

PhD in Entrance Test

Sample Paper (Technology)

1. The question paper is divided into two sections.
2. Section A (Compulsory)- contains 50 MCQ's carrying 1 mark each
3. Section B contains 5 descriptive questions carrying 10 marks each.

PART - A

1. Which of the following events is detrimental to an operating system's performance?
 - A. Deadlock
 - B. Interrupt
 - C. Booting
 - D. None of the above
2. Multitasking in a computer with only one CPU is accomplished by a technique called
 - A. Bootstrapping
 - B. Batch processing
 - C. Time sharing
 - D. Multiprocessing
3. Inserting an item into the stack when stack is not full is called Operation and deletion of item from the stack, when stack is not empty is calledoperation.
 - A. push, pop
 - B. pop, push
 - C. insert, delete
 - D. delete, insert
4. A graph is a collection of nodes, called And line segments called arcs or that connect pair of nodes.
 - A. vertices, edges
 - B. edges, vertices
 - C. vertices, paths
 - D. graph node, edges
5. The number of comparisons done by sequential search is
 - A. $(N / 2) + 1$
 - B. $(N + 1) / 2$
 - C. $(N - 1) / 2$
 - D. $(N - 2) / 2$
6. The complexity of Binary search algorithm is
 - A. $O(n)$
 - B. $O(\log n)$
 - C. $O(n^2)$
 - D. $O(n \log n)$

7. Which among the below specified condition is applicable if the Queue is non - empty?
 - A. rear > front
 - B. rear < front
 - C. rear = front
 - D. Unpredictable

8. Which linear structure has a provision of Last-In-First-Out (LIFO) mechanism for its elements?
 - A. Stack
 - B. Queue
 - C. Both a & b
 - D. None of the above

9. Which of the following ways is a post-order traversal?
 - A. root->left sub tree-> right sub tree
 - B. root->right sub tree-> left sub tree
 - C. left sub tree-> right sub tree->root
 - D. left sub tree-> root->right sub tree

10. What is size of MAC address?
 - A. 16 bits
 - B. 32 bits
 - C. 48 bits
 - D. 64 bits

11. Which layer is responsible for process to process delivery?
 - A. Network layer
 - B. Transport layer
 - C. Session layer
 - D. Data link layer

12. The transport layer protocols used for file transfer and DNS respectively are
 - A. UDP and TCP
 - B. TCP and TCP
 - C. TCP and UDP
 - D. UDP and UDP

13. What is default network mask for class A IP address?
 - A. 255.0.0.0
 - B. 255.255.0.0
 - C. 255.255.255.0
 - D. None of the above

14. Repeater operates in which layer of OSI model?
 - A. Data link layer
 - B. Network layer
 - C. Transport layer
 - D. Physical layer

15. Which of the following is not a valid name for a C variable?
- A. student_name
 - B. student name
 - C. studentname
 - D. None of the above
16. Which of the following settings can be changed in the computers CMOS?
- A. Computer Date & Time
 - B. CD-ROM drive Letter
 - C. Ram Memory Size.
 - D. None of the above
17. Which of the following is not an input device?
- A. Touch screen
 - B. Plotter
 - C. Light pen
 - D. Joystick
18. SSD stands for:
- A. Single Shared Drive
 - B. Soft Shared Drive
 - C. Solid State Drive
 - D. None of the above
19. Secondary storage memory is basically
- A. Volatile memory
 - B. Non-volatile memory
 - C. Backup memory
 - D. Impact memory
20. From what location are the 1st computer instructions available on boot up?
- A. ROM BIOS
 - B. RAM
 - C. Boot.ini
 - D. Config.sys
21. Which of the following holds data and processing instructions temporarily until the CPU needs it?
- A. ROM
 - B. Control unit
 - C. Main memory
 - D. Coprocessor chips
22. Which of the following is not a NoSQL database?
- A. MongoDB
 - B. Apache Cassandra
 - C. Couchbase
 - D. MySQL

23. Which of the following is not a RDBMS database?
- A. MariaDB
 - B. Microsoft SQL Server
 - C. Amazon DynamoDB
 - D. PostgreSQL
24. The collection of information stored in a database at a particular moment is called as
- A. Schema
 - B. Instance of the database
 - C. Data domain
 - D. Independence
25. The normal form that is not necessarily dependency preserving is
- A. 2NF
 - B. 3NF
 - C. BCNF
 - D. 4NF
26. In E-R Diagram total participation of an entity is represented by
- A. Double lines
 - B. Dashed lines
 - C. Single line
 - D. Triangle
27. HTML tag for the largest heading is
- A. <head>
 - B. <h6>
 - C. <heading>
 - D. <h1>
28. In flow chart, diamond shaped symbol is used to represent
- A. decision box
 - B. statement box
 - C. error box
 - D. if-statement box
29. Which of the following concepts means determining at runtime what method to invoke?
- A. Method overloading
 - B. Data hiding
 - C. Dynamic binding
 - D. Dynamic loading
30. An accurate and efficient raster line-generating algorithm is
- A. DDA algorithm
 - B. Mid-point algorithm
 - C. Parallel line algorithm
 - D. Bresenham's line algorithm

31. What is the output of the below python code snippet?
for i in range(10, 15, 2):
 print(i, end=', ')
- A. 10, 11, 12, 13, 14
 - B. 10 12 14
 - C. 10, 12, 14
 - D. 10, 12, 14,
32. When in-order traversing a tree resulted E A C K F H D B G; the pre-order traversal would return
- A. FAEKCDHBG
 - B. FAEKCDHGB
 - C. EAFKHDCBG
 - D. FEAKDCHBG
33. The post order traversal of binary tree is DEBFCA. Find out the pre order traversal.
- A. ABFCDE
 - B. ADBFEC
 - C. ABDECF
 - D. ABDCEF
34. Write a Class C IP address. _____
35. Comment on the output of following code:
- ```
#include <stdio.h>
void main()
{
 char *p = "Atlas";
 printf("value in pointer p is %c\n", p[1]);
}
```
- A. It will print t
  - B. It will print tlas
  - C. Compile time error
  - D. Run time error
36. What is the output of this C code?
- ```
#include <stdio.h>
void main()
{
    int a[3] = {1, 2, 3};
    int *p = a;
    printf("%p\t%p", p, a);
}
```
- A. Different addresses are printed
 - B. Same addresses are printed
 - C. Run time error
 - D. Nothing

37. What is the output of this C code?

```
#include <stdio.h>
int main()
{
    void foo(), f();
    f();
}
void foo()
{
    printf("2 ");
}
void f()
{
    printf("1 ");
    foo();
}
```

- A. Compile time error as foo is local to main
- B. 1 2
- C. 2 1
- D. Compile time error due to declaration of functions inside main

38. What is the output of this C code?

```
#include <stdio.h>
int main()
{
    while ()
        printf("In while loop ");
    printf("After loop\n");
}
```

- A. In while loop after loop
- B. After loop
- C. Compile time error
- D. Infinite loop

39. What is the output of this C code?

```
#include <stdio.h>
int main()
{
    char *str = "hello, world";
    char *str1 = "hello, world";
    if (strcmp(str, str1))
        printf("unequal");
    else
        printf("equal");
}
```

- A. equal
- B. unequal
- C. Compilation error
- D. Depends on the compiler

40. What is the output of this C code?

```
#include<stdio.h>
main()
{
    int i = 1;
    Charminar:
    printf("%d ",i++);
    if(i==3) break;
    if(i<=5) goto Charminar;
}
```

- A. 1 2
 - B. 1 2 3
 - C. 1 2 4 5
 - D. Compile error
41. The entry of all the PCBs of the current processes is in:
- A. Process Register
 - B. Program Counter
 - C. Process Table
 - D. Process Unit
42. To avoid the race condition, the number of processes that may be simultaneously inside their critical section is
- A. 8
 - B. 1
 - C. 16
 - D. 0
43. Interprocess communication
- A. is required for all processes
 - B. is usually done via disk drives
 - C. is never necessary
 - D. allows processes to synchronize activity
44. Is a pile in which items are added at one end and removed from the other.
- A. Stack
 - B. Queue
 - C. List
 - D. None of the above
45. A is a graph that has weights of costs associated with its edges.
- A. Network
 - B. Weighted graph
 - C. Both A and B
 - D. None A and B

46. A binary search tree whose left sub-tree and right sub-tree differ in height by at most 1 unit is called
- A. AVL tree
 - B. Red-black tree
 - C. Lemma tree
 - D. None of these
47. The post order traversal of binary tree is DEBFCA. Find out the pre order traversal.
- A. ABFCDE
 - B. ADBFEC
 - C. ABDECF
 - D. ABDCEF
48. A receives the digital signal, recovers the pattern of 1s and 0s and re-transmits a new signal.
- A. Repeater
 - B. Amplifier
 - C. Router
 - D. Booster
49. Which address identifies a process on a host?
- A. Physical address
 - B. Logical address
 - C. Port address
 - D. Specific address
50. What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask
- A. 14
 - B. 15
 - C. 30
 - D. 62

PART – B

Subjective Questions

1. Explain classful and classless IPv4 addressing.
2. Why there is need of normalization? Explain 1NF, 2NF, 3NF and BCNF with example.
3. Explain page replacement algorithms with suitable example.
4. What are the various searching techniques? Write a program (or pseudo code) to implement binary search.
5. Explain the OSI (Open Systems Interconnection) model and its seven layers.