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CHANDIGARH POLICE

POST: Constable Executive (IT)

Question Booklet & Answer Key

03.03.2024 (Sunday)

PAPER -II

1. Which of the following represents the life-cycle of software development?
 - A) Analysis → Design → Coding → Testing → Operation and Maintenance
 - B) Design → Analysis → Coding → Testing → Operation and Maintenance
 - C) Design → Analysis → Coding → Testing
 - D) Analysis → Design → Coding → Operation and Maintenance
2. What is software reengineering?
 - A) Re-constructing the original source code from the machine code program without changing its functionality.
 - B) Translating a program to a new source code language.
 - C) Scrapping the source code of a program and re-writing it entirely from scratch.
 - D) Re-structuring or re-writing part or all of a software system without changing its functionality.
3. Alpha and beta software testing are forms of:
 - A) Integration testing
 - B) Acceptance testing
 - C) System testing
 - D) Unit testing
4. Software Testing which is performed after modification to the existing system is known as:
 - A) Regression testing
 - B) Acceptance testing
 - C) Integration testing
 - D) Black-box testing
5. Wi-Fi (the brand name for products using IEEE 802.11 standards) and Bluetooth have some similar applications: setting up networks, printing, or transferring files. Which of the following is the difference between Bluetooth and Wi-Fi devices?
 - A) Bluetooth uses 2.4 GHz radio frequency band, whereas Wi-Fi can use 2.4 GHz or 5 GHz frequency band
 - B) Bluetooth is used for Wireless Local Area Networks (WLAN) only, whereas Wi-Fi is used for Wireless Wide Area Networks (WWAN) only
 - C) When information is transmitted between two devices using Bluetooth technology, the devices have to be in the line of sight of each other, but when Wi-Fi technology is used the devices need not be in the line of sight of each other
 - D) The statements (A) and (B) given above are correct in this context.
6. Which of the following best describes "Virtual Private Network (VPN)"?
 - A) It is a private computer network of an organization where the remote users can transmit encrypted information through the server of the organization while maintaining the security of the information transmitted.
 - B) It is a computer network across a public network, such as the Internet that provides users access to their organization's network while maintaining the security of the information transmitted.
 - C) It is a computer network in which users can access a shared pool of computing resources through a service provider
 - D) None of the statements (A), (B) and (C) given above is a correct description of Virtual Private Network
7. For an Internet connection with transmission rate 56Kbps, what will be the maximum size of a file that can be transmitted in ONE MINUTE?
 - A) 56K Bytes
 - B) 3360K Bytes
 - C) 56K bits
 - D) 420K Bytes
8. Why did virtualization boost the emergence of Cloud computing?
 - A) Virtualization made it easier and cheaper to share resources between users.
 - B) A virtual machine is more secure than a physical machine.
 - C) Virtual machines have greater performance than their physical counterparts.
 - D) Virtualization leads to better network utilization.

9. Which of the following is TRUE?
- A) In HTML, entities are used to incorporate external content into a Web page, such as images.
 B) Suppose that an online retailer uses a relational database to keep track of orders, and one table contains a row for each order. If an order contains several items, the foreign keys for each of those items would typically be stored in the row for that order.
 C) In a scripting language types are typically associated with values, not variables.
 D) Web browsers are stateless: if a browser isn't displaying a page for a particular server it need not retain any state related to that server.
10. Which of the following HTML code will affect the vertical alignment of the table content?
- A) `<td style= "vertical-align: middle">Text goes here.</td>`
 B) `<td valign= "center">Text goes here.</td>`
 C) `<td style= "text-align: center">Text goes here.</td>`
 D) `<td align= "middle">Text goes here.</td>`
11. In computer networking, what percentage of the IPv4 IP address space do all class C addresses consume?
- A) 25% B) 12.5% C) 50% D) 37.5%
12. 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) $\frac{n(n-1)}{2}$
13. Suppose there are eleven items in sorted order in an array. How many searches are required on the average, if binary search is employed and all searches are successful in finding the item?
- A) 3.00 B) 3.46 C) 2.81 D) 3.33
14. The number of times the statement " $x = x + 1$ " is executed in the following program fragment using Θ notation in terms of n is:
- ```

j = n;
while(j ≥ 1)
{
 for(i = 1; i ≤ j; ++i)
 x = x + 1;
 j = j / 2;
}

```
- A)  $\Theta(n)$                       B)  $\Theta(\log n)$                       C)  $\Theta(n^2)$                       D)  $\Theta(n \log n)$
15. Consider a database table T with attributes X and Y. Which of the following SQL queries is illegal?
- A) `select X from T;`  
 B) `select X, count(*) from T;`  
 C) `select X, count(*) from T group by X;`  
 D) `select X, Y, count(*) from T group by X, Y;`

16. Consider the relation: *Proj*(*pno*, *pname*, *budget*, *city*), where the primary key is underlined and the following SQL query:

```
SELECT city, count(pno) AS totproj, sum(budget) AS totbudget
FROM proj GROUP BY city
```

The SQL query:

- A) Computes the number of cities having at least one project and the total budget over all projects.  
B) Computes, for each city, the number of projects that are located in that city and the total budget over all projects in the city.  
C) Computes, for each city, the number of projects that are located in that city and the total budget over all projects in all the cities together.  
D) Computes the total number of projects that are located in all the cities together and the total budget over all projects in all the cities together.
17. 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
18. The major goal of object-oriented programming is:  
A) Speed      B) User-interfaces      C) Reuse      D) Top-down program development

19. Consider the following C-function:

```
int goFast(int x) {
 if (x < 100) x = goFast(x + 10);
 return (x - 1);
}
```

What does *goFast*(60) return?

- A) 59                      B) 69                      C) 95                      D) 99

20. Consider the following two functions F1 and F2 in a Java program:

```
public void F1 (int a, int b, int c)
{
 if ((a != 0) && ((b / a) == c))
 c = c + 1;
 System.out.println("a = " + a + " b = " + b + " c = " + c);
}
```

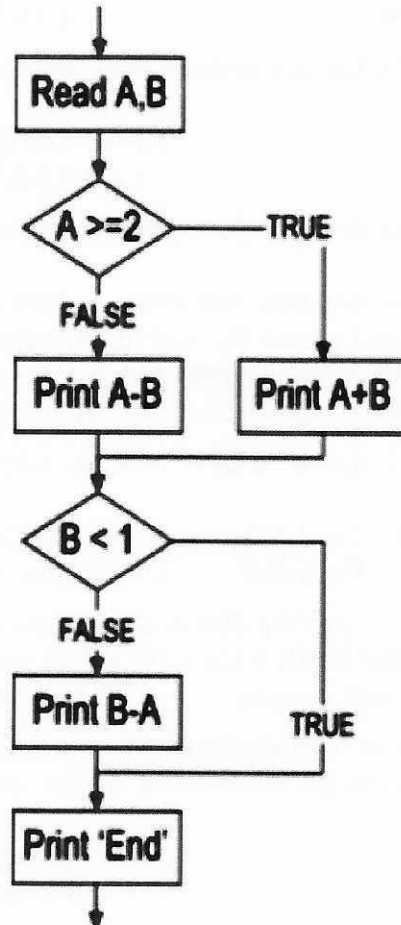
```
public void F2 (int a, int b, int c)
{
 if (((b / a) == c) && (a != 0))
 c = c + 1;
 System.out.println("a = " + a + " b = " + b + " c = " + c);
}
```

Which of the following is TRUE?

- A) For all a, b, and c, F1(a, b, c) and F2(a, b, c) have the same behavior.  
B) For all a and b, there exists c such that F1(a, b, c) and F2(a, b, c) behave differently.  
C) For all a and c, there exists b such that F1(a, b, c) and F2(a, b, c) behave differently.  
D) For all b and c, there exists a such that F1(a, b, c) and F2(a, b, c) behave differently.
21. In C++, which of the following statements correctly returns the memory from the dynamic array pointer pp to the free store?  
A) delete pp[];      B) delete [] pp;      C) delete \*pp;      D) delete pp;



22. In structured programming, a program is divided into modules. Coupling and cohesion describe the characteristics of modules. A good decomposition should attempt to:
- Maximize coupling and Minimize cohesion
  - Minimize coupling and Maximize cohesion
  - Maximize coupling and Maximize cohesion
  - Minimize coupling and Minimize cohesion
23. Given the following flow chart diagram:



What is the minimum number of test cases required for 100% statement coverage and 100% decision coverage, respectively?

- Statement Coverage = 1, Decision Coverage = 3
- Statement Coverage = 2, Decision Coverage = 3
- Statement Coverage = 2, Decision Coverage = 2
- Statement Coverage = 3, Decision Coverage = 3

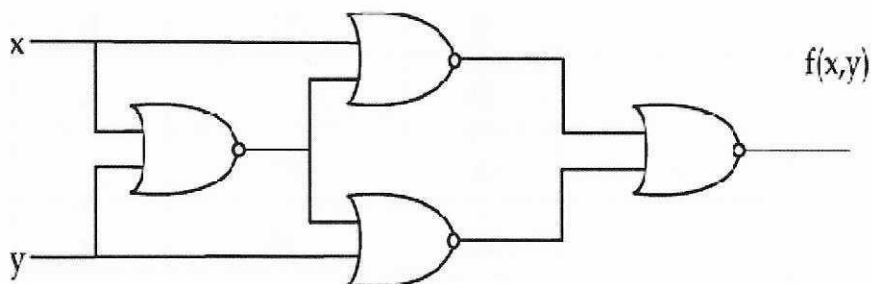
Directions (Q.No. 24 & 25) consider the following EXCEL worksheet:

|    | A   | B      | C      | D     |
|----|-----|--------|--------|-------|
| 1  | No. | Test 1 | Test 2 | Total |
| 2  | 1   | 80     | 60     | 140   |
| 3  | 2   | 70     | 50     | 120   |
| 4  | 3   | 40     | 30     | 70    |
| 5  | 4   | 30     | 32     | 62    |
| 6  | 5   | 85     | 85     | 170   |
| 7  | 6   | 65     | 80     | 145   |
| 8  | 7   | 72     | 96     | 168   |
| 9  | 8   | 25     | 32     | 57    |
| 10 | 9   | 90     | 78     | 168   |
| 11 | 10  | 25     | 40     | 65    |

24. The formula = IF (B10 + C10 > 100, IF (D10 > 100, "A", "B"), "C") in cell D12 will result in:
- AC
  - A
  - B
  - C

25. The formula = *SUMIF*(B2:B11, "<50", D2:D11) in cell D13 will result in:  
 A) 120                                      B) 90                                      C) 244                                      D) 254
26. Consider the equation:  $(146)_b + (313)_{b-2} = (246)_8$ . Which of the following is the value of *b*?  
 A) 16                                      B) 10                                      C) 8                                      D) 7
27. In UNIX/Linux OS, the *umask* value that will cause directories to be created with permissions *rwxr-x--x* is:  
 A) 751                                      B) 046                                      C) 026                                      D) 021
28. Which of the following UNIX/Linux command will count the lines of all the *.c* and *.h* files in the current working directory?  
 A) *cat \*.ch | wc -l*                                      B) *cat \*.[c-h] | wc -l*  
 C) *cat \*.[ch] | ls -l*                                      D) *cat \*.[ch] | wc -l*
29. One reason why UNIX/Linux is so flexible is that each program is automatically assigned three standard files. These are:  
 A) The standard input file, the standard output file, and the standard error file.  
 B) The backup file, the standard output file, and the standard error file.  
 C) The standard input file, the standard output file, and the standard hidden file.  
 D) The standard input file, the standard search file, and the standard error file.
30. In terms of the speed of storage of a byte of data, what should be the correct rank of the following storage devices?  
 A) Cache > Register > RAM > Hard disk                                      B) RAM > Cache > Register > Hard disk  
 C) Register > RAM > Cache > Hard disk                                      D) Register > Cache > RAM > Hard disk
31. *Rotational delay* is the time to spin the disk to the correct sector and is measured in RPM. If a disk is rotating at a rate of 5000 RPM, what is the average rotational delay in milliseconds?  
 A) 4 milliseconds                                      B) 6 milliseconds                                      C) 8 milliseconds                                      D) 12 milliseconds
32. Your roommate wants to regain peak performance on her computer's disk. You suggest she uses a(n) \_\_\_\_\_ utility to rearrange the files on a disk so that they are stored in contiguous clusters.  
 A) defragmentation                                      B) refragmentation  
 C) file shredder                                      D) disk cleanup
33. What is a specialized software program that allows input and output devices to communicate with the rest of the computer system?  
 A) Utility driver                                      B) Utility program  
 C) Device driver                                      D) Data compression utility
34. Laser Printer resolution is measured by the number of \_\_\_\_\_ a printer can output.  
 A) pages per minute (ppm)                                      B) lines per minute (lpm)  
 C) pixels per inch (ppi)                                      D) dots per inch (dpi)
35. The \_\_\_\_\_ chip, which uses battery power, stores configuration information about the computer.  
 A) BIOS                                      B) POST                                      C) CMOS                                      D) RAM
36. What is the technological advancement that made it possible for computers to become as small as they are today?  
 A) Repeater                                      B) Vacuum tube                                      C) Transistor                                      D) Silicon chip
37. A new optical disc format known as the Blu-ray Disc (BD) is becoming popular and the name Blu-ray is derived from the underlying technology, which utilizes a blue-violet laser to read and write data. In what way is it different from the traditional DVD?  
 1. DVD supports Standard Definition video while BD supports High Definition video.  
 2. Compared to a DVD, the BD format has several times more storage capacity.  
 3. Thickness of BD is 2.4 mm while that of DVD is 1.2 mm.  
 Which of the statements given above is/are correct?  
 A) 1 only                                      B) 2 and 3 only                                      C) 1 and 2 only                                      D) 1, 2 and 3

38. The *von Neumann* bottleneck arises due to:  
 A) Mismatch in speed between secondary and primary storage  
 B) Mismatch in speed between CPU and primary storage  
 C) Slow speed of Input/Output devices  
 D) Low clock speeds
39. Which of the following requires a device driver?  
 A) Registers                      B) RAM                      C) Keyboard                      D) CPU
40. What is the cycle time of 1.25GHz processor?  
 A)  $1.25 \mu s$                       B)  $0.8 \mu s$                       C) 1.25 ns                      D) 0.8 ns
41. In computer science, Moore's Law is a rule that predicts  
 A) The data transfer rate for a hard drive.                      B) The access time of the read/write head.  
 C) The pace at which CPUs improve.                      D) The speed of the front side bus.
42. Identify the logic function  $f(x, y)$  performed by the circuit shown below:



- A) Exclusive-OR                      B) AND                      C) Exclusive-NOR                      D) NOR
43. How many AND gates are required to realize  $Y = CD + EF + G$ ?  
 A) 4                      B) 5                      C) 3                      D) 2
44. The SI unit of electric current is:  
 A) ohm                      B) ampere                      C) volt                      D) faraday
45. In hardware, SMPS is housed in a metal box and generally consists of  
 A) Electronic Circuit Board (ECB).                      B) Hard Disk Drive (HDD).  
 C) Random Access Memory (RAM).                      D) Read Only Memory (ROM).
46. CMOS is a technology for fabricating Integrating Circuits and is an acronym that stands for:  
 A) Compound Metal Oxide Semiconductor                      B) Complementary Metal Oxide Semiconductor  
 C) Conditional Metal Oxide Semiconductor                      D) Compound Metal Oxide Superconductor
47. AMD, located in Santa Clara County, California, is an American Multinational semiconductor company producing computer processors and related technologies and is an acronym for:  
 A) Advanced Micro Devices                      B) Automatic Multiplexing Devices  
 C) American Macro Devices                      D) American Micro Devices
48. Which of the following is considered as the brain of the computer?  
 A) Motherboard                      B) RAM                      C) CPU                      D) BIOS chip
49. Which of the following is the communication line between CPU, memory, and peripheral devices and is commonly used for transferring data between the CPU and computer peripherals, CPU and memory, and different points within the CPU?  
 A) Bus                      B) Electronic wires                      C) Lines                      D) Cables
50. Which of the following statements are correct?  
 I. Motherboard is the circuit board that houses peripheral devices.  
 II. Data backup is to protect data by copying it from the original source to a different destination.  
 A) Only I                      B) Only II                      C) Both I and II                      D) Neither I nor II

**Chandigarh Police**  
**Post: Constable Executive (IT)**  
**03.03.2024, Answer Key : Paper-II**

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