



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: 24M10085

SLOT: A1+TA1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

Programme Name & Branch : M.Tech. CSE (Integrated)
Course Code and Course Name : CSI2004: Advanced Database Management Systems
Faculty Name(s) : Dr. NAGESHWAR RAO RAGI, Dr. ILAYARAJA V,
 Dr. GEETHA MARY A, Dr. JAYASHREE J
Class Number(s) : VL2025260501682, 1452, 1436, 1441
Date of Examination : 27 Jan 2026
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes
 - CO1 - Acquire the concept of physical database design and tuning.
 - CO2 - Learn the concept of parallel and distributed database.

Q. No	Question	Module	Marks	CO	BL
1.	Convert the ER diagram in the given figure into the corresponding relational schema, outlining each step clearly.	1	10	1	3
2.	For the following schedules, find all the conflict operations and in each case check for conflict serializability. If so find the possible serialized schedules. S1: r1(X);r2(X);w2(X);r3(Y);r1(Y);w1(Y);r2(Z);w2(Z);r3(X);w3(X);w1(X);w3(Y) S2: r3(X);r2(X);r2(Y);w2(Y);w3(X);r1(X);w1(X);r3(Y);w3(Y);r1(Y);w1(Y) S3: r1(X); r2(Z);r1(X);r3(X);r3(Y);w1(X);w3(Y);r2(Y);w2(Z);w2(Y)	1	10	1	3

**VIT**Vellore Institute of Technology
(Decreed to be University under section 3 of UGC Act, 1956)

REG.NO.:

SLOT: A1+TA1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

3.	Partition the following table among 3 partitions P_0, P_1 and P_2, by a. Round robin partitioning. [3 Mark] b. Hash partitioning on the attribute 'Age' using the formula, $h(\text{age}) = (\text{age} \bmod 3)$. [4 Mark] c. Range partitioning on the attribute 'Age' by the range vector [32, 40]. [3 Mark]																																																																				
	<table><tr><th colspan="4">PERSON</th></tr><tr><th>P_id</th><th>Name</th><th>Age</th><th>Salary</th></tr><tr><td>1</td><td>Anil</td><td>29</td><td>30,000</td></tr><tr><td>2</td><td>Bob</td><td>32</td><td>35,000</td></tr><tr><td>3</td><td>Emraan</td><td>27</td><td>32,000</td></tr><tr><td>4</td><td>David</td><td>34</td><td>40,000</td></tr><tr><td>5</td><td>Flora</td><td>42</td><td>51,000</td></tr><tr><td>6</td><td>Vijay</td><td>35</td><td>70,000</td></tr><tr><td>7</td><td>Rahul</td><td>44</td><td>35,000</td></tr><tr><td>8</td><td>Ellen</td><td>41</td><td>75,000</td></tr><tr><td>9</td><td>Clive</td><td>33</td><td>60,000</td></tr><tr><td>10</td><td>Bharat</td><td>37</td><td>50,000</td></tr><tr><td>11</td><td>Smith</td><td>28</td><td>35,000</td></tr><tr><td>12</td><td>John</td><td>36</td><td>32,000</td></tr><tr><td>13</td><td>Aleena</td><td>45</td><td>70,000</td></tr><tr><td>14</td><td>Divya</td><td>31</td><td>35,000</td></tr></table>	PERSON				P_id	Name	Age	Salary	1	Anil	29	30,000	2	Bob	32	35,000	3	Emraan	27	32,000	4	David	34	40,000	5	Flora	42	51,000	6	Vijay	35	70,000	7	Rahul	44	35,000	8	Ellen	41	75,000	9	Clive	33	60,000	10	Bharat	37	50,000	11	Smith	28	35,000	12	John	36	32,000	13	Aleena	45	70,000	14	Divya	31	35,000	2	10	2	3
PERSON																																																																					
P_id	Name	Age	Salary																																																																		
1	Anil	29	30,000																																																																		
2	Bob	32	35,000																																																																		
3	Emraan	27	32,000																																																																		
4	David	34	40,000																																																																		
5	Flora	42	51,000																																																																		
6	Vijay	35	70,000																																																																		
7	Rahul	44	35,000																																																																		
8	Ellen	41	75,000																																																																		
9	Clive	33	60,000																																																																		
10	Bharat	37	50,000																																																																		
11	Smith	28	35,000																																																																		
12	John	36	32,000																																																																		
13	Aleena	45	70,000																																																																		
14	Divya	31	35,000																																																																		
4.	A multinational retail company uses a cloud-based parallel database system. Identify the forms of parallelism applied on the following scenarios. For each of the forms, draw the architecture diagram and explain in detail how the processors handle the queries. a. During business hours, thousands of customers simultaneously place orders, check the availability of products and track their orders. [5 Mark] b. At the end of each day, the executive personnel record total sales, region-wise profit, and customer purchase trends by running a complex analytical query on the transactions happened on the day. [5 Mark]	2	10	2	2																																																																
5.	a. Differentiate between homogeneous and heterogeneous distributed database systems with suitable examples. b. Discuss the transparency levels, namely, fragmentation, replication, location with regard to distributed systems and their role in achieving user data independence. c. "Distributed databases provide scalability that centralized systems cannot match." Justify this statement.	3	4+4+2	2	2																																																																