M.sc. Computer Science

Set No. 1

Question Booklet No. 00681

16P/208/22

(To be filled up by the candidate by blue/black ball-point pen)

Roll No. ☐☐☐☐☐☐☐☐☐☐

Roll No. (Write the digits in words) .... **Code N. (486)**

Serial No. of OMR Answer Sheet ......**(2016)**........

Day and Date ....

(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

(Use only *blue/black ball-point pen* in the space above and on both sides of the **Answer Sheet**)

1. Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty **Question Booklet** bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.

2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope.*

3. *A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.*

4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.

5. *On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.*

6. No overwriting is allowed in the entries of Roll No., Question Booklet no. and Set no. (if any) on OMR sheet and Roll No. and OMR sheet no. on the Question Booklet.

7. *Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfairmeans.*

8. *Each question in this Booklet is followed by four alternative answers. For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet.*

9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.

10. *Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).*

11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.

12. Deposit only **OMR** *Answer Sheet* at the end of the Test.

13. You are not permitted to leave the Examination Hall until the end of the Test.

14. If a candidate attempts to use any form of unfair means, he/s shall be liable to such punishment as the University may determine and impose on him/her.

Total No. of Printed Pages : 32

[उपर्युक्त निर्देशनाद्दी में अन्तिम आवरण पृष्ठ पर दिये गए हैं]

7

ROUGH WORK
रफ़ कार्य

16P/208/22

Note : (1) Attempt as many questions as you can. Each question carries 3 (Three) marks. *One mark will be deducted for each incorrect answer*. **Zero** mark will be awarded for each unattempted question.

अधिकाधिक प्रश्नों को हल करने का प्रयत्न करें। प्रत्येक प्रश्न 3 (तीन) अंकों का है। *प्रत्येक गलत उत्तर के लिए एक अंक काटा जायेगा।* प्रत्येक अनुत्तरित प्रश्न का प्राप्तांक *शून्य* होगा।

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

यदि एकाधिक वैकल्पिक उत्तर सही उत्तर के निकट प्रतीत हों, तो निकटतम सही उत्तर दें।

01. A half adder is also known as :

    (1) NOR circuit   (2) XNOR circuit
    (3) NAND circuit   (4) XOR circuit

02. Booth's algorithm is used for the arithmetic operation of :

    (1) addition   (2) subtraction
    (3) multiplication   (4) division

03. The most relevant addressing mode to write position independent code is :

    (1) direct mode   (2) auto mode
    (3) relative mode   (4) indexed mode

04. The smallest integer that can be represented by an 8-bit number in 2's complement form is :

(1) -256

(2) -128

(3) -127

(4) 0

05. What combination of the inputs a JK flip-flop toggles ?

(1) J=0, K=0

(2) J=0, K=1

(3) J=1, K=0

(4) J=1, K=1

06. Which are the essential prime implicants of the following Boolean function ?

F (a, b, c) = a'c + ac' + b'c

(1) a'c and ac'

(2) a'c and b'c

(3) a'c only

(4) ac' and bc'

07. A question paper has two parts P and Q, each containing 10 questions. If a student needs to choose 8 from part P and 4 from Part Q, in how many ways can he do that ?

(1) 1000

(2) 6020

(3) 1200

(4) 9450

08. How many 3-letter words can be formed out of the letters of the word 'CORPORATION', if repetition of letters is not allowed ?

(1) 990

(2) 336

(3) 720

(4) 504

09. A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet ?

(1) 14

(2) 30

(3) 62

(4) 126

10. Which one of the following is NOT shared by the threads of the same process ?

    (1) Stack   (2) Address Space

    (3) File Descriptor Table   (4) Message

11. Suppose that two parties A and B wish to setup a common secret key (D-H key) between themselves using the Diffle-Hellman key exchange technique. They agree on 7 as the modulus and 3 as the primitive root. Party A chooses 2 and party B chooses 5 as their respective secrets. Their D-H key is :

    (1) 3   (2) 4   (3) 5   (4) 6

12. Consider the following message M=1010001101. The cyclic redundancy check (CRC) for this message using the divisor polynomial $X5+X4+X2+1$ is :

    (1) 01110   (2) 01011

    (3) 10101   (4) 10110

13. Which of the following statements is FALSE regarding a bridge ?

    (1) Bridge is a layer 2 device

    (2) Bridge reduces collision domain

    (3) Bridge is used to connect two or more LAN segments

    (4) Bridge reduces broadcast domain

14. A channel has a bit rate of 4 kbps and one-way propagation delay of 20 ms. The channel uses stop and wait protocol. The transmission time of acknowledgement frame is negligible. To get a channel efficiency of at least 50%, the minimum frame size should be :

    (1) 80 bytes   (2) 80 bits

    (3) 160 bytes   (4) 160 bits

P.T.O.

15. In a depth-first traversal of a graph G with n vertices k edges are marked as tree edges. The number of connected components in G is :

    (1) k   (2) k+1

    (3) n-k-1   (4) n-k

16. Which of the following statements is TRUE about CSMA/CD ?

    (1) IEEE 802.11 wireless LAN runs CSMA/CD protocol

    (2) Ethernet is not based on CSMA/CD protocol

    (3) CSMA/CD is not suitable for a high propagation delay network like satellite network

    (4) There is no contention in a CSMA/CD network

17. The minimum number of page frames that must be allocated to a running process in a virtual memory environment is determined by :

    (1) the instruction set architecture

    (2) page size

    (3) physical memory size

    (4) number of processes in memory

18. A Priority-Queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given below: 10, 8, 5, 3, 2. Two new elements 1 and 7 are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is :

    (1) 10, 8, 7, 5, 3, 2, 1   (2) 10, 8, 7, 2, 3, 1, 5

    (3) 10, 8, 7, 1, 2, 3, 5   (4) 10, 8, 7, 3, 2, 1, 5

19. Suppose the round trip propagation delay for a 10Mbps Ethernet having 48-bit jamming signal is 46.4 ms. The minimum frame size is :

    (1) 94   (2) 416

    (3) 464   (4) 512

20. The following numbers are inserted into an empty binary search tree in the given order : 10, 1, 3, 5, 15, 12, 16. What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root) ?

    (1) 2   (2) 3   (3) 4   (4) 6

21. The minimum number of 2-input NAND gates required to implement the function F= (X'+Y') (Z+W) is :

    (1) 3   (2) 4   (3) 5   (4) 6

22. A hash table has space for 100 records. Then the probability of collision before the table is 10% full, is :

    (1) 0.45   (2) 0.5

    (3) 0.3   (4) 0.34

23. How many pulses are needed to change the contents of a 8-bit up counter from 10101100 to 00100111 (rightmost bit is the LSB) ?

    (1) 134   (2) 133

    (3) 124   (4) 123

24. A 100 Km long cable runs at the T1 data rte. The propogation speed in the cable is 2/3 the speed of light. How many bits fit in the cable ?

    (1) 572   (2) 672

    (3) 772   (4) 872

P.T.O.

25. The average search time of hashing, with linear probing will be less if the load factor :

    (1) is far less than one
    (2) equals one
    (3) is far **greater than** one,
    (4) is far greater than hundred

26. Bounded minimalization is a technique for :

    (1) proving whether a primitive recursive function is turning computable or not
    (2) proving whether a primitive recursive function is a total function or not
    (3) generating primitive recursive functions
    (4) generating partial recursive functions

27. The address sequence generated by tracing a particular program executing in a pure demand paging system with 100 records per page, with a free main memory frame is recorded as follows. What is the number of page faults ?

    0100, 0200, 0430, 0499, 0510, 0530, 0560, 0120, 0220, 0240, 0260, 0320, 0370

    (1) 13
    (2) 8
    (3) 7
    (4) 10

28. Consider a logical address space of 8 pages of 1024 words mapped into memory of 32 frames. How many bits are there in the logical address ?

    (1) 9 bits
    (2) 13 bits
    (3) 11 bits
    (4) 15 bits

29. Consider the join of a relation R with a relation S. If R has m tuples and has n tuples, then the **maximum and minimum sizes** *of the join* respectively are :

    (1) m+n and 0

    (2) mn and 0

    (3) m+n and m-n

    (4) mn and m+n

30. What is the minimum number of two-input NAND gates used to perform the function of two input OR gate ?

    (1) one

    (2) two

    (3) three

    (4) four

31. Which of the following is a network topology ?

    (1) LAN

    (2) WAN

    (3) MAN

    (4) BUS

32. What is embedded system ?

    (1) The programme which arrives by being wrapped in box.

    (2) The programme which is the **permanent** part of the *computer*

    (3) The computer which is the part of a big computer

    (4) The computer and **software system that control** the machine

33. A person who used his or her expertise to gain access to other people's computers to get information illegally or do damage is :

    (1) Hacker

    (2) spammer

    (3) instant messenger

    (4) programmer

9

34. ASCII is a coding system that provides :

    (1) 256 different characters   (2) 512 different characters

    (3) 1024 different characters   (4) 128 different characters

35. The D-flip-flop captures the value of the input D when there is a :

    (1) Positive edge   (2) Rising edge

    (3) Negative edge   (4) Non-rising edge

36. A+B.C= (A+B) (A+C) is an example of :

    (1) Involution   (2) Commutative

    (3) Distributive   (4) Absorption

37. 98765 in decimal is .... in hexadecimal :

    (1) 1C81D   (2) C181D

    (3) 181CD   (4) CD181

38. The scheduling policy that has long waiting times for small processes is :

    (1) SJF   (2) Round Robin

    (3) FCFS   (4) FJS

39. The part of UNIX that contains all modules necessary for the processes, memory, files, devices, and security management is :

    (1) Kernel   (2) Shell

    (3) Files   (4) Processes

40. The operation in which the CPU waits for a device to be ready for an I/O operation is :

    (1) Buffering   (2) Spooling

    (3) Polling   (4) DMA

10

41. The type of high-level language that uses predicate logic is :

    (1) Unstructured   (2) Procedure oriented

    (3) Logic oriented   (4) Object oriented

42. The most important schema for application programmers is :

    (1) Physical schema   (2) Logical Schema

    (3) Conceptual Schema   (4) External Schema

43. Data compression is the responsibility of :

    (1) Session   (2) Application

    (3) Presentation   (4) Transport

44. The factor that considers varying load conditions is :

    (1) Minimum number of hops (2) Queuing delays

    (3) Transmission delay   (4) Propagation delay

45. The form of computing utilized by an email service is :

    (1) Distributed   (2) Grid

    (3) P2P   (4) Cloud

46. Bluetooth devices transmit very weak signals of about :

    (1) 1 milliwatt   (2) 2 milliwatts

    (3) 3 milliwatts   (4) 4 milliwatts

47. The technique that allows hackers to illegally and remotely access a user's phone is :

(1) Bluejacking   (2) Bluebugging

(3) Car whisperer   (4) Messenger

48. Of the following, a 5GL is :

(1) Prolog   (2) Java

(3) OPSS   (4) Pascal

49. Which operator has lowest precedence ?

(1) Sizeof   (2) Unary

(3) Assignment   (4) Comma

50. Which among the following is a LIFO data structure ?

(1) Stacks   (2) Linked lists

(3) Trees   (4) Graphs

51. If an array is declared as arr [] = {1, 3, 5, 7, 9}; then what is the value of sizeof (arr[3]) ?

(1) 1   (2) 2   (3) 3   (4) 8

52. Which open addressing technique is free from clustering problem ?

(1) Linear probing   (2) Quadratic probing

(3) Double hashing   (4) Rehashing

53. The transport layer protocols used for real time multimedia, file transfer, DNS and email, respectively are :

(1) TCP, UDP, UDP and TCP   (2) UDP, TCP, TCP and UDP

(3) UDP, TCP, UDP and TCP   (4) TCP, UDP, TCP and UDP

54. Which one of the following is the tightest upper bound that represents the time complexity of inserting an object into a binary search tree of n nodes ?

(1) O (1)

(2) O (log n)

(3) O (n)

(4) O(n lon n)

55. The preorder traversal sequence of a binary search tree is 30, 20, 10, 15, 25, 23, 39, 35, 42. Which one of the following is the postorder traversal sequence of the same tree ?

(1) 10, 20, 15, 23, 25, 35, 42, 39, 30

(2) 15, 10, 25, 23, 20, 42, 35, 39, 30

(3) 15, 20, 10, 23, 25, 42, 35, 39, 30

(4) 15, 10, 23, 25, 20, 35, 42, 39, 30

56. Parity check is method of :

(1) Transmission control

(2) Error control

(3) Encryption

(4) Decryption

57. The amount of ROM needed to implement a 4 bit multiplier is :

(1) 64 bits

(2) 128 bits

(3) 1 Kbits

(4) 2 Kbits

58. Given the basic ER and relational models, which of the following in INCORRECT ?

(1) An attribute of an entity can have more than one value

(2) **An attribute of an entity can be composite**

(3) In a row of a relational table, an attribute can have more than **one value**

(4) In a row of a relational table, an attribute can have exactly one **value or a** NULL value

13

59. Standard FTP uses reserved port(s) :

    (1) 20   (2) 25

    (3) 20 & 21   (4) 25 & 23

60. Which *of the following* is TRUE ?

    (1) Every relation is 3NF is also in BCNF

    (2) A relation R is in 3NF if every non-prime attribute or R is *fully* functionally dependent on every key of R

    (3) Every relation in BCNF is also in 3NF

    (4) No relation can be in both BCNF and 3NF

61. The addressing mode used in an instruction of the form ADD X Y, is

    (1) Absolute   (2) Indirect

    (3) Index   (4) Direct

62. In a memory- mapped I/O system, which of the following will not be there ?

    (1) LDA   (2) IN   (3) ADD   (4) OUT

63. Write Through technique is used in which memory for updating the data :

    (1) Virtual memory   (2) Main memory

    (3) Auxiliary memory   (4) Cache memory

64. A floating point number that has a O in the MSB for mantissa is said to have :

    (1) Overflow   (2) Underflow

    (3) Important number   (4) Undefined

65. The instructions which copy information from one location to another either in the processor's internal register set or in the external main memory are called :

(1) Data transfer instructions
(2) Program control instructions
(3) Input-output instructions
(4) Logical instructions

66. What is the content of Stack Pointer (SP) ?
(1) Address of the current instruction
(2) Address of the next instruction
(3) Address of the top element of the stack
(4) Size of the stack

67. Which symbol is used to enclose HTML tags ?
(1) ( )
(2) < >
(3) [ ]
(4) {}

68. Inheritance makes it easier to :
(1) reuse and modify existing modules of code.
(2) write and read code by sharing method names.
(3) hide and protect data from external code.
(4) Both [1] and [2]

69. Which statement is true ?
(1) A base class inherits some of the properties of a derived class.
(2) A base class inherits all of the properties of a derived class.
(3) A derived class inherits some of the properties of a base class.
(4) A derived class inherits all of the properties of a base class.

70. What is the maximum time that a datagram packet can exist on the Internet without finding a destination ?
(1) 255 seconds
(2) 256 seconds
(3) 260 seconds
(4) 270 seconds

15

71. In tuple relational calculus $P_1 \rightarrow P_2$ Is equivalent to :

    (1) $-P_1 \vee P_2$ (2) $P_1 \vee P_2$

    (3) $P_1 \wedge P_2$ (4) $P_1 \wedge \neg P_2$

72. The minimum number of page frames that must be allocated to a running process in a virtual memory environment is determined by :

    (1) The instruction set architecture

    (2) Page size

    (3) Physical memory size

    (4) Number of processes in memory

73. In databases, Locking level is also called as :

    (1) Gramulority   (2) S lock

    (3) X lock   (4) Dead lock

74. In C, masking operation can be performed through :

    (1) AND bitwise operator   (2) XOR bitwise operator

    (3) OR bitwise operator   (4) Shift operator

75. Initial value of the semaphore that allows only one of the many processes to enter their critical sections, is :

    (1) 8   (2) 1   (3) 16   (4) 0

76. In SQL the statement select * from R, S is equivalent to :

    (1) Select * from R natural join S.

    (2) Select * from R cross join S.

    (3) Select * from R union join S.

    (4) Select * from R inner join S.

16

77. Controlling redundancy in a database management system DOES NOT help to :
    (1) avoid duplication
    (2) avoid unnecessary wastage of storage space
    (3) avoid unauthorized access to data
    (4) avoid inconsistency among data

78. A die is thrown. Let A be the event that the number obtained is greater than 3. Let B be the event that the number obtained is less than 5. Then $P(A \square B)$ is :
    (1) 3/5
    (2) 0
    (3) 1
    (4) 5/2

79. The statement $p \to (q \to p)$ is equivalent to :
    (1) $p \to (p \to q)$
    (2) $p \to (p \square q)$
    (3) $p \to (p \square q)$
    (4) $p \to (p \leftrightarrow q)$

80. Relational calculus is a :
    (1) Procedural language
    (2) Non-Procedural language.
    (3) Data definition language
    (4) High level language.

81. DML is provided for :
    (1) Description of logical structure of database.
    (2) Addition of new structures in the database system.
    (3) Manipulation & processing of database.
    (4) Definition of physical structure of database system.

82. A relation R (X, Y, Z, W) with functional dependencies $XZ \to W$, $YZ \to W$, $X \to Y$ and $Y \to X$ is in :
    (1) 1 NF only
    (2) 2 NF only
    (3) 3 NF only
    (4) BCNF

17

83. In which type of switching all the datagrams of a message follow the same channel :
    (1) Circuit-switching
    (2) Datagram packet switching
    (3) Virtual circuit packet switching
    (4) Message switching

84. Verification of a login name and password in known as :
    (1) Configuration
    (2) Accessibility
    (3) Authentication
    (4) logging in

85. In the URL http://www.prenhall.com, the portion lebelled http is the :
    (1) host
    (2) domain name
    (3) protocol
    (4) top-level domain

86. Which one of the following is not a broadband communication medium ?
    (1) Microwave
    (2) Fibre optic cable
    (3) Twisted pair
    (4) Coaxial cable

87. The altering of data so that it is not usable unless the changes are undone is :
    (1) Biometrics
    (2) Compression
    (3) Encryption
    (4) Ergonomics

88. The purpose of the primary key in a database is to :
    (1) unlock the database
    (2) provide a map of the data
    (3) uniquely identify a record
    (4) establish constraints on database operations.

89. Given two sorted list of size m and n respectively. The number of comparisons needed in the worst case by the merge sort algorithm will be :

(1) m x n

(2) maximum of m, n

(3) minimum of m, n

(4) m+n-1

90. Part of program where the shared memory is accessed and which should be executed indivisibly, is called :

(1) semaphores

(2) directory

(3) critical section

(4) mutual exclusion

91. Maximum possible height of an AVL tree with 7 nodes is :

(1) 3

(2) 4

(3) 5

(4) 6

92. In which of the following page replacement polices, Balady's anomaly occurs ?

(1) FIFO

(2) LRU

(3) LFU

(4) NRU

93. In which of the storage placement strategies a program is placed in the smallest available :

hole in the main memory ?.

(1) best fit

(2) first fit

(3) worst fit

(4) buddy

94. Page fault occurs when :

(1) the page is corrupted by application software

(2) the page is in main memory

(3) the page is not in main memory

(4) one tries to divided a number by 0

19

95. Let A, B, C be independent events with probabilities 0.8, 0.5, 0.3. The probability of occurrence of at least one of these three is :

(1) 0.3

(2) 0.93

(3) 0.12

(4) 0.07

96. A network with bandwidth of 10 Mbps can pass only an average of 15,000 frames per minute with each Frame carrying an average of 8,000 bits. What is the throughput of this network ?

(1) 2 Mbps

(2) 60 Mbps

(3) 120 Mbps

(4) 10 Mbps

97. If there are n integers to sort, each integer has d digits and each digit is in the set {1, 2, ..., k}, radix sort can sort the number in :

(1) O (d n k)

(2) O (d n^k)

(3) O ((d+n)k)

(4) O(d(n+k))

98. In Propositional Logic, given P and P→Q we can infer :

(1) ~Q

(2) Q

(3) P □ Q

(4) ~P □ Q

99. Consider the following three SQL queries (Assume the data in the people table) :

(a) Select Name from people where Age>21 ;

(b) Select Name from people where Height>180 ;

(c) Select Name from people where (Age>21) or (Height>180) ;

If the SQL queries (a) and (b) above, return 10 rows and 7 rows in the result set respectively, then what is one possible number of rows returned by the SQL query (c) ?

(1) 3

(2) 7

(3) 10

(4) 21

100. The number of 1's present in the binary representation of

    10×256+5×16+5 is :
    (1) 5   (2) 6   (3) 7   (4) 8

101. The hexadecimal number equivalent to $(1762.46)_8$ is:
    (1) 3F2.89   (2) 3F2.98
    (3) 2F3.89   (4) 2F3.98

102. 8-bit 1's complement form of -77.25 is :
    (1) 01001101.0100   (2) 01001101.0010
    (3) 10110010.1011   (4) 10110010.1101

103. The number of different trees with 8 nodes is :
    (1) 256   (2) 255   (3) 248   (4) 250

104. Given a binary tree whose inorder and preorder traversal are given by

    Inorder : EICFBGDJHK

    Preorder : BCEIFDGHJK

    The post order traversal of the above binary tree is :
    (1) IEFCGJKHDB   (2) IEFCJGKHDB
    (3) IEFCGKJHDB   (4) IEFCGJKDBH

105. Data warehousing refers to :
    (1) storing data offline at a separate site
    (2) backing up data regularly
    (3) is related to data mining
    (4) uses tape as opposed to disk

21

P.T.O.

106. $(101011)_2 = (53)_b$, then b is equal to :

    (1)   4   (2)   8   (3)   10   (4)   16

107. Multi-valued dependency among attribute is checked at which level ?

    (1)   2 NF   (2)   3 NF
    (3)   4 NF   (4)   5 NF

108. If the postfix form of a string is ABC+-D*, the actual string is :

    (1)   (A-(B+C))*D   (2)   ((A-B)+C)*D
    (3)   ((A+B)-C)*D   (4)   (A+(B-C))*D

109. An example of a tautology is :

    (1)   xvy   (2)   xv(~y)
    (3)   xv (~x)   (4)   (x=>y) □ (x<=y)

110. Consider the following C code :

```
{ int a=5, b=9;

float r ;

r=b/a;}
```

what is the value of r ?

    (1)   1.8   (2)   1.0   (3)   2.0   (4)   0.0

111. Function overloading is a concept in which :

    (1)   a function is used to implement lots of tasks at the same time.
    (2)   a function is called too many number of times by another function.
    (3)   a function provides common interface to the user to carry out possibly different functions in each call.
    (4)   a function is computationally too expensive for the system to handle.

112. Which of the following set of keywords constitutes a mapping in SQL ?

   (1) SELECT, FROM, TABLE   (2) SELECT, FROM, WHERE

   (3) CONNECT, TABLE, CREATE (4) SELECT, TABLE, INSERT

113. Which one of the following sentences is true ?

   (1) The body of a while loop is executed at least once.

   (2) The body of a do .... while loop is executed at least once.

   (3) The body of a do .... while loop is executed zero or more times

   (4) A for loop can never be used in place of a while loop.

114. The baud rate is :

   (1) always equal to the bit transfer rate

   (2) equal to twice the bandwidth of an ideal channel

   (3) not equal to the signaling rate

   (4) equal to half of the bandwidth of an ideal channel

115. A program has five virtual pages, numbered from 0 to 4. If the pages are referenced in the order 012301401234, with three page frames, the total number of page faults with FIFO will be equal to.

   (1) 0   (2) 4   (3) 6   (4) 9

116. The following loop in 'C' :

int i =0;

While (i++<0) i--;

   (1) will terminate   (2) will go into an infinite loop

   (3) will give compilation error   (4) will never be executed

23

117. What is the function of a translating bridge ?

    (1)   Connect similar remote LANs

    (2)   Connect similar local LANs[3]

    (3)   **Connect different types of LANs**

    (4)   Translate the network addresses into a layer 2 address

118. The memory allocation scheme subjected to "external" fragmentation is :

    (1)   Segmentation

    (2)   Swapping

    (3)   Demand paging

    (4)   Multiple contiguous fixed partition

119. Bluetooth technology uses the transmission media :

    (1)   Radio links   (2)   Microwave links

    (3)   VSAT communication   (4)   Optical fiber links

120. Which of the following differentiates between overloaded functions and overridden functions ?

    (1)   Overloading is a dynamic of runtime binding and overridden is a static or compile time binding.

    (2)   Overloading is a static or compile time binding and overriding is dynamic or runtime binding .

    (3)   Redefining a function in a friend class is called overloading, while redefining a function in a derived class is called as overridden function.

    (4)   Redefining a function in a derived class is called function overloading, while redefining a function in a friend class is called function overriding.

121. A trigger is ?
    (1) A statement that enables to start any DBMS
    (2) A statement that is executed by the user when debugging an application program
    (3) A condition the system tests for the validity of the database user.
    (4) A statement that is executed automatically by the system as a side effect to modification to the database.

122. A deadlock exists in the system if and only if the wait-for graph contains a
    (1) Cycle
    (2) Direction
    (3) Bi-direction
    (4) Rotation

123. What is purpose of abstract class ?
    (1) to provide help with database connectivity.
    (2) to provide data data input to other classes.
    (3) to provide security to other classes.
    (4) to provide an appropriate base class from which other classes can inherit.

124. The algorithm, which may suffer from cascading roll back, is :
    (1) 2 phase locking Protocol
    (2) Strictly two phase locking Protocol
    (3) Strictly two phase
    (4) Time stamp ordering Protocol

125. Networking of libraries through electronic media is known as :
    (1) Inflibnet
    (2) Libinfnet
    (3) Internet
    (4) HTML

25

P.T.O.

126. In cyber crimes :
   - (1) The computer is a tool
   - (2) The computer is a target
   - (3) Both (1) and (2)
   - (4) Neither (1) nor (2)

127. Nod 32, Norton and Panda are :
   - (1) Search engines
   - (2) Operating Systems
   - (3) Antivirus software
   - (4) Internet browsers

128. What is a blog ?
   - (1) Online music
   - (2) Internet
   - (3) is a website, where you write stuff on an ongoing basis
   - (4) a personal or corporate Google search

129. Its main purpose is to prohibit unauthorized access to your computer via the Internet :
   - (1) popup blocker
   - (2) firewall
   - (3) spyware blocker
   - (4) spam

130. Information Communication Technology (ICT) involves primarily :
   - (1) Enrichment of existing knowledge
   - (2) Installation of equipments
   - (3) Storage and communication of information
   - (4) Use of technology for teaching

131. How many distinct binary search trees can be carried out of 4 distinct keys ?
   - (1) 5
   - (2) 14
   - (3) 24
   - (4) 42

132. Which of the following sorting algorithm has almost the same worst case and best case complexity ?
   - (1) Quick sort
   - (2) Merge sort
   - (3) Heap sort
   - (4) Shell sort

133. In an empty circular queue, the front and rear are :
   (1) -1, -1
   (2) 0, 0
   (3) 0, 1
   (4) 1, 1

134. If log 2 = 0.3010 and log 3 = 0.4771, then the value of log 5 is :
   (1) 0.7781
   (2) 0.6990
   (3) 0.3010
   (4) 1.6990

135. Complete binary tree can be implemented by making use of :
   (1) array
   (2) dequeue
   (3) priority queue
   (4) stack

136. A digital signature is used to provide security makes use of
   (1) Digitally scanned signature
   (2) A unique ASCII code number of the sender
   (3) Private key encryption
   (4) Public key encryption

137. XML uses :
   (1) User-defined tags
   (2) pre-defined tags
   (3) extensible tags
   (4) pairing tags

138. Time complexity of an algorithm T(n), where n is the input size is given by :

$$T(n) = T(n-1) + 1/n, \text{ if } n > 1$$

$$= 1, \text{ otherwise}$$

The order of this algorithm is
   (1) log n
   (2) n
   (3) n^2
   (4) n^n

27

139. An Exception is another name for :

    (1) compile error   (2) logic error

    (3) runtime error   (4) syntax error

140. The methodology where code is broken into small, logical procedures is called :

    (1) event-driven programming   (2) functional programming

    (3) granular programming   (4) modular programming

141. A Session variable is created :

    (1) when the application is first placed on a web server

    (2) when the web server is first started.

    (3) when the first client requests a URL resource

    (4) every time a new client interacts with the web application

142. The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet ?

    (1) 62 subnets and 262142 hosts

    (2) 64 subnets and 262142 hosts

    (3) 62 subnets and 1022 hosts

    (4) 64 subnets and 1024 hosts

143. A relation over the set S = {x, y, z} is defined by :

{ (x,x), (x, y), (y, x), (x, z), (y, z), (y, y), (z, z) } what properties hold for this relation ?

I. Symmetric
II. Reflexive
III. Antisymmetric
IV. Irreflexive

(1) I only
(2) II only
(3) I and II only
(4) I and IV only

144. What is the relation R on the set A= {a, b, c} if whenever a R b and b R c, then a R c ?

(1) transitive
(2) equivalence
(3) reflexive
(4) symmetric

145. In the set of integers, a relation R is defined as aRb, if and only if b= !a!. This relation is :

(1) reflexive
(2) irreflexive
(3) symmetric
(4) anti-symmetric

146. A group has 11 elements. The number of proper sub-group it can have is :

(1) 0
(2) 11
(3) 5
(4) 4

147. A graph consisting of only isolated n vertices is :

(1) 1-chromatic
(2) 2-chromatic
(3) 3-chromatic
(4) n-chromatic

148. Which of the following is valid IP address ?

(1) 984.12.787.76
(2) 192.168.321.10
(3) 1.888.234.3456
(4) 192.168.56.115

29

149. The time taken by Internet packets :
    (1) can be predetermined before transmission
    (2) depends upon the size of packet
    (3) is irrelevant for audio packets
    (4) is irrelevant for video packets

150. Disk I/O is measured in terms of :
    (1) Blocks   (2) Bits
    (3) Sectors   (4) Tracks

1,000

ROUGH WORK
रफ कार्य

P.T.O.

अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर
केवल नीली-काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।

2. परीक्षा भवन में लिफाफा रहित प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।

3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा। केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।

4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।

5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।

6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्नपुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्नपुस्तिका पर अनुक्रमांक और ओ० एम० आर० पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।

7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।

8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।

9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।

10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो संबंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।

11. रफ कार्य के लिए प्रश्न-पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।

12. परीक्षा के उपरान्त केवल ओ एम आर उत्तर-पत्र परीक्षा भवन में जमा कर दें।

13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।

14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।