QP code: 10067303

TE sem VI [redacted] Computer R-19 C scheme 16/12/24

(Time-3 Hours) Total Marks 80

NB

1) Question **number 1** is compulsory
2) Attempt **any three** out of the remaining five questions.
3) Assume suitable data if **necessary** and justify the assumptions.
4) **Draw** neat and **clean** diagrams
5) Figures to the **right** indicate full marks

Q1 Attempt the following **20**

a) Justify or contradict – 'Charts or graphs are more effective in attracting attention than any other method of presenting data'.

b) Explain Census method. Its merits and demerits.

c) Justify or contradict 'b_{xy} and b_{yx} must be either positive or negative'

d) Explain Simple Random Sampling

Q2 a) For 100 students of a class, the regression equation of marks Statistics(X) and Economics(Y) is 3Y-5X +180 =0. The mean marks in Economics is 50, and variance of marks in Statistics is 4/9 of the marks in Economics. Find the mean marks in Statistics and the coefficient of correlation between them. **10**

b) Define and explain the following terms with an example: Grouped data, class interval, class limits, class boundaries, class mark, inclusive and exclusive series, frequency and tally marks **10**

Q3 a) Explain regression and its types. Also explain regression analysis and discuss its applications. **10**

b) Explain parametric point estimation in detail **10**

Q4 a) For the following data **10**

i) Fit a regression $\hat{y} = a + b_1x_1 + b_2x_2$

ii) Find the coefficient of multiple determination (R^2).

iii) Also test the significance of regression (Given the appropriate Table value, F = 13.274, for a significance level of $\alpha = 0.01$)

Sales Territory	Sales in (Lakh Rs) Y	Advt in '000 (x1)	Number of selling agents (x2)
1	190	80	40
2	80	35	13
3	75	35	7
4	100	50	20
5	125	60	19
6	90	40	13
7	70	20	20
8	130	60	28

b) What do you understand by Data collection? Classify different types of data based on sources of data. **10**

Q5	a)	What do you mean by Partial correlation coefficients? Explain in detail.	10
	b)	Explain in detail Neyman Pearson lemma	10
Q6		Write short notes on	**20**
	a)	Meaning and importance of Tabulation	
	b)	Method of maximum likelihood	
	c)	Significance of Overall fit of regression model	
	d)	MP and UMP tests.	

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qp-10066057
16/12/24

Time: 3 hours

Max. Marks: 80

Instructions:

1) Attempt any **Four questions**.
2) Figures to the right indicate full marks.
3) Assume suitable additional data, if necessary and clearly state it.

Q.1	(a)	Discuss IOTWF Standardized Architecture.	10
	(b)	What is IOT? How IoT is different from Digitization? List out the different IOT Challenges.	10
Q.2	(a)	Give Classification of networks according to access technologies and distances. Describe domain specific IOT related to smart city.	10
Q.3	(a)	With example, explain the types of Sensors and Actuators used in IoT applications	10
	(b)	Describe data vs network analytics for an IoT network.	10
Q.4	(a)	Compare and contrast: Application Layer protocols.	10
	(b)	What are IOT software platform? Explain with examples.	10
Q.5	(a)	Short notes on Edge computing, Fog computing and Cloud computing.	10
	(b)	Briefly explain Adapting SCADA for IP.	10
Q.6	(a)	Explain different IoT enabling technologies.	10
	(b)	Discuss in brief- 1. Gateways and Backhaul Sublayer in Core IoT Functional Stack 2. Communications Network Layer in Core IoT Functional Stack.	10

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12|12|24.

Time: 3Hrs. Marks: 80

NOTE: - Q1 is compulsory
Solve any three from remaining.

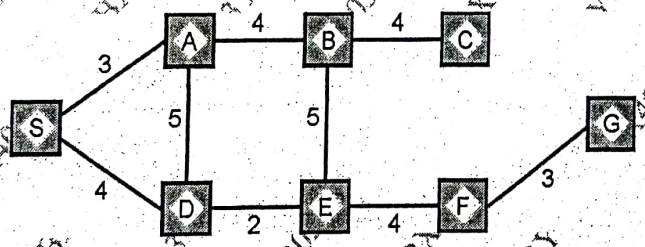
Q1. Solve any **four** from following. [20]

a. Explain the concept of Conditional order planning.
b. Explain the working of reinforcement learning.
c. Describe four categorize of Artificial Intelligence.
d. Illustrate the application areas of AI in the Robotics.
e. Generate the parse tree for a sentence "The *cat ate the fish*".

Q2. a. All people who are graduating are happy. All happy people smile. Someone is graduating. Convert to FOL and CNF. Also Prove that "Is someone smiling?" Solve using resolution. [10]

b. Design a planning problem using STRIP for Air cargo transport. It involves loading and unloading cargo onto and off of planes and flying it from place. Initial State: At SFO airport, Cargo1, Plane1 and at JFK airport, Cargo2, Plane2 is present. Goal State: At SFO airport Cargo2 and at JFK airport Cargo1 is present. [10]

Q3. a. Apply greedy best-first search. At each iteration, each node is expanded using evaluation function f (n) = h(n). h (S) = 10, h (A) = 10, h(D) = 8, h(B) = 6, h(E) = 6.5, h (C) = 4, h (F) = 3, h(G) = 0. S is start state and G is goal state. [10]



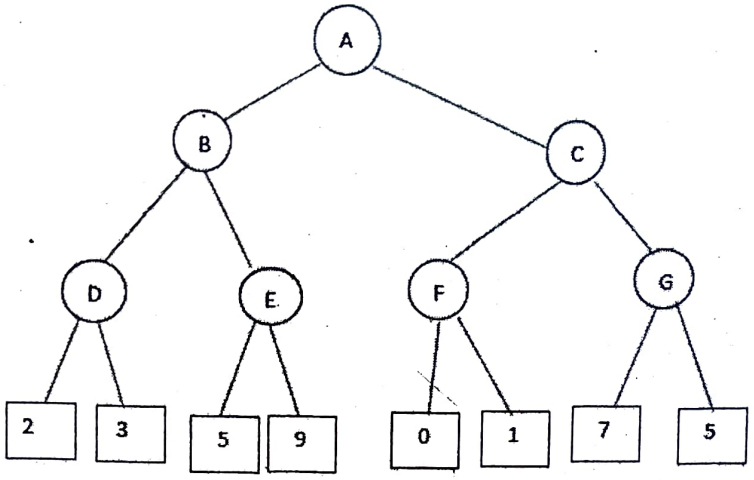
b. Explain the Depth Limit search and Depth-first iterative deepening search. [10]

Q4. a. Formulate the problem, Choose the formulation that is precise enough to be implemented. Also identify the initial state, goal test, successor function, and cost function for the following. [10]
Problem statement: Autonomous Taxi driver

b. Explain the concept of PAC learning [10]

Q5. a. Task of cleaning house has been assigned to a vacuum cleaner robot. Initial location of robot is not known. Robot has to execute appropriate actions in order to clean house. Identify the appropriate type of an agent and applicable task environment, also identify the PEAS parameters.

b. Apply alpha beta pruning on following graph



Q6. Write detailed note on following. (Any two) **[20]**

a. Wumpus World Environment

b. Differentiation of Forward and Backward Chaining

c. Language models of Natural Language Processing

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10|12|24

Time : 3 Hours **Marks : 80**

Instructions to Candidates

1. Question Number 1 is Compulsory, solve any 3 from Remaining Questions
2. Please Specify your answers with neat sketch wherever Necessary
3. Assume any suitable Data and Mention the same in your answer.

Q1. a) Compare all Mobile Generations i.e. 1G, 2G, 3G,4G and 5G. **10**

b) Explain GPRS Architecture in detail. **10**

Q2. a) Compare Infrastructure Based Network with Ad-hoc network **05**

b) Explain GSM Authentication in brief **05**

c) Explain in detail GSM System Architecture and Describe Function of Each Block. **10**

Q3 a) How IP Packet Delivery Takes Place to and from Mobile Node? Explain in detail. **10**

b) Explain Signal Propagation in detail. What are various Signal Propagation Effects? **10**

Q4 a) Explain Mobile Terminated and Mobile Originated Call in detail. **10**

b) Explain UMTS Architecture. **10**

Q5 a) What is Snooping TCP? What are it's advantages and Disadvantages? **10**

b) Explain need of Mobile Communication in various areas. **10**

Q6 a) Write a Short Note on the following **10**

1) Tunnelling and Encapsulation Mobile

2) Agent Advertisement and Agent Discovery

b) Draw a neat sketch of Bluetooth protocol Stack and explain the same **10**

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Duration: 3 hours **[Max Marks: 80]**

5/12/24

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

Q1. **20**

a. Explain TCP/IP vulnerabilities layer wise.
b. Give examples of replay attacks. List three general approaches for dealing with replay attack.
c. Explain algorithmic modes encryption process of symmetric key.
d. Explain different hash algorithm properties.

Q2 a. Apply Diffie-Hellman key exchange algorithm, two users P & Q will agree on two numbers as n=11 common prime & g=7 is generator. x=3, y=6 are private keys of P & Q respectively. What is shared secret key? **10**

b. Discuss DES with reference to following points **10**
1. Block size and key size
2.Need of expansion permutation
3.Role of S-box
4.Weak keys and semi weak keys
5. Possible attacks on DES

Q3 a. What characteristics are needed in secure hash function? Explain secure hash algorithm on 512 bits. **10**

b. Use RSA algorithm, user A has public key (17,321), B has public key (5,321). Calculate private keys of both the users. Encrypt m=7 by B's public keys. How B can decrypt the same. **10**

Q4 a. How does PGP achieve confidentiality and authentication in emails? **10**

b. Use the Play fair cipher with the key "DOCUMENT" to encrypt the message "ALL THE BEST" **10**

Q5 a. Why are digital certificates and signatures required? What is the role of digital signature in digital certificates? Explain any one digital signature algorithm. **10**

b. What are different types of firewalls? How firewall is different from IDS. **10**

Q6 a. Explain DES algorithm with flowcharts. **10**

b. What is DDOS Attack and how it is launched? **10**

QP – 10065655

TE | Sem VI | C-scheme | Computer Engg.

03/12

(3 Hours) Total Marks: 80

N.B: (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of the remaining five questions.
(3) Figures to the right indicate full marks.
(4) Make suitable assumptions wherever necessary.

Q.1.	A.	Compare Application Software and System Software.	5
	B.	Construct operator precedence Parser for the grammar: $E \rightarrow E+E \mid E*E \mid a.$ Parse the string "a+a*a" using the same parser.	5
	C.	Explain forward reference concept with example.	5
	D.	Explain the functions of a Loader.	5
Q.2.	A.	Explain with flowchart design of two pass assembler.	10

	B.	Construct Three address code for the following program
		`i= 1;`
		`x = 0;`
		`while (i <= n)`
		`{`
		`x = x + 1;`
		`i = i + 1;`
		`}`
			10

Q.3.	A.	Explain Direct Linking Loader in Detail.	10
	B.	Design LL(1) parsing table for the given grammar: $S \rightarrow iCtSE \mid a$ $E \rightarrow eS \mid \varepsilon$ $C \rightarrow b$ Also state that whether the given grammar is LL(1) or not.	10
Q.4.	A.	Explain the working of a Single-pass macro processor with neat flowchart.	10
	B.	Explain with suitable example code optimization techniques.	10
Q.5.	A.	Explain different issues in code generation phase of compiler.	10
	B.	Explain DAG with suitable example.	10
Q.6.	A.	Explain the different phases of a compiler with suitable example.	10
	B.	Explain advanced macro facilities with suitable examples.	10