University of Mumbai
Examinations Summer 2022

23/5/2022

QP 93515

S.E. (Computer Engineering) (SEM-IV)
(Choice Base Credit Grading System) (R- 19) (C Scheme)
Subject: Database Management System

Max. Marks: 80

Time: 2 hour 30 minutes

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The capacity to alter the database schema at one level without affecting any other levels is termed as
Option A:	Data Independence
Option B:	Data Mapping
Option C:	Data Isolation
Option D:	Data Transformation
2.	An attribute (say A) of entity set is calculated from other attribute value (say B). The attribute A is called
Option A:	Single valued
Option B:	Multi valued
Option C:	Composite
Option D:	Derived
3.	Consider the following relations: Parts (pid,pname,color) PartCost (pid,cost) What does the following relational algebra expression represent? $\Pi_{pid}((\sigma_{color='red'}(Parts)) \bowtie (\sigma_{cost \geq 1000}(PartCost)))$
Option A:	Find the pid of all parts whose color is red.
Option B:	Find the pid of all parts whose color is red or cost ≥ 1000.
Option C:	Find the pid of all parts whose color is red but not cost ≥ 1000.
Option D:	Find the pid of all parts whose color is red and cost ≥ 1000 .
4.	Let E1 and E2 be two entities in an E-R diagram with one multi-valued attribute in E1, R1 and R2 are two relationships between E1 and E2, where R1 is one-to-many and R2 is many-to-many, R1 and R2 do not have any attributes of their own, What is the minimum number of tables required to represent this situation in the relational model.
Option A:	2
Option B:	4
Option C:	3
Option D:	5
5.	Consider the instructor table: INSTRUCTOR (instr_id, name, dept name, salary). insert a new instructor 'I-101', named 'PMJ', with 50,000 salary for department 'COMP'. Identify the appropriate SQL statement.
Option A:	INSERT INTO TABLE INSTRUCTOR VALUES ('I-101','PMJ','COMP', 10,00,000)
Option B:	INSERT INTO INSTRUCTOR ('I-101','PMJ','COMP', 50,000)
Option C:	INSERT INTO INSTRUCTOR VALUES ('I-101', 'PMJ', 'COMP', 50,000)

D	What is the producer consumer problem? Provide solution to producer consumer problem using semaphores.
E	Give details of file organization types
F	Give details of IO Buffering techniques.

Q3.

Solve any Two Questions out of Three   **10 marks each**

A

Consider the following set of processes.

Process	Burst Time	Arrival Time	Priority
P1	0	4	2 (L)
P2	1	2	4
P3	2	3	6
P4	3	5	10
P5	4	1	8
P6	5	4	12 (H)
P7	6	6	9

Note Higher number is having higher priority.

1. Draw Gantt chart for SJF-Preemptive Scheduling and Preemptive Priority scheduling.
2. Calculate average waiting time, average turnaround time and average response time for this scheduling algorithms.

B

Define Deadlock. Explain the necessary & sufficient conditions of deadlock. Suggest techniques to avoid deadlock.

C

Given five memory partition of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would the first-fit, best-fit and worst-fit algorithms place processes of P1-212 KB, P2-417 KB, P3-112 KB and P4-426 KB (in order)? Which algorithm makes the most efficient use of memory? Use fixed size Dynamic partitioning method.

Q4.

		5 marks each
A	**Solve any Two**	
i.	Draw and Explain five state process model.	
ii.	Explain with the help of a diagram how the system call will be generated?	
iii.	Explain the effect of page size on performance.	
		10 marks each
B	**Solve any One**	
i.	Describe Disk Scheduling algorithms with example	
ii.	Explain File Allocation methods in detail.	