TBC: 17/17/ET	Booklet Sr. No. 171399
Roll No.	
COMPI	UTER SCIENCE AND APPLICATIONS
	PAPER III
Time Allowed : 2½ Hours]	[Maximum Marks: 15
on the Test Booklet exce  This paper consists of so equal marks.	Instruction for the Candidates in the space provided on the top of this page. Do not write anything elsept in the space provided for rough work.  eventy five (75) multiple-choice type of questions. All questions carref the examination, the question booklet will be given to you. In the first
(i) To have access to cover page. Do no open booklet.	ted to open the booklet and compulsorily examine it as below: o the Question Booklet, tear off the paper seal on the edge of thi not accept a booklet without sticker-seal and do not accept a er of pages and number of questions in the booklet with th
information prin missing or duplic replaced immedi	ated on the cover page. Faulty booklets due to pages/question cate or not in serial order or any other discrepancy should be go iately by a correct booklet from the invigilator within the perioderwards, neither the Question Booklet will be replaced nor an
4. Each item has four alter circle as indicated below ball point pen as shown responses on the answer	rnatives response marked (A), (B), (C) and (D). You have to darken the on the correct response against each item completely with <b>Blue/Blac</b> below. H.B. Pencil should not be used in blackening the circle to indicate sheet.
Example: (A) (5. Your responses to the each	(C) (D) Where (B) is correct response. Chitem are to be indicated in the <b>OMR</b> Sheet provided to you only. If you
mark your response at an	ny place other than in the circle in the OMR Sheet, it will not be evaluated
<ol><li>Read instructions given i</li></ol>	inside carefully.
<ol><li>Rough work is to be done</li></ol>	
	e in the end of this booklet.
<ol> <li>If you write your Nam the OMR Sheet, except your identity, or use ab</li> </ol>	e in the end of this booklet.  ne, Roll Number, Phone Number or put any mark on any part of the space allotted for the relevant entries, which may disclose ousive language or employ any other unfair means, such as chang thing or using white fluid, you will render yourself liable to
3. If you write your Name the OMR Sheet, except your identity, or use about of response by scrate disqualification.  You have to return the compulsorily and must response to the compul	ne, Roll Number, Phone Number or put any mark on any part of for the space allotted for the relevant entries, which may disclose ousive language or employ any other unfair means, such as chang
3. If you write your Name the OMR Sheet, except your identity, or use also of response by scrate disqualification.  3. You have to return the compulsorily and must reallowed to carry original examination.  4.0. Use of any calculator of the own of the compulsorily and must reallowed to carry original examination.	the, Roll Number, Phone Number or put any mark on any part of for the space allotted for the relevant entries, which may disclosed ousive language or employ any other unfair means, such as chang thing or using white fluid, you will render yourself liable to original OMR Sheet to the invigilators at the end of the examination not carry it with you outside the Examination Hall. You are however all question booklet and duplicate copy of OMR Sheet on conclusion or log table etc., is prohibited.
the OMR Sheet, except your identity, or use ab of response by scrate disqualification.  You have to return the compulsorily and must rallowed to carry original examination.  Use of any calculator of the compulsorily.  There are no negative	the, Roll Number, Phone Number or put any mark on any part of for the space allotted for the relevant entries, which may disclosed busive language or employ any other unfair means, such as chang thing or using white fluid, you will render yourself liable to original OMR Sheet to the invigilators at the end of the examination not carry it with you outside the Examination Hall. You are however all question booklet and duplicate copy of OMR Sheet on conclusion or log table etc., is prohibited.  The marks for incorrect answers.  SE OF ELECTRONICS/COMMUNICATION DEVICES IN

## COMPUTER SCIENCE AND APPLICATIONS

# Paper III

Time	Allow	$\mathrm{ved}:2^{1/2}$	4 Hour	rs]			39		[Maxim	um Mar	ks : 150
Note	:- T	his pap	er con	tains	Sever	nty fiv	e ( <b>75</b> )	multipl	e choice	questio	ns, each
	qı	uestion	carries	two	(2) n	narks.	Attem	pt <i>all</i> qu	estions.		
1.	In se	quentia	l circui	ts the	dura	tion of	activa	ting puls	e should	be	enough
	to al	low	S	tate c	hange	e(s) in	one a	ctive puls	se.	8	
	(A)	low, 2				= 8	(B)	low, 1			
	(C)	high, 3	=		N	8	(D)	high, 4			
2.	Mate	h the i	tems i	n List	I wi	ith the	items	in List	II:		
	*		Lis	t I					List	II .	
	<i>(i)</i>	The a	ddress	of th	е оре	rand i	s,	(a)	Register	mode	
		embed	lded in	the	instrı	iction	code	2 - 2			
= : <u>3</u>	(ii)	The n	ame/n	umber	of t	he CP	U	(b)	Index m	ode	
	146 K	registe	er is e	mbedo	ded in	1	NSA NSA	11 + 9			
*	107 K	instru	ction						Ž : x	#E	
	(iii)	Access	sing el	ement	s of	an		(c)	Base reg	gister m	ode
	2	array		s =							
	(iv)	Access	sing el	ement	s of	a		(d)	Absolute	mode	
		struct	ure (re	cord)	ω <sup>10</sup> g		a11a			2 8	
			22 42					(e)	Displace	ment m	ode
S.	Code	s:	*		¥.			Ħ			
	a (4)	(i)		(ii)		(iii)		(iv)			
(*)	(A)	(a)	8	(d)		(a)		(b)		9	e e
	(B)	(b)		(c)		( <i>d</i> )	3X H	(a)	92		ti e
	(C)	(c)		(b)	*	(c)	8 <sub>2</sub> :	(d)	9		* *
	(D)	( <i>d</i> )		(a)		(b)		(e)			
	No. 15 TOWNS	0.00 FEED (1997)		- vario-53/		7 <del>4</del>	ち に	3	9		A 8

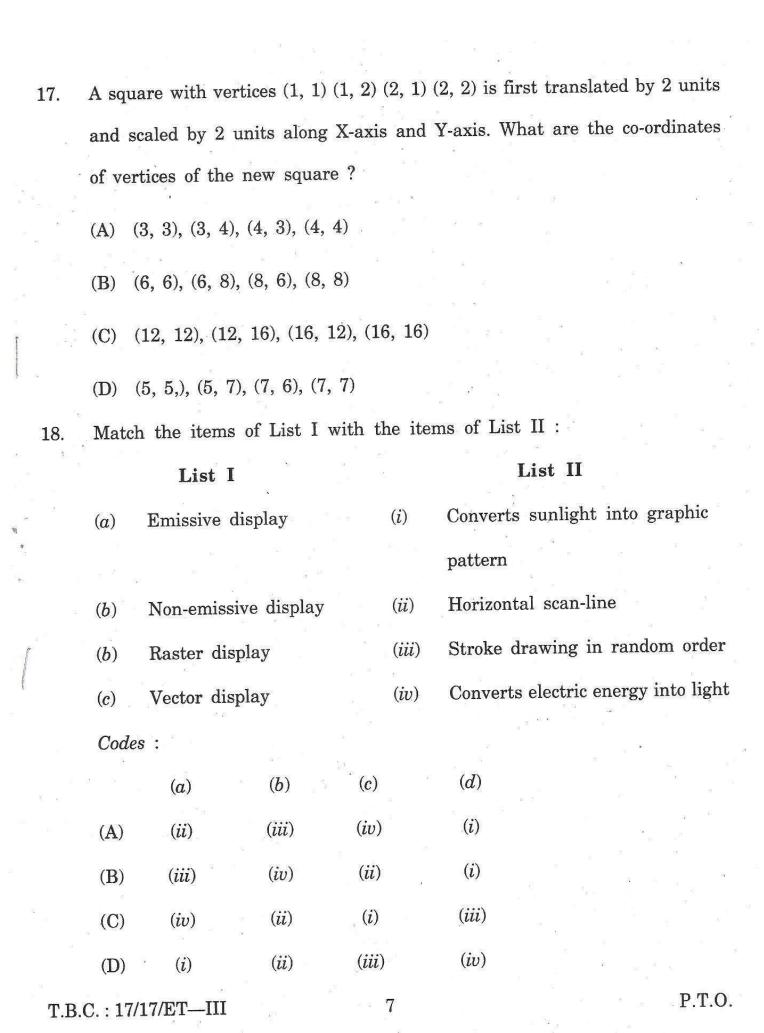
T.B.C.: 17/17/ET—III

3.	Whi	ch of the following i	s not an add	ressing mode	of 8085 micropr	ocessor?
ie ie	(A)	Base-plus-index		(B) Direct	s 8	
	(C)	Register indirect		(D) Register		a a
4.	The	valid register pair	in 8085 micro	processor are	B-C, D-E and I	H-L. The
10 TO		pair is used to	address mem	ories.		
	(A)	B-C only		(B) D-E only	7.	
	(C)	H-L only	10 g	(D) D-E and	H-L	
5.	Sim	plify the following I	Boolean funct	ion using K-m	iap:	
M U		F(A, B, C, D)	$= \Sigma(0, 2, 3,$	4, 5, 8, 9, 10,	14, 15)	9
	in s	um of product form	:		. = 1	1 8
, a	(A)	$A.B + \overline{A}\overline{B} + A\overline{B}\overline{C} +$	ĀĒC	s I	V	
* 8 8	(B).	$A.D + \overline{A}\overline{D} + A\overline{B}\overline{D} +$	⊦ ĀBC	· · · · · · · · · · · · · · · · · · ·	# W	v =
# D	(C)	$A.C + \overline{A}\overline{C} + A\overline{B}\overline{D} +$	- ĀBD			a d
	(D)	$A.C + \overline{A}.\overline{C} + A.\overline{B}.\overline{C}$	+ Ā.B.C	* = ;		
6.	In a	synchronous transfer	mode, which	of the following	g bit rate choice i	s popular
	choi	ce for voice and vio	leo-conferenci	ng?		* 3.5.
	(A)	Constant		(B) Availabl	e	
20 22	(C)	Unspecified	2 X	(D) Variable		
T.B.C	.:17	/17/ET—III	3			P.T.O.
				89 1878)		

7.	For	which local distributed transaction	on, a	database administrator can manu-
	ally	force the COMMIT or ROLLBA	ACK	?
	(A)	in-local	(B)	in-manual
	(C)	in-doubt	(D)	in-force
8.	UN	DER keyword in SQL is used to	defi	ne:
	(A)	Subtypes	(B)	Grouping of two tables
	(C)	Union of two tables	(D)	Intersection of two tables
9.	Whi	ch of the following operation auto	omati	ically eliminates duplicates in two
	table	es of a database?		
	(A)	SELECT	(B)	UNION
	(C)	PROJECT	(D)	UNION ALL
10.	The	main advantages of data distrib	oution	in databases is:
	(A)	Reliability and Availability		
# # **	(B)	Speedup query processing		
5 	(C)	Data sharing	a N	
SE 17: 18:	(D)	All of the above		
T.B.C.	. : 17	7/17/ET—III 4		· · · · · · · · · · · · · · · · · · ·

11.	A table professor has attributes name, salary and department name. Which
20 E	of the following query will display the names of all professors whose salary
8 8	is greater than at least one professor in computer department?
N N	(A) Select distinct P.name from Professor as P, professor as M where P.salary
	> M.salary and M.Departemnt = '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 > =
N	salary (computer);
#2	(D) Select P.name from professor where salary > salary (computer);
	COT 9
12.	Which of the following operator is used for pattern matching in SQL?
В	(A) EXIST (B) LIKE
	(C) INTERSECTION (D) DISTINCT
13.	Which of the following is not characteristic of storage device?
	(A) Capacity (B) Accessibility
2 P	(C) Addressability (D) Network connectivity
Т.В.	C.: 17/17/ET—III 5 P.T.O.

14.	Whi	ch of the following is not tr	ue for Compute	r Aided Design	n (CAD) ?
39	(A)	CAD is used to produce eng	ineering designs	through 2D d	rawings only
		of the physical components		## ## ## ## ## ## ## ## ## ## ## ## ##	7 20 18 =
*	(B)	CAD is used to produce eng	ineering designs	through 3D a	nd 2D draw-
	发	ings of the physical compor	nents	а * ш - 2 _ й	
* : * :	(C)	CAD is used to create prod	luct layout	***	9 2 ** 2 **
	(D)	CAD is used to study the s	trength and dy	namic analysis	of assembly
:#S		and manufacturing processe	<b>es</b>		
15.	In w	which authoring system elemen	nts are organised	d as pages of a	book or stack
*	of c	ards ?		© 55	0 88 6 8
	(A)	Score based	(B) Icon I	pased	
	(C)	Frame based	(D) Script	ing language	based
		* * *	· · · · · · · · · · · · · · · · · · ·	5 1	9. kà 96
16.	Whi	ch of the following is not a	graphic standa	rd?	# 35 <sup>™</sup> €
# X # X	(A)	Graphical kernel system	(B) PHIG	S	V 60
43	(C)	ANIM	(D) IGES		क है । हा क
Т.В.С	C. : 17	7/17/ET—III	6	10 (C) (A) (C) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	A W A SEC. N
		*		继	



19. Consider a regular language L. Define the following:

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

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

Which one of the following is correct?

- (A) only tail(L) is regular language
- (B) only min(L) is regular language
- (C) both tail(L) and min(L) are regular languages
- (D) both tail(L) and min(L) are not regular languages
- 20. Consider the following languages

$$L_1 = \{0^n \ 1^k \ 2^{n+k} | n \ge 0, k \ge 0\}$$

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

Which one of the following is correct?

- (A) Only L<sub>1</sub> is regular language
- (B) Only L<sub>2</sub> is regular language
- (C) Both L<sub>1</sub> and L<sub>2</sub> are regular languages
- (D) Both L<sub>1</sub> and L<sub>2</sub> are not regular languages

	(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
X S	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 $L = \{w \in \{a, b\}^*   w \text{ has no pair}\}$
	of consecutive a's} is:
W 	(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 = $\{a^n \mid n \ge 0, n \ne 5\}$ is :
260	(A) 5 (B) 6
	(C) 7 (D) 4
T.B.0	C.: 17/17/ET—III 9

Consider the following statements:

S<sub>1</sub>: Every S-grammar is unambiguous.

Which one of the following is correct?

S2: A regular language can not be inherently ambiguous.

21.

			n (4)	
25.	The	message 11001001 is to be tran	nsmit	ted using CRC polynomial $x^3 + 1$
E 250	to p	rotect it from errors. The messa	ige th	nat should be transmitted is:
æ n	(A)	11001001011	(B)	11001001000
	(C)	11001010	(D)	110010010011
26.	The	transmission signal coding met	hod o	f T1 carrier is called :
10 g	(A)	Binary	(B)	Bipolar
	(C)	Manchester	(D)	NRZ
27.	How	many OSI layers are covered i	in the	e X.25 standard ?
38 50	(A)	Two	(B)	Three
	(C)	Four	(D)	Seven
28.	RPF	stands for:	8 1	
87 83 <b>4</b> 8	(A)	Reverse path forwarding		
±2h pi	(B)	Reverse path failure		
*	(C)	Reverse packet forwarding	ā	
	(D)	Reverse protocol failure		
29.	In a	segment header, sequence numl	oer ai	nd acknowledgement number field
	refe	rs to ;		
8 -	(A)	Byte number	(B)	Buffer number
183	(C)	Segment number	(D)	Acknowledgement
TRO	. 17	7/17/ET_III 10		

	(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 $(n^{k/12}, n^k]$ , 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 $n-1$
50 10 10 10 10 10 10 10 10 10 10 10 10 10	(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
*	$(ii)  2^{2n+1} = 0(2^n)$
	Which of the following is correct?
	(A) Both (i) and (ii) are true
	(B) Both (i) and (ii) are false
2,	(C) Only (i) is true
	(D) Only (ii) is true

P.T.O.

In which routing method do all the routers have a common database?

30.

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The solution to the recurrence relation  $T(2^n) = 3T(2^{n-1}) + 1$ , T(1) = 1 is : 34. (A)  $3^{\log_2 k}$ (B)  $2^{\log_3 k}$ (D)  $\frac{(3^{k+1}-1)}{2}$ (C)  $2^k$ Consider a list of recursive algorithms and a list of recurrence relations as 35. given below: List II List I (Recurrence Relations) (Recurrence Relations) T(n) = T(n - k) + T(k) + cnBinary search (a) (i)T(n) = 2T(n/2) + knMerge sort (ii)(b)T(n) = 2T(n-1) + 1(iii)(c) Quick sort Tower of Hanoi (iv)(d)T(n) = T(n/2) + 1Which of the following is correct match between the algorithms and their recurrence relation ? Codes: (a)(b) · (c)(d)(A) (iv)(i)(ii)(iii) (iv)(ii)(i)(iii) (B) (C) (iii)(ii)(i)(iv)

(iv)

(*i*)

(D)

(ii)

(iii)

36.	The Floyd-Warshall algorithm for all pairs shortest paths computation is based
N N	on:
565 12 72	(A) Divide and conquer paradigm
	(B) Greedy paradigm
	(C) Dynamic programming paradigm
	(D) Branch-and-Bound paradigm
37.	XML does not information.
12 F3	(A) Structure (B) Store
a ya =	(C) Transport (D) Style
38.	Which of the following elements of HTML4 have been removed in
5.00 _P	HTML5 ?
	(A) <frame/> (B) <big></big>
8	(C) <dir> (D) <font></font></dir>
39.	Which of the following is not true with respect to Java?
a	(A) Applets are not stand along programs
10	(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
T.B.C	2.: 17/17/ET—III 13 P.T.O.

40.		is a process of defining more	than	n one method in a class with same
	nam	e and different signatures.	4. *	
	(A)	Function overriding	(B)	Function overloading
	(C)	Constructor overriding	(D)	Constructor overloading
41.	****	occurs when child object ge	ets ki	illed if the parent object is killed.
	(A)	Aggression	(B)	Association
	(C)	Composition	(D)	Encapsulation
42.	Whi	ch concept of Java defines real	world	l objects in terms of classes?
	(A)	Abstraction	(B)	Encapsulation
	(C)	Inheritance	(D)	Polymorphism
43.	In a	software project where a lot of ur	ncerta	ainties exist in requirement, which
	proc	cess model need to be applied?	2 H	
	(A)	Waterfall model	(B)	Prototyping model
	(C)	Iterative model	(D)	Timeboxing model
44.	Wh	ich of the following statements a	re ti	rue ?
	(a)	To prevent defects is a quality	cont	trol activity
	(b)	Quality audit is an example of	f qua	lity assurance
	(c)	Finding defect is a quality ass	uran	ce activity
şti	(d)	Inspection is the example of q	ualit	y control
	(A)	Only (b) and (d)	(B)	Only (b) and (c)
in the	(C)	Only (a), (b) and (c)	(D)	Only (d) and (c)
m D	0.1	7/17/PM III 1/		

			v.			6 B 8		a <sup>ll</sup>	
45.	Dat	a flow modelli	ing is used	d in :	n Pi	8 8	8 <sub>81</sub>	R Q	W.
10 10 10 12	(A)	Requirement	analysis	phase		3 11	e e		) = 1
	(B)	Design phase	е	* U 0	25 R		x Ř se	# E	HI <sup>ES</sup> R
30	(C)	Testing phas	se	2 2 8			e II	8 g	39
e = =	(D)	Coding phas	e		# # #		# E		
46.	Mat	ch the followi	ing and so	elect the	corr	ect answer fr	om the co	des giver	n -
N N 3	belo	w :	н в о						
# T	(	Quality Fact	tor			Predictable			
fl n	(a)	Defect level	* * * *		( <i>i</i> )	No	e <sub>At</sub>	8	
	(b)	Robustness	#8 #	11	(ii)	Yes	T 06		
** **	(c)	Defect sever	rity	e <sup>2</sup>	(iii)	Yes	e 1	(R ) 원	
	(d)	User satisfa	ction	9	(iv)	No	E -	$w_{\widetilde{\mathbf{x}}}^{\mathrm{H}}$	*
	Code	28 :		æ		** 19 ≠ ₹	B 20 M		
	2	(a)	(b)	(c)		(d)		9	
** ** **	(A)	(i)	(ii)	(iii)	, E	(iv)		8	
	(B)	(ii)	<i>(i)</i>	(iii)		(iv)	10. 100 H	, si	
	(C)	(iv)	<i>(i)</i>	(ii)		(iii)	9) # <sup>2</sup>   1/4 	\$18 \$18	
	(D)	(ii)	(i)	(iii)		(iv)	0	23	¥
47.	Duri	ng which softv	vare testin	g, the inp	out de	omain is divide	ed to exerci	se specific	3 * 12
		vare function						2 X	
	(A)	Boundary va	luo analya	i c	(D)	Control toati			
					(B)	Control testi	ng	s	
21 22 24 24 24 24 24	(C)	Equivalence	partitionin		(D)	Path basis to	esting	6	
T.B.C	5. : 17/	17/ET—III	e n	15		9 38	Tr S	P.T.O.	* H
						N 43			

48.	B.J.	Taute developed a software mainte	enanc	e model in 1983. He	ow many	phases
8	this	model has?		a	E	E N
x 4	(A)	Three	(B)	Four	8 N	
ES ST	(C)	Śix	(D)	Eight		e 3
49.	Whi	ch of the following is the benefit	ts m	ultithreaded progra	amming	?
	(A)	Resource sharing	(B)	Responsiveness	1 ×	
	(C)	Scalability	(D)	All of these	W &	est est
÷50.	Sing	gle message buffer is used for:	29		= a 	8
860 ¥	(A)	Synchronous communication	10 10 10 10			<sup>2</sup> pa
	(B)	Asynchronous communication			w	a 86
n n	(C)	Massaging in centralised system	n		·¥	\$ 6
o≅0	(D)	Massaging in a parallel system		e u e e e e e e e e e e e e e e e e e e	a v	W
51.	Ban	ker's algorithm used for deadloc	k avo	oidance has been	developed	d by:
to s	(A)	Donald Knuth	(B)	Alan Turing	SMT1	8
	(C)	Edsger W. Dijkstra	(D)	Tim Berners-Lee		
TR C	. 10	7/17/ET_III 16			19	

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?

	Process	Arrival Time	Burst Time
			(3.6°11° 1.8°
			(Milliseconds)
45			# B
	$\mathbf{P_1}$	0	8
	$\mathrm{P}_2$	1	4
	$P_3$	2	9
	$P_4$	3	5
(A)	6.5 and 7.75	(B) 7 and 6	5.5
(C)	8 and 7.75	(D) None of	these
			1 5 4

- 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.	Whi	ch of the following algorithm temporarily suspends a running process?
10 500 11 y	(A)	First come first served
# #4 8	(B)	Round-robin
	(C)	Non-preemptive shortest job first
	(D)	LRU
55.	Who	o is considered to be the "father" of artificial intelligence?
. V. 1	(A)	Allen Newell (B) John McCarthy
s x <sup>8</sup>	(C)	Fisher Ada (D) Alan Turing
56.	Con	sider the following components:
	( <i>i</i> )	Completeness
	(ii)	Optimality
	(iii)	Time and space complexity.
* 8°	Whi	ch one of the following is correct with respect to measuring the perform-
#	ance	e of problem solving ?
8	(A)	Only (i) and (ii) components
e 6	(B)	Only (ii) and (iii) components
3 "	(C)	Only (i) and (iii) components
e e	(D)	all the three components [(i), (ii) and (iii)]
T.B.C	). : 17	7/17/ET—III 18

57.	The statemen	$\operatorname{nt} (\neg p) \to (\neg$	q) is logically	equivalent to	which of the	statement
	below?	.9	: ::			

(i) 
$$p \rightarrow q$$

$$(ii)$$
  $q \rightarrow p$ 

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

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

$$(A)$$
  $(i)$  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) 
$$\frac{b^d}{(b-1)}$$

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

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

- 60. Corresponding to a search algorithm, we get s 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)  $0(n \log n)$

(B)  $0(n^2)$ 

(C)  $0(n^2 \log n)$ 

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- (D)  $0(n^3)$
- 62. Given the following languages:

$${\rm L}_1 \,=\, \{a^nb^n\,|\, n\,\geq\, 1\} \,\cup\, \{a\}$$

$$\mathbf{L}_2 = \{ w \subset \mathbf{W^R} \, | \, w \in \{1, \ 2\}^* \}$$

Which one of the following is correct?

- (A) Only L<sub>1</sub> is deterministic context free language
- (B) Only L<sub>2</sub> is deterministic context free language
- (C) Both L<sub>1</sub> and L<sub>2</sub> are deterministic context free languages
- (D) Both  $L_1$  and  $L_2$  are not deterministic context free languages

### 63. Consider the following languages:

 $\mathcal{L}_{\text{CF}}$ : The context free languages

 $\mathcal{L}_{\text{CS}}$ : The context-sensitive languages

 $L_{\mbox{\scriptsize REC}}$ : The recursive languages

L<sub>RE</sub>: The recursively enumerable languages

LDCF: 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 properity of DFT?

(A) Scalabiltiy

(B) Similarity

(C) Non-linearity

(D) Similarity

65. Relative frequency of characters in a message text is as given below:

Character			Frequency
C			18
E			1
M		6	5
O			16
P	9 37		4
${f T}$		¥	2
U		5 S E	3

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)

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68.	Consider	the	system,	each	consisting	of	X	linear	equations	in	Y
	variables				©.						
	variables								883		

- (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:

$$-2X_1 + 3X_2 \le 9$$
$$X_1 - 5X_2 \ge -20$$

$$X_1, X_2 \ge 0.$$

The above problem has:

- (A) Unbounded solution
- (B) Infeasible solution
- (C) Degenerate solution
- (D) Alternate optimum solution

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70. Consider the following two fuzzy sets A and B with the membership functions:

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

$$\mu_{\rm B}(x) = \{0.2, 0.3, 0.9, 0.4, 0.3\}$$

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

### List I List II

- (a) Single perceptron
- (i) XOR problem
- (b) Back propagation algorithm
- (ii) SOM model
- (c) Clustering algorithm
- (iii) AND problem

Codes:

- (a)
- (b)
- (c)

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

- (B)
- (*i*)
- (iii)
- (ii)

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

- (D)
- (iii)
- (*i*)
- (ii)

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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)  $0, \frac{1}{2}, \text{ and } 0$ 

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

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

(D)  $0, \frac{1}{4}, \text{ and } 1$ 

73. Match the following:

Shell variable

Description

(a) \$n

(i) The number of arguments supplied to a script

(b) \$#

(ii) Variables correspond to the arguments with which a script was invoked

(c) \$?

(iii) The process number of the current shell

(d) \$\$

(iv) The exit status of last command executed

Which of the following option is correct?

- (a)
- (b)
- (c)
- (d)

- (A)

- (iii)
- (iv)

- $(\mathbf{B})_{\cdot}$
- (ii)

(*i*)

(iii)

(ii)

- (iv)
- (i)

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

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

# 74. Match the following:

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		Jommano	1		Function	
e):	(a)	Keyes	982 So.	(i)	Estimate disk space of directory	
	(b)	Finger	-, E	(ii)	Keep track of cursor	
	(c)	du	2 4 4	(iii)	List who is on computers in the la	b
	(d)	XV	8 8	(iv)	Runs graphic file convertor	
	Whic	ch of the	following option	on is <i>cor</i>	rrect ?	*
23 338		(a)	(b)	(c)	(d)	
811	(A)	(ii)	(iii)	( <i>i</i> )	(iv)	
E.	(B)	(i)	(ii)	(iii)	(iv)	20
	(C)	(iv)	(ii)	(i)	(iii)	
7000 100 = 100 700	(D)	(iv)	<i>(i)</i>	(iii)	(ii)	
75.	Wha	t is the fi	unction of 'tou	ıch' com	mand in unix ?	
	(A)	It is used	d to update th	ne access	s of a file	
	(B)	Make a d	directory calle	d graphi	ics	
	(C)	Look at f	file, one page	at a tin	né	
s	(D)	Compress	the file	10		

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