THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI 625 015.
Department of Computer Science and Engineering
Continuous Assessment Test – I

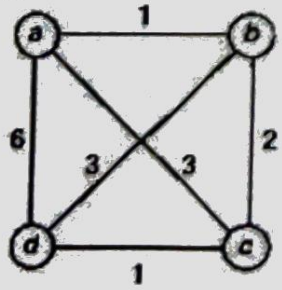
Course Code	22CS420	Course Name	*Design and Analysis of Algorithms*		
Degree	B.E	Programme	CSE	Semester	IV
Date	25/04/2024	Duration	1hr 45 minutes	Max. Marks	60
Faculty-in-Charge		**Dr. M.K. Kavitha Devi & Dr. J. Dharani**			

Assessment Pattern

Remember	*Understand*	*Apply*	*Analyze*	*Evaluate*	*Create*	*Total*
10	20	30	x	x	x	60

Answer All Questions

	Part A	5 x 2 =10
A1.	List the elements of dynamic programming	CO4
A2.	State the chromatic number of a graph.	CO5
A3.	Give the significance of branch and bound techniques compared to backtracking strategy.	CO5
A4.	State the property of problems that can be classified into class NP?	CO6
A5.	Justify that bin-packing problem belongs to class NP.	CO6

	Part B	4 x 5 =20
B1.	Show that the amortized cost of stack operations (any two) takes $O(1)$ running time.	CO1
B2.	Find the optimized solution for the following coin change problem using dynamic programming. Denominations: 1, 2, 4, 5. You want to make change for Rs.8.	CO4
B3.	Derive the state space tree for the 4-Queens problem.	CO5
B4.	Explain approximation algorithm for Travelling Salesman Problem and compute its approximation ratio. 	CO6

	Part C	3 x 10=30
C1	Solve the following Knapsack problem using dynamic programming approach. The capacity of the knapsack is $W = 8$.	CO4

Item	A	B	C	D
Profit	2	4	7	10
Weight	1	3	5	7

(OR)

C2.	Find an optimal parenthesization of a matrix-chain product whose sequence of dimensions is <5, 4, 6, 2, 7>	CO4
C3.	Construct a state space tree for the given assignment problem based on branch	CO5

	and bound algorithm. 		Job 1	Job 2	Job 3	Job 4
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A	9	2	7	8
B	6	4	3	7
C	5	8	1	8
D	7	6	9	4		
	(OR)	
C4.	Find a subset of a given set $A = \{4,5,6,8\}$ whose sum is equal to 18. Solve using backtracking.	CO5
C5.	Given the $3 - CNF$ formula $\phi = (x_1' \vee x_2' \vee x_3) \wedge (x_1 \vee x_2 \vee x_3') \wedge (x_1 \vee x_2 \vee x_3)$. Reduce the $3 - CNF$ to clique problem. Prove that clique problem is NP-complete.	CO6
	(OR)	
C6.	Derive the proof for the statement: Travelling Salesman problem is NP complete.	CO6

Name of the Candidate: **Reg. No.:**

22CS490

BE. DEGREE – APRIL 2024 – EXAMINATIONS

BRANCH: COMPUTER SCIENCE AND ENGINEERING

PROJECT MANAGEMENT

Duration : 3Hours **Maximum: 100 Marks**

Answer All questions

	PART – A *(10 x 2 = 20)*	**CO**	**Marks**
A1.	What is the difference between project and non-project work?	CO1	**(2)**
A2.	What is the role of the project manager?	CO1	**(2)**
A3.	Define Milestones in the project	CO2	**(2)**
A4.	What are project priorities?	CO2	**(2)**
A5.	What are Agile manifesto?	CO3	**(2)**
A6.	Define slack?	CO3	**(2)**
A7.	When the project manager faces a resource-constrained problem.	CO4	**(2)**
A8.	What is norming stage in team development?	CO4	**(2)**
A9.	What is a project kick-off meeting?	CO5	**(2)**
A10.	Why should a project manager emphasize group rewards over individual rewards?	CO5	**(2)**

	PART – B *(5 x 7 =35)*	**CO**	**Marks**
B1.	Discuss the structure of matrix organizational structure to carry out projects.	CO1	**(7)**
B2.	What are the details that are specified in a project scope statement	CO2	**(7)**
B3.	Discuss about the four lag relationships in detail.	CO3	**(7)**
B4.	Explain resource smoothing with detailed example.	CO4	**(7)**
B5.	Brief the Scrum product development life cycle.	CO5	**(7)**

	PART – C *(3 x 15 =45)*	**CO**	**Marks**
C1.	Develop a WBS for a local stage play. Be sure to identify the deliverables and Work packages. Complete with detailed responsibility matrix.	CO3	**(15)**

[OR]

C2.	Consider any project you are familiar with. Identify the deliverables and organizational units (people) responsible. Develop a detailed project communication plan.	CO3	**(15)**

CONTD.,

C3. CO4 **(15)**

Activity	Duration(days)	Preceding Activities
A. Obtain schedule of liabilities	3	none
B. Mail confirmation	15	A
C. Test pension plan	5	A
D. Vouch selected liabilities	60	A
E. Test accruals and amortization	6	D
F. Process confirmations	40	B
G. Reconcile interest expense to debt	10	C,E
H. Verify debt restriction compliance	7	F
I. Investigate debit balances	6	G
J. Review subsequent payments	12	H,I

For the above network information, draw the project network, compute forward and reverse pass and identify critical path.

[OR]

C4. CO4 **(15)**

Activity	Duration(days)	Preceding Activities	Lag
A	5	none	-
B	6	A	-
C	6	A	-
D	4	A	-
E	2	B,C	5
F	7	D,E	-
G	5	F	-
H	1	G	5
I	3	F	3
J	8	H,I	-

For the above network information,
1) Draw the project network
2)Compute forward and reverse pass
3)Calculate slack for all activity
4)Identify Critical path.

C5. Consider a new product production project which consists of Market analysis, Ideation, Design, prototyping, and production. CO5 **(15)**

1) Identify at least 4 possible risk events
2) Access each risk event using suitable metrics
3) Arrive at risk severity matrix diagram
4) Propose a suitable risk management plan.
5) Finally arrive at a risk response matrix table

[OR]

C6. Develop a sample project Wrap-up Closure activities Checklist for a project manager. CO5 **(15)**

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THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI 625 015.

Department of Computer Science and Engineering

Continuous Assessment Test – 1

Course Code	*22CS440*	Course Name	*Database Management Systems*		
Degree	*B.E*	Programme	*CSE*	Semester	*IV (Slot A & Slot B)*
Date	*01.03.2024*	Duration	*1 hour 45 Minutes*	Max. Marks	*60*
Faculty-in-Charge		*Dr. B.Subbulakshmi and Dr.M.Nirmala Devi*			

Answer All Questions

	Part A	**3 X 3 = 9**
A1.	Recall the mapping cardinalities? How do you represent them in E-R diagram.	CO1
A2.	Name the integrity constraints used in SQL. Give example of each in SQL.	CO2
A3.	Briefly describe about dependency preserving decomposition with an example.	CO3
	Part B	**3 x 6 = 18**
B1.	Illustrate the purpose of storage manager, query processor and transaction manager in DBMS.	CO1
B2.	**Consider a relational database containing the following schemas.** **Catalogue** sno, pno, cost S1, P1, 150 S1, P2, 50 S1, P3, 100 S2, P4, 200 S2, P5, 250 S3, P1, 250 S3, P2, 150 S3, P5, 300 S3, P4, 250 **Suppliers** sno, sname, location S1, M/s Royal furniture, Delhi S2, M/s Balaji furniture, Bangalore S3, M/s Premium furniture, Chennai **Parts** pno, pname, part_spec P1, Table, Wood P2, Chair, Wood P3, Table, Steel P4, Almirah, Steel P5, Almirah, Wood `SELECT s.sno, s.sname FROM Suppliers s, Catalogue c WHERE s.sno = c.sno AND cost > (SELECT AVG (cost) FROM Catalogue WHERE pno = 'P4' GROUP BY pno);` a. What is the result of the above query? **(3 marks)** b. Write a PL/SQL function to determine the number of products supplied by the given supplier number. **(3 marks)**	CO2 (GATE)
B3.	In a schema with attributes A, B, C, D and E, following set of functional dependencies are given: A->B, A->C, CD->E, B->D, E->A Which of the following functional dependencies is NOT implied by the above set? (a) CD->AC (b) BD->CD (c) BC->CD (d) AC->BC	CO3 (GATE)
	Part C	**3 x 11 = 33**
C1.	A university registrar's office maintains data about the following entities: (A) courses, including number, title, credits, syllabus, and prerequisites; (b) course offerings, including course number, year, semester, section number, instructor(s), timings and class rooms; (c) students, including student-id, name and program; and (d) instructors, including identification number, name, department, and title. Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.	CO1

	a) Construct an E-R diagram for the registrar's office. Document all assumptions you make about the mapping constraints. b) And write the equivalent relational schema for the above E-R diagram.	
	(OR)	
C2.	Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of various tests and examinations conducted. And write the equivalent relational schema for the above E-R diagram.	CO1
C3.	LIVES(employee-name, street,city),WORKS (employee-name, company-name, salary) LOCATED-IN (company-name, city),MANAGES (employee-name, manager-name) **Answer the following queries using Relational Algebra and in SQL.** a. Find all employees who live in the same city as the company they work for. b. Find the name, street and city of all employees who work for City Bank and earn more than Rs. 10,000. c. Find the employee names who are working as manager	CO2
	(OR)	
C4.	Employee (Employee_name, Street, City),Works (Employee_name, Company_name, Salary) Company (Company_name, City),Manages (Employee_name, Manager_name) **Answer the following queries using Relational Algebra and in SQL.** a. Find those companies whose employees earn a higher salary, on average, than the average salary at First Bank Corporation. b. Find the names of all employees in the database who live in the same cities as the companies for which they work. c. Find all employees in the database who live in the same cities as the companies for which they work.	CO2
C5.	Consider the universal relation R = {A, B, C,D,E,F,G,H,I,J} and set of functional dependencies F = {{A,B} -> {C}, {B,D} -> {E,F}, {A,D} -> {G,H}, {A} -> {I}, {H} -> {J}}. i. Compute the keys for R. ii. Compute the closure of F. List only the non-trivial functional dependencies with single attribute on right hand side.	CO3 (GATE)
	(OR)	
C6.a.	Consider the relation R(P, Q, S, T, X, Y, Z, W) with the following functional dependencies. PQ → X; P → YX; Q → Y; Y → ZW Consider the decomposition of the relation R into the constituent relations according to the following two decomposition schemes. D_1 : R = [(P, Q, S, T); (P, T, X); (Q, Y); (Y, Z, W)] D_2 : R = [(P, Q, S); (T, X); (Q, Y); (Y, Z, W)] Determine which decomposition is loss-less join decomposition and justify your answer. **(4 Marks)**	CO3 (GATE)
C6.b	**Consider the following relational schemas for a library database:** **Book (title, Author, Catalog no, publisher, year, price)** **Collection (title, Author, Catalog no)** **The following functional dependencies:** **title, Author → Catalog no** **Catalog no → title Author publisher year** **publisher title year → price** **Assume (Author, Title) is the key for both schemas.** Find the highest normal form of this relation. **(7 marks)**	CO3 (GATE)

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Department of Computer Science and Engineering

Continuous Assessment Test –2

Course Code	22CS490	Course Name	*Project Management*		
Degree	B.E	Programme	CSE	Semester	IV
Date	29/04/2024	Duration	105 minutes	Max. Marks	60
Faculty-in-Charge		**Dr N. Shivakumar & Mr S. Santhana Hari**			

Assessment Pattern

Remember	*Understand*	Apply	Analyze	Evaluate	Create	Total
10	20	20	-	-	-	50

Course Outcomes (COs) for Assessment in this test

Cos	Course Outcome
C4	Develop a project schedule using critical path method and to develop a Gantt chart using any project management tool
CO5	Develop a reschedule for a project based on constraints. Develop a suitable risk response based on the assessment.
CO6	Plan and implement a team-project for developing a complete project schedule using Project management tools like Open Projects, MS project management

Answer All Questions

		5x2=10
Part A(Remember type Questions)		
A1.	What is the purpose of team evaluation during project closure	CO5
A2.	Why should a project manager emphasize group rewards over individual rewards?	CO6
A3.	What are the five stages of team development	CO6
A4.	What is accepting risk	CO5
A5.	What is conflict management?	CO6

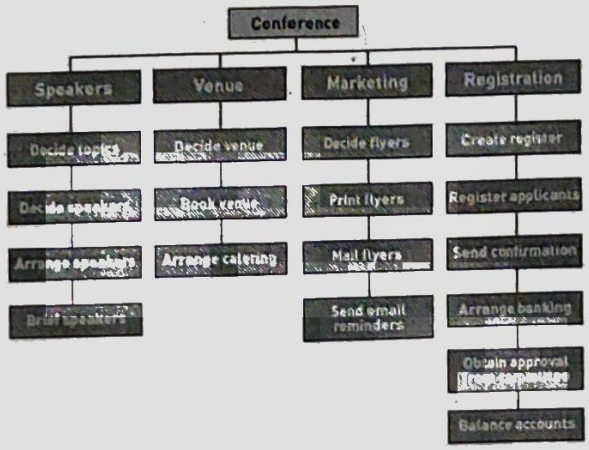
		2x10=20
Part B (Understand type Questions)		
B1.	In what situations resource smoothing and resource leveling can be done in a project planning	CO5
B2.	List out all project closure activities	CO6

Part C (Apply type Questions) — 2x15=30

C1. For the above network info-
1. Identify Critical Path.
2.Calculate float the activities other than Critical path. — CO4

Activity	Predecessor	Duration
A	-	3
B	A	4
C	A	2
D	B	5
E	C	1
F	C	2
G	D, E	4
H	F,G	3

OR

C2	Analyze the development strategies to be followed by a manager in building high-performance project teams	
C3	From the following RBS 1. Identify at least 4 possible risk event from the above RBS example. 2. Access each risk event using suitable metrics 3. Arrive at risk severity matrix diagram 4. Propose a suitable risk management plan. (Mitigate, avoid, transfer,retain) 5. Finally arrive at a risk response matrix table. (Risk Event, Response Contingency Plan, Trigger, Who Is Responsible) 	CO5
	or	
C4	0.0 Wedding 1.0 Invitations 1.1 Create guest list 1.2 Print the invitations 1.3 Mail the invitations 2.0 Food 2.1 Find caterer 2.2 Finalize the menu 3.0 Bridal 3.1 Shop for shoes, dress 3.2 Tailoring and fitting 4.0Venue 4.1 finalize Venue. 4.2 Decoration works 4.3 organizing 1. Identify at least 4 possible risk event from the above WBS example. 2. Access each risk event using suitable metrics 3. Arrive at risk severity matrix diagram 4. Propose a suitable risk management plan. 5. Finally arrive at a risk response matrix table.	C5

Assessment Summary (For official use only)

	Remember	Understand	Apply(Either)	Analyze	Evaluate	Create	Total
C4			15	-	-	-	15
CO5	4	10	15				29
CO6	6	10		-	-	-	16
	10	20	30	-	-	-	60

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Department of Computer Science and Engineering

Continuous Assessment Test – I

Course Code	22CS490	Course Name	*Project Management*		
Degree	B.E	Programme	CSE	Semester	IV
Date	01/03/2024	Duration	105 minutes	Max. Marks	60
Faculty-in-Charge		**Dr N. Shivakumar & Mr S. Santhana Hari**			

Answer All Questions

	Part A	15 Marks
A1.	Define Project and state the impacts of Project Management	CO1
A2.	Describe the roles of Project Manager	CO2
A3.	Define Milestones in project	CO2
A4.	Define WBS	CO3
A5.	State Agile Manifesto	CO3

	Part B	15 Marks
B1.	Discuss in detail the stages in project lifecycle. How is change management achieved in this project lifecycle?	CO1
B2.	i)What are strategic alignment, portfolio management and project management? ii)How are Projects integrated with Organizational Strategy?	CO2

	Part C	2 x 15 =30
C1.	Suggest a suitable organizational structure for a company which markets FMCG products all over the country	CO1
	or	
C2.	Prepare a project scope statement for a smart city development project	CO1
C3.	Develop a sample WBS for a new automobile project. Construct responsibility matrix and detailed project communication plan for the above project (PCP should contain answers following questions • What information needs to be collected and when? • Who will receive the information? • Who will receive the information? • What methods will be used to gather and store information? • What are the limits, if any, on who has access to certain kinds of information? • When will the information be communicated? How will it be communicated?)	CO3
	or	
C4	Discuss about the Scrum way of product development.	CO3