

## IBPS SO IT Officer Mains Memory Based 2022 Held on 29 January 2023

**Q1.** What is the total number of networks available in IPv4 Class C?

- (a)  $2^{16}$
- (b)  $2^{21}$
- (c)  $2^{24}$
- (d)  $2^{15}$
- (e)  $2^{20}$

**Ans.(b)**

**Q2.** The attribute whose value is derived from another attribute is called?

- (a) Primary Attribute
- (b) Composite Attribute
- (c) Derived Attribute
- (d) Foreign Attribute
- (e) Unique Attribute

**Ans.(c)**

**Q3.** Consider the following C++ code snippet:

```
#include <iostream>
using namespace std;

int main() {
    bool a = true;
    bool b = false;

    bool c = (a || b) && !(a && b);
    bool d = a && !b;

    cout << "Result: " << (c == d) << endl;

    return 0;
}
```

What is the output of the above program?

- (a) Result: 0
- (b) Result: 1
- (c) Result: true
- (d) Compilation Error
- (e) None of the above

**Ans.(b)**

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**Q4.** Which Linux command is used to display the current version of the kernel?

- (a) lskernel
- (b) kernel -v
- (c) version
- (d) uname -v
- (e) kerninfo

**Ans.(d)**

**Q5.** Consider the following NFA with  $\epsilon$ -transition:

State	a	b	$\epsilon$
$\rightarrow q_0$	q0	q1	—
q1	q2	—	—
*q2	q2	q0	q1

Where:

- $\rightarrow$  denotes the initial state
- \* denotes the final state

Using subset construction and considering only reachable DFA states, which of the following represents the set of states in the equivalent DFA?

- (a)  $\{\{q_0\},\{q_1\},\{q_1,q_2\}\}$
- (b)  $\{\{q_0\},\{q_1\},\{q_0,q_1\},\{q_1,q_2\}\}$
- (c)  $\{\{q_0\},\{q_1\},\{q_0,q_2\},\{q_1,q_2\}\}$
- (d)  $\{\{q_0\},\{q_1\},\{q_0,q_1,q_2\}\}$
- (e) None of the above

**Ans.(a)**

**Q6.** In the context of database transactions, a shared lock allows which of the following operations?

- (a) Only read operations by multiple transactions simultaneously
- (b) Both read and write operations by multiple transactions simultaneously
- (c) Only write operations by a single transaction
- (d) Both read and write operations by a single transaction
- (e) None of these

**Ans.(a)**

**Q7.** A system has 4 processes and 3 resource types. The following matrices are given:

Allocation Matrix

Process	R1	R2	R3
P1	0	1	0
P2	2	0	0
P3	3	0	2
P4	2	1	1

Maximum Matrix

Process	R1	R2	R3
P1	7	5	3
P2	3	2	2
P3	9	0	2
P4	2	2	2

Available Resources

R1	R2	R3
3	2	1

Using Banker's Algorithm, determine the number of safe sequences possible.

- (a) 0
- (b) 1
- (c) 2
- (d) 3
- (e) 4

**Ans.(a)**

**Q8.** According to the IEEE 802.3 standard, what is the maximum cable length of a single 100Base-TX Ethernet segment?

- (a) 100 meters
- (b) 200 meters
- (c) 185 meters
- (d) 500 meters
- (e) 1000 meters

**Ans.(a)**

**Q9.** Assume all transactions are attempting to access the same database resource.

Transaction	Operation Requested	Lock Type Requested
T1	Read	Shared (S-lock)
T2	Read	Shared (S-lock)
T3	Write	Exclusive (X-lock)
T4	Read	Shared (S-lock)

Based on standard DBMS lock compatibility rules, which of the following statements is correct?

- (a) Transactions T1, T2, and T4 can simultaneously hold S-locks on the same resource.
- (b) Transaction T3 can obtain an X-lock while T1 holds an S-lock.
- (c) Transaction T4 can read the resource while T3 holds an X-lock.
- (d) An S-lock and an X-lock are compatible on the same resource.
- (e) Shared and exclusive locks are interchangeable.

**Ans.(a)**

**Q10.** Which tag is used to create a table in the latest version of HTML?

- (a) <div>
- (b) <table>
- (c) <grid>
- (d) <html-table>
- (e) <section>

**Ans.(b)**

**Q11.** Which of the following scenarios can lead to starvation in process scheduling?

- (a) A process is stuck in a circular wait due to resource allocation.
- (b) A high-priority process continuously preempts a lower-priority process.
- (c) All processes have equal priority and resources are allocated fairly.

- 
- (d) Processes are executed in the order of their arrival without preemption.  
(e) Processes communicate with each other to avoid mutual exclusion violations.

**Ans.(b)**

**Q12.** Hyper-V is a product of which of the following?

- (a) VMware
- (b) Oracle
- (c) Microsoft
- (d) Red Hat
- (e) Google

**Ans.(c)**

**Q13.** Which of the following is a valid identifier in Python?

- (a) 1stVariable
- (b) variable-name
- (c) variable\_name
- (d) for
- (e) variable@name

**Ans.(c)**

**Q14.** What is the effective encryption key length used by the Data Encryption Standard (DES), excluding parity bits?

- (a) 64 bits
- (b) 56 bits
- (c) 128 bits
- (d) 32 bits
- (e) 192 bits

**Ans.(b)**

**Q15.** Which of the following is not a linear data structure?

- (a) Array
- (b) Stack
- (c) Queue
- (d) Tree
- (e) Linked List

**Ans.(d)**

**Q16.** A Class B network with default mask 255.255.0.0 must be subnetted into at least 1024 subnets. Which subnet mask should be used under modern subnetting rules?

- (a) 255.255.224.0
- (b) 255.255.240.0
- (c) 255.255.248.0
- (d) 255.255.255.192
- (e) 255.255.255.0

**Ans.(d)**

**Q17.** In object-oriented programming, what is the method called where one type is defined based on another type?

- (a) Inheritance
- (b) Class
- (c) Object
- (d) Polymorphism
- (e) Encapsulation

**Ans.(a)**

**Q18.** Which of the following web application attacks involves injecting malicious scripts into trusted websites to target users?

- (a) Cross-Site Request Forgery (CSRF)
- (b) Injection Attacks
- (c) Cross-Site Scripting (XSS)
- (d) Distributed Denial-of-Service (DDoS)
- (e) Brute Force Attack

**Ans.(c)**

**Q19.** What is the number of pins in the Intel 8089 I/O processor?

- (a) 20
- (b) 40
- (c) 64
- (d) 24
- (e) 80

**Ans.(b)**

**Q20.** Which of the following protocols is not part of the HTTP/HTTPS web communication protocol family?

- (a) HTTPS
- (b) FTP
- (c) HTTP
- (d) WebDAV
- (e) None of the above

**Ans.(b)**

**Q21.** Which of the following statements about Third Normal Form (3NF) is true?

- (a) A table is in 3NF if it is in 2NF and every non-prime attribute is non-transitively dependent on every key of the table.
- (b) A table is in 3NF if it is in 2NF and every non-prime attribute is dependent on every non-key attribute of the table.
- (c) A table is in 3NF if it has no transitive dependencies and every non-prime attribute is partially dependent on a candidate key.
- (d) A table is in 3NF if it has no repeating groups and all attributes are atomic.
- (e) A table is in 3NF if it is in 1NF and has only one candidate key.

**Ans.(a)**

**Q22.** Which of the following is an example of a bit-oriented protocol?

- (a) HDLC (High-Level Data Link Control)
- (b) SMTP (Simple Mail Transfer Protocol)
- (c) FTP (File Transfer Protocol)
- (d) HTTP (Hypertext Transfer Protocol)
- (e) None of the above

**Ans.(a)**

**Q23.** In IPv4 Class C, what is the range of the first octet?

- (a) 1-126
- (b) 128-191
- (c) 192-223
- (d) 224-239
- (e) 240-255

**Ans.(c)**

**Q24.** Which of the following PDU units corresponds to the Transport and Network Layers in the OSI model?

- (a) Packet (Transport Layer), Datagram (Network Layer)
- (b) Segment (Transport Layer), Packet (Network Layer)
- (c) Datagram (Transport Layer), Frame (Network Layer)
- (d) Packet (Transport Layer), Frame (Network Layer)
- (e) None of the above

**Ans.(b)**

**Q25.** What will be the output of the following C program?

```
#include <stdio.h>
int main() {
    int a = 5, b = 10, c = 15;
    int result = (a > b) ? ((b > c) ? b : c) : ((a > c) ? a : c);
    printf("%d", result);
    return 0;
}
```

- (a) 5
- (b) 10
- (c) 15
- (d) 0
- (e) Compilation Error

**Ans.(c)**

**Q26.** What is BitLocker?

- (a) A disk encryption feature in Windows
- (b) A malware protection software
- (c) A network firewall tool
- (d) A file compression utility
- (e) A backup management tool

**Ans.(a)**

**Q27.** Which CPU register stores the address of the next instruction before it is fetched from memory?

- (a) Instruction Register (IR)
- (b) Memory Address Register (MAR)
- (c) Program Counter (PC)
- (d) Accumulator (AC)
- (e) Stack Pointer (SP)

**Ans.(c)**

**Q28.** In C Programming, the ternary operator is also called as:

- (a) Conditional Operator
- (b) Logical Operator
- (c) Bitwise Operator
- (d) Relational Operator
- (e) Arithmetic Operator

**Ans.(a)**

**Q29.** Which of the following is a form of a snooping attack that involves unauthorized monitoring of network communications to capture sensitive information?

- (a) Spoofing
- (b) SQL Injection
- (c) Eavesdropping
- (d) Denial of Service (DoS)
- (e) Phishing

**Ans.(c)**

**Q30.** Which of the following statements about offsite recovery strategies is correct?

- (a) A hot site provides fully operational systems with real-time data mirroring and requires minimal downtime during recovery.
- (b) A cold site has all the necessary equipment pre-installed and ready to use in case of a disaster.
- (c) A warm site is identical to a hot site but does not provide real-time data synchronization.
- (d) A backup site is typically a secondary facility that is fully equipped and ready for immediate switchover.
- (e) None of the above statements are correct.

**Ans.(a)**

**Q31.** Which of the following is a general-purpose processing register?

- (a) PC
- (b) DR
- (c) IR
- (d) AR
- (e) None of the above

**Ans.(e)**

**Q32.** The reserved words in C programming are called?

- (a) Constants
- (b) Identifiers

- (c) Keywords
- (d) Operators
- (e) Functions

**Ans.(c)**

**Q33.** Which of the following testing types focuses on verifying individual components or modules of a software application?

- (a) Integration Testing
- (b) Unit Testing
- (c) System Testing
- (d) Acceptance Testing
- (e) Regression Testing

**Ans.(b)**

**Q34.** Consider the following code snippet:

```
#include <stdio.h>

int main() {
    char arr[] = "FGHJKJGF";
    char *p = arr;

    printf("%c\n", *(p + 3));
    return 0;
}
```

What is the output of the above program?

- (a) F
- (b) G
- (c) H
- (d) J
- (e) K

**Ans.(d)**

**Q35.** Consider the following C program:

```
#include <stdio.h>

void exampleFunction(int x, int y) {
    printf("x = %d, y = %d\n", x, y);
}

int main() {
    int a = 10;
    int b;
    exampleFunction(a, b);
    return 0;
}
```

What is the output of the above program?

- (a) x = 0, y = 10
- (b) x = 10, y = 10
- (c) x = 10, y = some garbage value
- (d) x = 0, y = some garbage value
- (e) Compilation Error

**Ans.(c)**

**Q36.** Consider the following processes with their respective burst times and arrival times:

Process	Arrival Time	Burst Time
P1	0	5
P2	2	3
P3	4	1
P4	6	8
P5	8	6

Using the First-Come, First-Served (FCFS) scheduling algorithm, calculate the average waiting time and average turnaround time for the processes.

- (a) Average Waiting Time: 4.2, Average Turnaround Time: 8.2
- (b) Average Waiting Time: 6.0, Average Turnaround Time: 11.0
- (c) Average Waiting Time: 4.6, Average Turnaround Time: 8.6
- (d) Average Waiting Time: 3.8, Average Turnaround Time: 8.4
- (e) Average Waiting Time: 3.6, Average Turnaround Time: 7.6

**Ans.(d)**

**Q37.** Which communication mode allows data transmission in both directions simultaneously?

- (a) Simplex
- (b) Half Duplex
- (c) Full Duplex
- (d) Asynchronous
- (e) Synchronous

**Ans.(c)**

**Q38.** Consider the following disk request sequence for I/O operations in a disk queue: 95, 180, 34, 119, 11, 123, 62, 64.

The disk head is initially positioned at cylinder 50. Calculate the total head movement to satisfy all the requests using FCFS disk scheduling.

- (a) 440
- (b) 620
- (c) 560
- (d) 735
- (e) 644

**Ans.(e)**

**Q39.** Which of the following is a NoSQL database?

- (a) MariaDB
- (b) MySQL
- (c) Cassandra
- (d) Informix
- (e) DB2

**Ans.(c)**

**Q40.** What is the height of an AVL tree with 12 nodes, assuming the degree of the root node is 0?

- (a) 3
- (b) 4
- (c) 5
- (d) 6
- (e) None of the above

**Ans.(b)**

**Q41.** What is the purpose of the -n option in the Linux traceroute command?

- (a) Displays the output in numeric IP format without resolving hostnames
- (b) Traces routes to the local network only
- (c) Resolves hostnames to domain names
- (d) Specifies the maximum number of hops
- (e) Displays additional debugging information

**Ans.(a)**

**Q42.** What type of VLAN is used to carry traffic from multiple VLANs across a single link?

- (a) Access
- (b) Native
- (c) Trunk
- (d) Management
- (e) Voice

**Ans.(c)**

**Q43.** Consider a network where a packet is sent from Host A to Host B. The packet has an initial hop limit of 10. The packet passes through 3 routers before reaching Host B. Each router decrements the hop limit by 1. What is the remaining hop limit of the packet when it reaches Host B?

- (a) 7
- (b) 8
- (c) 9
- (d) 10
- (e) 6

**Ans.(a)**

**Q44.** What are the partitioning styles available in Windows operating systems?

- (a) NTFS and FAT32
- (b) Primary and Extended
- (c) Logical and Physical
- (d) MBR and GPT
- (e) BIOS and UEFI

**Ans.(d)**

**Q45.** Which transport layer protocol is used by SMTP?

- (a) TCP
- (b) UDP
- (c) ICMP
- (d) SCTP
- (e) ARP

**Ans.(a)**

**Q46.** Match the following OSI layers with their corresponding functionalities:

OSI Layer	Functionality
1. Network Layer	(a) Access Control
2. Transport Layer	(b) Channel Transmission
3. Data Link Layer	(c) Routing
4. Physical Layer	(d) Segmentation and Reassembly

Choose the correct matching:

- (a) 1-c, 2-d, 3-a, 4-b
- (b) 1-d, 2-a, 3-b, 4-c
- (c) 1-a, 2-c, 3-d, 4-b
- (d) 1-c, 2-b, 3-d, 4-a
- (e) 1-d, 2-c, 3-a, 4-b

**Ans.(a)**

**Q47.** What is the binary equivalent of 726?

- (a) 1011010110
- (b) 1101101010

- (c) 1110010110
- (d) 1010110110
- (e) 1110101010

**Ans.(a)**

**Q48.** In the context of server security, which of the following real-world practices is NOT desirable?

- (a) Using a reverse proxy to hide server IP addresses
- (b) Deploying servers in a DMZ (Demilitarized Zone) for public-facing services
- (c) Disabling unnecessary services and ports on the server
- (d) Allowing unrestricted root login via SSH for faster access
- (e) Enforcing regular vulnerability assessments on the server

**Ans.(d)**

**Q49.** In the context of Java, which of the following keywords is used to declare class-level variables and methods, ensuring that they can be accessed without creating an instance of the class?

- (a) final
- (b) static
- (c) transient
- (d) volatile
- (e) synchronized

**Ans.(b)**

**Q50.** Consider the following statements about CISC (Complex Instruction Set Computing):

1. CISC instructions are more complex and can execute multiple tasks in a single instruction.
2. CISC processors require fewer instructions to complete a task, resulting in simpler control units.
3. CISC architecture prioritizes hardware over software complexity.

Which of the following options correctly classifies the statements as true or false?

- (a) 1: True, 2: True, 3: False
- (b) 1: True, 2: False, 3: True
- (c) 1: False, 2: True, 3: True
- (d) 1: False, 2: False, 3: True
- (e) 1: True, 2: False, 3: False

**Ans.(b)**

**Q51.** Which UNIX command is used to display the kernel name?

- (a) whoami
- (b) kernel
- (c) uname
- (d) hostname
- (e) sysinfo

**Ans.(c)**

**Q52.** Which of the following is a private IP address?

- (a) 192.168.1.1
- (b) 172.32.0.1
- (c) 10.0.0.1

- (d) 8.8.8.8
- (e) 172.15.0.1

**Ans.(a)**

**Q53.** Consider the following statements about namespaces in programming:

(i) Namespaces provide a way to group identifiers and avoid naming conflicts in large projects. (ii) Using the using directive in C++ eliminates the need to qualify names explicitly within the namespace. (iii) In C++, two namespaces cannot have the same identifier within them.

Which of the following options correctly classifies the statements as true or false?

- (a) (i): True, (ii): True, (iii): False
- (b) (i): True, (ii): False, (iii): False
- (c) (i): False, (ii): True, (iii): True
- (d) (i): True, (ii): True, (iii): True
- (e) (i): False, (ii): False, (iii): True

**Ans.(a)**

**Q54.** Dirty bit is used to identify which of the following?

- (a) Pages that are modified in memory but not written to disk
- (b) Pages that are currently in use in memory
- (c) Pages that are swapped out to disk
- (d) Pages that are read-only in memory
- (e) Pages that are not loaded in memory

**Ans.(a)**

**Q55.** What is the final value of a after the loops are executed in the following program?

```
public class Main {  
    public static void main(String[] args) {  
        int a = 0;  
        for (int i = 0; i < 5; i++) {  
            a++;  
        }  
        for (int j = 0; j < 5; j++) {  
            a--;  
        }  
        System.out.println("Final value of a: " + a);  
    }  
}
```

- (a) -5
- (b) 0
- (c) 5
- (d) 10
- (e) None of the above

**Ans.(b)**

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**Q56.** Which of the following is NOT a feature of Extreme Programming (XP)?

- (a) Pair programming
- (b) Continuous feedback from the customer
- (c) Fixed project requirements before development
- (d) Test-driven development (TDD)
- (e) Continuous integration

**Ans.(c)**

**Q57.** Which of the following is a type of Intrusion Detection System that analyzes network traffic in real-time?

- (a) Host-Based IDS (HIDS)
- (b) Network-Based IDS (NIDS)
- (c) Signature-Based IDS
- (d) Anomaly-Based IDS
- (e) Behavior-Based IDS

**Ans.(b)**

**Q58.** A subset of a Data Warehouse designed for a specific department is called:

- (a) Data Mart
- (b) ODS
- (c) Cloud Warehouse
- (d) Metadata store
- (e) None of the above

**Ans.(a)**

**Q59.** Which cloud model allows end-users to access software applications via a web browser without needing local installation?

- (a) IaaS
- (b) PaaS
- (c) SaaS
- (d) FaaS
- (e) DaaS

**Ans.(c)**

**Q60.** Which of the following exemplifies Divide and Conquer?

- (a) Heapsorts
- (b) Insertion sort
- (c) Bubble sort
- (d) Merge sort
- (e) None of the above

**Ans.(d)**