Hall Ticket Number :										

R-20

Code: 20A305CT

III B.Tech. I Semester Supplementary Examinations June 2024

Optimization Techniques

(Artificial Intelligence & Data Science)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Discuss about objective function.	1	1
b)	List out the characteristics of standard form of LPP	2	2
c)	Write about Powell's method	3	1
d)	Explain about random search method	4	2
e)	What are the limitations of dynamic programming?	5	1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2.	Solve the following by Lagrangian Method Min $f(x_1, x_2, x_3) = x_1^2 + x_2^2 + x_3^2 + 40x_1 + 20x_2$ Sub to $g_1(x_1, x_2, x_3) = x_1 - 50 \geq 0$ $g_2(x_1, x_2, x_3) = x_1 + x_2 - 100 \geq 0$ $g_3(x_1, x_2, x_3) = x_1 + x_2 + x_3 - 150 \geq 0$ $x_1, x_2, x_3 \geq 0$	12M	1	2
	OR			
3.	Find the extreme points of $F(x_1, x_2) = x_1^3 + x_2^3 + 2x_1^2 + 4x_2^2 + 6$	12M	1	2
	UNIT-II			
4.	Consider the following L.P model and solve it by using **graphical** method. Maximize $Z = 6x_1 + 8x_2$ Subject to $5x_1 + 10x_2 \leq 60$; $4x_1 + 4x_2 \leq 40$; and $x_1, x_2 \geq 0$	12M	2	6
	OR			
5.	Consider the following L.P model and find the multiple optimal solution by using the **simplex** method. Maximize $Z = 3x_1 + 6x_2$ Subject to $x_1 + x_2 \leq 5$; $x_1 + 2x_2 \leq 6$; and $x_1, x_2 \geq 0$	12M	2	6

UNIT-III

6. Solve the following problem by Quadratic interpolation method. Minimize $f(\lambda) = \lambda^2-5\lambda^3-20\lambda+5$ — 12M — 3 — 6

OR

7. Minimize $f(x) = x^2$ over (-5, 15) using Golden Section method. Take n=7. — 12M — 3 — 6

UNIT-IV

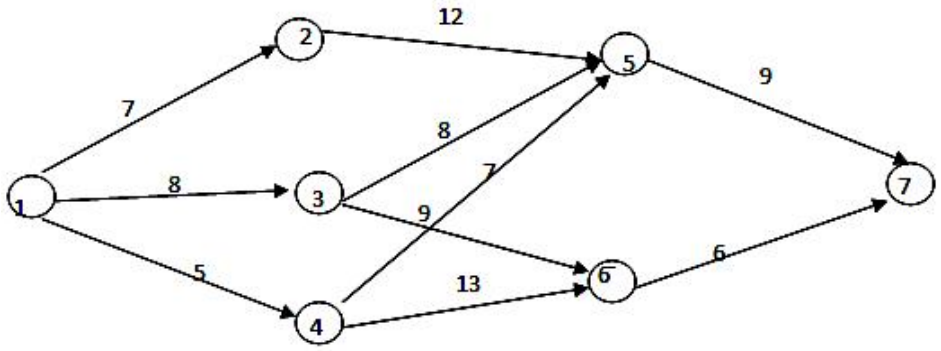
8. Explain with Powell's method with the help of flow diagram — 12M — 4 — 4

OR

9. Solve the unconstrained problem
   Minimize $f(x_1 – x_2+2x_1^2+2x_1x_2 +x_2^2$ from the starting point $x_1 =(_0^0)$using Powell's method — 12M — 4 — 4

UNIT-V

10. Find the shortest path between the two nodes by following the stage coach method



12M — 5 — 4

OR

11. a) Explain the computational procedure used in dynamic programming. — 6M — 5 — 1

    b) State Bellman's principle of optimality and explain by an illustrative example how it can be used to solve multistage decision problem. — 6M — 5 — 1

*** End ***

Hall Ticket Number :										

R-20

Code: 20A553T

III B.Tech. I Semester Supplementary Examinations June 2024

Software Engineering

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	BL
1. Answer ***all*** the following short answer questions (5 X 2 = 10M)			
a)	List the types of software process models.	1	2
b)	Explain the difference between functional and non-functional requirements	2	2
c)	What is coupling in component level design	2	2
d)	What is integration testing?	3	2
e)	What is software reverse engineering?	4	2

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
UNIT-I				
2. a)	Discuss some common software myths and misconceptions.	6M	1	2
b)	Provide an overview of the Unified Process in software development.	6M	1	1
OR				
3.	Summarize all phases of the Software Development Life Cycle.	12M	1	1
UNIT-II				
4. a)	Explain the requirement elicitation and requirement elaboration tasks in brief	6M	2	2
b)	Demonstrate Scenario-Based Modeling	6M	2	2
OR				
5. a)	How can use cases help in identifying system boundaries and user interactions?	6M	2	3
b)	Discuss Class-Based Modeling and Data Modeling in brief	6M	2	2

UNIT-III

6.		Explain the design process in software engineering. What are the key steps involved?	12M	3	2

OR

7.		Describe the process of conducting component-level design in software engineering.	12M	3	3

UNIT-IV

8.		What are the "Golden Rules" of user interface design, and why are they important?	12M	4	4

OR

9.	a)	What is software testing, and why is it crucial in software development?	6M	4	4
	b)	What is unit testing, and how is it performed in software development?	6M	4	2

UNIT-V

10.		What are the key steps involved in project planning in software project management?	12M	5	2

OR

11.		Describe the key characteristics of software maintenance and its role in the software development life cycle.	12M	5	2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A552T

III B.Tech. I Semester Supplementary Examinations June 2024

Computer Networks

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M) CO BL

a) Identify the layers which these protocols belong to: TCP, IEEE 802.3, SMTP and OSPF. CO1 L1

b) What are the two sublayers of the data link layer? What do they perform? CO2 L2

c) State the differences between IPv4 and IPv6 addressing schemes with a mention of the number of hosts forming the network. CO3 L3

d) How many bits are required to specify a TCP/UDP port number? Specify the port numbers on which the HTTP and FTP are served. CO4 L4

e) Define the terms URN, URI and URL and also state the relationships among them. CO5 L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.	a)	List the layers of TCP/IP reference model with description on the functionalities of each layer.	8M	CO1	L1
	b)	Compare and contrast among the physical media: coaxial cable, twisted pair wires and optical fiber cable.	4M	CO1	L2
		OR			
3.	a)	State the purpose of following network devices with a mention on the layers at which they perform: hubs, switches, routers, firewalls and gateways.	6M	CO1	L1
	b)	What is meant by network topology? State and compare the types of such topologies.	6M	CO1	L2
		UNIT–II			
4.	a)	Are parity check mechanisms capable of detecting multiple bit errors? If the received byte is 10001010 and even-parity mechanism is adopted, determine whether the received bit stream is having bit-error or not.	6M	CO2	L4
	b)	Explain how the CSMA technique is better than ALOHA in efficiently sharing the channel.	6M	CO2	L2

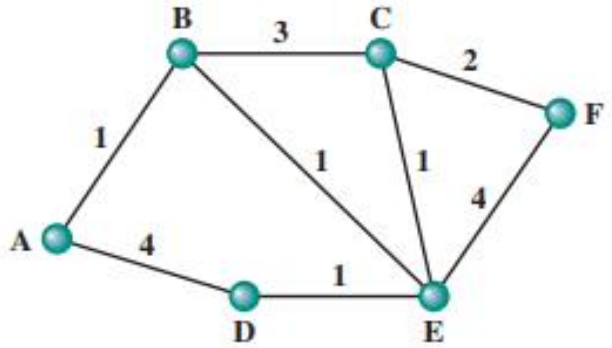
OR

5.	a)	Describe the structure of MAC frame format of IEEE 802.3	6M	CO2	L1
	b)	Explain binary exponential back off mechanism.	6M	CO2	L2

UNIT–III

6.	a)	Write brief notes on adaptive routing.	5M	CO3	L2
	b)	Write down the steps involved in Dijkstra's algorithm	7M	CO3	L5

OR

7.	a)	State the differences between Dijkstra's and Bellman-Ford algorithms	4M	CO3	L2
	b)	Apply Bellman-Ford algorithm for the following network. 	8M	CO3	L4

UNIT–IV

8.	a)	Distinguish between TCP and UDP with respect to their header structures.	6M	CO4	L2
	b)	List and explain any four socket functions.	6M	CO4	L3

OR

9.	a)	Differentiate between the terms 'collision' and 'congestion'. Which of the layers give importance to these phenomena?	6M	CO4	L2
	b)	What are QoS parameters? Write brief notes on traffic shaping.	6M	CO4	L2

UNIT–V

10.	a)	Describe the functional modules and protocols used in Internet Mail Architecture.	8M	CO5	L2
	b)	What are the elements of Domain Name Systems?	4M	CO5	L3

OR

11.	a)	Illustrate the message formats of HTTP requests and responses.	6M	CO5	L2
	b)	Write brief notes on HTML and WWW.	6M	CO5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A3051T

III B.Tech. I Semester Supplementary Examinations June 2024

Data Warehousing and Data Mining

(Common to AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)	CO	BL
a)	What is data mining?	CO1	L2
b)	Describe about Rollup operation	CO2	L2
c)	What is meant by bagging?	CO3	L2
d)	How does agglomerative differ from divisive hierarchical clustering techniques?	CO4	L2
e)	Explain about mining data streams	C05	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2. a)	Describe the data mining functionalities, and the kinds of patterns they can discover.	6M	CO1	L2
b)	Describe in detail about various data transformation techniques.	6M	CO1	L2
	OR			
3. a)	What is the main idea of data preprocessing and explain the various techniques?	6M	CO2	L2
b)	What kinds of data can be mined	6M	CO2	L2
	UNIT-II			
4. a)	A database has four transactions. Let min_sup=60% and min_conf=80%.			

TID	Date	items_bought
T100	10/15/99	{K,A,D,B}
T200	10/15/99	{D,A,C,E,B}
T300	10/19/99	{C,A,B,E}
T400	10/22/99	{B,A,D}

Find all frequent item sets using Apriori algorithm. 6M CO2 L3

	b)	Write the differences between OLTP and OLAP	6M	CO2	L2

OR

5.	a)	How are association rules generated from frequent itemsets? Illustrate.	6M	CO2	L3
	b)	What is multi-dimensional data model? Explain star schema with an example and diagrammatic illustration.	6M	CO2	L2

UNIT-III

6.	a)	Define information gain and explain its importance in decision tree induction.	6M	CO3	L3
	b)	What are the features of Bayesian classification? Explain in detail with an example.	6M	CO3	L2

OR

7.	a)	Explain in detail about support vector machines	6M	CO3	L2
	b)	Describe the data classification process with a neat diagram.	6M	CO3	L3

UNIT-IV

8.	a)	Explain K-means algorithm with an example	6M	CO4	L2
	b)	Discuss in detail about the various detection techniques in outlier.	6M	CO4	L2

OR

9.		Explain in detail about Density based and grid based methods of clustering	12M	CO4	L2

UNIT-V

10.	a)	How is text mining related to web mining? What are the techniques for text mining?	6M	CO5	L3
	b)	Write short notes on multimedia data mining.	6M	CO5	L2

OR

11.		Explain in detail various data mining applications	12M	CO5	L2

*** End ***