Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Third Semester

Artificial Intelligence and Data Science

AD3391 – Database Design and Management

Regulations – 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Assess the characteristics that distinguish the strong entity with weak entity.	L2	1	2
2.	Differentiate file processing system with database management system.	L2	1	2
3.	Consider the following tables: Employee (Emp_no, Name, Emp_city) Company (Emp_no, Company_name, Salary) i. Write a SQL query to display Employee name and company name. ii. Write a SQL query to display employee name, employee city ,company name and salary of all the employees whose salary >10000	L3	2	2
4.	Compare and contrast between primary key and unique key.	L2	2	2
5.	What do you mean by functional dependencies? Give an example.	L1	3	2
6.	Assess how 'Boyce-Codd normal form is found to be stricter than third normal form'.	L3	3	2
7.	List down the properties of transactions with simple explanation.	L1	4	2
8.	Evaluate the situation to roll back a transaction.	L5	4	2
9.	Compare the structured data with unstructured data.	L2	5	2
10.	List out the key components of HBase.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	With the help of a neat block diagram explain the basic architecture of a database management system?	L3	1	16
		Or			
	b	Develop an entity relationship model preparation staff (chef) and finalize the customer_s bill. The Food preparation staffs (Chefs), with their touch-display interfaces to the system, are able to view orders sent to the kitchen by waiters. During preparation, they are able to let the waiter know the status of each item, and can send notifications when items are completed. The system should have full accountability and logging facilities, and should support Supervisor actions to account for exceptional circumstances, such as a meal	L3	1	16

being refunded or walked out on.

12.	a	Explain about database languages with examples?	L2	2	16
		Or			
	b i	What is an integrity constraint? Explain the importance of referential integrity constraint.	L2	2	8
	ii	Explain about aggregate operators in SQL with example.	L2	2	8
13.	a i	An agency called Instant cover supplies part-time/temporary staff to hotels in Scotland. The below lists the time spent by agency staff working at various hotels. The national insurance number (NIN) is unique for every member of staff.	L2	3	8

NIN	ContractNo	Hours	eName	hNo	hLoc
1135	C1024	16	Smith J.	H25	East Killbride
1057	C1024	24	Hocine D.	H25	East Killbride
1068	C1025	28	White T.	H4	Glasgow
1135	C1025	15	Smith J.	H4	Glasgow

i. This table is susceptible to update anomalies. Provide examples of insertion, deletion and update anomalies.
ii. Normalize this table to third normal form. State any assumptions.

	ii	Write about loss -less join decomposition with an example.	L2	3	8
		Or			
	b	Define normalization? Explain 1NF,2NF,3NF and BCNF normal forms.	L2	3	16
14.	a	Consider the following schedules. The actions are listed in the order they are scheduled, and prefixed with the transaction name. S1:T1:R(X),T2:R(X),T1:W(Y),T2:W(Y),T1:R(Y),T2:R(Y) S2:T3:W(X),T1:R(X),T1:W(Y),T2:R(Z),T2:W(Z),T3:R(Z) For each of the schedule, answer the following questions: (i) What is the precedence graph for the schedule? (ii) Is the schedule conflict –serializable? If so, what are all the conflict equivalent serial schedules? (iii) Is the schedule view-serializable? if so, what are all the view equivalent serial schedules?	L3	4	16
		Or			
	b	What is concurrency control? How is it implemented in DBMS? Explain.	L3	4	16
15.	a i	What is document based NoSQL systems? Explain about basic operations CRUD in MongoDB.	L2	5	8
	ii	Explain the CAP theorem in NoSQL Systems.	L2	5	8
		Or			
	b i	How to Query for null or missing fields in MongoDB? Discuss with example.	L2	5	8
	ii	What is NoSQL? Explain briefly about aggregate data models with a	L2	5	8

neat diagram. Considering examples of relationships and aggregates.