23-0008-AB TEST BOOKLET

| Time Allowed: 3 hours | PAPER - II | Maximum Marks: 300 |

INSTRUCTIONS TO CANDIDATES

Read the instructions carefully before answering the questions: -

1. This Test Booklet consists of 12(twelve) pages and has 75 (seventy-five) items (questions).
2. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET *DOES NOT* HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
3. Please note that it is the candidate's responsibility to fill in the Roll Number and other required details carefully and without any omission or discrepancy at the appropriate places in the OMR Answer Sheet and the Separate Answer Booklet. Any omission/discrepancy will render the OMR Answer Sheet and the Separate Answer Booklet liable for rejection.
4. Do not write anything else on the OMR Answer Sheet except the required information. Before you proceed to mark in the OMR Answer Sheet, please ensure that you have filled in the required particulars as per given instructions.
5. Use only Black Ball Point Pen to fill the OMR Answer Sheet.
6. This Test Booklet is divided into 4 (four) parts – Part – I, Part – II, Part - III and Part – IV.
7. All the parts are Compulsory.
8. Part-I consists of Multiple Choice-based Questions. The answers to these questions have to be marked in the OMR Answer Sheet provided to you.
9. Part-II, Part-III and Part-IV consist of Conventional Essay-type Questions. The answers to these questions have to be written in the separate Answer Booklet provided to you.
10. In Part-I, each item (question) comprises of 04 (four) responses (answers). You are required to select the response which you want to mark on the OMR Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose *ONLY ONE* response for each item.
11. After you have completed filling in all your responses on the OMR Answer Sheet and the Answer Booklet(s) and the examination has concluded, you should hand over to the Invigilator *only the OMR Answer Sheet and the Answer Booklet(s)*. You are permitted to take the Test Booklet with you.
12. Penalty for wrong answers in Multiple Choice-based Questions:
    THERE WIL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE.
    (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to the question will be deducted as penalty.
    (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above to the question.
    (iii) If a question is left blank. i.e., no answer is given by the candidate, there will be **no penalty** for that question.

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Instructions for Questions 1 to 50:
- *Choose the correct answer for the following questions.*
- *Each question carries 3 marks. [3x50=150]*

1. Which key combination is used to minimize all open windows and displays in the screen ?
   a) Alt+M
   b) Shift+M
   c) Windows Key+D
   d) CTRL+D

2. In which of the following files most operating systems save error information whenever a process fails?
   a) new file
   b) another running process
   c) log file
   d) debugger file

3. Which one of the following statements about kernel is not true?
   a) kernel remains in the memory during the entire computer session
   b) kernel is made of various modules which cannot be loaded in running operating system
   c) kernel is the first part of the operating system to load into memory during booting
   d) kernel is the program that constitutes the central core of the operating system

4. The multiplexing method that shifts every signal to a different carrier frequency is called -
   a) FDM
   b) TDM
   c) Both FDM & TDM
   d) PDM

5. The _____ address must be consulted in order to deliver a message to the appropriate application programme running on a host.
   a) IP
   b) MAC
   c) port
   d) program

6. The DoS attack, in which the attacker creates several TCP connections that are either fully open or partially open at the target host, _____.
   a) Vulnerability attack
   b) Bandwidth flooding
   c) Connection flooding
   d) UDP flooding

7. Which of the following delays in a network might be 0 if packet A is the only one being transmitted and no other packets have been sent before?
    a) Propagation delay
    b) Queuing delay
    c) Transmission delay
    d) Processing delay

8. How do you instantiate an array in Java?
    a) int arr[] = new int(3);
    b) int arr[];
    c) int arr[] = new int[3];
    d) int arr() = new int(3);

9. In a stack, it is known as _____ if a user attempts to remove an element from an empty stack.
    a) Underflow
    b) Empty collection
    c) Overflow
    d) Garbage Collection

10. Entries in a stack are "ordered". What is the meaning of this statement?
    a) a collection of stacks is sortable
    b) stack entries may be compared with the '<' operation
    c) the entries are stored in a linked list
    d) there is a sequential entry that is one by one

11. The characteristic that allows program-data independence and program-operation independence is called -
    a) data abstraction
    b) data manipulation
    c) data modeling
    d) data virtualization

12. In DBMS, the abstraction of association is used to associate objects from several _____ classes.
    a) dependent
    b) independent
    c) joint
    d) disjoint

13. Which of the following constraints deal with state changes in the database?
    a) transition
    b) semantics
    c) integrity
    d) state

14. The theta join operation of relational algebra -
    a) produces all combinations of tuples from R1 and R2 that satisfy the join condition.
    b) produces all combinations of tuples from R1 and R2 that satisfy the equality condition.
    c) produces all combinations of tuples from R1 and R2 that satisfy the union condition.
    d) produces all combinations of tuples from R1 and R2 that satisfy the natural join condition.

15. In DBMS, which of the following is not specified by a trigger?
    a) an event
    b) a condition
    c) an action
    d) a view

16. A safe expression in relational calculus is one that is guaranteed to yield a/an _____ .
    a) finite number of tuples
    b) infinite number of tuples
    c) dependent tuples
    d) independent tuples

17. The equivalent decimal value of $(4021.2)_5$
    a) 511.2
    b) 511.4
    c) 411.4
    d) 411.1

18. Given a number N in base r having n digits, its diminished radix complement, is defined as -
    a) $(r^n - 1) - N$
    b) $(r^n - 1) + N$
    c) $(r^n + 1) - N$
    d) $(r^n + 1) + N$

19. The minimum number of bits required to code 2^n distinct quantities are -
    a) n -1
    b) n+1
    c) n
    d) n^2

20. The operator precedence for evaluating Boolean expressions is -
    a) parentheses, NOT, AND, OR
    b) NOT, parentheses, AND, OR
    c) AND, parentheses, NOT, OR
    d) parentheses, OR, NOT, AND

21. The diagram of a combinational circuit has logic gates with -
    a) zero feedback paths
    b) one feedback path
    c) two feedback paths
    d) three feedback paths

22. The SR flip-flop has -
    a) one input
    b) two inputs
    c) three inputs
    d) four inputs

23. How many different logic operations can be performed with two binary variables?
    a) 4
    b) 8
    c) 16
    d) 32

24. Which of the following is not a primary constant in language 'C'?
    a) Integer Constant
    b) Real Constant
    c) Character Constant
    d) Enum

25. How many keywords are available in C?
    a) 16
    b) 32
    c) 64
    d) 128

26. Which of the following is not true in C?

    a) an arithmetic operation between an integer and integer always yields
       an integer result.
    b) an operation between a real and real always yields a real result.
    c) an operation between an integer and real always yields a real result.
    d) an operation between a real and integer always yields an integer result.

27. What is a preprocessor directive in C?
    a) a message from compiler to the programmer
    b) a message from compiler to the linker
    c) a message from programmer to the preprocessor
    d) a message from programmer to the microprocessor

28. What is the difference between the 5's in these two expressions?
     int num[5] ;
     num[5] = 11 ;
     a) first is particular element, second is type
     b) first is array size, second is particular element
     c) first is particular element, second is array size
     d) both specify array size

29. What would be the output of the following program?
     main( )
     {
     int sub[50], i ;
     for (i = 0 ; i<= 48 ; i++) ;
     {
     sub[i] = i ;
     printf("\n%d", sub[i]) ;
     }
     }

     a) 47
     b) 48
     c) 49
     d) 50

30. The macro FILE is defined in which of the following files?
     a) stdlib.h
     b) stdio.c
     c) io.h
     d) stdio.h

31. Which of the following is not a primitive type of data in JAVA?
     a) byte
     b)short
     c)int
     d) string

32. On which type of the operands, the arithmetic operators cannot be used in JAVA?
     a) numeric
     b) boolean
     c) char
     d) int

33. Which of the following is a linear data structure?
     a) Array
     b) AVL trees
     c) binary trees
     d) graphs

34. In linked list each node contains a minimum of two fields.
    One field is data field to store the data second field is?
    a) pointer to character
    b) pointer to integer
    c) pointer to node
    d) node

35. What would be the asymptotic time complexity to find an element in the linked list?
    a) O(1)
    b) O(n)
    c) $O(n^2)$
    d) $O(n^4)$

36. Express -15 as a 6-bit signed binary number.
    a) 001111
    b) 101111
    c) 101110
    d) 001110

37. Which of the following is the predefined method available in Java to convert decimal to binary numbers?
    a) toBinaryInteger(int)
    b) toBinaryValue(int)
    c) toBinaryNumber(int)
    d) toBinaryString(int)

38. What is the time complexity for converting decimal to binary numbers?
    a) O(1)
    b) O(n)
    c) O(logn)
    d) O(nlogn)

39. What would be the solution to the given prefix notation ?
    - + 5 / 10 5 5
    a) 2
    b) 5
    c) 10
    d) 7

40. Which of the following is an advantage of matrices?
    a) Internal complexity
    b) Searching through a matrix is complex
    c) Not space efficient
    d) Graph Plotting

41. JavaScript is the programming language of the _____.
    a) Desktop
    b) Mobile
    c) Web
    d) Server

42. Which symbol is used to separate JavaScript statements?
    a) Comma (,)
    b) Colon (:)
    c) Hyphen (_)
    d) Semicolon (;)

43. In JavaScript, what is a block of statement?
    a) conditional block
    b) block that combines a number of statements into a single compound statement
    c) both conditional block and a single statement
    d) block that contains a single statement

44. What does PHP stand for?
    a) Preprocessor Home Page
    b) Pretext Hypertext Processor
    c) Hypertext Preprocessor
    d) Personal Hyper Processor

45. Which is the right way of declaring a variable in PHP?
    a) $3hello
    b) $_hello
    c) $this
    d) $5_Hello

46. What is the extension of a C# language file?
    a) .c
    b) .cpp
    c) .cs
    d) .csp

47. SOAP in C# stands for ___.
    a) Simple Object Access Protocol
    b) Simple Object Access Program
    c) Standard Object Access Protocol
    d) Standard Object Access Program

48. Which symbol represents the top-level directory in Linux?
    a) ~
    b) @
    c) #
    d) /

49. Which Linux command is used to remove files?
    a) remove
    b) rm
    c) delete
    d) del

50. Which one is the default 'Word Processor' for Microsoft Windows?
   a) MS Word
   b) Ms Paint
   c) WordPad
   d) Notepad

PART - II
(Short Answer-type Questions)

Instructions for Questions 51 to 63:
- *Write the answers in short for any 10 (TEN) out of the thirteen questions.*
- *Each question carries 5 marks. [5x10=50]*

51. List out any five reasons for process termination.

52. Write a shell script that lists all the ordinary files with names starting with a vowel.

53. What are the main categories of data models in DBMS?

54. The following data fragment occurs in the middle of a data stream for which the byte-stuffing algorithm is used: A B ESC C ESC FLAG FLAG D. What is the output after stuffing?

55. Write any two HTTP commands.

56. Define an asymptotic notation.

57. Show the conversion of an infix expression can be converted to a post fix expression with an example.

58. Define object-oriented programming.

59. Write a java program to find the area of the triangle, square and circle.

60. Define regular expression.

61. Define any two types of operators in C language.

62. Define the term computer architecture and pipeline processing.

63. Define latency and throughput.

PART - III
(Long Answer-type Questions)

Instructions for Questions 64 to 71:
- *Answer any 5 (FIVE) out of the eight questions.*
- *Each question carries 10 marks. [10x5=50]*

64. Process A and B needs to exchange data and information to perform their tasks. Give two methods, which can help to process A and B along with their brief implementation mechanism.

65. Briefly explain the Linux commands used for changing the access permission and setting the default permissions for files. Give suitable examples.

66. Discuss the main characteristics of the database approach and how it differs from traditional file systems.

67. Suppose a message 1001 1100 1010 0011 is transmitted using Internet Checksum (4-bit word). What is the value of the checksum?

68. Explain any five important features of PHP.

69. Define the terms Website, Web page, Web server, URL and home page giving example of each.

70. Illustrate any two kinds of loops provided by JavaScript.

71. What is a graph? Explain how graphs are represented.

PART - IV
(Essay-type Questions)

Instructions for Questions 72 to 75:
- *Answer any 2 (TWO) out of the four questions.*
- *Each question carries 25 marks. [25x2= 50]*

72. Consider the following snapshot of a system:

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	0 0 1 2	0 0 1 2	1 5 2 0
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:

a) What is the content of the matrix Need?
b) Is the system in a safe state?
c) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately?

73. Choose a database application with which you are familiar. Design a schema, draw an ER diagram and show a sample database for that application.

74. Consider the given network in *Fig 1*. Distance vector routing is used, and the following vectors have just come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The cost of the links from C to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the cost.
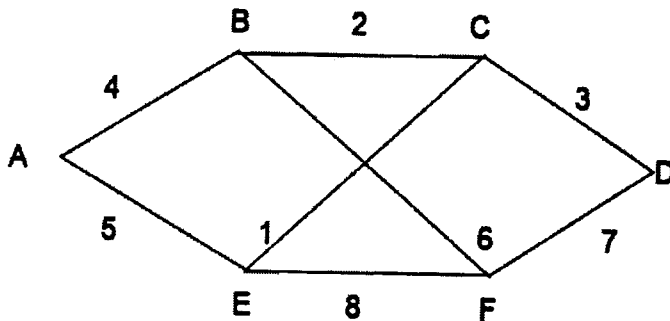
Fig 1

75. Discuss the idea of HTML tags and describe any three HTML tags. Illustrate the technique that allows to split the HTML page window into two or more sections. Create a Web page that displays your own details (like name, date of birth, address, class, course, hobbies, etc.) in about 100 words, and also includes your photograph.