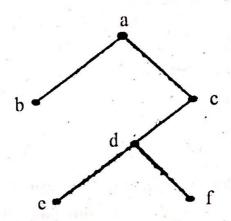
1.		sted four criminals ollowing statement		S. The criminals knew	each other.
	P says "Q comm	itted the crime."			
	Q says "S comm	nitted the crime."			- 13
	R says" I did no	t do it."			
	S says "What Q	said about me is fal	se."		
		one of the arrested e above is true. Who		the crime and only orime?	one of the
	(1) P	(2) R	(3) S	(4) Q	
2.	students are onlin both Drama students are in the students in	y in the Dance club, and Dance clubs, 1 both Drama and Ma	30 students are of 2 students are in this clubs, and 2 so in any of these	ints are only in the Draminly in Maths club, 40 states both Dance and Mathstudents are in all clubs. clubs, then the total n	udents are s clubs, 7 If 75% of
	(1) 1000	(2) 975	(3) 900	(4) 225	
3	. The random ex the sum of two		pair of six sided	dice. Compute the prob	ability of
	(1) 5/36	(2) 7/36	(3) 6/36	(4) 8/36	
4.		directed complete grate G is		where $n > 2$. Then, the n	umber of
	$(1)^{n!}$	(2) $n-1!$	(3) 1	(4) $(n-1)!/2$	
5		}. Then number of mmetric but not tran		ing (1, 2) and (1, 3) w	hich are
	(1) 1	(2) 2	(3) 3	(4) 4	
6.	. How many disti	nct binary functions	of order 3 are ther	e ?	
	(1) 22 (2)	256	(3) 64	(4) 128	

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7. In the given tree list the order that the nodes are processed using preorder and postorde are:

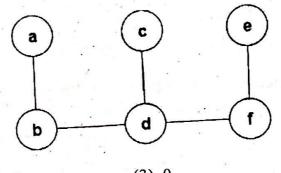


(1) befdca; acdfeb

(2) befdca; abcdef

(3) abcdef; befdca

- (4) abcdef; fedeba
- 8. In graphical solutions of linear inequalities, solution can be divided into:
 - (1) one subset
- (2) two subsets
- (3) three subsets
- (4) four subsets
- 9. According to system of constraints, solution set graphical representation is classified as:
 - (1) region of ordinate solutions
- (2) region of intercept solutions
- (3) region of vertex solutions
- (4) region of feasible solutions
- 10. How many Hamiltonian paths does the following graph have?



(1) 1

(2) 2

(3) 0

(4) 3

- 11. Which one of the following electronic circuits can be used to store 1 bit of data?
 - (1) Encoder
- (2) OR gate
- (3) Flip flop
- (4) Decoder
- 12. In 16-bit 2's complement representation, the decimal number -20 is:
 - (1) 1111 1111 0001 0100
- (2) 0000 0000 1110 0100
- (3) 1111 1111 1110 1100
- (4) 1000 0000 1110 0100.

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- 13. When an interrupt occurs, which one of the following takes place?
 - (1) Execution of the current instruction is completed and the address of the next instruction is saved before the interrupt service program starts
 - (2) Execution of the current instruction is aborted and its address is saved before the interrupt service program starts
 - (3) Execution of the current instruction is completed and the interrupt service program starts
 - (4) Execution of the current instruction is aborted and the interrupt service program starts
- 14. Which one of the following is the *correct* arrangement of the ease of programming (from easiest to hardest) of various programming languages?
 - (1) Binary machine code, hex code, assembly, high level language
 - (2) Binary machine code, assembly, hex code, high level language
 - (3) High level language, assembly, hex code, Binary machine code
 - (4) High level language, hex code, assembly, Binary machine code
- 15. Which one of the following is a valid comparison of the characteristics of an RISC and a CISC computer?
 - (1) CISC computers exhibit better performance than RISC computers because complex instructions get executed in hardware.
 - (2) For the same program, a compiler generates more number of CISC instructions than RISC instructions.
 - (3) CISC computers usually have a higher MIPS rating as compared with comparable RISC computers.
 - (4) RISC computers deploy hardware control as compared with microprogrammed control in case of CISC computers.

16.	For transferring data from a hard disk to the attached computer on a page fault, which one of the following would be preferred mode of transfer?
	(1) Direct Memory access
	(2) Programmed I/O
	(3) Hardware interrupt driven I/O
	(4) Software interrupt driven
17.	A ROM is used to store the multiplication table of two 8 bit unsigned integers. What would be the size of required ROM?
	(1) 64K X 16bits (2) 16K X 8bits (3) 256 X 16 bits (4) 32K X 8bits
18.	If four processors are to be interconnected with three memory modules using a crossbar interconnection, what is the minimum number of switches required? (1) 7 (2) 12 (3) 16 (4) 17
19.	Distributed computers belong to which one of the following classes of computers?
	(1) SISD (2) SIMD (3) MIMD (4) MISD
20.	What is the minimum number of 2-input NOR gates required to implement 4-variable function expressed in sum-of-minterms from as $f = \Sigma$ (0, 2, 5, 7, 8, 10, 13, 15)? Assume that all the inputs and their complements are available.
. *	(1) 3 (2) 4 (3) 5 (4) 6
21.	In orthographic projection, the object is placed with one of its faces to the picture plane.
	(1) Inclined (2) Perpendicular (3) Parallel (4) Any of the above
22.	The intersection of primary ROB colours and primary CMYK colours produces
	(1) White colour, White colour
- 0 O	(2) White colour, Black colour
	(3) Black colour, White colour
	(4) Black colour, Black colour
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23. Let swap () be a function that swaps two elements using their addresses. Consider the following C function:

```
void fun(int arr[], int n)
{
    for (int i = 0; i < n; i + = 2)
    {
        if (i > 0 && arr[i - 1] > arr[i])
            swap(&arr[i], &arr[i-1]);
        if (i < n - 1 && arr[i] < arr[i + 1])
            swap(&arr[i], &arr[i + 1]);
        }
}</pre>
```

If an array {10, 20, 30, 40, 50, 60, 70, 80} is passed to the function, the array is changed to:

- (1) {20, 10, 40, 30, 60, 50, 80, 70}
- (2) {10, 30, 20, 40,60, 50, 80, 70}
- (3) {10, 20, 30, 40, 50, 60, 70, 80}
- (4) {80, 70, 60, 50, 40, 30, 20, 10}
- 24. What is the return value of f(p, p), if the value of p is initialized to 5 before the call? Note that the first parameter is passed by reference, whereas the second parameter is passed by value:

```
int (int &x, int c) {
    c = c - 1;
    if (c == 0) return 1;
    x = x + 1;
    return f(x, c) * x;
}
(1) 3024 (2) 6561 (3) 55440 (4) 161051
```

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- 25. Which of the following is used to open document in new window?
 - (1) Link
- (2) Link
- (3) Link
- (4) Link
- **26.** What is the difference between servlets and applets?
 - i. Servlets execute on Server; Applets execute on browser
 - ii. Servlets have no GUI; Applet has GUI
 - iii. Servlets creates static web pages; Applets creates dynamic web pages
 - iv. Servlets can handle only a single request; Applet can handle multiple requests
 - (1) i, ii, iii are correct

(2) i, ii are correct

(3) i, iii are correct

- (4) i, ii, iii, iv are correct
- **27.** The transformation in which an object can be shifted to any coordinate position in three dimensional plane are called:
 - (1) Translation
- (2) Scaling
- (3) Rotation
- (4) All of these
- 28. While inheriting a class, if no access mode is specified, then which among the following is *true*? (in C++)
 - (1) It gets inherited publicly by default
 - (2) It gets inherited protected by default
 - (3) It gets inherited privately by default
 - (4) It is not possible
- 29. The most appropriate matching for the following pairs is:
 - X: Indirect addressing
- (i): Loops
- Y: Imeediate addressing
- (ii): Pointers
- Z: Auto decrement addressing
- (iii): Constants
- (1) X (iii), Y (ii), Z (i)
- (2) X (i), Y (iii), Z (ii)
- (3) X (ii), Y (iii), Z (i)
- (4) X (iii), Y (i), Z (ii)

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30.	fseek() should be preferred over rewind() mainly because:
	(1) rewind() doesn't work for empty files
	(2) rewind() may fail for large files
	(3) In rewind, there is no way to check if the operations completed successfully
	(4) All of the above
31.	One of the main challenge/s of NLP is
	(1) Handling Ambiguity of Sentences
	(2) Handling Tokenization
	(3) Handling POS- Tagging
	(4) All of the mentioned
32.	What is state space?
	(1) The whole problem
	(2) Your Definition to a problem
	(3) Problem you design
	(4) Representing your problem with variable and parameter
33.	Which search is similar to min-max search?
	(1) Hill-climbing search
	(2) Depth-first search
	(3) Breadth-first search
18	(4) All of the mentioned
34.	A 3-input neuron is trained to output a zero when the input is 110 and a one when the input is 111. After generalization, the output will be zero when and only when the input is:
	(1) 000 or 110 or 011 or 101 (2) 010 or 100 or 110 or 101
	(3) 000 or 010 or 110 or 100 (4) 100 or 111 or 101 or 001

35.	The truth values of traditional set theory is and that of fuzzy set is
	(1) Either 0 or 1, between 0 & 1
	(2) Between 0 & 1, either 0 or 1
	(3) Between 0 & 1, between 0 & 1
7.	(4) Either 0 or 1, either 0 or 1
36.	Which of the following statement(s) is/are true for Gradient Decent (GD) an Stochastic Gradient Decent (SGD)?
, ·	a. In GD and SGD, you update a set of parameters in an iterative manner to minimiz the error function.
	b. In SGD, you have to run through all the samples in your training set for a single update of a parameter in each iteration.
	c. In GD, you either use the entire data or a subset of training data to update a parameter in each iteration.
	(1) Only a (2) Only b (3) Only c (4) a, b and c
37.	In hopfield network with symmetric weights, energy at each state may?
	(1) increase (2) decrease
	(3) decrease or remain same (4) decrease or increase
38.	In which of the following learning techniques, the teacher returns reward and punishment to learner?
	(1) Active learning (2) Reinforcement learning
	(3) Supervised learning (4) Unsupervised learning
39.	algorithm(s) is used to extract the plan directly from the planning graph rather than using graph to provide heuristic.
,	(1) BFS/DFS (2) A* (3) Graph-Plan (4) Greedy
40.	Inference algorithm is complete only if: (1) It can derive any sentence
	(2) It can derive any sentence that is an entailed version(3) It is truth preserving
	(4) It can derive any sentence that is an entailed version & It is truth preserving
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				•	
41.	Database:	In second	normal	torm	

- (1) A composite attributes is converted to individual attributes.
- (2) Non key attributes are functionally dependent on key attributes.
- (3) The non key attributes functionally dependent not on a part of key attributes.
- (4) All the above.

What stores the metadata about the structure of the database, in particular the schema of the database?

(1) Indices

(2) Database log

(3) Data files

(4) Data Dictionary

43. Consider the following Employee table:

ID salary	DeptNam
1 10000	EC
2 40000	EC
3 30000	CS
4 40000	ME
5 50000	ME
6 60000	ME
7 70000	CS

How many rows are there in the result of following query?

SELECT E.ID

FROM Employee E

WHERE EXISTS (SELECT E2.salary

FROM Employee E2

WHERE E2.DeptName = 'CS'

AND E.salary> E2.salary)

44.	In DBMS, index is clustered, if:
	(1) it is on a set of fields that form a candidate key.
	(2) it is on a set of fields that include the primary key.
	(3) the data records of the file are organized in the same order as the data entries of the index.
	(4) the data records of the file are organized not in the same order as the data entries of the index.
45.	Which of the following statement is true for the "Reconciled data"?
	(1) Data stored in the various operational systems throughout the organization.
	(2) Current data intended to be the single source for all decision support systems.
	(3) Data stored in one operational system in the organization.
	(4) Data that has been selected and formatted for end-user support applications.
46.	Data warehouse is:
	(1) The actual discovery phase of a knowledge discovery process
ř	(2) The stage of selecting the right data for a KDD process
	(3) A subject-oriented integrated time variant non-volatile collection of data in support of management
	(4) None of these
47.	The need to synchronize data upon update is called
	(1) Data Manipulation (2) Data Replication
	(3) Data Coherency (4) Data Imitation
48.	can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
	(1) MapReduce (2) Mahout
	(3) Oozie (4) All of the mentioned
49.	The attribute AGE is calculated from DATE_OF _BIRTH. The attribute AGE is
	(1) Single valued (2) Multi valued (3) Composite (4) Derived

- **50.** Which of the following is a NoSQL Database Type?
 - (1) SQL

(2) Document databases

(3) JSON

- (4) All of the mentioned
- 51. A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is *true* if the processes have no I/O operations and all arrive at time zero?
 - (1) This algorithm is equivalent to the first-come-first-serve algorithm.
 - (2) This algorithm is equivalent to the round-robin algorithm.
 - (3) This algorithm is equivalent to the shortest-job-first algorithm.
 - (4) This algorithm is equivalent to the shortest-remaining-time-first algorithm.
 - **52.** An operating system maintains smaller data structures for a thread than a process, as a thread is usually defined as a 'light weight process'. What is the per thread basis of the operating system?
 - (1) Does not maintain a separate stack
 - (2) Maintains only CPU register state
 - (3) Does not maintain a virtual memory state
 - (4) Maintains only scheduling and accounting information
 - **53.** Which of the following statements are *true*?
 - (1) Shortest remaining time first scheduling may cause starvation
 - (2) Starvation may be caused by pre-emptive scheduling.
 - (3) In terms of response time robin round is better than FCFS
 - (4) All of the above statements are true
 - 54. Which of the following statements is true for the dirty page in a page table?
 - (1) Helps to maintain LRU information
 - (2) Allows only read on a page
 - (3) Helps to avoid unnecessary writes on paging device
 - (4) None of the above

```
The following program consists of 3 concurrent processes and 3 binary semaphores.
     The semaphores are initialized as S0 = 1, S1 = 0, S2 = 0.
     Process P0
     while(true)
         wait(S0);
         print '0';
         release(S1);
         release(S2);
      Process PI
      waite(S1);
      release(S0);
      Process P2
      wait(S2);
      release(S0);
      How many times will P0 print '0'?
      (1) At least twice
                                            (3) Exactly thrice (4) Exactly once
                         (2) Exactly twice
      .....is not possible in distributed file system.
 56.
                                            (2) Migration
      (1) File replication
                                            (4) Remote access
      (3) Client interface
      In LINUX, a file named file 01 should be readable, writable and executable only by the
      user(owner). Which one of the following set of command will be used?
       (1) chmod 700 file01
                                            (2) chmod 000 file01
                                            (4) chmod 007 file01
       (3) chmod 477 file01
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```

58.	Which is an unsolvable problem in ac	ccess-matrix ?		
•	(1) Owner override(3) Access denied	(2) Brute force(4) Confinement		
59.	Data Encryption Standard is an exam (1) Symmetric-key (3) hash key	(2) public key		
60.	RAID level is also known block level striping and keeps a parity (1) 1 (2) 2	block on a separate disl	rity organisation	n and uses
61.	Which one of the following is no Specifications (SRS) document?		. ,	quirement
	(1) Functional Requirements			
	(2) Non-Functional Requirements			
	(3) Goals of Implementation			* J *
	(4) Algorithms for Software Implement	ntation		
62.	The Phases of formal review process Arrange them in the <i>correct</i> order:		g are mentioned	below.
	i. Planning			
	ii. Review Meeting		#I	•
	iii. Rework			
	iv. Individual Preparations			
	v. Kick Off			.*
	vi. Follow Up			
	(1) i, ii, iii, iv, v, vi	(2) vi, i, ii, iii, iv, v		
	(3) i, v, iv, ii, iii, vi	(4) i, ii, iii, v, iv, vi		
63.	System architecture is determined durin	g which phase?		
	(1) Requirement gathering	(2) Implementation	and Carrier	
-200	(3) Development	(4) Design	3.55 June 1.55	
				1

U T .	Component testing is a:
,	(1) Black box testing (2) White box testing
	(3) Grey box testing (4) Both (1) and (2)
65.	The objective of software project planning is to:
	(1) Convince the customer that a project is feasible
	(2) Make use of historical project data
	(3) Enable a manager to make reasonable estimates of cost and schedule
	(4) Determine the probable profit margin prior to bidding on a project
66.	In Software Engineering which is not an element of requirement model?
	(1) Behavioural elements (2) Class based elements
	(3) Data elements (4) Scenario based elements
67.	The model which estimates the total effort in terms of person, months of the technical project staff is
68.	Agile Modelling (AM) provides guidance to practitioner during which of these software tasks?
	(1) Analysis (2) Design (3) Testing (4) Both 1 and 2
69.	Read the columns and match the following:
	(a) Data coupling (i) Module A and Module B have shared data.
	(b) Stamp coupling (ii) Dependency between modules is based on the fact they communicate by only passing of data.
	(c) Common coupling (iii) When complete data structure is passed from one module to another.
	(d) Content coupling (iv) When the control is passed from one module to the middle of another.
	(1) $a - iii$, $b - ii$, $c - i$, $d - iv$ (2) $a - ii$, $b - iii$, $c - i$, $d - iv$
	(1) a - iii, b - ii, c - i, d - iv (2) a - ii, b - iii, c - i, d - iv (3) a - ii, b - iii, c - iv, d - i (4) a - iii, b - ii, c - iv, d - i
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- 70. Which of the following is *not* included in the Software requirements specification document?
 - (1) Functional Requirements
 - (2) Non-functional requirements
 - (3) Goals of implementation
 - (4) User Manual
- 71. Which one of the following statements is *not* correct about the B+ tree data structure used for creating an index of a relational database table?
 - (1) B+ Tree is a height-balanced tree
 - (2) Non-leaf nodes have pointers to data records
 - (3) Key values in each node are kept in sorted order
 - (4) Each leaf node has a pointer to the next leaf node
 - 72. Select the correct asymptotic complexity of an algorithm with runtime T(n, n) where

$$T(x, c) = \Theta(x)$$
 for $c \le 2$,

$$T(c, y) = \Theta(y)$$
 for $c \le 2$, and

$$T(x, y) = \Theta(x+y) + T(x/2, y/2)$$

- (1) Θ(nLogn)
- (2) $\Theta(n^2)$
- (3) $\Theta(n)$
- (4) $\Theta(n^2 \text{Logn})$
- 73. Which of the following changes to QuickSort algorithm will improve its performance on average and are generally done in practice?
 - A. Randomly picking up to make worst case less likely to occur.
 - B. Calling insertion sort for small sized arrays to reduce recursive calls.
 - C. QuickSort is tail recursive, so tail call optimizations can be done.
 - D. A linear time median searching algorithm is used to pick the median, so that the worst case time reduces to $O(n Log_n)$
 - (1) A and B
- (2) B, C and D
- (3) A, B and C
- (4) B, C and D

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74.	The number of e	elements that can be so	orted in (log n) time using heap sort is:	
	Λ. Θ(1)	B. $\Theta(\sqrt{\log n})$	C. $\Theta\left(\frac{\log n}{\log\log n}\right)$ D. $\Theta(\log n)$	
	(1) A	(2) B	(3) C (4) D	
75.	Consider a com trees.	plete graph G with 4	vertices. The graph G has spanni	ng
	(1) 15	(2) 8	(3) 16 (4) 13	
76.	destination.	es the problem of find	ling the shortest path from a point in a graph to	a
	(1) Kruskal's al(3) Dijkstra alg	·/ ₁	(2) Prim's algorithm(4) Bellman ford algorithm	
77.		comparisons done by s $(2) (N + 1)/2$	sequential search is: $(3) (N-1)/2 \qquad (4) (N+2)/2$	
78.		* * * * * * * * * * * * * * * * * * * *	versal from a source node W in an unweighted e T formed by the tree arcs is a data structure for	
	(1) the shortest	t path between every pa	air of vertices.	
	(2) the shortest	t path from W to every	vertex in the graph.	
	(3) the shortest	t paths from W to only	those nodes that are leaves of T.	
2.87		path in the graph.		
79.	are resolved by	chaining. The following	he hash function is $h(k) = k \mod 9$. The collisioning 9 keys are inserted in the order:	18
		0, 33, 12, 17, 10		
	(1) 3, 0, and 1	(2) 3, 3, and 3	e chain lengths in the hash table, respectively, are (3) 4, 0, and 1 (4) 3, 0, and 2	:
80	A B-tree of ord (1) 255	ler 4 and of height 3 wi (2) 63	ill have a maximum of keys. (3) 127 (4) 188	is in
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81. Consider the following grammar:

 $P \rightarrow x Q R S$

 $Q \rightarrow yz \mid z$

 $R \rightarrow w \mid \varepsilon$

 $S \rightarrow y$

What is FOLLOW (Q)?

- $(1) \{R\}$
- (2) $\{w\}$
- $(3) \{w, y\}$
- $(4) \{w, \$\}$

82. Pushdown machine represents:

- (1) Type 3 regular grammar
- (2) Type 2 context free grammar
- (3) Type 1 Context sensitive grammar
- (4) Type 0 grammar

83. The languages generated by Turing machine are:

- (1) Recursively enumerable languages
- (2) Regular languages
- (3) Regular expression
- (4) Context free languages

84. Any strings of terminals that can be generated by CFG is:

 $S \rightarrow XY$

 $X \rightarrow aX \mid bX \mid a$

 $Y \rightarrow Ya \mid Yb \mid b$

(1) has at least one b

- (2) should end by 'a'
- (3) has no consecutive a's or b's
- (4) has at least 2a's

85. In a compiler, keywords of a language are recognized during:

- (1) parsing of the program
- (2) the code generation
- .(3) the lexical analysis of the program
- (4) dataflow analysis

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86. Match all items in Group 1 with correct options from those given in Group 2:

Group 1

P. Regular expression

Q. Pushdown automata

R. Dataflow analysis

S. Register allocation

(1) P-(iv) Q-(i), R-(ii), S-(iii)

(3) P-(iii), Q-(iv), R-(i), S-(ii)

Group 2

- (i) Syntax analysis
- (ii) Code generation
- (iii) Lexical analysis
- (iv) Code optimization
- (2) P-(iii), Q-(i), R-(iv), S-(ii)
- (4) P-(ii), Q-(i), R-(iv), S-(iii)

87. An LALR(I) parser for a grammar G can have shift-reduce (S-R) conflicts if and only if:

- (1) the SLR(1) parser for G has S-R conflicts
- (2) the LR(1) parser for G has S-R conflicts
- (3) the LR(0) parser for G has S-R conflicts
- (4) the LALR(1) parser for G has reduce-reduce conflicts

88. Rahul, Mohan, Srinivas and Arun are seated around a square table. Rahul is sitting to the left of Mohan. Srinivas is sitting to the right of Arun. Which of the following pairs are seated opposite each other?

(1) Rahul and Mohan

- (2) Srinivas and Arun
- (3) Srinivas and Mohan
- (4) Srinivas and Rahul

89. Consider the following languages:

$$L_{1} = \left\{ 0^{p} 1^{q} 0^{r} \mid p, q, r \ge 0 \right\}$$

$$L_{2} = \left\{ 0^{p} 1^{q} 0^{r} \mid p, q, r \ge 0, p \ne r \right\}$$

Which one of the following statements is false?

- (1) L₂ is context-free
- (2) L₁ intersection L₂ is context-free
- (3) Complement of L₂ is recursive
- (4) Complement of L₁ is context-free but not regular

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90.	Resolution of ext	ernally defined sym	bols is performed by	G various of the	
,•	(1) Linker	(2) Loader	(3) Compiler	(4) Interpreter	
91	switches. Assum	machines need to that these switch r of switches needed	es do not have any	LAN using 8-port Ethernoseparate up link ports. Th	et e
	44.1	(2) 4	(3) 5	(4) 6	
92.	og signa	l carries four bits in al elements are sent	each signal element	. Find the baud rate and bit	Ļ
	(1) 2000bauds p		a far Liga	State of the	
	(2) 8000bauds p	er see, 2000bps	real Thin ways	and makes	
	(3) 2000bauds p				
	(4) 8000bauds pe	er sec, 8000bps			
93.	Using Cyclic Rethe data unit is 11	dundancy Check (Cl	RC), find what is the is 1010?	dividend at the receiver, if	
		(2) 111111110	(3) 1010110	(4) 110111111	
94.	In the IPv4 add addresses is:	ressing format, the		s allowed under Class C	
	$(1) 2^{14}$	(2) 2 ⁷	$(3) 2^{21}$	$(4) 2^{24}$	
95.	What is the use of	Ping command?			
	(1) To know netw	ork speed			
	(2) To test storage	device			
	(3) To test a host of	on the network is read	chable		
	(4) None of the ab	oove			
96.	Which layer is Co	Λ Ρ ?			
	(1) Control layer		(2) Transport layer		
	(3) Service layer		(4) Application layer	er	
MPH/F	PHD/URS-EE-2019/(Com. Sci.)(SET-Z)/(A		P. T. O.	,

97.	Which layer in OSI model is respon	sible for translation, encr	yption and compression
	data?		
	(1) Session layer	(2) Application layer	er de la companya de
	(3) Presentation layer	(4) Physical layer	
98.	The protocol is used protocol is used by email programs (1) POP, SMTP (2) SMTP, PO		email server.
99.	Point out the correct statement with	regard to Cloud Computin	ng:
	(1) Platforms can be based on spe frameworks, or other constructs		nt languages, application
	(2) SaaS is the cloud-based equivalent	ent of shrink-wrapped soft	ware.
	(3) Software as a Service (SaaS) deployed on a hosted service.	may be succinctly descr	ibed as software that is
	(4) All of the mentioned.		
100	O. In IoT, MQTT is orien	ted.	
	(1) Data (2) Message	(3) Network	(4) Device

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M.Phil./Ph.D./URS-EE-2019

SET-Z

SUBJECT: Computer Science

	404
Time: 11/4 Hours Max. Marks: 100	Total Questions: 100
Roll No. (in figures) (in words)	
Name Father's Name	
Mother's Name Date of Examination	
	a 3
(Signature of the Candidate) (Signat	ture of the Invigilator)

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SET-Z

10000

SUBJECT: Computer Science

		Sr. No
Time: 11/4 Hours	Max. Marks : 100	Total Questions: 100
Roll No. (in figures)	(in words)	
Name	Father's Name	
Mother's Name	Date of Examination_	
* **		
(Signature of the Candidate)	·	(Signature of the Invigilator)

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M.Phil./Ph.D./URS-EE-2019

SUBJECT: Computer Science

		sr. No. 10002	
Time: 1¼ Hours Roll No. (in figures)	Max. Marks : 100 (in words)	Total Questions : 1	
Name	Father's Name		
Mother's Name	Date of Examination		
(Signature of the Candidate)		(Signature of the Invigilator)	

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MPH/PHD/URS-EE-2019/(Computer Sci.)(SET-Z)/(B)

- Which one of the following statements is not correct about the B+ tree data structure used for creating an index of a relational database table?
 - (1) B+ Tree is a height-balanced tree
 - (2) Non-leaf nodes have pointers to data records
 - (3) Key values in each node are kept in sorted order
 - (4) Each leaf node has a pointer to the next leaf node
- 2. Select the correct asymptotic complexity of an algorithm with runtime T(n, n) where

$$T(x, c) = \Theta(x)$$
 for $c \le 2$,

$$T(c, y) = \Theta(y)$$
 for $c \le 2$, and

$$T(x, y) = \Theta(x+y) + T(x/2, y/2)$$

(1) $\Theta(nLogn)$

(2) $\Theta(n^2)$

 $(3) \Theta(n)$

- (4) $\Theta(n^2 \text{Logn})$
- Which of the following changes to QuickSort algorithm will improve its performance on average and are generally done in practice?
 - A. Randomly picking up to make worst case less likely to occur.
 - Calling insertion sort for small sized arrays to reduce recursive calls.
 - QuickSort is tail recursive, so tail call optimizations can be done.
 - D. A linear time median searching algorithm is used to pick the median, so that the worst case time reduces to O(n Log_n)
 - (1) A and B

(2) B, C and D

(3) A, B and C

- (4) B, C and D
- The number of elements that can be sorted in (log n) time using heap sort is:
 - A. $\Theta(1)$
- B. $\Theta(\sqrt{\log n})$ C. $\Theta(\frac{\log n}{\log \log n})$ D. $\Theta(\log n)$

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

a

5.	Consider a contrees.	nplete graph G wi	th 4 vertices. The gra	pn G nas	spannit
	(1) 15	(2) 8	(3) 16	(4) 13	el Ti
6.	solv	ves the problem of	finding the shortest pa	ath from a point in a	graph to
	destination.				
	(1) Kruskal's a	llgorithm	(2) Prim's algo	rithm	
	(3) Dijkstra al	gorithm	(4) Bellman fo	rd algorithm	s.
7.	The number of	comparisons done	by sequential search is	ine Al a salti i di sila	
	(1) (N/2) - 1		(2) $(N+1)/2$		
	(3) (N-1)/2		(4) $(N+2)/2$		
8.			traversal from a source tree T formed by the t		· —
	(1) the shorte	st path between eve	ry pair of vertices.	Service of the officer	7 18
	(2) the shorte	est path from W to e	very vertex in the graph		
	(3) the shorte	est paths from W to	only those nodes that are	e leaves of T.	
	(4) the longes	st path in the graph.			
g	are resolved b	by chaining. The foll	s. The hash function is a owing 9 keys are inserted	$h(k) = k \mod 9$. The ed in the order:	collisions
	•	20, 33, 12, 17, 10			
	(1) 3, 0, and	n, minimum, and avo	erage chain lengths in the	hash table, respective	'ely, are:
	(3) 4, 0, and		(2) 3, 3, and 3 (4) 3, 0, and 2		
10			3 will have a maximum		
1	(1) 255	der Fund of Height	(2) 63	or keys	
	(3) 127		(4) 188		
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				ALL ALL STREET, ST. WOOL	Will French

- 11. A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is *true* if the processes have no I/O operations and all arrive at time zero?
 - (1) This algorithm is equivalent to the first-come-first-serve algorithm.
 - (2) This algorithm is equivalent to the round-robin algorithm.
 - (3) This algorithm is equivalent to the shortest-job-first algorithm.
 - (4) This algorithm is equivalent to the shortest-remaining-time-first algorithm.
- 12. An operating system maintains smaller data structures for a thread than a process, as a thread is usually defined as a 'light weight process'. What is the per thread basis of the operating system?
 - (1) Does not maintain a separate stack
 - (2) Maintains only CPU register state
 - (3) Does not maintain a virtual memory state
 - (4) Maintains only scheduling and accounting information
- 13. Which of the following statements are true?
 - (1) Shortest remaining time first scheduling may cause starvation
 - (2) Starvation may be caused by pre-emptive scheduling.
 - (3) In terms of response time robin round is better than FCFS
 - (4) All of the above statements are true
- 14. Which of the following statements is true for the dirty page in a page table?
 - (1) Helps to maintain LRU information
 - (2) Allows only read on a page
 - (3) Helps to avoid unnecessary writes on paging device
 - (4) None of the above

```
The following program consists of 3 concurrent processes and 3 binary semaphores.
 The semaphores are initialized as S0 = 1, S1 = 0, S2 = 0.
  Process P0
  while(true)
  { ,
      wait(S0);
      print '0';
       release(S1);
       release(S2);
    Process PI
    waite(S1);
    release(S0);
    Process P2
     wait(S2);
     release(S0);
     How many times will P0 print '0'?
     (1) At least twice (2) Exactly twice
                                            (3) Exactly thrice
                                                               (4) Exactly once
     .....is not possible in distributed file system.
      (1) File replication
                                            (2) Migration
      (3) Client interface
                                             (4) Remote access
      In LINUX, a file named file 01 should be readable, writable and executable only by the
      user(owner). Which one of the following set of command will be used?
                                         (2) chmod 000 file01
      (1) chmod 700 file01
      (3) chmod 477 file01
                                             (4) chmod 007 file01
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4

18.	Which is an unsolvable problem in acces	s-m	atrix?	ar organizacja i Litarija.	
	(1) Owner override	(2)	Brute force		
	(3) Access denied	(4)	Confinement		
19.	Data Encryption Standard is an example	of a	cry	ptosystem.	·.
	(1) Symmetric-key	(2)	public key		
	(3) hash key	(4)	asymmetric-key		
20.	RAID level is also known as block level striping and keeps a parity b				ses
	(1) 1 (2) 2	(3)	3	(4) 4	
21	1. One of the main challenge/s of NLP is .	••••			
	(1) Handling Ambiguity of Sentences				
	(2) Handling Tokenization				
	(3) Handling POS- Tagging				
٠	(4) All of the mentioned				
2	22. What is state space?				
	(1) The whole problem				
	(2) Your Definition to a problem		*.		2
	(3) Problem you design	. 8			
	(4) Representing your problem with v	ariat	ole and parameter		
	23. Which search is similar to min-max se				
*	(1) Hill-climbing search	(2) Depth-first sea	rch	
	(3) Breadth-first search	. (4) All of the men	tioned	
	24. A 3-input neuron is trained to output input is 111. After generalization, the				
	is:				
	(1) 000 or 110 or 011 or 101				
	(3) 000 or 010 or 110 or 100		(4) 100 or 111 or	101 or 001	•
N	MPH/PHD/URS-EE-2019/(Com. Sci.)(SET-Z)	/(B)	orse, Similar		N.C

25.	The truth values of traditional set theory is and that of fuzzy set is
	(1) Either 0 or 1, between 0 & 1
	(2) Between 0 & 1, either 0 or 1
	(3) Between 0 & 1, between 0 & 1
	(4) Either 0 or 1, either 0 or 1
26.	Which of the following statement(s) is/are true for Gradient Decent (GD) and Stochastic Gradient Decent (SGD)?
1	a. In GD and SGD, you update a set of parameters in an iterative manner to minimize the error function.
	b. In SGD, you have to run through all the samples in your training set for a single update of a parameter in each iteration.
	c. In GD, you either use the entire data or a subset of training data to update a parameter in each iteration.
	(1) Only a (2) Only b (3) Only c (4) a, b and c
27.	In hopfield network with symmetric weights, energy at each state may?
	(1) increase (2) decrease
	(3) decrease or remain same (4) decrease or increase
28.	In which of the following learning techniques, the teacher returns reward and punishment to learner?
	(1) Active learning (2) Reinforcement learning
	(3) Supervised learning (4) Unsupervised learning
29.	algorithm(s) is used to extract the plan directly from the planning graph, rather than using graph to provide heuristic.
	(1) BFS/DFS (2) A* (3) Graph-Plan (4) Greedy
30.	Inference algorithm is complete only if: (1) It can derive any sentence (2) It can derive any sentence that is an entailed version
	(3) It is truth provided that is an entailed version

(4) It can derive any sentence that is an entailed version & It is truth preserving MPH/PHD/URS-EE-2019/(Com. Sci.)(SET-Z)/(B)

- 31. Which one of the following electronic circuits can be used to store 1 bit of data?
 - (1) Encoder
- (2) OR gate
- (3) Flip flop
- (4) Decoder
- 32. In 16-bit 2's complement representation, the decimal number -20 is:
 - (1) 1111 1111 0001 0100
- (2) 0000 0000 1110 0100
- (3) 1111 1111 1110 1100
- (4) 1000 0000 1110 0100
- 33. When an interrupt occurs, which one of the following takes place?
 - (1) Execution of the current instruction is completed and the address of the next instruction is saved before the interrupt service program starts
 - (2) Execution of the current instruction is aborted and its address is saved before the interrupt service program starts
 - (3) Execution of the current instruction is completed and the interrupt service program starts
 - (4) Execution of the current instruction is aborted and the interrupt service program starts
 - 34. Which one of the following is the *correct* arrangement of the ease of programming (from easiest to hardest) of various programming languages?
 - (1) Binary machine code, hex code, assembly, high level language
 - (2) Binary machine code, assembly, hex code, high level language
 - (3) High level language, assembly, hex code, Binary machine code
 - (4) High level language, hex code, assembly, Binary machine code
 - 35. Which one of the following is a valid comparison of the characteristics of an RISC and a CISC computer?
 - (1) CISC computers exhibit better performance than RISC computers because complex instructions get executed in hardware.
 - (2) For the same program, a compiler generates more number of CISC instructions than RISC instructions.
 - (3) CISC computers usually have a higher MIPS rating as compared with comparable RISC computers.
 - (4) RISC computers deploy hardware control as compared with microprogrammed control in case of CISC computers.

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P. T. O

36	For transferring data from a hard disk to the attached computer on a page fault, which one of the following would be preferred mode of transfer?					
	(1) Direct Memory access(2) Programmed I/O(3) Hardware interrupt driven I/O					
	(4) Software interrupt driven					
37	A ROM is used to store the multiplication table of two 8 bit unsigned integers. What would be the size of required ROM?					
	(1) 64K X 16bits (2) 16K X 8bits (3) 256 X 16 bits (4) 32K X 8bits					
38	If four processors are to be interconnected with three memory modules using a crossbar interconnection, what is the minimum number of switches required? (1) 7 (2) 12 (3) 16 (4) 17					
39	. Distributed computers belong to which one of the following classes of computers ?					
	(1) SISD (2) SIMD (3) MIMD (4) MISD					
40	What is the minimum number of 2-input NOR gates required to implement 4-variable function expressed in sum-of-minterms from as $f = \Sigma$ (0, 2, 5, 7, 8, 10, 13, 15)? Assume that all the inputs and their complements are available.					
	(1) 3 (2) 4 (3) 5 (4) 6					
41.	Consider that 15 machines need to be connected in a LAN using 8-port Ethernet switches. Assume that these switches do not have any separate up link ports. The minimum number of switches needed is					
	(1) 3 (2) 4 (3) 5 (4) 6					
42.	An analog signal carries four bits in each signal element. Find the baud rate and bit rate, if 2000 signal elements are sent per second:					
	(1) 2000bauds per sec, 8000bps					
- 1	(2) 8000bauds per sec, 2000bps					
	(3) 2000bauds per sec, 2000bps					
	(4) 8000bauds per sec, 8000bps					
MPH	PHD/URS-EE-2019/(Com. Sci)(SET-Z)/(D)					

43.	the data unit is 111111 and the divisor is 1010?						
	(1) 111111011 (2) 111111110 (3) 1010110 (4) 110111111						
44.	In the IPv4 addressing format, the number of networks allowed under Class addresses is: (1) 2^{14} (2) 2^7 (3) 2^{21} (4) 2^{24}						
45.	What is the use of Ping command?						
	(1) To know network speed						
	(2) To test storage device						
	(3) To test a host on the network is reachable						
	(4) None of the above						
46.	Which layer is CoAP?						
	(1) Control layer (2) Transport layer						
•	(3) Service layer (4) Application layer						
47.	Which layer in OSI model is responsible for translation, encryption and compression of data?						
	(1) Session layer (2) Application layer						
	(3) Presentation layer (4) Physical layer						
48.	The protocol is used for the transmission of e-mails and protocol is used by email programs to retrieve emails from an email server. (1) POP, SMTP (2) SMTP, POP (3) SMTP, SMTP (4) POP, POP						
49.	Point out the correct statement with regard to Cloud Computing:						
	(1) Platforms can be based on specific types of development languages, application frameworks, or other constructs.						
	(2) SaaS is the cloud-based equivalent of shrink-wrapped software.						
	(3) Software as a Service (SaaS) may be succinctly described as software that is deployed on a hosted service.						
	(4) All of the mentioned.						
(PH/P	PHD/URS-EE-2019/(Com. Sci.)(SET-Z)/(B)						

50.	In IoT, MQTT is oriented.
	(1) Data (2) Message
	(3) Network (4) Device
51.	Which one of the following is not desired in a good Software Requirement Specifications (SRS) document?
	(1) Functional Requirements
	(2) Non-Functional Requirements
	(3) Goals of Implementation
	(4) Algorithms for Software Implementation
52.	The Phases of formal review process, in software engineering are mentioned below. Arrange them in the <i>correct</i> order:
	i. Planning
	ii. Review Meeting
	iii. Rework
	iv. Individual Preparations
	v. Kick Off
	vi. Follow Up
	(1) i, ii, iii, iv, v, vi (2) vi, i, ii, iii, iv, v
	(3) i, v, iv, ii, iii, vi (4) i, ii, iii, v, iv, vi
53.	System architecture is determined during which phase?
	(1) Requirement gathering (2) Implementation
	(3) Development (4) Design
54.	Component testing is a:
	(1) Black box testing (2) White box testing
	(3) Grey box testing (4) Both (1) and (2)
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55.	The objective of software project planning is to:
	(1) Convince the customer that a project is feasible
	(2) Make use of historical project data
	(3) Enable a manager to make reasonable estimates of cost and schedule
	(4) Determine the probable profit margin prior to bidding on a project
56.	In Software Engineering which is <i>not</i> an element of requirement model?
	(1) Behavioural elements (2) Class based elements
	(3) Data elements (4) Scenario based elements
57.	The model which estimates the total effort in terms of person, months of the technical project staff is
	(1) Spiral Model (2) Waterfall model
•	(3) Win-win spiral model (4) COCOMO Model
58.	Agile Modelling (AM) provides guidance to practitioner during which of these software tasks?
	(1) Analysis (2) Design (3) Testing (4) Both 1 and 2
59	Read the columns and match the following:
	(a) Data coupling (i) Module A and Module B have shared data.
	(b) Stamp coupling (ii) Dependency between modules is based on the fact they communicate by only passing of data.
•	(c) Common coupling (iii) When complete data structure is passed from one module to another.
	(d) Content coupling (iv) When the control is passed from one module to the middle of another.
	(1) a - iii, b - ii, c - i, d - iv (2) a - ii, b - iii, c - i, d - iv
	(3) a - ii, b - iii, c - iv, d - i (4) a - iii, b - ii, c - iv, d - i

2		
60.	Which of the following is not included document?	in the Software requirements specification
	(1) Functional Requirements	
	(2) Non- functional requirements	
	(3) Goals of implementation	
	(4) User Manual	
61.	Consider the following grammar:	

$P \rightarrow x Q R S$			10 Y 5 1 1 1		
$Q \rightarrow y z \mid z$					
$R \rightarrow w \mid \varepsilon$					
$S \rightarrow y$		40 - 102 - 120 1			
What is FOLLOW	/(Q)?				
(1) {R}	$(2) \{w\}$	(3) {w,	y }	(4) {w, \$}	
 			1 × -	7.0	

- 62. Pushdown machine represents:
 - (1) Type 3 regular grammar (2) Type 2 context free grammar
 - (3) Type 1 Context sensitive grammar (4) Type 0 grammar
- 63. The languages generated by Turing machine are:
 - (1) Recursively enumerable languages
 - (2) Regular languages
 - (3) Regular expression
 - (4) Context free languages
- 64. Any strings of terminals that can be generated by CFG is:

$$S \rightarrow XY$$

$$X \rightarrow aX \mid bX \mid a$$

$$Y \rightarrow Ya \mid Yb \mid b$$

(1) has at least one b

- (2) should end by 'a'
- (3) has no consecutive a's or b's
- (4) has at least 2a's

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In a compiler, keywords of a language are recognized during:

- (1) parsing of the program
- (2) the code generation
- (3) the lexical analysis of the program
- (4) dataflow analysis

Match all items in Group 1 with correct options from those given in Group 2:

Group 1

Group 2

Regular expression **P**.

(i) Syntax analysis

Q. Pushdown automata

(ii) Code generation

Dataflow analysis

(iii) Lexical analysis

Register allocation S.

- (iv) Code optimization
- (1) P-(iv) Q-(i), R-(ii), S-(iii)
- (2) P-(iii), Q-(i), R-(iv), S-(ii)
- (3) P-(iii), Q-(iv), R-(i), S-(ii)
- (4) P-(ii), Q-(i), R-(iv), S-(iii)
- An LALR(I) parser for a grammar G can have shift-reduce (S-R) conflicts if and only 67. if:
 - (1) the SLR(1) parser for G has S-R conflicts
 - (2) the LR(1) parser for G has S-R conflicts
 - (3) the LR(0) parser for G has S-R conflicts
 - (4) the LALR(1) parser for G has reduce-reduce conflicts

	and the second of the second o
68.	Rahul, Mohan, Srinivas and Arun are seated around a square table. Rahul is sitting to the left of Mohan. Srinivas is sitting to the right of Arun. Which of the following pairs are seated opposite each other?
	(1) Rahul and Mohan (2) Srinivas and Arun
	(3) Srinivas and Mohan (4) Srinivas and Rahul
69.	Consider the following languages:
	$L_1 = \left\{ 0^p 1^q 0^r \mid p, q, r \ge 0 \right\}$
	$L_2 = \left\{ 0^p 1^q 0^r \mid p, q, r \ge 0, \ p \ne r \right\}$
	Which one of the following statements is false?
	(1) L ₂ is context-free
	(2) L ₁ intersection L ₂ is context-free
	(3) Complement of L ₂ is recursive
	(4) Complement of L ₁ is context-free but not regular
70.	Resolution of externally defined symbols is performed by:
	(1) Linker (2) Loader (3) Compiler (4) Interpreter
71.	Database: In second normal form
	(1) A composite attributes is converted to individual attributes.
	(2) Non key attributes are functionally dependent on key attributes.
	(3) The non key attributes functionally dependent not on a part of key attributes.
	(4) All the above:
72.	What stores the metadata about the structure of the database, in particular the schema of the database?
*	(1) Indices (2) Database log .
	(3) Data files (4) Data Dictionary

73. Consider the following Employee table:

ID salary		DeptName
1 10000		EC
2 40000		EC
3 30000		CS
4 40000		ME
5 50000	g . 5 m	ME
6 60000		ME
7 70000		CS

How many rows are there in the result of following query?

SELECT E.ID

FROM Employee E

WHERE EXISTS (SELECT E2.salary

FROM Employee E2

WHERE E2.DeptName = 'CS'

AND E.salary> E2.salary)

(1) 0

- (2) 4
- (3) 5
- (4) 6

74. In DBMS, index is clustered, if:

- (1) it is on a set of fields that form a candidate key.
- (2) it is on a set of fields that include the primary key.
- (3) the data records of the file are organized in the same order as the data entries of the index.
- (4) the data records of the file are organized not in the same order as the data entries of the index.

Which of the following statement is true for the "Reconciled data"?

- (1) Data stored in the various operational systems throughout the organization.
- (2) Current data intended to be the single source for all decision support systems.
- (3) Data stored in one operational system in the organization.
- (4) Data that has been selected and formatted for end-user support applications.

	The state of the s
76. Data warehouse is:	Section of the sectio
(1) The actual discovery phase of a know	wledge discovery process
(2) The stage of selecting the right data	for a KDD process
(3) A subject-oriented integrated time v of management	variant non-volatile collection of data in support
(4) None of these	
77. The need to synchronize data upon upda	ate is called
(1) Data Manipulation	(2) Data Replication
(3) Data Coherency	(4) Data Imitation
78 can best be described as a based applications that can process mas	programming model used to develop Hadoopsive amounts of data.
(1) MapReduce	(2) Mahout
(3) Oozie	(4) All of the mentioned
	m DATE_OF _BIRTH. The attribute AGE is
(1) Single valued (2) Multi valued	(3) Composite (4) Derived
80. Which of the following is a NoSQL Da	atabase Type?
(1) SQL	(2) Document databases
(3) JSON	(4) All of the mentioned
81. In orthographic projection, the object picture plane.	is placed with one of its faces to the
(1) Inclined (2) Perpendicula	
82. The intersection of primary ROB and colour resp	colours and primary CMYK colours produces ectively
(1) White colour, White colour	
(2) White colour, Black colour	The second of th
(3) Black colour, White colour	Charles of the property of the second
(4) Black colour, Black colour	
MANUALIDATE 2010//Com Sci VSFT-7	((R)

Let swap () be a function that swaps two elements using their addresses. Consider the following C function:

```
void fun(int arr[], int n)
    for (int i = 0; i < n; i + = 2)
         if (i > 0 \&\& arr[i - 1] > arr[i])
              swap(&arr[i], &arr[i-1]);
         if (i < n - 1 &\& arr[i] < arr[i + 1])
               swap(\&arr[i], \&arr[i+1]);
```

If an array {10, 20, 30, 40, 50, 60, 70, 80} is passed to the function, the array is changed to:

- (1) {20, 10, 40, 30, 60, 50, 80, 70}
- (2) {10, 30, 20, 40,60, 50, 80, 70}
- (3) {10, 20, 30, 40, 50, 60, 70, 80}
- (4) {80, 70, 60, 50, 40, 30, 20, 10}
- What is the return value of f(p, p), if the value of p is initialized to 5 before the call? 84. Note that the first parameter is passed by reference, whereas the second parameter is passed by value:

```
int (int &x, int c) {
   c = c - 1;
  if (c == 0) return 1;
   x = x + 1:
   return f(x, c) * x;
                                     (3) 55440 (4) 161051
                  (2) 6561
(1) 3024
                                             Albania di History, Alfrica
```

3			
85.	Which of the following is used to open document in new window?		
	(1) Link	(2) Link	
	(3) Link	(4) Link	
86.	What is the difference between servlets	and applets?	
	i. Servlets execute on Server; Applets	execute on browser	
	ii. Servlets have no GUI; Applet has G	UI	
*	iii. Servlets creates static web pages; A	pplets creates dynamic web pages	
	iv. Servlets can handle only a single re	quest; Applet can handle multiple requests	
	(1) i, ii, iii are correct	(2) i, ii are correct	
	(3) i, iii are correct	(4) i, ii, iii, iv are correct	
87	. The transformation in which an object of dimensional plane are called:	can be shifted to any coordinate position in thre	
	(1) Translation (2) Scaling	(3) Rotation (4) All of these	
88	3. While inheriting a class, if no accerding following is <i>true</i> ? (in C++)	ss mode is specified, then which among th	
	(1) It gets inherited publicly by defaul		
	(2) It gets inherited protected by defau	lt	
	(3) It gets inherited privately by defau	lt	
	(4) It is not possible		
8	9. The most appropriate matching for the	following pairs is:	
	X: Indirect addressing	(i) : Loops	
	Y: Imeediate addressing	(ii): Pointers	
	Z: Auto decrement addressing	(iii): Constants	

(1) X - (iii), Y - (ii), Z - (i)

(3) X - (ii), Y - (iii), Z - (i)

(2) X - (i), Y - (iii), Z - (ii)

(4) X - (iii), Y - (i), Z - (ii)

90.

	P says "Q committe	ed the crime."		2		
	Q says "S committe	ed the crime."				E
	R says" I did not de			*		
	S says "What Q sai		sc."			(
	Assume only one statements made al					one of the
	(1) P	(2) R	(3) S	. A po	(4) Q	
92.	In a college, there students are only in	n the Dance club	, 30 students are	only in I	Maths club, 40 s	students are
	in both Drama an students are in bot the students in the students in the coll	h Drama and Ma e college are no	ths clubs, and 2 if in any of thes	students	are in all clubs	. If 75% of
	(1) 1000	(2) 975	(3) 900	in a final	(4) 225	
93.	The random exper the sum of two die		a pair of six side	d dice. (Compute the pro-	obability of
	(1) 5/36	(2) 7/36	(3) 6/36		(4) 8/36	1
94.	Let G be an undired different Hamilton	ected complete grain cycles in G is	raph on <i>n</i> vertices sequal to:	s, where	n > 2. Then, the	number of
	(1) n!	(2) $n-1!$	(3) 1	1	(4) $(n-1)!/2$	2
95.	Let $\Lambda = \{1,2,3\}$. reflexive and symr	Then number o	f relations contansitive are:	ining (1	, 2) and (1, 3)) which are
	(1)-1	(2) 2	(3) 3		(4) 4	
MPH/	PHD/URS-EE-2019/	(Com. Sci.)(SET-	Z)/(B)	e v		P. T. O.

fseck() should be preferred over rewind() mainly because:

(3) In rewind, there is no way to check if the operations completed successfully

The police arrested four criminals - P, Q, R and S. The criminals knew each other.

(1) rewind() doesn't work for empty files

(2) rewind() may fail for large files

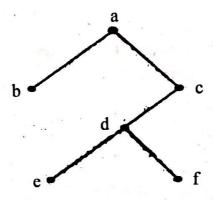
They made the following statements:

(4) All of the above

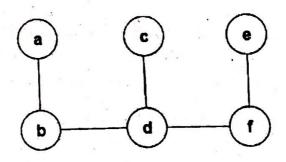
- 96. How many distinct binary functions of order 3 are there?
 - (1) 32 (2)

256

- (3) 64
- (4) 128
- 97. In the given tree list the order that the nodes are processed using preorder and postorder are:



- (1) befdca; acdfeb
- (2) befdca; abcdef
- (3) abcdef; befdca
- (4) abcdef; fedcba
- 98. In graphical solutions of linear inequalities, solution can be divided into:
 - (1) one subset
- (2) two subsets
- (3) three subsets
- (4) four subsets
- 99. According to system of constraints, solution set graphical representation is classified as:
 - (1) region of ordinate solutions
- (2) region of intercept solutions
- (3) region of vertex solutions
- (4) region of feasible solutions
- 100. How many Hamiltonian paths does the following graph have?



- (1) 1
- (2) 2
- (3) 0
- (4) 3

Total No. of Printed Pages: 21

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

C

M.Phil./Ph.D./URS-EE-2019

SUBJECT: Computer Science

SI	ET	-Z

10011

		Sr. No
Time: 1¼ Hours	Max. Marks: 100	Total Questions: 100
Roll No. (in figures)	(in words)	
Name	Father's Name	*
Mother's Name	Date of Examination	
(Signature of the Candidate)		(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 6. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

1.	Database: In second normal form	
	(1) A composite attributes is converted	l to individual attributes.
	(2) Non key attributes are functionally	
		dependent not on a part of key attributes.
	(4) All the above.	
2.	What stores the metadata about the str of the database?	ructure of the database, in particular the schem
	(1) Indices	(2) Database log
	(3) Data files	(4) Data Dictionary
3.	Consider the following Employee table	
	ID salary	DeptName
6	1 10000	EC
	2 40000	EC
	3 30000	CS
	4 40000	ME
	5 50000	ME
	6 60000	ME
	7 70000	CS
	How many rows are there in the result o	of following query?
	SELECT E.ID	
	FROM Employee E	
	WHERE EXISTS (SELECT E2.salary	
	FROM Employee E2	
	WHERE E2.DeptName = 'CS'	
	AND E.salary> E2.salary)	
		(3) 5
	(1) 0 (2) 4	(3) 5 (4) 6

4.	In DBMS, index is clustered, if:
	(1) it is on a set of fields that form a candidate key.
	(2) it is on a set of fields that include the primary key.
	(3) the data records of the file are organized in the same order as the data entries of the index.
	(4) the data records of the file are organized not in the same order as the data entries of the index.
5.	Which of the following statement is true for the "Reconciled data"?
	(1) Data stored in the various operational systems throughout the organization.
	(2) Current data intended to be the single source for all decision support systems.
	(3) Data stored in one operational system in the organization.
	(4) Data that has been selected and formatted for end-user support applications.
6.	Data warehouse is:
	(1) The actual discovery phase of a knowledge discovery process
	(2) The stage of selecting the right data for a KDD process
	(3) A subject-oriented integrated time variant non-volatile collection of data in support of management
	(4) None of these
7.	The need to synchronize data upon update is called
	(1) Data Manipulation (2) Data Replication
	(3) Data Coherency (4) Data Imitation
8.	can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
	(1) MapReduce (2) Mahout
	(3) Oozie . (4) All of the mentioned
9.	The attribute AGE is calculated from DATE_OF _BIRTH. The attribute AGE is
	(1) Single valued (2) Multi valued (3) Composite (4) Derived
MPH/I	PHD/URS-EE-2019/(Com. Sci.)(SET-Z)/(C)

```
Which of the following is a NoSQL Database Type?
     (1) SQL
                                            (2) Document databases
     (3) JSON
                                             (4) All of the mentioned
11. In orthographic projection, the object is placed with one of its faces ...... to the
     picture plane.
     (1) Inclined
                         (2) Perpendicular
                                                               (4) Any of the above
                                            (3) Parallel
12. The intersection of primary ROB colours and primary CMYK colours produces
     ..... and ..... colour respectively
     (1) White colour, White colour
                                            (2) White colour, Black colour
     (3) Black colour, White colour
                                            (4) Black colour, Black colour
13. Let swap () be a function that swaps two elements using their addresses. Consider the
     following C function:
     void fun(int arr[], int n)
         for (int i = 0; i < n; i + = 2)
             if (i > 0 \&\& arr[i-1] > arr[i])
                 swap(&arr[i], &arr[i-1]);
             if (i \le n - 1 &\& arr[i] \le arr[i + 1])
                  swap(\&arr[i], \&arr[i+1]):
    If an array {10, 20, 30, 40, 50, 60, 70, 80} is passed to the function, the array is
    changed to:
    (1) {20, 10, 40, 30, 60, 50, 80, 70}
                                            (2) {10, 30, 20, 40,60, 50, 80, 70}
    (3) {10, 20, 30, 40, 50, 60, 70, 80}
                                            (4) {80, 70, 60, 50, 40, 30, 20, 10}
```

P. T. O.

14. What is the return value of f(p, p), if the value of p is initialized to 5 before the call? Note that the first parameter is passed by reference, whereas the second parameter is passed by value:

```
int (int &x, int c) {
    c = c - 1;
    if (c == 0) return 1;
    x = x + 1;
    return f(x, c) * x;
}
```

- (1) 3024
- (2) 6561
- (3) 55440.
- (4) 161051

15. Which of the following is used to open document in new window?

- (1) Link
- (2) Link
- (3) Link
- (4) Link

16. What is the difference between servlets and applets?

- i. Scrvlets execute on Server; Applets execute on browser
- ii. Servlets have no GUI; Applet has GUI
- iii. Servlets creates static web pages; Applets creates dynamic web pages
- iv. Servlets can handle only a single request; Applet can handle multiple requests
- (1) i, ii, iii are correct

(2) i, ii are correct

(3) i, iii are correct

(4) i, ii, iii, iv are correct

17. The transformation in which an object can be shifted to any coordinate position in three dimensional plane are called:

(1) Translation

(2) Scaling

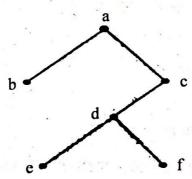
(3) Rotation

(4) All of these

18.	While inheriting a class, if no access following is <i>true</i> ? (in C++)	mode is specified, then	which among th
	(1) It gets inherited publicly by default		
	(2) It gets inherited protected by default		
	(3) It gets inherited privately by default		
	(4) It is not possible		
19.	The most appropriate matching for the fo	lowing pairs is:	
	X: Indirect addressing	(i) : Loops	•
	Y: Imeediate addressing	(ii): Pointers	5 - 18 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
	Z: Auto decrement addressing	(iii): Constants	1.5
	(1) $X - (iii), Y - (ii), Z - (i)$	(2) $X - (i)$, $Y - (iii)$, $Z - (ii)$	
	(3) $X - (ii), Y - (iii), Z - (i)$	(4) $X - (iii), Y - (i), Z - (ii)$	•
20.	. fseek() should be preferred over rewind) mainly because :	
	(1) rewind() doesn't work for empty file	3	
	(2) rewind() may fail for large files		
	(3) In rewind, there is no way to check i	the operations completed su	ccessfully
	(4) All of the above		
2	1. The police arrested four criminals - P, They made the following statements:	Q, R and S. The criminals	knew each other.
	P says "Q committed the crime."		
	Q says "S committed the crime."		
	R says" I did not do it."		
	S says "What Q said about me is false."		
	Assume only one of the arrested for statements made above is true. Who cor		only one of the
	(1) P (2) R	· · · · · · · · · · · · · · · · · · ·	way or

- 22. In a college, there are three student clubs, Sixty students are only in the Drama club, 80 students are only in the Dance club, 30 students are only in Maths club, 40 students are in both Drama and Dance clubs, 12 students are in both Dance and Maths clubs, 7 students are in both Drama and Maths clubs, and 2 students are in all clubs. If 75% of the students in the college are not in any of these clubs, then the total number of students in the college is:
 - (1) 1000
- (2) 975
- (3) 900
- (4) 225
- 23. The random experiment is rolling a pair of six sided dice. Compute the probability of the sum of two dice being 8.
 - (1) 5/36
- (2).7/36
- (3) 6/36
- (4) 8/36
- **24.** Let G be an undirected complete graph on n vertices, where n > 2. Then, the number of different Hamiltonian cycles in G is equal to:
 - (1) n!
- (2) n-1!
- (3) 1
- (4) (n-1)!/2
- **25.** Let $\Lambda = \{1,2,3\}$. Then number of relations containing (1, 2) and (1, 3) which are reflexive and symmetric but not transitive are:
 - (1) 1
- (2) 2
- (3) 3
- (4) 4
- 26. How many distinct binary functions of order 3 are there?
 - (1) 32 (2)
- 256

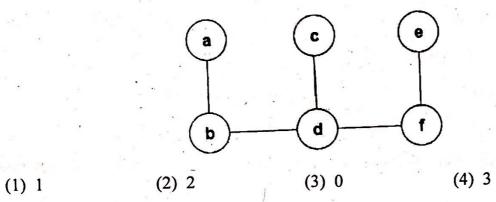
- (3) 64
- (4) 128
- 27. In the given tree list the order that the nodes are processed using preorder and postorder are:



- (1) befdca; acdfeb
- (2) befdca; abcdef
- (3) abcdef; befdca
- (4) abcdef; fedcba

28.	In graphical soluti	ons of linear inequal	ities, solution can be d	livided into:
	(1) one subset	(2) two subsets	(3) three subsets	(4) four subsets
	1		.1	is

- According to system of constraints, solution set graphical representation is classified as:
 - (2) region of intercept solutions (1) region of ordinate solutions (4) region of feasible solutions (3) region of vertex solutions
- How many Hamiltonian paths does the following graph have? 30.



- Consider that 15 machines need to be connected in a LAN using 8-port Ethernet switches. Assume that these switches do not have any separate up link ports. The minimum number of switches needed is
 - (4) 6(3) 5(2) 4(1) 3
- An analog signal carries four bits in each signal element. Find the baud rate and bit 32. rate, if 2000 signal elements are sent per second:
 - (1) 2000bauds per sec, 8000bps
 - (2) 8000bauds per sec, 2000bps
 - (3) 2000bauds per sec, 2000bps
 - (4) 8000bauds per sec, 8000bps
- Using Cyclic Redundancy Check (CRC), find what is the dividend at the receiver, if 33. the data unit is 111111 and the divisor is 1010?
 - (1) 1111111011
- (2) 111111110 (3) 1010110
- (4) 110111111

	34.	In the IPv4 addressing format, the naddresses is:	number of networks allowed under Class
		$(1) 2^{14} (2) 2^7$	$(3) 2^{21} (4) 2^{24}$
	35.	What is the use of Ping command?	
		(1) To know network speed	
	٠,	(2) To test storage device	
		(3) To test a host on the network is reach	able
	٠.	(4) None of the above	
	36.	Which layer is CoAP?	
		(1) Control layer	(2) Transport layer
		(3) Service layer	(4) Application layer
	37.	Which layer in OSI model is responsible data?	for translation, encryption and compression of
		(1) Session layer	(2) Application layer
	317 1	(3) Presentation layer	(4) Physical layer
	38.	protocol is used by email programs to ret	the transmission of e-mails andrieve emails from an email server. (3) SMTP, SMTP (4) POP, POP
	39.	Point out the correct statement with regard	
		(2) SaaS is the cloud-based equivalent of	f shrink-wrapped software
		(3) Software as a Service (SaaS) may	be succinctly described as software that is
	40.	In IoT, MQTT is oriented. (1) Data (2) Message	(3) Network (4) Device
N	1PH/I	PHD/URS-EE-2019/(Com. Sci.)(SET-Z)/(C)	Device.
		(-2. 2)/(C)	A William Control of the Control of

)	
41.	Which one of the following is not desired in a good Software Requirement Specifications (SRS) document?
	(1) Functional Requirements
	(2) Non-Functional Requirements
,	(3) Goals of Implementation
	(4) Algorithms for Software Implementation
42.	The Phases of formal review process, in software engineering are mentioned below. Arrange them in the <i>correct</i> order:
	i. Planning
	ii. Review Meeting
	iii. Rework
	iv. Individual Preparations
	v. Kick Off
•	vi. Follow Up
	(1) i, ii, iii, iv, v, vi (2) vi, i, ii, iii, iv, v
	(3) i, v, iv, ii, iii, vi (4) i, ii, iii, v, iv, vi
43	3. System architecture is determined during which phase?
	(1) Requirement gathering (2) Implementation
į.	(3) Development (4) Design
4	1. Component testing is a:
	(1) Black box testing (2) White box testing
	(3) Grey box testing (4) Both (1) and (2)
4	5. The objective of software project planning is to:
	(1) Convince the customer that a project is feasible
	Sommer of historical project data

- (2) Make use of historical project data
- (3) Enable a manager to make reasonable estimates of cost and schedule
- (4) Determine the probable profit margin prior to bidding on a project

P. T. O.

46.	In Software Engineering which is not an element of requirement model?
	(1) Behavioural elements (2) Class based elements
	(3) Data elements (4) Scenario based elements
47.	The model which estimates the total effort in terms of person, months of the technical project staff is
	(1) Spiral Model (2) Waterfall model
	(3) Win-win spiral model (4) COCOMO Model
48.	Agile Modelling (AM) provides guidance to practitioner during which of these software tasks?
	(1) Analysis (2) Design
	(3) Testing (4) Both 1 and 2
49.	Read the columns and match the following:
	(a) Data coupling (i) Module A and Module B have shared data.
	(b) Stamp coupling (ii) Dependency between modules is based on the fact they communicate by only passing of data.
•	(c) Common coupling (iii) When complete data structure is passed from one module to another.
	(d) Content coupling (iv) When the control is passed from one module to the middle of another.
	(1) a - iii, b - ii, c - i, d - iv (2) a - ii, b - iii, c - i, d - iv
	(3) a - ii, b - iii, c - iv, d - i (4) a - iii, b - ii, c - iv, d - i
50.	Which of the following is not included in the Software requirements specification document?
	(1) Functional Requirements
	(2) Non- functional requirements
2	(3) Goals of implementation
	(4) User Manual

51.	One of the main challenge/s of IVEI is
	(1) Handling Ambiguity of Sentences
	(2) Handling Tokenization
	(3) Handling POS- Tagging
	(4) All of the mentioned
52.	What is state space?
	(1) The whole problem
,	(2) Your Definition to a problem
	(3) Problem you design
	(4) Representing your problem with variable and parameter
53.	Which search is similar to min-max search?
	(1) Hill-climbing search
	(2) Depth-first search
	(3) Breadth-first search
	(4) All of the mentioned
54.	
	input is 111. After generalization, the output will be zero when and only when the input is:
	(1) 000 or 110 or 011 or 101 (2) 010 or 100 or 110 or 101
	(3) 000 or 010 or 110 or 100 (4) 100 or 111 or 101 or 001
	(4) 100 of 110 of 100
55.	The truth values of traditional set theory is and that of fuzzy set is
	(1) Either 0 or 1, between 0 & 1
×	(2) Between 0 & 1, either 0 or 1
	(3) Between 0 & 1, between 0 & 1
	(4) Either 0 or 1, either 0 or 1
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12	- (CD) and
56.	Which of the following statement(s) is/are true for Gradient Decent (GD) and Stochastic Gradient Decent (SGD)?
	a. In GD and SGD, you update a set of parameters in an iterative manner to imminize
	b. In SGD, you have to run through all the samples in your training set for a single update of a parameter in each iteration.
	c. In GD, you either use the entire data or a subset of training data to update a parameter in each iteration.
	(1) Only a (2) Only b (3) Only c (4) a, b and c
57.	In hopfield network with symmetric weights, energy at each state may?
	(1) increase (2) decrease (3) decrease or remain same (4) decrease or increase
58.	In which of the following learning techniques, the teacher returns reward and punishment to learner?
	(1) Active learning (2) Reinforcement learning
	(3) Supervised learning (4) Unsupervised learning
59.	algorithm(s) is used to extract the plan directly from the planning graph, rather than using graph to provide heuristic.
	(1) BFS/DFS (2) A* (3) Graph-Plan (4) Greedy
60.	Inference algorithm is complete only if: (1) It can derive any sentence
	(2) It can derive any sentence that is an entailed version
	(3) It is truth preserving (4) It are derive any contange that is an entailed version & It is truth preserving.
	(4) It can derive any sentence that is an entailed version & It is truth preserving
61.	Which one of the following statements is not correct about the B+ tree data structure used for creating an index of a relational database table?
	(1) B+ Tree is a height-balanced tree
	(2) Non-leaf nodes have pointers to data records
. #	(3) Key values in each node are kept in sorted order
	(4) Each leaf node has a pointer to the next leaf node
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62.	Select the correct asymptotic complexity of an algorithm with runtime T(n, n) where
	$T(x, c) = \Theta(x)$ for $c \le 2$,
	$T(c, y) = \Theta(y)$ for $c \le 2$, and
	$T(x, y) = \Theta(x+y) + T(x/2, y/2)$
	(1) $\Theta(nLogn)$ (2) $\Theta(n^2)$ (3) $\Theta(n)$ (4) $\Theta(n^2Logn)$
63.	Which of the following changes to QuickSort algorithm will improve its performance on average and are generally done in practice?
χ.	A. Randomly picking up to make worst case less likely to occur.
	B. Calling insertion sort for small sized arrays to reduce recursive calls.
	C. QuickSort is tail recursive, so tail call optimizations can be done.
•	D. A linear time median searching algorithm is used to pick the median, so that the worst case time reduces to O(n Log _n)
	(1) A and B (2) B, C and D (3) A, B and C (4) B, C and D
64.	The number of elements that can be sorted in (log n) time using heap sort is:
ъ.	A. $\Theta(1)$ B. $\Theta(\sqrt{\log n})$ C. $\Theta(\frac{\log n}{\log \log n})$ D. $\Theta(\log n)$ (1) A (2) B (3) C (4) D
	(1) A (2) B (3) C (4) D
65.	Consider a complete graph G with 4 vertices. The graph G has spanning trees.
	(1) 15 (2) 8 (3) 16 (4) 13
66.	solves the problem of finding the shortest path from a point in a graph to a destination.
	(1) Kruskal's algorithm (2) Prim's algorithm
	(3) Dijkstra algorithm (4) Bellman ford algorithm
67.	The number of comparisons done by sequential search is:
	(1) $(N/2) - 1$ (2) $(N+1)/2$ (3) $(N-1)/2$ (4) $(N+2)/2$

68	3. Consider the tree arcs of a BFS traconnected, undirected graph. The tre computing:	versal from a source node W in an unweighted, e T formed by the tree arcs is a data structure for
	(1) the shortest path between every p	air of vertices.
	(2) the shortest path from W to every	vertex in the graph.
	(3) the shortest paths from W to only	those nodes that are leaves of T.
	(4) the longest path in the graph.	1
69	. Consider a hash table with 9 slots. The are resolved by chaining. The following	he hash function is $h(k) = k \mod 9$. The collisions ag 9 keys are inserted in the order:
	5, 28, 19, 15, 20, 33, 12, 17, 10	
		chain lengths in the hash table, respectively, are:
•	(1) 3, 0, and 1 (2) 3, 3, and 3	(3) 4, 0, and 1 (4) 3, 0, and 2
70.	A B-tree of order 4 and of height 3 wil (1) 255 (2) 63	1 have a maximum of keys. (3) 127 (4) 188
71.	Consider the following grammar:	visit 123, harry executive resources (C) 143
	$P \rightarrow x Q R S$	
	$Q \rightarrow y z \mid z$	
	$R \to w \mid \varepsilon$	
	$S \rightarrow y$	1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	What is FOLLOW (Q)?	
	(1) $\{R\}$ (2) $\{w\}$	(3) $\{w, y\}$ (4) $\{w, \$\}$
72.	Pushdown machine represents:	9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	(1) Type 3 regular grammar	(2) Type 2 context free grammar
	(3) Type 1 Context sensitive grammar	(4) Type 0 grammar
73.	The languages generated by Turing mac	hine are:
	(1) Recursively enumerable languages	(2) Regular languages
	(3) Regular expression	(4) Context free languages

74. Any strings of terminals that can be generated by CFG is:

 $S \rightarrow XY$

 $X \rightarrow aX \mid bX \mid a$

 $Y \rightarrow Ya \mid Yb \mid b$

(1) has at least one b

- (2) should end by 'a'
- (3) has no consecutive a's or b's
- (4) has at least 2a's

75. In a compiler, keywords of a language are recognized during:

- (1) parsing of the program
- (2) the code generation
- (3) the lexical analysis of the program
- (4) dataflow analysis

76. Match all items in Group 1 with correct options from those given in Group 2:

Group 1

Group 2

P. Regular expression

(i) Syntax analysis

Q. Pushdown automata

(ii) Code generation

R. Dataflow analysis

(iii) Lexical analysis

S. Register allocation

- (iv) Code optimization
- (1) P-(iv) Q-(i), R-(ii), S-(iii)
- (2) P-(iii), Q-(i), R-(iv), S-(ii)
- (3) P-(iii), Q-(iv), R-(i), S-(ii)
- (4) P-(ii), Q-(i), R-(iv), S-(iii)

77. An LALR(I) parser for a grammar G can have shift-reduce (S-R) conflicts if and only if:

- (1) the SLR(1) parser for G has S-R conflicts
- (2) the LR(1) parser for G has S-R conflicts
- (3) the LR(0) parser for G has S-R conflicts
- (4) the LALR(1) parser for G has reduce-reduce conflicts

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78.	Rahul, Mohan, Srinivas and Arun are seated around a sq	uare table. Rahul is sitting to
	the left of Mohan. Srinivas is sitting to the right of Arun.	Which of the following pans
	are seated opposite each other?	

(1) Rahul and Mohan

(2) Srinivas and Arun

(3) Srinivas and Mohan

(4) Srinivas and Rahul

79. Consider the following languages:

$$L_{1} = \left\{ 0^{p} 1^{q} 0^{r} \mid p, q, r \ge 0 \right\}$$

$$L_{2} = \left\{ 0^{p} 1^{q} 0^{r} \mid p, q, r \ge 0, p \ne r \right\}$$

Which one of the following statements is false?

- (1) L₂ is context-free
- (2) L₁ intersection L₂ is context-free
- (3) Complement of L₂ is recursive
- (4) Complement of L₁ is context-free but not regular
- 80. Resolution of externally defined symbols is performed by:
 - (1) Linker
- (2) Loader
- (3) Compiler
- (4) Interpreter
- 81. Which one of the following electronic circuits can be used to store 1 bit of data?
 - (1) Encoder
- (2) OR gate
- (3) Flip flop
- (4) Decoder
- 82. In 16-bit 2's complement representation, the decimal number -20 is:
 - (1) 1111 1111 0001 0100
- (2) 0000 0000 1110 0100
- (3) 1111 1111 1110 1100
- (4) 1000 0000 1110 0100
- 83. When an interrupt occurs, which one of the following takes place?
 - (1) Execution of the current instruction is completed and the address of the next instruction is saved before the interrupt service program starts
 - (2) Execution of the current instruction is aborted and its address is saved before the interrupt service program starts
 - (3) Execution of the current instruction is completed and the interrupt service program starts
 - (4) Execution of the current instruction is aborted and the interrupt service program starts

- 84. Which one of the following is the correct arrangement of the ease of programming (from easiest to hardest) of various programming languages?
 - (1) Binary machine code, hex code, assembly, high level language
 - (2) Binary machine code, assembly, hex code, high level language
 - (3) High level language, assembly, hex code, Binary machine code
 - (4) High level language, hex code, assembly, Binary machine code
- 85. Which one of the following is a valid comparison of the characteristics of an RISC and a CISC computer?
 - (1) CISC computers exhibit better performance than RISC computers because complex instructions get executed in hardware.
 - (2) For the same program, a compiler generates more number of CISC instructions than RISC instructions.
 - (3) CISC computers usually have a higher MIPS rating as compared with comparable RISC computers.
 - (4) RISC computers deploy hardware control as compared with microprogrammed control in case of CISC computers.
 - 86. For transferring data from a hard disk to the attached computer on a page fault, which one of the following would be preferred mode of transfer?
 - (1) Direct Memory access
 - (2) Programmed I/O
 - (3) Hardware interrupt driven I/O
 - (4) Software interrupt driven
 - 87. A ROM is used to store the multiplication table of two 8 bit unsigned integers. What would be the size of required ROM?
 - (1) 64K X 16bits (2) 16K X 8bits (3) 256 X 16 bits (4) 32K X 8bits

						- a aracchar
88.	If four processors ar	e to be interconnec	ted with thre	ee memory	y modules usi	ng a crossoar
	interconnection, wh	at is the minimum r	number of sv	vitches re	quired?	20.0
	(1) 7	(2) 12	(3) 16	a contract	(4) 17	1
00	Distributed comput	Appearance of the second second	f tha f	allowing (lasses of com	puters?
89.					(4) MISD	
	(1) SISD	(2) SIMD	(3) MIMI		and, nvil *	
90.	What is the minimum	um number of 2-ing	out NOR gat	es require	d to impleme	nt 4-variable
	function expressed	in sum-of-mintern	ns from as	$f = \Sigma (0,$	2, 5, 7, 8, 1	0, 13, 15) ?
	Assume that all the	inputs and their cor	nplements a	re availabl	le. 11 1111	65. A. Lin
٠	(1) 3	(2) 4	(3) 5		(4) 6	21
91.	A scheduling algor	rithm assigns priorit	y proportion	nal to the	waiting time of	of a process.
		s with priority zero				
		ies every T time u				
	arrive at time zero	following is <i>true</i> i	i the proces	ses have	no no operat	ions and an
			first-come-fi	irst_serve	algorithm	
	(1) This algorithm is equivalent to the first-come-first-serve algorithm.					
	(2) This algorithm is equivalent to the round-robin algorithm.(3) This algorithm is equivalent to the shortest-job-first algorithm .					
		· ·				
	(4) This algorithm is equivalent to the shortest-remaining-time-first algorithm.					
92.	An operating syste	m maintains smalle	r data structi	ures for a	thread than a	process, as a
	thread is usually de	efined as a ' light we	eight process	s'. What is	the per thread	basis of the
	operating system?	tain a separate stack	S (1)	21 47 47 7		Van
		CPU register state			TENNEN	
		tain a virtual memor	ry state			
		scheduling and acc		rmation	1 1100 (190)	Part ()
-			•	imation	tot deve	
93.		wing statements are		1	To and the section	
	(1) Shortest remain	ning time first sched	luling may c	ause starv	ation	
	(2) Starvation may	be caused by pre-e	mptive sched	duling.	- 1 · 1	TOTAL TO .
	(3) In terms of resp	oonse time robin rou	and is better	than FCF	5	
		e statements are tru		,		

```
Which of the following statements is true for the dirty page in a page table?
94.
     (1) Helps to maintain LRU information
     (2) Allows only read on a page
     (3) Helps to avoid unnecessary writes on paging device
     (4) None of the above
95.
    The following program consists of 3 concurrent processes and 3 binary semaphores.
     The semaphores are initialized as S0 = 1, S1 = 0, S2 = 0.
     Process Po
     while(true)
     {
          wait(S0);
          print '0';
          release(S1);
          release(S2);
      Process PI
      waite(S1);
     release(S0);
      Process P2
      wait(S2);
      release(S0);
      How many times will P0 print '0'?
                                              (2) Exactly twice
      (1) At least twice
                                              (4) Exactly once
      (3) Exactly thrice
```

96.	is not possible in distributed	file system.
	(1) File replication	(2) Migration
	(3) Client interface	(4) Remote access
97.	In LINUX, a file named file 01 should buser(owner). Which one of the following	oe readable, writable and executable only by the set of command will be used?
	(1) chmod 700 filc01	(2) chmod 000 filc01
	(3) chmod 477 file01	(4) chmod 007 filc01
98.	Which is an unsolvable problem in acce	ss-matrix?
	(1) Owner override	(2) Brute force
•	(3) Access denied	(4) Confinement
99.	Data Encryption Standard is an example	of a cryptosystem.
	(1) Symmetric-key	(2) public key
	(3) hash key	(4) asymmetric-key
100.	RAID level is also known a block level striping and keeps a parity b	s block interleaved parity organisation and uses lock on a separate disk.
	(1) 1 (2) 2	(3) 3 (4) 4

Total No. of Printed Pages: 21

Sr. No.

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M.Phil./Ph.D./URS-EE-2019

SET-Z

SUBJECT: Computer Science

10036

Time : 1¼ Hours Roll No. (in figures)	x. Marks : 100 vords)	Tota	al Questions : 10
Name	Father's Name		
Mother's Name	Date of Examination		
	<u> </u>		
(Signature of the Candidate)		(Signature of t	ne Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code will be got uploaded on the University website after the conduct of Entrance Examination. In case there is any discrepancy in the Question Booklet/Answer Key, the same may be brought to the notice of the Controller of Examination in writing/through E.Mail within 24 hours of uploading the same on the University Website. Thereafter, no complaint in any case, will be considered.
- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 6. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

- 1. Which one of the following electronic circuits can be used to store 1 bit of data?
 - (1) Encoder

(2) OR gate

(3) Flip flop

- (4) Decoder
- 2. In 16-bit 2's complement representation, the decimal number -20 is:
 - (1) 1111 1111 0001 0100

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- (4) 1000 0000 1110 0100
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- 4. Which one of the following is the *correct* arrangement of the ease of programming (from easiest to hardest) of various programming languages?
 - (1) Binary machine code, hex code, assembly, high level language
 - (2) Binary machine code, assembly, hex code, high level language
 - (3) High level language, assembly, hex code, Binary machine code
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- 5. Which one of the following is a valid comparison of the characteristics of an RISC and a CISC computer?
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6.	For transferring data from a hard disk to the attached computer on a page fault, which one of the following would be preferred mode of transfer?
	(1) Direct Memory access
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	(3) Hardware interrupt driven I/O
	(4) Software interrupt driven
7.	would be the size of required ROM?
	(1) 64K X 16bits (2) 16K X 8bits (3) 256 X 16 bits (4) 32K X 8bits
8.	If four processors are to be interconnected with three memory modules using a crossbar interconnection, what is the minimum number of switches required? (1) 7 (2) 12 (3) 16 (4) 17
9.	Distributed computers belong to which one of the following classes of computers?
Э.	(1) SISD (2) SIMD (3) MIMD (4) MISD
10.	What is the minimum number of 2-input NOR gates required to implement 4-variable function expressed in sum-of-minterms from as $f = \Sigma$ (0, 2, 5, 7, 8, 10, 13, 15)? Assume that all the inputs and their complements are available.
	(1) 3 (2) 4 (3) 5 (4) 6
11.	Consider that 15 machines need to be connected in a LAN using 8-port Ethernet switches. Assume that these switches do not have any separate up link ports. The minimum number of switches needed is
	(1) 3 (2) 4 (3) 5 (4) 6
12.	An analog signal carries four bits in each signal element. Find the baud rate and bit rate, if 2000 signal elements are sent per second:
	(1) 2000bauds per sec, 8000bps
	(2) 8000bauds per sec, 2000bps
	(3) 2000bauds per sec, 2000bps
	(4) 8000bauds per sec, 8000bps
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13.	Using Cyclic Redundancy Check (CRC), find what is the dividend at the receiver, if the data unit is 111111 and the divisor is 1010?				
	(1) 111111011	(2) 111111110			
	(3) 1010110	(4) 110111111			
14.	In the IPv4 addressing format, the addresses is:	number of networks allowed under Class C			
·	$(1) 2^{14} (2) 2^7$	$(3) 2^{21} (4) 2^{24}$			
15.	What is the use of Ping command?				
	(1) To know network speed				
	(2) To test storage device				
	(3) To test a host on the network is rea	chable			
	(4) None of the above				
16.	Which layer is CoAP?				
	(1) Control layer	(2) Transport layer			
	(3) Service layer	(4) Application layer			
17.	Which layer in OSI model is responsible data?	ple for translation, encryption and compression of			
J. 20 1803	(1) Session layer	(2) Application layer			
	(3) Presentation layer	(4) Physical layer			
18.	The protocol is used for protocol is used by email programs to				
	(1) POP, SMTP	(2) SMTP, POP			
	(3) SMTP, SMTP	(4) POP, POP			
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	(2) SaaS is the cloud-based equivalent of shrink-wrapped software.				
4	(3) Software as a Service (SaaS) may be succinctly described as software that is deployed on a hosted service.				
	(4) All of the mentioned.				
20.	In IoT, MQTT is oriented.				
	(1) Data (2) Message (3) Network (4) Device				
21.	Which one of the following statements is <i>not</i> correct about the B+ tree data structure used for creating an index of a relational database table?				
	(1) B+ Tree is a height-balanced tree				
	(2) Non-leaf nodes have pointers to data records				
×	(3) Key values in each node are kept in sorted order				
	(4) Each leaf node has a pointer to the next leaf node				
22.	Select the correct asymptotic complexity of an algorithm with runtime T(n, n) where				
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•	$T(c, y) = \Theta(y)$ for $c \le 2$, and				
15.	$T(x, y) = \Theta(x+y) + T(x/2, y/2)$				
	(1) $\Theta(nLogn)$ (2) $\Theta(n^2)$ (3) $\Theta(n)$ (4) $\Theta(n^2Logn)$				
23.	Which of the following changes to QuickSort algorithm will improve its performance on average and are generally done in practice?				
	A. Randomly picking up to make worst case less likely to occur.				
	B. Calling insertion sort for small sized arrays to reduce recursive calls.				
*1	C. QuickSort is tail recursive, so tail call optimizations can be done.				
	D. A linear time median searching algorithm is used to pick the median, so that the worst case time reduces to O(n Log _n)				
	(1) A and B (2) B, C and D (3) A, B and C (4) B, C and D				
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19. Point out the *correct* statement with regard to Cloud Computing:

frameworks, or other constructs.

(1) Platforms can be based on specific types of development languages, application

24.	The number of eler	The number of elements that can be sorted in (log n) time using neap sort is.				
*	Α. Θ(1)	B. $\Theta(\sqrt{\log n})$	C. $\Theta\left(\frac{\log}{\log$	$\left(\frac{n}{\lg n}\right)$ D. $\Theta(\log n)$		
	(1) A			(4) D		
25.	Consider a completrees.	ete graph G with 4	vertices. The g	raph G has	panning	
	(1) 15	(2) 8	(3) 16	(4) 13		
26.	solves the problem of finding the shortest path from a point in a graph to destination.					
	(1) Kruskal's algor	rithm	(2) Prim's al	gorithm		
	(3) Dijkstra algori	thm	(4) Bellman	ford algorithm		
27.	The number of comparisons done by sequential search is:					
	(1) (N/2) - 1		(2) $(N+1)$	2		
	(3) (N-1)/2		(4) (N+2)/2			
28.	Consider the tree arcs of a BFS traversal from a source node W in an unweighted, connected, undirected graph. The tree T formed by the tree arcs is a data structure for computing:					
	(1) the shortest path between every pair of vertices.					
	(2) the shortest path from W to every vertex in the graph.					
	(3) the shortest paths from W to only those nodes that are leaves of T.					
¥ .	(4) the longest path in the graph.					
29.	Consider a hash table with 9 slots. The hash function is $h(k) = k \mod 9$. The collisions are resolved by chaining. The following 9 keys are inserted in the order:					
	5, 28, 19, 15, 20, 3		1 lawadha im	the head table many stime!		
	The maximum, minimum, and average chain lengths in the hash table, respectively, are:					
	(1) 3, 0, and 1		(2) 3, 3, and			
	(3) 4, 0, and 1		(4) 3, 0, and	2		
			in a second of the second of	5 46 36 30 30 30 30 30 30 30 30 30 30 30 30 30	D T O	

30.	A B-tree of order 4 and of height 3 will have a maximum	of keys.

- (1) 255
- (2) 63
- (3) 127
- (4) 188
- 31. A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is *true* if the processes have no I/O operations and all arrive at time zero?
 - (1) This algorithm is equivalent to the first-come-first-serve algorithm.
 - (2) This algorithm is equivalent to the round-robin algorithm.
 - (3) This algorithm is equivalent to the shortest-job-first algorithm .
 - (4) This algorithm is equivalent to the shortest-remaining-time-first algorithm.
- 32. An operating system maintains smaller data structures for a thread than a process, as a thread is usually defined as a 'light weight process'. What is the per thread basis of the operating system?
 - (1) Does not maintain a separate stack
 - (2) Maintains only CPU register state
 - (3) Does not maintain a virtual memory state
 - (4) Maintains only scheduling and accounting information
- 33. Which of the following statements are true?
 - (1) Shortest remaining time first scheduling may cause starvation
 - (2) Starvation may be caused by pre-emptive scheduling.
 - (3) In terms of response time robin round is better than FCFS
 - (4) All of the above statements are true
- 34. Which of the following statements is true for the dirty page in a page table?
 - (1) Helps to maintain LRU information
 - (2) Allows only read on a page
 - (3) Helps to avoid unnecessary writes on paging device
 - (4) None of the above

```
D
```

```
The following program consists of 3 concurrent processes and 3 binary semaphores.
The semaphores are initialized as S0 = 1, S1 = 0, S2 = 0.
Process P0
while(true)
    wait(S0);
     print '0';
     release(S1);
     release(S2);
 Process PI
 waite(S1);
 release(S0);
 Process P2
 wait(S2);
 release(S0);
 How many times will P0 print '0'?
                                         (3) Exactly thrice (4) Exactly once
(1) At least twice
                    (2) Exactly twice
 .....is not possible in distributed file system.
                                         (2) Migration
  (1) File replication
                                         (4) Remote access
  (3) Client interface
 In LINUX, a file named file 01 should be readable, writable and executable only by the
  user(owner). Which one of the following set of command will be used?
                                         (2) chmod 000 file01
  (1) chmod 700 file01
                                         (4) chmod 007 file01
  (3) chmod 477 file01
```

38.	Which is an unsolvable problem in acce	ess-matrix?	
	(1) Owner override	(2) Brute force	
	(3) Access denied	(4) Confinement	
39.	Data Encryption Standard is an exampl	e of a cryptosy	ystem.
	(1) Symmetric-key	(2) public key	
	(3) hash key	(4) asymmetric-key	
40.	RAID level is also known a block level striping and keeps a parity b	plock on a separate disk.	
(0.4)	(1) 1 (2) 2	(3) 3 (4) 4	# # # # # # # # # # # # # # # # # # #
41.	One of the main challenge/s of NLP is		1 182
	(1) Handling Ambiguity of Sentences		
į	(2) Handling Tokenization		
	(3) Handling POS- Tagging		
	(4) All of the mentioned		
42.	What is state space?		
	(1) The whole problem		•
	(2) Your Definition to a problem		e don le la
	(3) Problem you design		
	(4) Representing your problem with va	riable and parameter	
43.	Which search is similar to min-max sea	rch?	
· ·	(1) Hill-climbing search		
	(2) Depth-first search	la en avelgement er og det. Nederlande	i garage and
	(3) Breadth-first search	, OA	
* .	(4) All of the mentioned	Lance	
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44.	A 3-input neuron is trained to output a zero input is 111. After generalization, the output is:	when the input is 110 and a one when the will be zero when and only when the input
	(1) 000 or 110 or 011 or 101	
	(2) 010 or 100 or 110 or 101	the single and war of
	(3) 000 or 010 or 110 or 100	
	(4) 100 or 111 or 101 or 001	
45.	5. The truth values of traditional set theory is	and that of fuzzy set is
,	(1) Either 0 or 1, between 0 & 1	
	(2) Between 0 & 1, either 0 or 1	
	(3) Between 0 & 1, between 0 & 1	
	(4) Either 0 or 1, either 0 or 1	
46.	Stochastic Gradient Decent (SGD)?	are true for Gradient Decent (GD) and
	the error function.	rameters in an iterative manner to minimize
	b. In SGD, you have to run through all t update of a parameter in each iteration.	he samples in your training set for a single
	c. In GD, you either use the entire dat parameter in each iteration.	a or a subset of training data to update a
	(1) Only a (2) Only b (3)	Only c (4) a, b and c
47	47. In hopfield network with symmetric weigh	s, energy at each state may?
	(1) increase	2) decrease
	(3) decrease or remain same	decrease or increase
4	48. In which of the following learning te punishment to learner?	chniques, the teacher returns reward and
	(1) Active learning	2) Reinforcement learning
•	(3) Supervised learning	4) Unsupervised learning
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49	rather than using graph to provid	d to extract the plan directly from the planning graple heuristic.
	(1) BFS/DFS	(2) A*
	(3) Graph-Plan	(4) Greedy
50	. Inference algorithm is complete of	only if:
	(1) It can derive any sentence	
	(2) It can derive any sentence that	at is an entailed version
	(3) It is truth preserving	
٠	(4) It can derive any sentence tha	t is an entailed version & It is truth preserving
51.	In orthographic projection, the ob-	pject is placed with one of its faces to the
	picture plane.	
	(1) Inclined	(2) Perpendicular
	(3) Parallel	(4) Any of the above
52.	The intersection of primary RO	B colours and primary CMYK colours produces
	and colour re	
	(1) White colour, White colour	
٠	(2) White colour, Black colour	
	(3) Black colour, White colour	
	(4) Black colour, Black colour	

53. Let swap () be a function that swaps two elements using their addresses. Consider the following C function:

```
void fun(int arr[], int n)
{
    for (int i = 0; i < n; i + = 2)
    {
        if (i > 0 && arr[i - 1] > arr[i])
            swap(&arr[i], &arr[i-1]);
        if (i < n - 1 && arr[i] < arr[i + 1])
            swap(&arr[i], &arr[i + 1]);
        }
}</pre>
```

If an array {10, 20, 30, 40, 50, 60, 70, 80} is passed to the function, the array is changed to:

```
(1) {20, 10, 40, 30, 60, 50, 80, 70}
```

- (2) {10, 30, 20, 40,60, 50, 80, 70}
- (3) {10, 20, 30, 40, 50, 60, 70, 80}
- (4) {80, 70, 60, 50, 40, 30, 20, 10}

54. What is the return value of f(p, p), if the value of p is initialized to 5 before the call? Note that the first parameter is passed by reference, whereas the second parameter is passed by value:

```
int (int &x, int c) {
    c = c - 1;
    if (c == 0) return 1;
    x = x + 1;
    return f(x, c) * x;
}
(1) 3024 (2) 6561 (3) 55440 (4) 161051
```

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55. V	Vhich of the following	ng is used to open	document in r	new window?	1
-------	------------------------	--------------------	---------------	-------------	---

- (1) Link
- (2) Link
- (3) Link
- (4) Link

56. What is the difference between servlets and applets?

- i. Servlets execute on Server; Applets execute on browser
- ii. Servlets have no GUI; Applet has GUI
- iii. Servlets creates static web pages; Applets creates dynamic web pages
- iv. Servlets can handle only a single request; Applet can handle multiple requests
- (1) i, ii, iii are correct

(2) i, ii are correct

(3) i, iii are correct

(4) i, ii, iii, iv are correct

57. The transformation in which an object can be shifted to any coordinate position in three dimensional plane are called:

- (1) Translation
- (2) Scaling
- (3) Rotation
- (4) All of these

- (1) It gets inherited publicly by default
- (2) It gets inherited protected by default
- (3) It gets inherited privately by default
- (4) It is not possible

59. The most appropriate matching for the following pairs is:

X: Indirect addressing

(i): Loops

Y: Imeediate addressing

(ii): Pointers

Z: Auto decrement addressing

(iii): Constants

(1) X - (iii), Y - (ii), Z - (i)

(2) X - (i), Y - (iii), Z - (ii)

(3) X - (ii), Y - (iii), Z - (i)

(4) X - (iii), Y - (i), Z - (ii)

60.	fseek() should be preferred over rewind (1) rewind() doesn't work for empty fil	
	(2) rewind() may fail for large files	and approximate with the second control of t
	(3) In rewind, there is no way to check(4) All of the above	if the operations completed successfully
61.	Database: In second normal form	
	(1) A composite attributes is converted	
	(2) Non key attributes are functionally	
		dependent not on a part of key attributes.
*	(4) All the above.	
62.	what stores the metadata about the str of the database?	ructure of the database, in particular the schema
	(1) Indices	(2) Database log
	(3) Data files	(4) Data Dictionary
63.	Consider the following Employee table	
	ID salary	DeptName
	1 10000	EC
	2 40000	EC
	3 30000	CS
	4 40000	ME
	5 50000	ME
	6 60000	ME
	7 70000	CS
	How many rows are there in the result	of following query?
	SELECT E.ID	
	FROM Employee E	the second secon
,	WHERE EXISTS (SELECT E2.salary	
	FROM Employee E2	
	WHERE E2.DeptName = 'CS'	W
	AND E.salary> E2.salary)	
	(1) 0 (2) 4	(3) 5

64.	In DBMS, index is clustered, if:
	(1) it is on a set of fields that form a candidate key.
	(2) it is on a set of fields that include the primary key.
	(3) the data records of the file are organized in the same order as the data entries of the index.
	(4) the data records of the file are organized not in the same order as the data entries of the index.
65.	Which of the following statement is true for the "Reconciled data"?
	(1) Data stored in the various operational systems throughout the organization.
	(2) Current data intended to be the single source for all decision support systems.
	(3) Data stored in one operational system in the organization.
	(4) Data that has been selected and formatted for end-user support applications.
66.	Data warehouse is:
	(1) The actual discovery phase of a knowledge discovery process
	(2) The stage of selecting the right data for a KDD process
9 4	(3) A subject-oriented integrated time variant non-volatile collection of data in support of management
•	(4) None of these
67.	The need to synchronize data upon update is called
	(1) Data Manipulation (2) Data Replication
	(3) Data Coherency (4) Data Imitation
68.	can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
	(1) MapReduce (2) Mahout
	(3) Oozie (4) All of the mentioned
69.	The attribute AGE is calculated from DATE_OF _BIRTH. The attribute AGE is
	(1) Single valued (2) Multi valued (3) Composite (4) Derived
70.	Which of the following is a NoSQL Database Type?
	(1) SQL (2) Document databases
	(3) JSON (4) All of the mentioned
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71.	Which one of the following is not Specifications (SRS) document?	desi	ired in	n a	good	Software	Requir	ement
	(1) Functional Requirements		٠.		a •			
	(2) Non-Functional Requirements		,					6
	(3) Goals of Implementation						•	. \
	(4) Algorithms for Software Implementa	ation						
72.	The Phases of formal review process, in Arrange them in the <i>correct</i> order:	in sof	ftware	engir	eering	are men	tioned b	elow.
	i. Planning							
	ii. Review Meeting					•		
	iii. Rework	(I)					, 2	*1
	iv. Individual Preparations		*					
	v. Kick Off	10	· .	•		· •		
	vi. Follow Up							* *
	(1) i, ii, iii, iv, v, vi	(2)	vi, i, ii	i, iii, i	v, v			
, (,) b	(3) i, v, iv, ii, iii, vi	(4)	i, ii, ii	i, v, iv	, vi			
73	System architecture is determined during	ıg whi	ch pha	ise?				
	(1) Requirement gathering		Imple		tion		* 26	
*	(3) Development	(4)	Design	n				
				¥.				
7	4. Component testing is a:				21 80 5 12 1			
	(1) Black box testing		White					
	(3) Grey box testing	(4)	Both ((1) an	d(2)			

The objective of software project planning is to:

- (1) Convince the customer that a project is feasible
- (2) Make use of historical project data
- (3) Enable a manager to make reasonable estimates of cost and schedule
- (4) Determine the probable profit margin prior to bidding on a project

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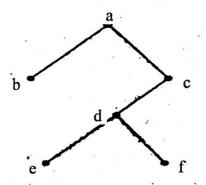
(3) Grey box testing

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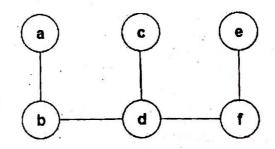
76.	In Software Engineering which is not a	in element of requirement model?
	(1) Behavioural elements	(2) Class based elements
	(3) Data elements	(4) Scenario based elements
77.	The model which estimates the total exproject staff is	ffort in terms of person, months of the technical
•	(1) Spiral Model	(2) Waterfall model
	(3) Win-win spiral model	(4) COCOMO Model
78.	Agile Modelling (AM) provides gui software tasks?	dance to practitioner during which of these
	(1) Analysis	(2) Design
	(3) Testing	(4) Both 1 and 2
79.	Read the columns and match the follow	ing:
	(a) Data coupling (i) Module	A and Module B have shared data.
		ency between modules is based on the fact they nicate by only passing of data.
		complete data structure is passed from one to another.
		ne control is passed from one module to the of another.
	(1) a - iii, b - ii, c - i, d - iv	(2) a - ii, b - iii, c - i, d - iv
	(3) a - ii, b - iii, c - iv, d - i	(4) a - iii, b - ii, c - iv, d - i
80.	Which of the following is <i>not</i> include document?	ed in the Software requirements specification
	(1) Functional Requirements	
	(2) Non-functional requirements	
•	(3) Goals of implementation	ing. Marijan ing mga mga mga mga mga mga mga mga mga mg
	(4) User Manual	

81.	The police arrested four criminals - P, Q, R and S. The criminals knew each other. They made the following statements:
	P says "Q committed the crime."
	Q says "S committed the crime."
	R says" I did not do it."
	S says "What Q said about me is false."
	Assume only one of the arrested four committed the crime and only one of the statements made above is true. Who committed the crime?
	(1) P (2) R (3) S (4) Q
82.	In a college, there are three student clubs, Sixty students are only in the Drama club, 80 students are only in the Dance club, 30 students are only in Maths club, 40 students are in both Drama and Dance clubs, 12 students are in both Dance and Maths clubs, 7 students are in both Drama and Maths clubs, and 2 students are in all clubs. If 75% of the students in the college are not in any of these clubs, then the total number of students in the college is
83.	The random experiment is rolling a pair of six sided dice. Compute the probability of the sum of two dice being 8.
	(1) 5/36 (2) 7/36 (3) 6/36 (4) 8/36
84.	Let G be an undirected complete graph on n vertices, where $n > 2$. Then, the number of different Hamiltonian cycles in G is equal to:
	(1) $n!$ (2) $n-1!$ (3) 1 (4) $(n-1)!/2$
85.	Let $A = \{1,2,3\}$. Then number of relations containing $(1, 2)$ and $(1, 3)$ which are reflexive and symmetric but not transitive are:
	(1) 1 (2) 2 (3) 3 (4) 4
86.	
	(1) 32 (2) 256 (3) 64 (4) 128

87. In the given tree list the order that the nodes are processed using preorder and postorde are:



- (1) befdca; acdfeb
- (2) befdca; abcdef
- (3) abcdef; befdca
- (4) abcdef; fedcba
- 88. In graphical solutions of linear inequalities, solution can be divided into:
 - (1) one subset
- (2) two subsets
- (3) three subsets
- (4) four subsets
- 89. According to system of constraints, solution set graphical representation is classified as:
 - (1) region of ordinate solutions
- (2) region of intercept solutions
- (3) region of vertex solutions
- (4) region of feasible solutions
- 90. How many Hamiltonian paths does the following graph have?



- (1) 1
- (2) 2
- (3) 0
- (4) 3

91. Consider the following grammar:

$$P \rightarrow x Q R S$$

$$Q \rightarrow yz \mid z$$

 $R \rightarrow w \mid \varepsilon$

 $S \rightarrow y$

What is FOLLOW (Q)?

- $(1) \{R\}$
- $(2) \{w\}$
- $(3) \{w, y\}$
- $(4) \{w, \$\}$

92.	Pushdown machine represents:	GREAT AND THE STATE OF THE STAT
	(1) Type 3 regular grammar	(2) Type 2 context free grammar
	(3) Type 1 Context sensitive grammar	
93.	The languages generated by Turing mac	hine are:
	(1) Recursively enumerable languages	
	(2) Regular languages	
	(3) Regular expression	est of the second control of the con
	(4) Context free languages	to a to provide the section of the control of the
94.	Any strings of terminals that can be gen	crated by CFG is:
	$S \rightarrow XY$	
	$X \rightarrow aX \mid bX \mid a$	
	$Y \rightarrow Ya \mid Yb \mid b$	
	(1) has at least one b	(2) should end by 'a'
	(3) has no consecutive a's or b's	(4) has at least 2a's
95.	In a compiler, keywords of a language a	are recognized during:
	(1) parsing of the program	and the state of t
	(2) the code generation	
	(3) the lexical analysis of the program	e to a paralle de l'en acce d'accet d'accet
	(4) dataflow analysis	e decele grien plat pre our des la la la la la compa
06	Group 1 with correct	et options from those given in Group 2:
96	Group 1	Group 2
	P. Regular expression	(i) Syntax analysis
	Q. Pushdown automata	(ii) Code generation
	R. Dataflow analysis	(iii) Lexical analysis
	S. Register allocation	(iv) Code optimization
	(1) P-(iv) Q-(i), R-(ii), S-(iii)	(2) P-(iii), Q-(i), R-(iv), S-(ii)
	(3) P-(iii), Q-(iv), R-(i), S-(ii)	(4) P-(ii), Q-(i), R-(iv), S-(iii)
	(-) - (-)/	

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- 97. An LALR(I) parser for a grammar G can have shift-reduce (S-R) conflicts if and only if:
 - (1) the SLR(1) parser for G has S-R conflicts
 - (2) the LR(1) parser for G has S-R conflicts
 - (3) the LR(0) parser for G has S-R conflicts
 - (4) the LALR(1) parser for G has reduce-reduce conflicts
- 98. Rahul, Mohan, Srinivas and Arun are seated around a square table. Rahul is sitting to the left of Mohan. Srinivas is sitting to the right of Arun. Which of the following pairs are seated opposite each other?
 - (1) Rahul and Mohan

(2) Srinivas and Arun

(3) Srinivas and Mohan

- (4) Srinivas and Rahul
- 99. Consider the following languages:

$$L_{1} = \left\{ 0^{p} 1^{q} 0^{r} \mid p, q, r \ge 0 \right\}$$

$$L_{2} = \left\{ 0^{p} 1^{q} 0^{r} \mid p, q, r \ge 0, p \ne r \right\}$$

Which one of the following statements is false?

- (1) L₂ is context-free
- (2) L₁ intersection L₂ is context-free
- (3) Complement of L₂ is recursive
- (4) Complement of L₁ is context-free but not regular
- 100. Resolution of externally defined symbols is performed by:
 - (1) Linker
- (2) Loader
- (3) Compiler
- (4) Interpreter

r. No.	nswer Key of M.Phil/Ph. Set A	2019 (Computer Sc	ience Engineering / Cor	mputer Science)
1	2	Oet D	Set C	Set D
2	3	2	2	3
3	1	3	4	3
4	4	3	3	1
5	1	3	3	3
6	2	3	2	4
7	3	3	3	1
8		2	3	3
9	2	2	1	2
10	4	1	4	3
11	3	1,	2	1
12	3	2	3	1
13	3	4	2	1
	1	4	1	2.
14	3	3	2	3.
15	4	1	2	3
16	1	2	2	3
17	3	1	1	3
18	2	4	3	_
19	3	1		2
20	1	4	3	4
21	3		3	2,
22	2	1	2	2
23	1	4	3	3 ,
24		2	1	3.
25	2	3	4	3
	2	1	1	3 -
26	2	1	2	3
27	1	3	3	2.
28	3	2	2	2
29	3	3	4	1
30	3	4	3.	1
31	1	3	1	2
12	4	3	1	
33	2	1	2	4
34	3	3		4
35	1		3	3
36		4	3	1-
37	1	1	3	2 -
	3	3	3	1
38	2	2	2	4
19	3	3	4	1
10	4	1	2,	4
1	2	1	4	1
2	4	1	3	
3	3	2	4	4
4	3	3		2
5	2	3	2	3
		3	3	1
6	3	3	3	1
7	3	3	4	3
3	1	2	4	2
	4	4	2	3
0	2	2		
1	2		4	4
2		4	1	3
-	4	3	4	2
3	4	4	2	1
	3	2	3	2

55	1	3	1	2	
56	2	3	1		
57	1	4	3	1	
58	4	4	2	3	
59	1	2	3	3	
60	4	4	4	3,	
61	4	3	2	2 ·	
62	3	2	3	4 '	
63	4	1	3	3.	
64	2	4	3	3 '	
65	3	3	3	2.	
66	3	2	3	3 ·	
67	4	2	2	3 ·	
68	4	3	2	1	
69	2	4	1	4.	
70	4	1	1	2 ·	
71	2	2	3	4 :	
72	3	4	2	3 ·	
73	3	3	1	4 ·	
74	3	3	4	2 '	
75	3	2	3	3	
76	3	3	2	3,	
77	2	3	2	4	
78	2	1	3	4	
79	1	4	4	2 ,	
80	1	2	1	4 -	
81	3	3	3	2	
82	2	2	3		
83	1	1	1	3 ·	
84	4	2	3	1	
85	3	2		4 -	
86	2	2	4	1 .	
87	2	1	1	2 '	
88	3	3	3	3 .	
89	4	3	2	2 .	
90	1	3	3	4 .	
91	1	2	1	3 ·	
92	1	3	2	3	
93	2		4	2	
94	3	1	4	1	
95	3	4	3	4	
96	3	1	1	3	
97	3	2	2	2	
98	2	3	1		
99		2	4	2	
100	4	4	1	3	
	2	3	4	4	
Jaly 19/11/		9 - 1 = 19 19. 19	11/19. Bw 2. Rainer Naudal	9/11/19 Or Bulki	1
Kamalda	up Dr. K	amna		WV ,	