COMMON P.G. ENTRANCE TEST–2022 (CPET-2022)

Subject Code : **57**   Test Booklet No.:

Entrance Subject : **Computer Science**   Hall Ticket No.:

TEST BOOKLET

Time Allowed : **90 Minutes**   Full Marks : **70**

INSTRUCTIONS TO CANDIDATES

1. **Please do not open this Question Booklet until asked to do so.**

2. Check the completeness of the Question Booklet immediately after opening.

3. Enter your **Hall Ticket No.** on the Test Booklet in the box provided alongside. **Do not** write anything else on the Test Booklet.

4. Fill up & darken Hall Ticket No. & Test Booklet No. in the OMR Answer Sheet as well as fill up Test Booklet Serial No. & OMR Answer Sheet Serial No. in the Attendance Sheet carefully. Wrongly filled up OMR Answer Sheets are liable for rejection.

5. Each question has four answer options marked (A), (B), (C) & (D).

6. Answers are to be marked on the Answer Sheet, which is provided separately.

7. Choose the most appropriate answer option and darken the oval completely, corresponding to (A), (B), (C) or (D) against the relevant question number.

8. Use only **Blue/Black Ball Point Pen** to darken the oval for answering.

9. Please do not darken more than one oval against any question, as scanner will read such markings as wrong answer.

10. **Each question carries equal marks. There will be no negative marking for wrong answer.**

11. **Electronic items such as calculator, mobile, etc., are not permitted inside the examination hall.**

12. Don't leave the examination hall until the test is over and permitted by the invigilator.

13. **The candidate is required to handover the original OMR sheet to the invigilator and take the question booklet along with the candidate's copy of OMR sheet after completion of the test.**

14. Sheet for rough work is appended in the Test Booklet at the end.

W-Computer Science-57   P.T.O.

1. What will be the output of the following C programming code?

```
#include <stdio.h>
int main()
{int a[4]={1,2,3,4};
int m,n,p;
m=++a[1];
n=a[1]++;
p=a[m++];
printf("%d %d %d", m, n, p);
return 0;
}
```

(A) 3 3 4

(B) 3 4 3

(C) 4 3 4

(D) 2 3 2

2. What will be displayed when the following C code is executed?

```
#include<stdio.h>
int main()
{ int hello(int);
            int i = hello(10);
            printf("%d\n", --i);
            return 0; }
int hello(int i)
{return (i++);}
```

(A) 8

(B) 9

(C) 10

(D) 11

3. There was an error while compiling the following code. What could be the possible compilation error?

```
#include<stdio.h>
#include<stdlib.h>
int main()
{ int *p;
            p=(char*)malloc(20);
            printf("%d", p);
            return 0;}
```

(A) Incorrect use of the malloc() function

(B) value of p can't be printed

(C) type conversion error

(D) p can't be a pointer variable

4. Size of memory allocated for the following user-defined data type when **struct** is replaced by **union** will be:

                struct data
                {char x;
                float y;
                }d1;

   (A) 8
   (B) 6
   (C) 5
   (D) 4

5. Which of the following is not a valid file opening mode in C programming?

   (A) r
   (B) w+
   (C) +a
   (D) a

6. What is the output of the following C code?

```
#include<stdio.h>
int main(){
int a=5, b, c;
b=++a;
c=b++;
printf("%d", c++);
}
```

   (A) 5
   (B) 6
   (C) 7
   (D) 8

7. What does the following algorithm do?

```
for i=1 to n-1
    for j=i+1 to n
            If (A[i]>A[j])
            T=A[i]
            A[i]=A[j]
            A[j]=T
    [End of inner for-loop]
    [End of outer for-loop]
```

   (A) Display the numbers 1 to n
   (B) Display the numbers 1 to n in reverse order
   (C) Arrange a list of numbers in increasing order of values
   (D) Arrange a list of numbers in decreasing order of values

8. What does the following C function do?

```
int xyz (int n)
{
if (n==0)
return 1;
else return (n*xyz(n-1));
}
```

(A) Generate the Fibonacci series

(B) Find the factorial of a number

(C) Find the sum of a series

(D) None of the above

9. If x and y are two pointer variables, then which one of the following is a valid statement?

(A) n= *x+*y

(B) x=x+y

(C) x= y * 5

(D) x= 5+x

10. What will the following C program do?

```
#include<stdio.h>
int main()
{
int n, m=0;
printf("Enter a +ve integer");
scanf("%d",&n);
while(n>0)
{
m=m+n%10;
n=n/10;
}
printf("%d", m);
}
```

(A) Find the factorial of n

(B) Find the factorial of m

(C) Find the sum of the digits of n

(D) Find the sum of the digits of m

11. When the infix expression A/B+C+D*(E-F) is converted to postfix, it gives

    (A) AB/C+DEF-*+

    (B) AB/CDEF-*++

    (C) AB/C+DEF*-+

    (D) AB/CD+EF-*+

12. The Inorder and Preorder traversal of a binary tree produces the following sequence.

    Inorder: B E D A H F I C J G

    Preorder: A B D E C F H I G J

    If the same tree is traversed in Postodrer the sequence will be:

    (A) J G I H F C E D B A

    (B) G J C I F H A D E B

    (C) E D B H I F J G C A

    (D) None of the above

13. The order of time to locate an item in a doubly linked list with n nodes will be:

    (A) O(1)

    (B) O(n)

    (C) O(n²)

    (D) O(logn)

14. The height difference between the left and right subtree of any node in an AVL tree is:

    (A) 0

    (B) -1

    (C) +1

    (D) All of the above

15. Which traversal method would arrange the values stored in a Binary Search tree in ascending order?

    (A) Preorder

    (B) Postorder

    (C) Inorder

    (D) Level-by-level

16. The implementation of Depth First traversal of an undirected graph would require a ....

    (A) Stack

    (B) Queue

    (C) Circular Queue

    (D) Deque

17. Which data structure can provide an efficient represent of a sparse matrix in computer's memory?

    (A) 2-D array

    (B) Single linked list

    (C) Binary tree

    (D) Stack

18. An empty circular linked list with head node has at least ....number of node(s).

    (A) 0

    (B) 1

    (C) 2

    (D) Can't be determined

19. Which of the following statement is true for an output restricted deque?

    (A) Allows insertion of items only at one end

    (B) Allows insertion of items at both the ends

    (C) Allows deletion of items at both the ends

    (D) Does not allow deletion of items

20. What will be the maximum number of edges in an undirected graph with 10 vertices having no self-loops?

    (A) 100

    (B) 90

    (C) 45

    (D) 50

21. The simplification of the following Boolean function using 3-variable map will be:

    $F(A,B,C) = \sum (0,1,5,7)$

    (A) $F = AB' + BC'$

    (B) $F = A'B' + BC$

    (C) $F = A'B' + BC'$

    (D) $F = AB + B'C'$

22. The processing power of a computer can be measured in terms of

  (A) MIPS

  (B) FLOPS

  (C) Terabyte

  (D) Both (A) and (B)

23. If A= $(1010100)^2$ & B= $(1000011)^2$ then A-B using 2s complement will be:

  (A) $(0011000)^2$

  (B) $(0010111)^2$

  (C) $(0010001)^2$

  (D) $(1010101)^2$

24. The address space and memory space of a computer are specified by 24-bits and 16-bits respectively. The number of words in the address space and memory space will be

  (A) 16 M and 64 K

  (B) 24 M and 16 M

  (C) 24 K and 16 K

  (D) None of the above

25. The technique that allows the DMA controller to transfer one data word at a time after which it must return control of the buses to the CPU is referred s

  (A) Memory stealing

  (B) Bus stealing

  (C) Inter-leaving

  (D) Cycle stealing

26. Out of the 7 layers of OSI model, which of the following layer is not present in the TCP/IP model?

  (A) Application

  (B) Transport

  (C) Session

  (D) Data link

27. Which of the following communication protocol best suits to connectionless communication?

  (A) TCP

  (B) UDP

  (C) FTP

  (D) HTTP

28. Which of the following is not the responsibility of the Physical layer?

    (A) Synchronizing the sender and receiver

    (B) Machine port level addressing

    (C) Transferring bits

    (D) Congestion control

29. The technique of encapsulating one data packet inside another packet while sending across a public network is known as

    (A) Tunnelling

    (B) Jitter

    (C) Hand-shaking

    (D) Packet switching

30. An encrypted version of the hash computed from a message is referred to as

    (A) Digital signature

    (B) Message digest

    (C) Hashing

    (D) Datagram

31. The Java function that returns the smallest whole number greater than or equal to x is:

    (A) rnd(x)

    (B) floor(x)

    (C) ceil(x)

    (D) next(x)

32. Which of the following is a valid Java declaration?

    (A) int arr[ ] [ ]= { {1, 1, 1, 1}, {2, 2, 2, 2} };

    (B) arr=new int[2] [4];

    (C) int arr[ ] [ ]=new int[2] [4];

    (D) All of the above

33. The lifecycle of a Java thread includes the following states

    (A) runnable, running, dead

    (B) runnable, blocked, dead

    (C) running, blocked, dead

    (D) All of the above

34. When should you use the finalize( ) method in Java?

    (A)   To create an object

    (B)   To allocate memory space to an object

    (C)   To reclaim memory space used by an object

    (D)   To finalize a class description

35. If one intends a field is to be visible everywhere in the current package and also subclasses in other packages then one would use …………………..access modifier.

    (A)   Private

    (B)   Public

    (C)   Protected

    (D)   Friendly

36. Which inheritance type is used in the following class declaration?

            class A : public X, public Y

            {

                }

    (A)   Multilevel inheritance

    (B)   Multiple inheritance

    (C)   Hierarchical Inheritance

    (D)   Hybrid inheritance

37. Which of the following class does not override equals() method?

    (A)   java.lang.String

    (B)   java.lang.Double

    (C)   java.lang.StringBuffer

    (D)   java.lang.Character

38. Which two are valid constructors for Thread?

            i. Thread (Runnable r, String name)

            ii. Thread()

            iii. Thread(int priority)

            iv. Thread(Runnable r, int priority)

    (A)   i and iii

    (B)   ii and iv

    (C)   i and ii

    (D)   ii and iii

39. Which of the following keywords is not a part of exception handling in Java?

   (A) Try

   (B) Catch

   (C) Finally

   (D) Thrown

40. The interface in Java is a mechanism to implement ………………….…

   (A) multi-level inheritance

   (B) multiple inheritance

   (C) overloading of functions

   (D) hierarchical inheritance

41. Which of the following logical equivalence is not true?

   (A) $P \rightarrow Q \equiv \sim P \vee Q$

   (B) $P \rightarrow Q \equiv \sim Q \rightarrow \sim P$

   (C) $P \leftrightarrow Q \equiv (\sim P \vee Q) \wedge (P \wedge Q))$

   (D) $P \leftrightarrow Q \equiv (P \wedge Q) \vee (\sim P \wedge \sim Q)$

42. Which of the following refers to modus ponen?

   (A) $P \wedge (P \rightarrow Q) \Rightarrow Q$

   (B) $P \vee (P \rightarrow \sim Q) \Rightarrow Q$

   (C) $P \wedge (\sim P \rightarrow Q) \Rightarrow Q$

   (D) None of the above

43. The cardinality of the power set of X = {1, 2, 3 } is …………………….

   (A) 3

   (B) 6

   (C) 8

   (D) 9

44. Which of the following is the correct representation of the sentence "some real numbers are integers"?

   (A) $\exists x \ (P(x) \vee Q(x))$

   (B) $\exists x \ (P(x) \rightarrow Q(x))$

   (C) $\exists x \ (P(x) \wedge Q(x))$

   (D) None of the above

45. The ease with which software can be transferred from one platform to another is referred to as ……………..

(A) Usability

(B) Portability

(C) Reliability

(D) Transferability

46. Which of the following process model was introduced by Boehm?

(A) Waterfall

(B) Prototyping

(C) Iterative Waterfall

(D) Spiral

47. Which of the following is not included in the feasibility study during a software development process?

(A) Technical feasibility

(B) Economic feasibility

(C) Developer feasibility

(D) Operational feasibility

48. The degree of interdependence among software modules is called ……………….

(A) Cohesion

(B) Coupling

(C) Interoperability

(D) Software integration

49. Which of the following software testing strategy is meant to test the internal structure of a software?

(A) White box testing

(B) Black box testing

(C) Beta testing

(D) Stress testing

50. Which of the following is not a type of software maintenance?

(A) Corrective

(B) Preventive

(C) Adaptive

(D) Fault tolerant

51. Which of the following is not a database system?

    (A) MySQL

    (B) NoSQL

    (C) Python

    (D) SQL Server

52. If you wish to obtain a third relation containing tuples that occur in the first relation but not in the second, which relational algebraic operation will you use?

    (A) Divide

    (B) Difference

    (C) Projection

    (D) Equi-join

53. For any non-trivial functional dependency, $X \rightarrow A$, if X must be a super-key then the relation is in …………..

    (A) 1 NF

    (B) 2 NF

    (C) 3 NF

    (D) BCNF

54. Which of the following SQL command would delete all the rows from a relational table and free the space containing the table?

    (A) DELETE

    (B) ALTER

    (C) TRUNCATE

    (D) None of the above

55. If you want to undo transactions that have not already been saved to the database, which command will you prefer?

    (A) Commit

    (B) Savepoint

    (C) Rollback

    (D) Revoke

56. Which of the following is not a file allocation method?

    (A) Tree-like allocation

    (B) Contiguous allocation

    (C) Linked allocation

    (D) Indexed allocation

57. Which of the following directory structure can allow shared subdirectories and files?

   (A) Single-level

   (B) Two-level

   (C) Tree structured

   (D) Acyclic graph

58. Overlapped swapping can

   (A) Increase overall swapping time

   (B) reduce overall swapping time

   (C) does not require any swapping time

   (D) deteriorate system performance

59. Which of the following strategy would allocate the largest memory block to a requesting process?

   (A) First fit

   (B) Best fit

   (C) Worst fit

   (D) Exact fit

60. The basic objective of CPU scheduling is to

   (A) Minimize CPU utilization

   (B) Minimize throughput

   (C) Minimize turnaround time

   (D) Maximize response time

61. What is the average waiting time for the following workload using non-preemptive SJF scheduling?

Process ID	Arrival time	CPU burst time
A	0	7
B	2	4
C	4	1
D	5	4

   (A) 3

   (B) 4

   (C) 5

   (D) 7

62. Which of the following is a non-preemptive CPU scheduling technique?

    (A) First-Come-First-Serve

    (B) Shortest-Remaining-Time-First

    (C) Round-Robin

    (D) Pre-emptive SJF

63. How many page faults will be encountered for the memory reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5 using optimal page replacement technique with 4 frames per process?

    (A) 4

    (B) 5

    (C) 6

    (D) 7

64. Which of the following statement is false?

    (A) Thrashing leads to low CPU utilization

    (B) Aging will eventually help a process to execute

    (C) Round-Robin scheduling can lead to Convoy effect

    (D) Belady's anomaly is encountered in FIFO page replacement

65. Which of the following disk scheduling is also known as Elevator algorithm?

    (A) Shortest-Seek-Time-First

    (B) First-Come-First-Serve

    (C) SCAN

    (D) C-Look

66. Banker's algorithm is a type of ………………technique.

    (A) Deadlock avoidance

    (B) Deadlock detection

    (C) Deadlock prevention

    (D) Deadlock recovery

67. Which of the following can be used as a synchronization tool?

(A) Buffering

(B) Rendezvous

(C) Semaphore

(D) All of the above

68. The open source software suite LAMP refers to?

(A) Linux, Apache, Microsoft and Python

(B) Linux, Apache, MySQL and PHP

(C) Linux, Amazon, MySQL and Postgres

(D) Linux, Apache, MySQL and PostgreSQL

69. When a derived class is allowed to change the definition of its base class member function, it is referred as ………..

(A) Function overloading

(B) Multilevel inheritance

(C) Function overriding

(D) Hybrid inheritance

70. What is true about an Abstract class?

(A) An abstract class cannot be instantiated

(B) It is not possible to inherit an abstract class to create a derived class

(C) An abstract class cannot contain a virtual function as its member

(D) None of the above

****

ROUGH WORK