish and Verma are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their age will become 11 : 9 respectively. What is Verma's present age in years ?

- A) 22      B) 27      C) 24      D) data inadequate

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**ANSWER KEY (A-Series)**

| <b>Q.No.</b> | <b>Ans</b> | <b>Q.No.</b> | <b>Ans</b> |
|--------------|------------|--------------|------------|
| 1            | <b>A</b>   | 26           | <b>C</b>   |
| 2            | <b>C</b>   | 27           | <b>C</b>   |
| 3            | <b>C</b>   | 28           | <b>C</b>   |
| 4            | <b>D</b>   | 29           | <b>A</b>   |
| 5            | <b>C</b>   | 30           | <b>C</b>   |
| 6            | <b>C</b>   | 31           | <b>D</b>   |
| 7            | <b>C</b>   | 32           | <b>D</b>   |
| 8            | <b>B</b>   | 33           | <b>D</b>   |
| 9            | <b>D</b>   | 34           | <b>D</b>   |
| 10           | <b>B</b>   | 35           | <b>A</b>   |
| 11           | <b>B</b>   | 36           | <b>C</b>   |
| 12           | <b>C</b>   | 37           | <b>C</b>   |
| 13           | <b>A</b>   | 38           | <b>B</b>   |
| 14           | <b>D</b>   | 39           | <b>A</b>   |
| 15           | <b>A</b>   | 40           | <b>B</b>   |
| 16           | <b>D</b>   | 41           | <b>C</b>   |
| 17           | <b>B</b>   | 42           | <b>B</b>   |
| 18           | <b>A</b>   | 43           | <b>B</b>   |
| 19           | <b>C</b>   | 44           | <b>C</b>   |
| 20           | <b>A</b>   | 45           | <b>C</b>   |
| 21           | <b>B</b>   | 46           | <b>C</b>   |
| 22           | <b>C</b>   | 47           | <b>D</b>   |
| 23           | <b>D</b>   | 48           | <b>C</b>   |
| 24           | <b>C</b>   | 49           | <b>D</b>   |
| 25           | <b>A</b>   | 50           | <b>C</b>   |