	Total Pages: 7

Final Scheme of Valuation/Answer Key

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE (R)COMPREHENSIVE EXAMINATION, JUNE 2022
(2019 SCHEME)

Course Code: CST308

Course name: COMPREHENSIVE EXAM (R)

Max. Marks: 50	Duration: 1Hour

Instruc

(1) Each question carries one mark. No negative marks for wrong answers
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation.
(5) Calculators are not permitted

1.	The Inorder and Preorder traversal of a binary tree is **d b e a f c g** and **a b d e c f g** respectively. Which among the following is the correct Post Order Traversal Sequence for this tree?							
	a)	**d e b f g c a**						
2.	Which of the following is not the application of stack?							
							d)	**Data Transfer between two asynchronous processes**
3.	In the worst case, the number of comparisons needed to search a singly linked list of length n for a given element is?							
							d)	**n**
4.	To implement a stack using queue (with only enqueue and dequeue operations), how many queues will you need?							
			b)	**2**				
5.	The optimal data structure used to solve Tower of Hanoi is _____							
	a)						**d)**	**Stack**
6.	Assume that the operators +, -, X are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, X, +, -. The postfix expression for the infix expression a + b X c – d ^ e ^ f is?							
	a)	**abc X+ def ^^ –**	b)					
7.	The time complexity of heap sort in worst case is							

					c)	**O(nlogn)**		
8.	Suppose we are sorting an array of eight integers using heapsort, and we have just finished some heapify (either maxheapify or minheapify) operations. The array now looks like this: 16 14 15 10 12 27 28 How many heapify operations have been performed on root of heap?							
			b)	**2**				
9.	What is the number of edges present in a complete graph having n vertices?							
			b)	**(n*(n-1))/2**				
10.	If several elements are competing for the same bucket in the hash table, what is it called?							
					c)	**Collision**		
11	A process which is copied from main memory to secondary memory on the basis of requirement is known as							
	a)	**Demand paging**						
12	For which of the following purposes, Banker's algorithm is used?							
	a)	**Preventing deadlock**						
13	Identify the system calls that on termination does not return control to the calling point.							
	a)	**exec**						
14	A CPU generates 32-bit virtual addresses. The page size is 4 KB. The processor has a translation look-aside buffer (TLB) which can hold a total of 128-page table entries and is 4-way set associative. The minimum size of the TLB tag is							
					c)	**15 bits**		
15	Dirty bit is used to indicate which of the following?							
					c)	**A page has been modified after being loaded into cache**		
16	A system uses FIFO policy for page replacement. It has 4-page frames with no pages loaded to begin with. The system first accesses 100 distinct pages in some order and then accesses the same 100 pages but now in the reverse order. How many page faults will occur?							
	a)	**196**						
17	If a process is executing in its critical section, then no other processes can be executing in their critical section. What is this condition called?							

	a)	**mutual exclusion**						
18	What is a long-term scheduler?							
	a)	**It selects processes which have to be brought into the ready queue**						
19	A systematic procedure for moving the CPU to new process is known as-							
							d)	**Context Switching**
20	In a virtual memory system, size of virtual address is 32-bit, size of physical address is 30-bit, page size is 4 Kbyte and size of each page table entry is 32-bit. The main memory is byte addressable. Which one of the following is the maximum number of bits that can be used for storing protection and other information in each page table entry?							
							d)	**14**
21	The amount of ROM needed to implement a 4-bit multiplier is							
							d)	**2 Kbits**
22	Match the following (a) Immediate address mode (1) Local variables (b) Direct address mode (2) Relocatable programs (c) Indirect address mode (3) Pointer (d) Index addressing mode (4) Locality of reference (e) Base address mode (5) Arrays (f) Relative address mode (6) Constant Operands							
	a)	**a6 b1 c3 d5 e2 f4**						
23	Register renaming is done in pipelined processors							
					c)	**to handle certain kinds of hazards**		
24	Memory interleaving is done to							
			b)	**Reduce memory access time**				
25	In an instruction execution pipeline, the earliest that the data TLB (Translation Lookaside Buffer) can be accessed is							
					c)	**after effective address calculation has completed**		

26	The correct matching for the following pairs is (A) DMA I/O (1) High speed RAM (B) Cache (2) Disk (C) Interrupt I/O (3) Printer (D) Condition Code Register (4) ALU							
			b)	**A2B1C3D4**				
27	The technique whereby the DMA controller steals the access cycles of the processor to operate is called ------							
					c)	**Cycle Stealing**		
28	For the daisy chain scheme of connecting I/O devices, which of the following statement is true?							
	a)	**It gives non-uniform priority to various devices**						
29	A machine with N different opcodes can contain how many different sequences of micro-operations							
							d)	**N**
30	A cache has a 64 KB capacity, 128 -byte lines (blocks), and is 4 -way set associative. The system containing the cache uses 32 -bit addresses. How many lines (blocks) and sets does the cache have?							
			b)	**128**				
31	Which of the following is the property of transaction that protects data from system failure?							
					c)	**Durability**		
32	Which normalization form is based on the transitive dependency?							
					c)	**3NF**		
33	Which of the following SQL command is used for removing (or deleting) a relation form the database?							
	a)	**Drop**						
34	Which of the following is known as minimal super key?							
			b)	**Candidate key**				
35	Given the following relation instance. x y z 1 4 2 1 5 3 1 6 3 3 2 2 Which of the following functional dependencies are satisfied by the instance?							
			b)	**YZ -> X and Y -> Z**				

36 Consider the following relational schema:

Suppliers(sid:integer, sname:string, city:string, street:string)
Parts(pid:integer, pname:string, color:string)
Catalog(sid:integer, pid:integer, cost:real)
Consider the following relational query on the above database:

```
SELECT S.sname
   FROM Suppliers S
      WHERE S.sid NOT IN (SELECT C.sid
                  FROM Catalog C
                  WHERE C.pid NOT IN (SELECT P.pid
                              FROM Parts P
                              WHERE P.color<> 'blue'))
```

Assume that relations corresponding to the above schema are not empty. Which one of the following is the correct interpretation of the above query

	a)	**Find the names of all suppliers who have supplied a non-blue part.**	b)					

37 An entity in A is associated with at most one entity in B. An entity in B, however, can be associated with any number (zero or more) of entities in A.

							d)	**Many-to-one**

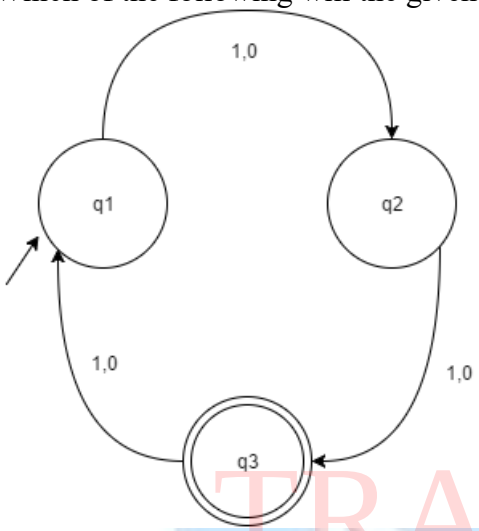
38 Which commands are used to control access over objects in relational database?

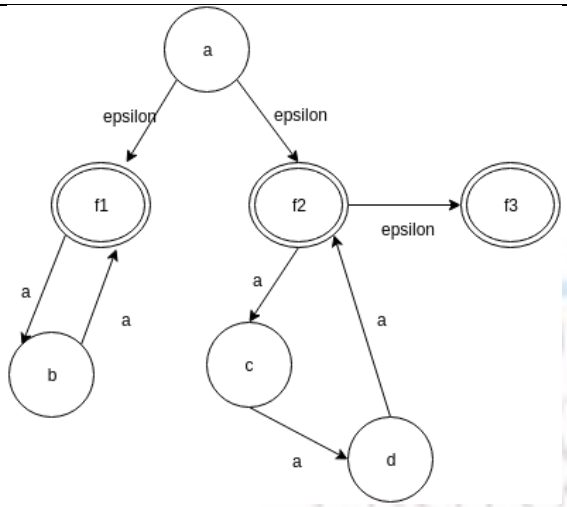
			b)	**GRANT & REVOKE**				

39 Consider the ORACLE relationships below:One (x, y) = {<2, 5>, <1, 6>, <1, 6>, <1, 6>, <4, 8>, <4, 8>} Two (x, y) = {<2, 55>, <1, 1>, <4, 4>, <1, 6>, <4, 8>, <4, 8>, <9, 9>, <1, 6>}. Consider the following SQL queries, SQ1 and SQ2, respectively:

```
SQ1 : SELECT * FROM One)
        EXCEPT
    (SELECT * FROM Two);
SQ2 : SELECT * FROM One)
      EXCEPT ALL
    (SELECT * FROM Two);
```

What is the cardinality of the result generated on the execution of each SQL query on the instances above?

			b)	**1 and 2, respectively**				
40	Which of the following is **TRUE**?							
					c)	**Every relation in BCNF is also in 3NF**		
41	A Language for which no DFA exist is a_____							
			b)	**Non-Regular Language**				
42	Which of the following will the given DFA won't accept?  							
	a)	**ε**						
43	Regular expression for all strings starts with ab and ends with bba is.							
					c)	**ab(a+b)*bba**		
44	Which of the following options is correct? Statement 1: Initial State of NFA is Initial State of DFA. Statement 2: The final state of DFA will be every combination of final state of NFA.							
	a)	**Statement 1 is true and Statement 2 is true**						
45	The number of elements present in the e-closure(f2) in the given diagram:							

									
						c)	**2**		
46	The language accepted by Push down Automaton:								
			b)	**Context free language**					
47	Given grammar G: (1)S->AS (2)S->AAS (3)A->SA (4)A->aa Which of the following productions denies the format of Chomsky Normal Form?								
	a)	**2,4**							
48	Which of the problems are unsolvable?								
						c)	**Halting problem & Boolean Satisfiability problem**		
49	Given Grammar: S->A, A->aA, A->e, B->bA Which among the following productions are Useless productions?								
								d)	**B->bA**
50	The production of the form A->B , where A and B are non terminals is called								
			b)	**Unit production**					