

(3 Hours)

[Total Marks:80]

N.B. 1) Question No. 1 is compulsory.

- 2) Attempt any three questions from the remaining questions.
- 3) Figures to right indicates full marks.
- 4) Assume suitable data, if necessary.

**Q1.** Write short notes on the following (Any Four) **20**

- i. Triple constraints in Project Management
- ii. Project charter and Project sponsor
- iii. Project Management Information system
- iv. Goldratt's critical chain methods
- v. Project audits

**Q.2 (a)** Explain stages of team development and growth. What are the advantages of effective team and barriers to team effectiveness? **10**

**(b)** A project is composed of 8 activities, the time estimate for which are given below. **10**

Activity	Predecessor	Duration		
		$t_o$	$t_m$	$t_p$
A	-	2	4	12
B	-	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B, C	9	9	9
G	D	3	3.5	7
H	E, F, G	5	5	5

Z	Probability (P)
0	0.5
0.5	0.6950
1	0.843

- (i) Draw the network diagram.
- (ii) Find the critical path and expected projected duration.
- (iii) Calculate the standard deviation and variance of the project.
- (iv) What is the probability of completing the project on 30-week deadline?

**Q.3 (a)** Explain work breakdown structure and Gantt chart with example. **10**

**(b)** A project requires an initial investment of Rs. 200000 and it is expected to generate a cash flow of Rs. 10000 for 3 years. The target rate of return of the project is 12% per annum. Calculate the net present value of the project. **05**

**(c)** Explain non numeric project selection models. **05**

- Q.4** (a) Explain top down and bottom-up budgeting. **05**  
(b) What is the difference between resource loading and resource leveling? **05**  
(c) Describe probability and impact matrix. Explain risk response strategies for positive and negative risks. **10**
- Q.5** (a) A project in its 20<sup>th</sup> week has an actual cost of Rs. 250,000. It was scheduled to have spent Rs. 241,000. For the work performed to date, the budgeted value is Rs. 252,000. What are the cost and schedule variances for the project? What are the SPI and CPI? **05**  
(b) Describe Earned value management technique in Project Management. **05**  
(c) Explain Project Procurement Management. What is the difference between contracting and outsourcing? **10**
- Q.6** (a) Explain multicultural and virtual projects. **05**  
(b) Why is ethics important in Project management? **05**  
(c) What is project termination? Explain different types of project terminations. **10**

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Duration:(3 hrs.)

[Maximum Marks : 80]

NB:

- (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. ATTEMPT ANY FOUR [20]
- a. Differentiate between Generative Adversarial Network and Variational Auto Encoder.
  - b. Explain Contractive autoencoders.
  - c. What are the benefits of pre-trained models?
  - d. Explain XGBoost regression.
  - e. Explain the limitations of 2D learning environments.
- Q2. a. Explain WGAN in detail. [10]  
b. Explain the MinMax loss function used in GAN, along with the components of GAN. [10]
- Q3. a. Explain transfer learning. Describe different types of transfer learning. [10]  
b. Explain DCGAN in detail. [10]
- Q4. a. Explain Sparse autoencoders in detail. [10]  
b. Explain AdaBoost in detail. [10]
- Q5. a. Explain Gaussian Mixture Models. [10]  
b. Explain CycleGAN in detail. [10]
- Q6. a. What is metaverse? Explain the characteristics and components of the metaverse. [10]  
b. Explain Markov Random Field in detail. [10]

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**Duration 3 hours**

**Total marks 80**

N.B: (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of the remaining five questions

**Q 1. Attempt any four question**

**20 marks**

- a. Define reinforcement learning and explain the key components involved in the RL framework. 5
- b. Explain exploration approach and exploitation approach in multi armed bandit problem? 5
- c. Enlist components of MDP model and explain in detail?5
- d. What is the Bellman equation, and how does it relate to value iteration and policy iteration?5
- e. Define Temporal Difference and explain parameters of TD in detail? 5

**Q 2. A.**

**20 marks**

- i. Discuss the difference between on-policy and off-policy learning. Provide examples of algorithms that fall into each category. 6
  - ii. What is optimal policies and explain optimal value function ( $q^*$ )? 4
- B.**
- i. Compare between value iteration and Policy iteration? 5
  - ii. Write gradient bandit algorithm and explain its steps? 5

**Q. 3**

**20 marks**

- a. Define Offpolicy algorithm and onpolicy algorithm and identify SARSA is which type of algorithm and why? Write SARSA algorithm in detail? 10
- b. Write Epsilon Greedy algorithm in detail with any one example? 10

**Q. 4**

**20 marks**

- a. Explain the concept of Monte Carlo Prediction in reinforcement learning and describe the main steps involved in a Monte Carlo prediction algorithm. 10
- b. Explain the concept of Deep Q-Networks (DQN) and discuss how deep learning can be integrated with Q-learning to solve complex problems. 10

**Q. 5**

**20 marks**

- a. Write and explain off policy TD control using Q-learning? 5
- b. Explain Generalised policy iteration of policy evaluation and policy improvement? 5
- c. Define Agent and Environment and explain Agent Environment interface with diagram? 5
- d. After 12 iterations of the UCB 1 algorithm applied on a 4-arm bandit problem, we have  $n_1 = 3, n_2 = 4, n_3 = 3, n_4 = 2$  and  $Q_{12}(1) = 0.55, Q_{12}(2) = 0.63, Q_{12}(3) = 0.61, Q_{12}(4) = 0.40$ . Which arm should be played next? 5

**Q. 6**

**20 marks**

- a. Explain the differences between TD learning and Monte Carlo methods. Also, describe the main components and key steps involved in TD prediction algorithms. 10
- b. Explain the concept of Elevator Dispatching in a multi-floor building with diagram. Discuss the objectives and challenges of an elevator dispatching system. 10

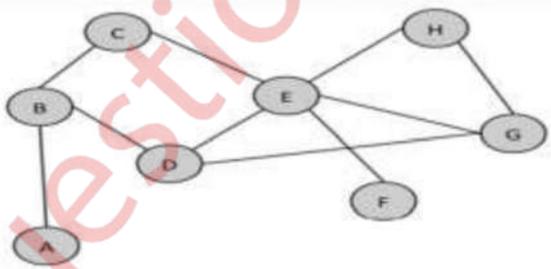
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- N.B. : (1) Question No 1 is Compulsory.  
 (2) Attempt any three questions out of the remaining five.  
 (3) All questions carry equal marks.  
 (4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR [20]

- a Draw and explain the Social Media Analytics Cycle with a detailed description of 5 each stage. 5
- b Explain Tie strength and trust. What is significance of weak ties in a social network? 5
- c What is mobile analytics? Explain characteristics of mobile Apps. 5
- d Explain types of search engines. 5
- e Explain data privacy, privacy policies and settings, issues related to data ownership on social media in the context of social media platforms. How can individuals protect their personal data when using digital platforms? 5

2 a Explain in detail the "Seven Layers of Social Media Analytics." Also, discuss the tools commonly used for each layer with suitable examples. [10]

b  [10]

Answer the following questions about this graph.

- a. What is the degree distribution for this graph? [2mark]
- b. What is the density of this graph? [1 mark]
- c. Which node(s) have the highest degree? What is the degree? [1 mark]
- d. Which node(s) have the lowest degree? What is the degree? [1 mark]
- e. Which node has the highest closeness centrality? Calculate it. [2 mark]
- f. Which node has the highest degree centrality? [1 mark]
- g. Draw the 1.5 egocentric network of node D. [1 mark]
- h. Draw 1 egocentric network of node D. [1 mark]

- 3 a Explain types of social media text. What are text analytics and explain text analytics steps. [10]
- b Explain Social Media Hyperlink Analytics by discussing the types of hyperlinks, types of hyperlink analytics, and commonly used hyperlink analytics tools. [5]
- c Explain what action analytics is. Identify some of the existing social media and types of actions used in them. [5]
- 4 a Explain categories of location analytics. What are applications of each category of location analytics? [10]
- b Explain Search Engine Analytics. Also, discuss the concepts of Search Engine Optimization (SEO) and Search Trend Analytics. Further, describe the different types of analytics provided by Google Trends with examples. [10]
- 5 a Describe Automated Recommendation Systems and compare Traditional Recommendation Systems with Social Recommendation Systems. [8]
- b Discuss the key steps involved in Formulating a Social Media Strategy and highlight how organizations can Manage Social Media Risks effectively. [6]
- c Explain the importance of Understanding Social Media and Business Alignment, and describe key Social Media KPIs used to measure performance. [6]
- 6 a Discuss a case study highlighting effective use of social media in the public sector. [10]
- b Discuss how businesses can measure the success of their social media initiatives. Explain the importance of interaction and monitoring in business social media strategies. [10]

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