Question Booklet Series

A

JECA-2022

2060002737

(Booklet Number)

Duration: 2 Hours | No. of MCQ : 100 | Full Marks: 120

INSTRUCTIONS

1. **All** questions are of objective type having four answer options for each.
2. Category-I : Carry 1 mark each and only one option is correct. In case of incorrect answer or any combination of more than one answer, ¼ mark will be deducted.
3. Category-II : Carry 2 marks each and one or more option(s) is/are correct. If all correct answers are not marked and no incorrect answer is marked, then score = 2 × number of correct answers marked ÷ actual number of correct answers. If any wrong option is marked or if any combination including a wrong option is marked, the answer will be considered wrong, but there is **no negative marking** for the same and zero mark will be awarded.
4. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D. Question booklet series code (A, B, C, or D) must be properly marked on the OMR.
5. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.
6. Write question booklet number and your roll number carefully in the specified locations of the **OMR**. Also fill appropriate bubbles.
7. Write your name (in block letters), name of the examination center and put your full signature in appropriate boxes in the OMR.
8. The OMR is liable to become invalid if there is any mistake in filling the correct bubbles for question booklet number/roll number or if there is any discrepancy in the name/ signature of the candidate, name of the examination center. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
9. Candidates are not allowed to carry any written or printed material, calculator, pen, log-table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will be **reported against** and his/her candidature will be summarily cancelled.
10. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
11. Hand over the OMR to the invigilator before leaving the Examination Hall.

SPACE FOR ROUGH WORK

Category-I (Q 1 to 80)
(Carry 1 mark each. Only one option is correct. Negative marks : – ¼)

1. What is the output of the following program ?

```
#include <stdio.h>
void main ( )
{
    const int a=4;
    float b;
    b=++a;
    printf("%d, %f", a, ++b);
}
```

(A) Compiler error
(B) 5, 5
(C) 4, 5
(D) 5, 4

2. What is the output of the following program ?

```
#include <stdio.h>
# define I char
void main ( )
{
    I i = 65;
    printf("sizeof(i) = %d", sizeof(i));
}
```

(A) Compiler Error
(B) sizeof(i) = 1
(C) sizeof(i) = 65
(D) sizeof(i) = 66

3. What is the output of the following program ?

```
#include <stdio.h>
void main( )
{
    int x=0, y=0;
    if(x && y++)
        printf("%d..%d", x++, y);
    printf("%d.. %d", x, y);
}
```

(A) 0..0
(B) 0..1
(C) 1..1
(D) 1..0

4. What is the output of the following program ?

```
#include <stdio.h>
enum colors{BLACK, BLUE, CYAN};
void main ( )
{
    printf ("%d..%d..%d", BLACK, BLUE, CYAN);
}
```

(A) BLACK, BLUE, CYAN
(B) 0..0..0
(C) 0..1..2
(D) No output

5. What is the output of the following program ?

```
#include <stdio.h>
void main ( )
{
    char xy=0;
    for(;xy>0;xy++);
    printf("%d\n", xy);
}
```

(A) 2
(B) 0
(C) Compiler error
(D) 1

6. What is the output of the following program ?

```
#include<stdio.h>
void main( )
{
    int *j;
    {
        int i =1000;
        j=&i;
    }
    printf("%d", *j);
}
```

(A) 1000
(B) 0
(C) Garbage value
(D) Compiler error

7. Which of the following statement immediately terminates the execution of a loop ?

(A) else
(B) break
(C) return
(D) goto

8. An unrestricted use of the "goto" statement is harmful because _____.

(A) it is difficult to verify program
(B) memory requirement is increased
(C) it increases execution time of the program
(D) compiler generates longer machine code

9. In object oriented programming, inheritance is a technique to _____.
   (A) pass arguments and improve data hiding
   (B) pass arguments and add features to existing classes without rewriting them
   (C) automatically acquire features from its parent object
   (D) improve data hiding and encapsulation

10. In object oriented programming, the visibility mode by default is _____.
   (A) public
   (B) private
   (C) protected
   (D) anywhere

11. Which statement is false based on the concept of object oriented programming ?
   (A) Method overloading is an example of compile time polymorphism.
   (B) Method overriding is an example of runtime polymorphism.
   (C) Derived class does not need a base class.
   (D) Object oriented programming supports inheritance.

12. Method overloading in respect of object oriented programming is _____.
   (A) overloading without argument passing
   (B) overloading the method that has same name but different parameters
   (C) a feature in which multiple functions with different names and same parameters
   (D) not possible

13. In object oriented programming, _____ can be declared in a class template.
   (A) global data members
   (B) constant data members
   (C) static data members
   (D) statistical data members

14. In object oriented programming, same function or object behaves different in different situations. It is known as _____.
   (A) inheritance
   (B) polymorphism
   (C) memory addressing
   (D) encapsulation

15. Which of the following class constructor will be invoked first in object oriented programming ?
   (A) Base class
   (B) Virtual base class
   (C) Abstract class
   (D) Derived class

16. In object oriented programming, public members of a base class become protected member of the derived class. This situation happens in _____.
   (A) Virtual inheritance
   (B) Protected inheritance
   (C) Private inheritance
   (D) Public inheritance

17. In unix/linux platform, which vi editor command copies the current line of the file ?
   (A) yy
   (B) yw
   (C) yc
   (D) zz

18. In unix/linux platform, which command is used to delete a line in vi editor ?

(A) p (B) dd

(C) x (D) q

19. In unix/linux platform, which set is correct to move cursor within vi editor ?

(A) h - Move cursor up, k - Move cursor down, j - Move cursor left, l - Move cursor right.

(B) k - Move cursor up, j - Move cursor down, h - Move cursor left, l - Move cursor right.

(C) k - Move cursor up, l - Move cursor down, h - Move cursor left, j - Move cursor right.

(D) l - Move cursor up, j - Move cursor down, k - Move cursor left, h - Move cursor right.

20. In unix/linux platform, which command is used to see path of the working directory ?

(A) ls (B) dir

(C) vi (D) pwd

21. In unix/linux platform, which command is used to view the first n number of lines of a particular file (consider the file name is "filename") ?

(A) head -n filename (B) tail -n filename

(C) head -n -tail filename (D) top -n filename

22. In unix/linux platform, which command is used to search for a pattern within a file ?

(A) cd (B) cp

(C) paste (D) grep

23. In unix/linux platform, hidden file can be viewed using _____.

(A) ls -a (B) ls -l

(C) ls -h (D) ls - k

24. In unix/linux platform, what is the output of the following command (consider the file name is "filename") ?

grep -v 'hello' filename

(A) show the current directory

(B) show the pattern ignoring case

(C) show the lines which don't match with the pattern

(D) show the line numbers at the time of result

25. In shell script, what is the output of the following program ?

```
counter=1
while [ $counter -le 10 ]
do
        echo $counter
        ((counter++))
done
```

(A) lists all the numbers from 1 to 10
(B) lists all the odd numbers from 1 to 10
(C) lists all the even numbers from 1 to 10
(D) lists only the 10th position number

26. Stack is a _____ in data structure concept.
(A) basic data type
(B) derived data type
(C) float data type
(D) char data type

27. In data structure, the stack is a linear type of data structure in which data is stored and retrieved in a _____ manner.
(A) No out only in
(B) Last in First out
(C) First in First out
(D) Last out Last in

28. In bubble sort algorithm, worst case time complexity is _____ considering 'n' is the number of elements.
(A) O(1)
(B) $O(n^2)$
(C) O(n)
(D) O(n log n)

29. In data structure, a binary tree with 'n' nodes has _____.
(A) n edges
(B) n+1 edges
(C) n-1 edges
(D) n-2 edges

30. Merge sort follows _____ in data structure.
(A) divide and conquer strategy
(B) back tracking approach
(C) heuristic search
(D) greedy approach

31. In data structure, maximum degree of a vertex in a typical graph with 'n' vertices is _____.
(A) n
(B) $n - 1$
(C) $n + 1$
(D) $2n - 1$

32. In data structure, a graph is represented as a pair of sets (V, E), where _____.
(A) V is the set of variables and E is the set of edges
(B) V is the set of vertices and E is the set of edges
(C) V is the set of vertices and E is the set of elements
(D) V is the set of variables and E is the set of elements

33. In binary search tree data structure, in-order traversal means the nodes are being searched in _____ order.
(A) left child node – right child node – root node
(B) right child node – root node – left child node
(C) root node – right child node – left child node
(D) left child node – root node – right child node

34. Queue data structure can be utilized for _____ implementation.
(A) radix sort
(B) quick sort
(C) recursion
(D) depth first search

35. The hardware device used for direct memory access is known as _____.
(A) DMA scheduler
(B) DMA controller
(C) DMA disk
(D) DMA monitor

36. Hit ratio means _____.
(A) [number of hit / (number of hit + number of miss)]
(B) [number of miss / (number of hit + number of miss)]
(C) a negative value based on specific software
(D) a negative value based on specific hardware

37. A suspension of a process, caused by an event external to that process and performed in such a way that the process can be resumed, is known as _____.
(A) scheduler
(B) interrupt
(C) deadlock
(D) virtual memory

38. Operating system supports FCFS scheduling which is _____ type.
(A) viral
(B) non-preemptive
(C) preemptive
(D) multi-layer

39. Round robin is a type of _____ in context of operating system.
(A) fragmentation
(B) process scheduling
(C) process synchronization
(D) deadlock

40. In operating system, dispatcher module helps in _____ between the processes at CPU.
(A) spawning
(B) processing
(C) killing
(D) switching

41. Belady's anomaly happens in _____ page replacement policy.
(A) FIFO
(B) LRU
(C) LFU
(D) NRU

42. In operating system, a thread is considered as _____.
(A) Heavy Weight Process
(B) Light Weight Process
(C) Process
(D) Program

43. In operating system, Inter Process Communication (IPC) is required for _____ activity.
(A) cache
(B) DMA
(C) synchronization
(D) disk

44. Paging is a _____ management function in operating system.
(A) CPU
(B) memory
(C) disk
(D) process

45. What do you mean by best fit algorithm in memory management ? Select the correct option.
(A) Allocate the program to a specific memory partition which is the smallest available partition to be able to allocate the whole program.
(B) Allocate the program to a specific disk partition which is the smallest available partition to be able to allocate the whole program.
(C) Allocate the process to a specific memory partition which is the smallest available partition to be able to allocate the whole process.
(D) Allocate the process to a specific disk partition which is the smallest available partition to be able to allocate the whole process.

46. In operating system, Banker's algorithm is used for _____.
(A) Mutual exclusion
(B) Deadlock recovery
(C) Deadlock avoidance
(D) Cache allocation

47. In operating system, a state is considered as _____ only if the system is capable of allocating resources to each process following resource allocation methods avoiding deadlock situation.
(A) starvation
(B) greedy allocation
(C) unsafe state
(D) safe state

48. SCAN, C-SCAN, LOOK, C-LOOK are types of _____ scheduling.
(A) process
(B) CPU
(C) memory
(D) disk

49. In Computer Network, TFTP means _____.
(A) Transition File Transfer Protocol
(B) Transport File Transfer Protocol
(C) Trimmed File Transfer Protocol
(D) Trivial File Transfer Protocol

50. In Computer Network, SGMP means _____.
(A) Simplex Gateway Monitoring Protocol
(B) Simplex Gateway Memory Protocol
(C) Simple Gateway Monitoring Protocol
(D) Simple Gateway Memory Protocol

51. In computer network, Token Ring (IEEE 802.5) is a type of _____.
(A) monitoring protocol
(B) communication protocol
(C) visibility protocol
(D) chaos protocol

52. In network, a _____ device can transmit data in bi-directional way at a particular time instance.
(A) simplex
(B) half duplex
(C) multiplex
(D) full duplex

53. IEEE 802.2 specifies LLC which means _____.
(A) logical link control
(B) logistic link control
(C) length-wise link control
(D) layer link control

54. In computer network, Open Systems Interconnection model has seven layers within which _____ layer is used for routing.
(A) application
(B) network
(C) session
(D) transport

55. In computer network, _____ helps to find out hardware address of a host from its known IP address.
(A) Address Resolution Protocol
(B) Reverse Address Resolution Protocol
(C) Simple Network Management Protocol
(D) Simple Mail Transfer Protocol

56. In computer network, error control is considered as a function of _____ layer.
(A) Application
(B) Presentation
(C) Session
(D) Data link

57. If hexadecimal notation of an IP address is F32C1483, then the equivalent decimal notation (separated by dot) is _____.
(A) 241.44.20.131
(B) 243.42.20.135
(C) 243.44.20.131
(D) 243.44.20.135

58. Based on DBMS, choose the correct option for composite attribute.
(A) Address
(B) Birth date
(C) Phone number
(D) Age

59. In DBMS, what do you mean by a tuple ?
(A) One column
(B) Two columns
(C) One row
(D) Two rows

60. Rho (ρ) indicates _____ in relational algebra.
(A) Selection
(B) Projection
(C) Rename
(D) Join

61. Normalization is the technique to organize data in database to _____ redundancy.
(A) maximize
(B) minimize
(C) average
(D) diffuse

62. In DBMS, a relation is having _____ Normal Form if it contains an atomic value.
(A) First
(B) Second
(C) Third
(D) Fourth

63. In software engineering, the tester does not know the internal designs of the software application in case of _____ testing.
(A) White box (B) Black box
(C) Acceptance (D) Beta

64. In software engineering, context diagram is termed as _____.
(A) Level 0 DFD (B) Level 1 DFD
(C) Level 2 DFD (D) Level 3 DFD

65. In software engineering, SRS means _____.
(A) System Requirements Specification (B) System Readable Specification
(C) Software Requirements Specification (D) Software Readable Specification

66. In software engineering, degree of interdependence between software modules is termed as _____.
(A) data (B) coupling
(C) control (D) pointer

67. In software engineering, Alpha testing is the product testing executed by _____.
(A) Development team (B) Friendly set of customers
(C) Management team (D) Beta Testing team

68. In Software Engineering, COCOMO means _____.
(A) Constructive Cost Model (B) Conclusive Cost Model
(C) Constructive Cohesion Model (D) Conclusive Cohesion Model

69. Which of the following option is not a software life cycle model ?
(A) Waterfall model (B) Prototyping model
(C) Spiral model (D) Seed model

70. In Software Engineering, Build and Fix model has _____ number of phases.
(A) 1 (B) 2
(C) 3 (D) 4

71. In software engineering, Waterfall model maintains the sequence of stages as follows:
(A) Testing the Product → Requirement Analysis and Planning → Designing the Product Architecture → Building or Developing the Product → Feasibility Study → Deployment in the Market and Maintenance.
(B) Requirement Analysis and Planning → Feasibility Study → Designing the Product Architecture → Building or Developing the Product → Testing the Product → Deployment in the Market and Maintenance.
(C) Designing the Product Architecture → Requirement Analysis and Planning → Feasibility Study → Building or Developing the Product - > Testing the Product → Deployment in the Market and Maintenance.
(D) Feasibility Study → Requirement Analysis and Planning → Designing the Product Architecture → Building or Developing the Product → Testing the Product → Deployment in the Market and Maintenance.

72. In machine learning, Bayes error rate is considered as the _____ possible error rate for a given class of classifier.
(A) highest (B) medium
(C) lowest (D) median

73. Markov property supports _____.
(A) only current state (B) current & previous states
(C) only previous state (D) only next state

74. In machine learning, _____ is considered as the generalized formula of distance measurement.
(A) Distance metric (B) Minkowski metric
(C) Classification (D) Clustering

75. In machine learning, Viterbi path is used in _____.
(A) dynamic programming algorithm for clustering
(B) dynamic programming algorithm for classification
(C) static programming algorithm for clustering
(D) static programming algorithm for classification

76. In machine learning, CART is a _____.
(A) classification and regression tree based algorithm
(B) clustering and regression tree based algorithm
(C) decision tree algorithm
(D) artificial neural algorithm

77. In machine learning, perceptron can be considered as artificial _____.
(A) neutron (B) neuron
(C) nucleus (D) atom

78. In linear discriminant function based classifier, decision boundary is considered as _____.
(A) plane (B) hypoplane
(C) hyperplane (D) pseudoplane

79. In hierarchical clustering, CF tree is _____ tree which stores clustering features.
(A) weight balanced (B) width balanced
(C) height balanced (D) not a balanced

80. Loss function states _____ in Bayesian decision theory.
(A) normal distribution (B) normal density
(C) exactly how cheap each action is (D) exactly how costly each action is

Category-II (Q 81 to 100)

(Carry 2 marks each. One or more options are correct. No negative marks)

81. What is the output of the following program ?

```
#include <stdio.h>
void main( )
{
    int z=50;
    printf("%d", z+++++z);
}
```

(A) 53 (B) Compiler error
(C) 52 (D) lvalue required

82. Select the memory handling functions from the following options :

(A) malloc (B) free
(C) calloc (D) realloc

83. Which of the following are good reasons to use an object oriented language ?

(A) you can define your own data types
(B) an object oriented program can be taught to correct its own errors
(C) it is easier to conceptualize an object oriented program
(D) you can use polymorphism

84. In view of object oriented programming, select the correct statement(s).

(A) Constructors return values
(B) Constructors do not return values
(C) Constructors cannot be overloaded
(D) Destructors do not have return values

85. In unix/linux platform, which of the following statement(s) is(are) not correct ?

(A) vim editor is the improved version of vi editor
(B) vi editor commands are not case sensitive
(C) vi editor has two modes of operation: command mode and insert mode
(D) vi is not a text editor

86. Example of linear data structure is _____.

(A) Linked-list (B) Graph
(C) Tree (D) stack

87. In operating system, process means _____.

(A) a program in high level language
(B) instance of a computer program
(C) a job in secondary memory
(D) a program in execution

88. Which type of operating system fetches data and gives response in terms of actual time ?

(A) Time sharing system
(B) RTOS
(C) Real-time operating system
(D) Job processing system

89. In operating system, fork is _____.

(A) dispatching of a task
(B) creation of a child process
(C) creation of a new process
(D) increasing priority of a task

90. In operating system, file attributes are _____.

(A) Name
(B) Type
(C) Location
(D) Processor

91. Producer-consumer is a _____ problem in operating system level.

(A) deadlock
(B) synchronization
(C) memory
(D) multi-process synchronization

92. What do you mean by binary semaphore ? Select the correct option(s).

(A) Only one entity can access the critical section at any time instance.
(B) Make available several access tokens to a given critical section.
(C) It can have only two values (0, 1).
(D) It can have only three values (–1, 0, +1).

93. Select the protocol(s) utilized for delivering email over Internet.

(A) FTP
(B) SMTP
(C) POP
(D) IMAP

94. IPv4 header consists of _____.

(A) Version
(B) TTL
(C) Source IP address
(D) Destination IP address

95. Choose the correct option(s) for functions of DBMS.

(A) Concurrency
(B) Non-shareable database
(C) Backup and recovery
(D) Database schema

96. Select the correct option(s) regarding "Union" and "Union All" in SQL.

(A) "Union" removes duplicate rows.
(B) "Union" does not remove duplicate rows.
(C) "Union all" removes duplicate rows.
(D) "Union All" does not remove duplicate rows.

97. Choose of the correct option(s) for the type of ordered index used in DBMS.

(A) Light index
(B) Dense index
(C) Sparse index
(D) Thread index

98. Select the correct option(s) for query processing in DBMS.

(A) Parsing
(B) Translation
(C) Optimization
(D) Evaluation

99. Select the process metrics used in software engineering for typical measurements to evaluate the performance of the proposed system.

(A) Productivity
(B) Error Rate
(C) Plan
(D) Efficiency

100. In Support Vector Machine (SVM), hyperplane is selected based on _____.

(A) largest separation between two classes
(B) shortest separation between two classes
(C) average margin between two classes
(D) largest margin between two classes

SPACE FOR ROUGH WORK