DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

TBC : 17/17/ET

Roll No. __________

COMPUTER SCIENCE AND APPLICATIONS

PAPER III

Time Allowed : 2½ Hours] [Maximum Marks : 150

Instruction for the Candidates

1. Write your Roll Number in the space provided on the top of this page. Do not write anything else on the Test Booklet except in the space provided for rough work.

2. This paper consists of seventy five (75) multiple-choice type of questions. All questions carry equal marks.

3. At the commencement of the examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below:
   
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.

   (ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.

4. Each item has four alternatives response marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item completely with Blue/Black ball point pen as shown below. H.B. Pencil should not be used in blackening the circle to indicate responses on the answer sheet.

   Example : 

   ![Example Image]

   Where (B) is correct response.

5. Your responses to the each item are to be indicated in the OMR Sheet provided to you only. If you mark your response at any place other than in the circle in the OMR Sheet, it will not be evaluated.

6. Read instructions given inside carefully.

7. Rough work is to be done in the end of this booklet.

8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclosed your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.

9. You have to return the original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Sheet on conclusion of examination.

10. Use of any calculator or log table etc., is prohibited.

11. There are no negative marks for incorrect answers.

12. CARRYING AND USE OF ELECTRONICS/COMMUNICATION DEVICES IN EXAMINATION HALL ARE NOT ALLOWED.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

P.T.O.
Time Allowed : 2½ Hours] [Maximum Marks : 150

Note:—This paper contains Seventy five (75) multiple choice questions, each question carries two (2) marks. Attempt all questions.

1. In sequential circuits the duration of activating pulse should be .......... enough to allow .............. state change(s) in one active pulse.
   (A) low, 2
   (B) low, 1
   (C) high, 3
   (D) high, 4

2. Match the items in List I with the items in List II:

<table>
<thead>
<tr>
<th>List I</th>
<th>List II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) The address of the operand is ..........</td>
<td>(a) Register mode</td>
</tr>
<tr>
<td>embedded in the instruction code</td>
<td>(b) Index mode</td>
</tr>
<tr>
<td>(ii) The name/number of the CPU register is</td>
<td>(c) Base register mode</td>
</tr>
<tr>
<td>embedded in instruction</td>
<td>(d) Absolute mode</td>
</tr>
<tr>
<td>(iii) Accessing elements of an array</td>
<td>(e) Displacement mode</td>
</tr>
<tr>
<td>(iv) Accessing elements of a structure (record)</td>
<td></td>
</tr>
</tbody>
</table>

Codes :

(A)  (a)  (d)  (a)  (b)
(B)  (b)  (c)  (d)  (a)
(C)  (c)  (b)  (c)  (d)
(D)  (d)  (a)  (b)  (e)

T.B.C. : 17/17/ET—III  2
3. Which of the following is not an addressing mode of 8085 microprocessor?
   (A) Base-plus-index          (B) Direct
   (C) Register indirect       (D) Register

4. The valid register pair in 8085 microprocessor are B-C, D-E and H-L. The .......... pair is used to address memories.
   (A) B-C only                (B) D-E only
   (C) H-L only                (D) D-E and H-L

5. Simplify the following Boolean function using K-map:
   \[ F(A, B, C, D) = \Sigma(0, 2, 3, 4, 5, 8, 9, 10, 14, 15) \]
   in sum of product form:
   (A) \( A.B + \overline{A}B + \overline{A}B\overline{C} + \overline{A}B\overline{C} \)
   (B) \( A.D + \overline{A}D + \overline{A}B\overline{D} + \overline{A}B\overline{C} \)
   (C) \( A.C + \overline{A}C + \overline{A}B\overline{D} + \overline{A}B\overline{D} \)
   (D) \( A.C + \overline{A}C + A.B.C + \overline{A}.B.C \)

6. In asynchronous transfer mode, which of the following bit rate choice is popular choice for voice and video conferencing?
   (A) Constant                (B) Available
   (C) Unspecified             (D) Variable

T.B.C.: 17/17/ET—III                                                                 P.T.O. 3
7. For which local distributed transaction, a database administrator can manually force the COMMIT or ROLLBACK?
   (A) in-local    (B) in-manual
   (C) in-doubt    (D) in-force

8. UNDER keyword in SQL is used to define:
   (A) Subtypes     (B) Grouping of two tables
   (C) Union of two tables   (D) Intersection of two tables

9. Which of the following operation automatically eliminates duplicates in two tables of a database?
   (A) SELECT     (B) UNION
   (C) PROJECT    (D) UNION ALL

10. The main advantages of data distribution in databases is:
    (A) Reliability and Availability
    (B) Speedup query processing
    (C) Data sharing
    (D) All of the above

T.B.C. : 17/17/ET—III
11. A table professor has attributes name, salary and department name. Which of the following query will display the names of all professors whose salary is greater than at least one professor in computer department?

(A) Select distinct P.name from Professor as P, professor as M where P.salary > M.salary and M.Department = 'computer';

(B) Select name from professor where P.salary > M.salary and M.Department = 'Computer';

(C) Select P.name from Professor as P, professor as M where salary >= salary (computer);

(D) Select P.name from professor where salary > salary (computer);

12. Which of the following operator is used for pattern matching in SQL?

(A) EXIST  (B) LIKE

(C) INTERSECTION  (D) DISTINCT

13. Which of the following is not characteristic of storage device?

(A) Capacity  (B) Accessibility

(C) Addressability  (D) Network connectivity

T.B.C.: 17/17/ET—III 5 P.T.O.
14. Which of the following is not true for Computer Aided Design (CAD) ?

(A) CAD is used to produce engineering designs through 2D drawings only of the physical components

(B) CAD is used to produce engineering designs through 3D and 2D drawings of the physical components

(C) CAD is used to create product layout

(D) CAD is used to study the strength and dynamic analysis of assembly and manufacturing processes

15. In which authoring system elements are organised as pages of a book or stack of cards ?

(A) Score based

(B) Icon based

(C) Frame based

(D) Scripting language based

16. Which of the following is not a graphic standard ?

(A) Graphical kernel system

(B) PHIGS

(C) ANIM

(D) IGES

T.B.C. : 17/17/ET—III 6
17. A square with vertices (1, 1) (1, 2) (2, 1) (2, 2) is first translated by 2 units and scaled by 2 units along X-axis and Y-axis. What are the co-ordinates of vertices of the new square?

(A) (3, 3), (3, 4), (4, 3), (4, 4)  
(B) (6, 6), (6, 8), (8, 6), (8, 8)  
(C) (12, 12), (12, 16), (16, 12), (16, 16)  
(D) (5, 5), (5, 7), (7, 6), (7, 7)

18. Match the items of List I with the items of List II:

**List I**

(a) Emissive display  
(b) Non-emissive display  
(b) Raster display  
(c) Vector display

**List II**

(i) Converts sunlight into graphic pattern  
(ii) Horizontal scan-line  
(iii) Stroke drawing in random order  
(iv) Converts electric energy into light

**Codes:**

(a) (b) (c) (d)  
(A) (ii) (iii) (iv) (i)  
(B) (iii) (iv) (ii) (i)  
(C) (iv) (ii) (i) (iii)  
(D) (i) (ii) (iii) (iv)

T.B.C.: 17/17/ET—III  
P.T.O.
19. Consider a regular language \( L \). Define the following:

\[
\text{tail}(L) = \{ y | xy \in L \text{ for some } x \in \Sigma^* \}
\]

\[
\text{min}(L) = \{ w \in L | \text{ there is no } u \in L, v \in \Sigma^*, \text{ such that } w = uv \}
\]

Which one of the following is correct?

(A) only \( \text{tail}(L) \) is regular language

(B) only \( \text{min}(L) \) is regular language

(C) both \( \text{tail}(L) \) and \( \text{min}(L) \) are regular languages

(D) both \( \text{tail}(L) \) and \( \text{min}(L) \) are not regular languages

20. Consider the following languages:

\[
L_1 = \{ 0^n \ 1^k \ 2^{n+k} | n \geq 0, \ k \geq 0 \}
\]

\[
L_2 = \{ a^n, b^l | n \neq l \}
\]

Which one of the following is correct?

(A) Only \( L_1 \) is regular language

(B) Only \( L_2 \) is regular language

(C) Both \( L_1 \) and \( L_2 \) are regular languages

(D) Both \( L_1 \) and \( L_2 \) are not regular languages

T.B.C. : 17/17/ET-III
21. Consider the following statements:

$S_1$: Every S-grammar is unambiguous.

$S_2$: A regular language can not be inherently ambiguous.

Which one of the following is correct?

(A) Only $S_1$      (B) Only $S_2$

(C) Both $S_1$ and $S_2$ (D) Neither $S_1$ nor $S_2$

22. Let $G = (V, T, S, P)$ be any context-free grammar without any $\lambda$-productions or unit productions. Let $K$ be the maximum number of symbols on the right of any production in $P$. An equivalent grammar in Chomsky normal form will have no more than .......... production rules.

(A) $(K - 1) |P| + |T|$     (B) $K |P| + |T|$

(C) $(K - 1) |P|$           (D) $K |P|$

23. The regular expression for the language $L = \{w \in \{a, b\}^* | w$ has no pair of consecutive $a$'s$\}$ is:

(A) $(b^* abb^*)^*$       (B) $b^*(a + \lambda)$

(C) $(b + ab)^*$          (D) $(b + ab)^*(a + \lambda)$

24. The number of states in minimal deterministic finite automation for the language $L = \{a^n | n \geq 0, n \neq 5\}$ is:

(A) 5     (B) 6

(C) 7     (D) 4

T.B.C.: 17/17/ET—III 9       P.T.O.
25. The message 11001001 is to be transmitted using CRC polynomial $x^3 + 1$ to protect it from errors. The message that should be transmitted is:

(A) 11001001011  
(B) 11001001000  
(C) 11001010  
(D) 110010010011

26. The transmission signal coding method of T1 carrier is called:

(A) Binary  
(B) Bipolar  
(C) Manchester  
(D) NRZ

27. How many OSI layers are covered in the X.25 standard?

(A) Two  
(B) Three  
(C) Four  
(D) Seven

28. RPF stands for:

(A) Reverse path forwarding  
(B) Reverse path failure  
(C) Reverse packet forwarding  
(D) Reverse protocol failure

29. In a segment header, sequence number and acknowledgement number field refers to:

(A) Byte number  
(B) Buffer number  
(C) Segment number  
(D) Acknowledgement

T.B.C. : 17/17/ET—III 10
30. In which routing method do all the routers have a common database?
   (A) Link state   (B) Distance vector
   (C) Link vector  (D) Shortest path routing

31. If we use Radix sort to sort \( n \) integers in the range \( \left( n^{k/12}, n^k \right) \), for some \( k > 0 \) which is independent of \( n \), the time taken would be:
   (A) \( \Theta(n^2) \)   (B) \( \Theta(kn) \)
   (C) \( \Theta(k \log n) \)  (D) \( \Theta(n \log n) \)

32. Consider an undirected graph \( G \) with \( n \) nodes. Its adjacency matrix is given by an \( n \times n \) square matrix whose non-diagonal elements are 1’s and diagonal elements are 0’s.

Which of the following is correct?
   (A) Graph \( G \) has a unique minimum spanning tree of cost \( n - 1 \)
   (B) Graph \( G \) has no minimum spanning tree
   (C) Graph \( G \) has multiple spanning trees of different cost
   (D) Graph \( G \) has multiple distinct minimum spanning trees, each of cost \( n - 1 \)

33. Consider the following:
   (i) \( (n + k)^m = \Theta(n^m) \), where \( k \) and \( m \) are constants
   (ii) \( 2^{2n+1} = \Theta(2^n) \)

Which of the following is correct?
   (A) Both (i) and (ii) are true
   (B) Both (i) and (ii) are false
   (C) Only (i) is true
   (D) Only (ii) is true

T.B.C.: 17/17/ET—III 11 P.T.O.
34. The solution to the recurrence relation $T(2^n) = 3T(2^{n-1}) + 1$, $T(1) = 1$ is:

(A) $3^{\log_2 k}$  
(B) $2^{\log_3 k}$

(C) $2^k$  
(D) $\frac{(3^{k+1} - 1)}{2}$

35. Consider a list of recursive algorithms and a list of recurrence relations as given below:

<table>
<thead>
<tr>
<th>List I</th>
<th>List II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Recurrence Relations)</strong></td>
<td><strong>(Recurrence Relations)</strong></td>
</tr>
<tr>
<td>(a) Binary search</td>
<td>(i) $T(n) = T(n - k) + T(k) + cn$</td>
</tr>
<tr>
<td>(b) Merge sort</td>
<td>(ii) $T(n) = 2T(n/2) + kn$</td>
</tr>
<tr>
<td>(c) Quick sort</td>
<td>(iii) $T(n) = 2T(n - 1) + 1$</td>
</tr>
<tr>
<td>(d) Tower of Hanoi</td>
<td>(iv) $T(n) = T(n/2) + 1$</td>
</tr>
</tbody>
</table>

Which of the following is correct match between the algorithms and their recurrence relation?

**Codes**:

(A) (iv) (i) (ii) (iii)

(B) (iv) (ii) (i) (iii)

(C) (iv) (ii) (iii) (i)

(D) (iv) (i) (iii) (ii)

T.B.C : 17/17/ET—III
36. The Floyd-Warshall algorithm for all pairs shortest paths computation is based on:

(A) Divide and conquer paradigm

(B) Greedy paradigm

(C) Dynamic programming paradigm

(D) Branch-and-Bound paradigm

37. XML does not .......... information.

(A) Structure  (B) Store

(C) Transport  (D) Style

38. Which of the following elements of HTML4 have been removed in HTML5?

(A) <frame>  (B) <big>

(C) <dir>  (D) <font>

39. Which of the following is not true with respect to Java?

(A) Applets are not stand along programs

(B) Output of an applet window is performed by system.out.println()

(C) Init() method is the first method to be called in life cycle of an applet

(D) Java-script is executed without compilation
40. .......... is a process of defining more than one method in a class with same name and different signatures.
   (A) Function overriding       (B) Function overloading
   (C) Constructor overriding    (D) Constructor overloading

41. .......... occurs when child object gets killed if the parent object is killed.
   (A) Aggression                 (B) Association
   (C) Composition               (D) Encapsulation

42. Which concept of Java defines real world objects in terms of classes?
   (A) Abstraction               (B) Encapsulation
   (C) Inheritance               (D) Polymorphism

43. In a software project where a lot of uncertainties exist in requirement, which process model need to be applied?
   (A) Waterfall model           (B) Prototyping model
   (C) Iterative model           (D) Timeboxing model

44. Which of the following statements are true?
   (a) To prevent defects is a quality control activity
   (b) Quality audit is an example of quality assurance
   (c) Finding defect is a quality assurance activity
   (d) Inspection is the example of quality control
   (A) Only (b) and (d)          (B) Only (b) and (c)
   (C) Only (a), (b) and (c)     (D) Only (d) and (c)
45. Data flow modelling is used in:

(A) Requirement analysis phase
(B) Design phase
(C) Testing phase
(D) Coding phase

46. Match the following and select the correct answer from the codes given below:

<table>
<thead>
<tr>
<th>Quality Factor</th>
<th>Predictable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Defect level</td>
<td>(i) No</td>
</tr>
<tr>
<td>(b) Robustness</td>
<td>(ii) Yes</td>
</tr>
<tr>
<td>(c) Defect severity</td>
<td>(iii) Yes</td>
</tr>
<tr>
<td>(d) User satisfaction</td>
<td>(iv) No</td>
</tr>
</tbody>
</table>

Codes:

(A) (i) (ii) (iii) (iv)
(B) (ii) (i) (iii) (iv)
(C) (iv) (i) (ii) (iii)
(D) (ii) (i) (iii) (iv)

47. During which software testing, the input domain is divided to exercise specific software function:

(A) Boundary value analysis
(B) Control testing
(C) Equivalence partitioning
(D) Path basis testing

T.B.C. : 17/17/ET—III

P.T.O.
48. B.J. Taute developed a software maintenance model in 1983. How many phases this model has?

(A) Three  
(B) Four  
(C) Six  
(D) Eight

49. Which of the following is the benefits of multithreaded programming?

(A) Resource sharing  
(B) Responsiveness  
(C) Scalability  
(D) All of these

50. Single message buffer is used for:

(A) Synchronous communication  
(B) Asynchronous communication  
(C) Massaging in centralised system  
(D) Massaging in a parallel system

51. Banker's algorithm used for deadlock avoidance has been developed by:

(A) Donald Knuth  
(B) Alan Turing  
(C) Edsger W. Dijkstra  
(D) Tim Berners-Lee

T.B.C.: 17/17/ET—III 16
52. Consider the following four processes with length of CPU burst given in milliseconds. What will be average waiting time in case of the preemptive SJF and Non-preemptive SJF algorithm?

<table>
<thead>
<tr>
<th>Process</th>
<th>Arrival Time</th>
<th>Burst Time (Milliseconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_1 )</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>( P_3 )</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>( P_4 )</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

(A) 6.5 and 7.75  
(B) 7 and 6.5  
(C) 8 and 7.75  
(D) None of these

53. What are the major components of the page-fault service time?

(A) Restart the process  
(B) Service the page-fault interrupt  
(C) Read in the page  
(D) All of the above
54. Which of the following algorithm temporarily suspends a running process?

(A) First come first served

(B) Round-robin

(C) Non-preemptive shortest job first

(D) LRU

55. Who is considered to be the “father” of artificial intelligence?

(A) Allen Newell

(B) John McCarthy

(C) Fisher Ada

(D) Alan Turing

56. Consider the following components:

(i) Completeness

(ii) Optimality

(iii) Time and space complexity.

Which one of the following is correct with respect to measuring the performance of problem solving?

(A) Only (i) and (ii) components

(B) Only (ii) and (iii) components

(C) Only (i) and (iii) components

(D) all the three components [(i), (ii) and (iii)]
57. The statement \((- p) \rightarrow (- q)\) is logically equivalent to which of the statement below?

(i) \(p \rightarrow q\)  
(ii) \(q \rightarrow p\)

(iii) \((\neg q) \lor p\)  
(iv) \((\neg p) \lor q\)

(A) (i) only  
(B) (ii) only

(C) (i) and (iv) only  
(D) (ii) and (iii) only

58. Assume, \(d\) and \(b\) represents depth and number of branches of a given tree. The ratio of the number of nodes expanded by Depth-first iterative deepening compared to that of depth-first search is:

(A) \(\frac{bd}{(b-1)}\)  
(B) \(\frac{b}{(b-1)}\)

(C) \(\frac{b^d}{(b-1)}\)  
(D) \(\frac{b^d}{(b^d - 1)}\)

59. Which artificial intelligence system provides a diagnosis to a specific problem?

(A) Data mining system

(B) Geographical information system

(C) Expert system

(D) Intelligent system

T.B.C. : 17/17/ET—III  
19  
P.T.O.
60. Corresponding to a search algorithm, we get a search tree which may be unbounded. Which of the following is true for reason(s) of unbounded?

(A) When the state space is infinite

(B) When there are loops in the search space

(C) When the state space is infinite and/or contains loop

(D) When the state space is finite and contains loop

61. The CYK algorithm determines membership for any language generated by a grammar in Chomsky normal form, whose time complexity is:

(A) \( O(n \log n) \)  

(B) \( O(n^2) \)  

(C) \( O(n^2 \log n) \)  

(D) \( O(n^3) \)  

62. Given the following languages:

\[ L_1 = \{a^n b^n \mid n \geq 1\} \cup \{a\} \]

\[ L_2 = \{w \in W^R \mid w \in \{1, 2\}^*\} \]

Which one of the following is correct?

(A) Only \( L_1 \) is deterministic context free language

(B) Only \( L_2 \) is deterministic context free language

(C) Both \( L_1 \) and \( L_2 \) are deterministic context free languages

(D) Both \( L_1 \) and \( L_2 \) are not deterministic context free languages

T.B.C. : 17/17/ET—III

20
63. Consider the following languages:

$L_{CF}$: The context free languages

$L_{CS}$: The context-sensitive languages

$L_{REC}$: The recursive languages

$L_{RE}$: The recursively enumerable languages

$L_{DCF}$: The deterministic context-free languages

Which one of the following exhibits correct relationship between above defined languages?

(A) $L_{DCF} \subseteq L_{CF} \subseteq L_{CS} \subseteq L_{REC} \subseteq L_{RE}$

(B) $L_{CF} \subseteq L_{DCF} \subseteq L_{CS} \subseteq L_{REC} \subseteq L_{RE}$

(C) $L_{DCF} \subseteq L_{CF} \subseteq L_{CS} \subseteq L_{RE} \subseteq L_{REC}$

(D) $L_{CF} \subseteq L_{DCF} \subseteq L_{CS} \subseteq L_{RE} \subseteq L_{REC}$

64. Which of the following is not a property of DFT?

(A) Scalability

(B) Similarity

(C) Non-linearity

(D) Similarity

T.B.C.: 17/17/ET—III  21  P.T.O.
65. Relative frequency of characters in a message text is as given below:

<table>
<thead>
<tr>
<th>Character</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>18</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
</tr>
<tr>
<td>M</td>
<td>5</td>
</tr>
<tr>
<td>O</td>
<td>16</td>
</tr>
<tr>
<td>P</td>
<td>4</td>
</tr>
<tr>
<td>T</td>
<td>2</td>
</tr>
<tr>
<td>U</td>
<td>3</td>
</tr>
</tbody>
</table>

Which of the characters have shortest Huffman code?

(A) C  (B) O  
(C) P  (D) U

66. Given the following in the signal transmission:
(a) Noise following Gaussian probability function
(b) Changes to propagation path following Rayleigh model
(c) Low-signal to noise ratio

Which of the following is true for high bit-error rate?

(A) (a) and (b) only  (B) (b) and (c) only
(C) (a) and (c) only  (D) (a), (b) and (c)

67. A feasible solution to a transportation problem is said to be degenerate if the number of occupied cell is ($m$ : number of rows, $n$ : number of column):

(A) less than $(m + n - 1)$  (B) greater than $(m + n - 1)$
(C) less than $(m + n)$  (D) greater than $(m + n + 1)$
68. Consider the system, each consisting of $X$ linear equations in $Y$ variables:

1. If $X < Y$, then all such systems have a solution
2. If $X = Y$, then there exist a system which has a solution
3. If $X > Y$, then none of these systems have a solution

Which one of the following is correct?

(A) (1), (2) and (3) are true
(B) only (1) and (2) are true
(C) only (2) is true
(D) none of them is true

69. For the linear programming problem:

Maximize:

$$Z = 3X_1 + 2X_2$$

Subject to:

$$-2X_1 + 3X_2 \leq 9$$
$$X_1 - 5X_2 \geq -20$$
$$X_1, X_2 \geq 0.$$  

The above problem has:

(A) Unbounded solution  
(B) Infeasible solution

(C) Degenerate solution  
(D) Alternate optimum solution
70. Consider the following two fuzzy sets $A$ and $B$ with the membership functions:

$$\mu_A(x) = \{0.3, 0.4, 0.6, 0.2, 0.5\}$$

$$\mu_B(x) = \{0.2, 0.3, 0.9, 0.4, 0.3\}$$

The value of $\mu_{A \cap B}(x)$ is:

(A) $\{0.7, 0.6, 0.1, 0.6, 0.5\}$

(B) $\{0.8, 0.7, 0.4, 0.8, 0.7\}$

(C) $\{0.4, 0.88, 0.46, 0.94, 0.85\}$

(D) $\{0.5, 0.3, 0.5, 0.4, 0.2\}$

71. Match the following List I and List II:

<table>
<thead>
<tr>
<th>List I</th>
<th>List II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Single perceptron</td>
<td>(i) XOR problem</td>
</tr>
<tr>
<td>(b) Back propagation algorithm</td>
<td>(ii) SOM model</td>
</tr>
<tr>
<td>(c) Clustering algorithm</td>
<td>(iii) AND problem</td>
</tr>
</tbody>
</table>

Codes:

(A) (i) (ii) (iii)

(B) (i) (iii) (ii)

(C) (ii) (iii) (i)

(D) (iii) (i) (ii)

T.B.C.: 17/17/ET—III

24
72. Consider the sigmoid function:

$$f(t) = \frac{1}{1 + e^{-t}}.$$  

The value of $f''(t)$ at $t = -\infty, 0, \infty$ respectively are:

(A) $0, \frac{1}{2},$ and $0$  
(B) $0, \frac{1}{4},$ and $0$

(C) $0, \frac{1}{2};$ and $1$  
(D) $0, \frac{1}{4},$ and $1$

73. Match the following:

<table>
<thead>
<tr>
<th>Shell variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) $n$</td>
<td>(i) The number of arguments supplied to a script</td>
</tr>
<tr>
<td>(b) $#</td>
<td>(ii) Variables correspond to the arguments with which a script was invoked</td>
</tr>
<tr>
<td>(c) $?</td>
<td>(iii) The process number of the current shell</td>
</tr>
<tr>
<td>(d) $$</td>
<td>(iv) The exit status of last command executed</td>
</tr>
</tbody>
</table>

Which of the following option is correct?

<table>
<thead>
<tr>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(i)</td>
<td>(ii)</td>
<td>(iii)</td>
</tr>
<tr>
<td>(B)</td>
<td>(ii)</td>
<td>(iii)</td>
<td>(iv)</td>
</tr>
<tr>
<td>(C)</td>
<td>(i)</td>
<td>(iv)</td>
<td>(iii)</td>
</tr>
<tr>
<td>(D)</td>
<td>(ii)</td>
<td>(i)</td>
<td>(iv)</td>
</tr>
</tbody>
</table>

T.B.C. : 17/17/ET—III

P.T.O.
74. Match the following:

<table>
<thead>
<tr>
<th>Command</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Keyes</td>
<td>(i) Estimate disk space of directory</td>
</tr>
<tr>
<td>(b) Finger</td>
<td>(ii) Keep track of cursor</td>
</tr>
<tr>
<td>(c) du</td>
<td>(iii) List who is on computers in the lab</td>
</tr>
<tr>
<td>(d) XV</td>
<td>(iv) Runs graphic file convertor</td>
</tr>
</tbody>
</table>

Which of the following option is correct?

(A) (ii) (iii) (i) (iv)
(B) (i) (ii) (iii) (iv)
(C) (iv) (ii) (i) (iii)
(D) (iv) (i) (iii) (ii)

75. What is the function of ‘touch’ command in unix?

(A) It is used to update the access of a file
(B) Make a directory called graphics
(C) Look at file, one page at a time
(D) Compress the file