 <h1 style="text-align: center;">SASTRA</h1> <p style="text-align: center;">DEEMED TO BE UNIVERSITY 2005 of the UGC Act 1956</p> <p style="text-align: center;">THINK SMART • THINK TRANSPARENCY • THINK SASTRA</p>	<p style="text-align: center;">School of Computing First CIA Exam – Feb 2025 Course Code: INT422 Course Name: IT Project Management Duration: 90 minutes Max Marks: 50</p>
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PART A

Answer ALL the questions

5 x 10 = 50 Marks

1. List the key elements of a project overview and feasibility study in IT project management.
2. Explain the process of finding the market and performing demand analysis for an IT project. Write short notes on different methods of cost estimation.
3. An automotive company investing \$500,000 by expecting cash benefits on Year 1 = \$200,000, Year 2 = \$250,000, Year 3 = \$300,000 and Year 4 = \$350,000 along with the discount rate of 14%. Calculate the Benefit-Cost Ratio for the given scenario and interpret the value.
4. Find the probabilistic time duration using PERT and deterministic Time duration using CPM for the given set of activities for a project by drawing Activity-On-Node (AON) Diagram. Compare both estimated durations.

For PERT calculation set the values as follows:

Most Likely Time = $0.5 \times$ Duration given in the Table,

Pessimistic Time = $2 \times$ Duration given in the Table and


Most Likely Time = Duration given in the Table.

(Example for Activity B: O = 2.5, P = 10, M = 5)

Activity	Predecessor	Duration (Days)
A	-	3
B	A	5
C	A	7
D	B	10
E	C	5
F	D,E	4

5. Calculate the Total Float and Free Float for the given activities in the Network diagram. Find the critical path by drawing Activity-On-Arrow (AOA) Diagram and crash all the critical activities. Estimate the new duration and cost after crashing to complete the project.

Activity	Predecessor	Normal Time	Crashing Time	Normal Cost	Crashing Cost
A	-	7	5	\$250	\$350
B	A	6	4	\$150	\$250
C	B	4	2	\$350	\$500
D	C	5	3	\$400	\$450
E	C	9	7	\$300	\$400

 SASTRA DELMED TO BE UNIVERSITY 1983 of the JGC Act 1935 THINK/RESULT / THINK/TRANSPARENCY / THINK/SASTRA	School of Computing Second CIA Exam – March 2025 Course Code: INT422 Course Name: IT Project Management Duration: 90 minutes Max Marks: 50
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PART A

Answer ANY FIVE questions

5 x 10 = 50 Marks

1. Describe Project Control within the context of IT project management. Discuss its essential elements, identify relevant tools and techniques, outline key activities involved, and analyze the benefits gained from implementing effective project control.
2. Explain how resources are allocated in software product development. Describe the processes of resource scheduling and resource leveling within the context of an IT project, and identify the key elements involved in each process.
3. Describe the concept of Risk in Software Project Management (SPM). Explain how risks can be managed effectively during software product development, and outline the steps involved in the risk management process within SPM.
4. Explain the concept of a project audit in software product development and justify its necessity. Describe the detailed

procedure for conducting a project audit, and outline the processes involved in both project audit and project termination.

5. Describe the Agile approach in software development. Differentiate Agile from traditional software development models. Identify various types of Agile methodologies and explain any six principles underpinning the Agile framework.
6. Explain the Scrum framework within software development. Identify and describe the primary roles involved, and outline the essential terminologies associated with Scrum methodology.



SASTRA

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School of Computing Third CIA Exam – April 2025

Course Code: INT422

Course Name: IT Project Management

Duration: 90 minutes Max Marks: 50

PART A

Answer ANY FIVE questions

5 x 10 = 50 Marks

1. List all the key components of project overview. Explain each of them with their purposes.
2. Develop a Project Schedule for the Development of a Web Application for the Online Fruits selling Business. Create a schedule for every phase of the project along with the respective tasks to completed along with task dependencies. Use any of the visualization method for the schedule.
3. Explain all the key components of project control with their purposes along with benefits of the project control activities in Software project Development.
4. Build a Web Application as per the Project Schedule created in Question number 2 using Scrum. Plan the development and explain each sprint as per the plan.

5. What is DevOps? Compare DevOps with Agile. Explain various phases in DevOps with their dependencies by drawing a DevOps Diagram.
6. Write short notes on the following DevOps terminologies:
- Continuous Integration
 - Continuous Deployment
 - CI/CD Pipeline
 - Continuous Monitoring
 - Automation in DevOps



SASTRA

SARAJITHA ANANDHARAJU INSTITUTE OF TECHNOLOGY

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(UPE 3 of 14/10/02 No. 19/14)

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School of Computing
First CIA Exam – Feb 2025

Course Code: CSE435

Course Name: Image Processing &
Pattern Recognition

Duration: 90 minutes Max Marks: 50

PART A

Answer the following questions

5x10=50

- (a). A security camera with a focal length of 30 mm is installed to monitor a parking lot. If the camera is placed 5 meters away from the area to be monitored, what should be the image distance (v) to get a clear view? (4 marks)

(b). Brief the steps involved in JPEG compression of an image. (6 marks)
- Determine the output image, if the input image

10	20	30
40	50	60
70	80	90

is processed using a box filter.

100	200	150
140	150	160
250	200	190
- What will be the output image when the image

140	150	160
250	200	190


is processed using i) Binary threshold operator having threshold values 110 and 210 ii) Contrast stretching with thresholds 110 and 210
- Show the histogram equalized image for the input

10	20	30	40
20	60	30	80
10	20	30	40
70	80	10	40

image
- (a). An image has a resolution of 640x480 pixels and 8-bit pixel values. If the image is sampled at a rate of $1/4$, what is the new resolution? (2 marks)

(b). An RGB color image has a resolution of 640x480 pixels. Each pixel is represented using 3 bytes (1 byte for each color component). What is the total number of bytes required to store the image? (4 marks)

(c). List out the various stages in an image processing. (4 marks)

 <h1 style="text-align: center;">SASTRA</h1> <p style="text-align: center;">DEEMED TO BE UNIVERSITY U.P.S. 3 of the UGC Act 1956</p> <p style="text-align: center;">THINK MERIT THINK TRANSPARENCY THINK SASTRA</p>	<p style="text-align: center;">School of Computing Second CIA Exam – March 2025</p> <p>Course Code: CSE435 Course Name: Image Processing & Pattern Recognition</p> <p>Duration: 90 minutes Max Marks: 50</p>
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PART A

Answer any FIVE of the following questions

5x10=50

1. Find the resultant image when a vertical Prewitt operator is convolved with

$\begin{bmatrix} 1 & 3 & 6 \\ 1 & 4 & 8 \\ 1 & 5 & 10 \end{bmatrix}$

2. Estimate the GLCM of the image and brief the numerical features of GLCM

$\begin{bmatrix} 15 & 15 & 15 & 14 \\ 16 & 14 & 14 & 14 \\ 16 & 14 & 14 & 18 \\ 15 & 15 & 15 & 15 \end{bmatrix}$

$\lambda=1, \theta=45^\circ$

3. Consider the following binary image:

$\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}$

- Label the connected components in this image. (6 marks)
- Number of Connected Components (2 marks)
- Calculate the area (number of pixels) of each connected component.

$\begin{bmatrix} 21 & 20 & 24 \end{bmatrix}$

4. For the image $\begin{bmatrix} 16 & 19 & 24 \\ 18 & 18 & 21 \end{bmatrix}$, find the resulting image when processed using a max filter, min filter and median filter.

5. Given a set of 2D points (2, 2), (4, 4), (1, 3), (3, 1), (5, 5). Find the convex hull: (Draw the convex hull with its coordinates)

- List the steps involved in Otsu method of image segmentation
- List the steps used in Canny edge detection to detect edges.



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THANJAVUR | KUMBAKONAM | CHENNAI

School of Computing
Third CIA Exam – April 2025
Course Code: CSE435
Course Name: Image Processing &
Pattern Recognition
Duration: 90 minutes Max Marks: 50

PART A

Answer any **FOUR** of the following questions

4x10=40

1. Perform opening operation on the image
- | | | | | |
|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 |
- with the

structuring element

1	0	1
0	0	0
1	0	1

2. Given an RGB pixel with the following values: $R = 120$; $G = 150$; $B = 100$. Normalize the RGB values to the range $[0, 1]$ and convert the pixel to HIS.

3. Given a 2D point $(x, y) = (3, 4)$ in an image, apply a rotation transformation of 90 degrees clockwise about the origin $(0, 0)$. Calculate the new coordinates (x', y') of the point.

4. Perform Hit Miss transform on the image
- | | | | | |
|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 1 |
- with the
- structuring elements S1 as
- | | | |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 0 | 1 |
- S2 as
- | | | |
|---|---|---|
| 1 | 1 | 1 |
| 0 | 1 | 0 |

5. (a). Calculate the Euclidean distance, city block distance and chess board distance between two pixels $(x_1, y_1) = (3, 4)$ and $(x_2, y_2) = (6, 8)$. (6 marks)
(b). Brief the statistical measures used to evaluate image registration.

PART B

Answer the following questions

1x10=10

6. For the 3x3 image given below determine the

10 20 30

40 50 60

110 120 130

- (a). Smoothened image when operated using median filter (5 marks)
(b). Resultant image when contrast is decreased by factor of 0.5



School of Computing
First CIA Exam - February 2025
Course Code: MGT214
Course Name: Marketing Research & Management
Duration: 90 minutes
Max Marks: 50

PART A

Answer any 5 questions

5x10=50 Marks

1. Explain in detail the core concepts of marketing.
2. Explain how political, legal, cultural, social and economic factors affect the global marketing scenario.
3. Discuss the concept of lifestyle segmentation and its relevance in consumer marketing.
4. Discuss the stages of new product development with example.
5. Enumerate the strategic importance of the concepts Segmentation, Targeting, Positioning (STP) with examples.
6. Discuss the concept of 4Ps in the marketing mix and their interplay in a successful marketing strategy.
7. Analyze the impact of technological advancements on the marketing environment, considering both opportunities and challenges.



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2

School of Computing
Second CIA Exam – March 2025
Course Code: MGT214
Course Name: Marketing Research &
Marketing Management
Duration: 90 minutes
Max Marks: 50

PART A

Answer any 5 questions

5x10=50 Marks

1. Explain the different factors that determine pricing decisions with examples.
2. Explain the role and importance of promotion in the global marketing scenario.
3. Discuss the steps in Marketing Research Process
4. Discuss the different types and functions of wholesaler
5. Enumerate the objectives and functions of advertising with examples
6. Explain the application of any four statistical tools commonly used for analyzing primary data in market research.
7. Design a comprehensive questionnaire to understand consumer perceptions and buying behavior for consumer durables of your choice



A 26


School of Computing
Third CIA Exam – May 2025
Course Code: MGT214
Course Name: Marketing Research
& Marketing Management
Duration: 90 minutes Max Marks: 50

PART A

Answer any 5 questions

5x10=50 Marks

1. Explain the different functions of marketing and describe how changing business environments are influencing modern marketing practices.
2. Explain the stages of the new product development process and describe what strategies should be emphasized at each stage.
3. Explain the different types of market research process
4. In what ways has digital marketing revolutionized traditional marketing practices? Discuss with relevant examples to illustrate its impact.
5. Discuss key design elements that contribute to creating effective and user-friendly websites with examples?
6. Explain the 7 Ps of marketing and illustrate each element with suitable examples
7. Enumerate the different components of internet marketing with examples


 SASTRA SASTRA UNIVERSITY THINK MERIT THINK TRANSPARENCY THINK SASTRA	School of Computing First CIA Exam – Feb 2025 Course Code: MGT213 Course Name: Service Science and Service Operations Management Duration: 90 minutes Max Marks: 50
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PART A

Answer the following questions

5x10=50

1. Discuss the role of service in economy and society.
2. Elucidate the nature of services and service encounters.
3. Explain various frameworks to design service operation systems.
4. Evaluate Goods dominant logic to Service dominant logic.
5. Elaborate the strategies for matching capacity and demand.


 <p>SASTRA <small>ENGINEERING MANAGEMENT AND SCIENCES HUMANITIES EDUCATION</small> DEEMED TO BE UNIVERSITY <small>(U-23 of the UGC Act 1956)</small> THINK MERT THINK TRANSPARENCY THINK SASTRA</p>	<p>School of Computing Second CIA Exam – Mar 2025 Course Code: MGT213 Course Name: Service Science and Service Operations Management Duration: 90 minutes Max Marks: 50</p>
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PART A

Answer the following questions

5x10=50

1. Discuss the NSD Cycle.
2. Elaborate Complaint handling & Service recovery.
3. Evaluate forecasting demand & service.
4. Explain Vehicle routing problem.
5. Elucidate managing Service supply relationship.

 <h1 style="text-align: center;">SASTRA</h1> <p style="text-align: center;">ENGINEERING · MANAGEMENT · LAW · SCIENCES · HUMANITIES · EDUCATION</p> <p style="text-align: center;">DEEMED TO BE UNIVERSITY</p> <p style="text-align: center;">(UFS 3 of the UGC Act, 1956)</p> <p style="text-align: center;">THINK MERIT THINK TRANSPARENCY THINK SASTRA</p>	<p style="text-align: center;">School of Computing</p> <p style="text-align: center;">Third CIA Exam – May 2025</p> <p>Course Code: MGT213</p> <p>Course Name: Service Science and Service Operations Management</p> <p>Duration: 90 minutes Max Marks: 50</p>
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PART A

Answer the following questions

4x10=40

1. Discuss the nature of service and service encounters. 10
2. Explain various frameworks to design service operation systems. 10
3. Elaborate Complaint handling and Service recovery. 10
4. Evaluate forecasting demand & service. 10
5. Discuss the role of inventory in service
6. Develop the strategies for Building a world class service organization. 10

10
50

PART – B

Answer ALL the Questions

1 x 10 = 10 Marks

7. Examine the GDP growth in Indian Service sector



SASTRA

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School of Computing

First CIA Exam – Feb 2025

Course Code: INT434

Course Name: Advanced Social, Text and Media Analytics

Duration: 90 minutes Max Marks: 50

PART A

Answer ALL the questions

5x10=50 marks.

1. a. Summarize the basic principles of Vector Space model in information retrieval with suitable example.

b. Using the text mining method of TF-IDF, calculate the TF and IDF for the following small set of documents: Doc 1: "Text mining is fun". Doc 2: "Mining data with text is important". Doc 3: "Text data and mining techniques" (Show all calculations for TF and IDF and compute the final TF-IDF scores for the word "text" in each document.)

2. Calculate entropy and purity for the given group of clusters.

Cluster Id:	A	B	C
TOPIC 1:	250	20	10
TOPIC 2:	20	180	80
TOPIC 3 :	30	100	210


3. Using the IQR method, describe the steps involved in detecting outliers in a given dataset. Illustrate your explanation with the following dataset: 4, 8, 10, 14, 16, 18, 20, 22, 24, 28

i. Calculation of Q1, Q3, and IQR. ii. Determining lower and upper bounds for outlier detection. iii. Identify any outliers in the dataset.

4. Write in detail condition random field probabilistic model for information extraction .

5. Explain the following with suitable examples

a. Shallow Parsing. b. Constituency Grammars c. Dependency Grammar

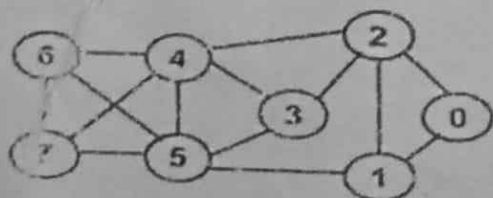
 <p>SASTRA SARAJITHA ANTHONY SASTRIAN DEEMED TO BE UNIVERSITY THINK MERIT / THINK TRANSPARENCY / THINK SASTRA</p>	<p>School of Computing Second CIA Exam – March 2025 Course Code: INT434 Course Name: Advanced Social Text Media Analytics Duration: 90 minutes Max Marks: 50</p>
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PART A

Answer any TWO questions

2x15=30 marks


1. Illustrate the 'big three centrality measures' used in social network analysis with examples.
2. a. Given the following undirected graph: Vertices: A, B, C, D, E, F, Edges: AB, BC, BE, BD, CD, CE, DE, DF. Compute the k-core collapse sequence for $k=1,2,3$, and 4. (8marks)
b. Describe the importance of Off-Page SEO and how they influence search engine rankings. (7marks)
3. Write short notes on :
a. Two-mode network analysis with examples (6marks)
b. Find the Egocentric network of all nodes. (9 marks)



Part -- B

1x20=20 marks

4. A social media analysis categorizes user interactions into two sentiment states: **Engaged (E)** and **Disengaged (D)**. The initial probabilities of user sentiment states are $P(E)=0.6$ and $P(D)=0.4$. Over time, user sentiment transitions according to the following probabilities: $P(E \rightarrow E)=0.7$, $P(E \rightarrow D)=0.3$, $P(D \rightarrow D)=0.6$, and $P(D \rightarrow E)=0.4$. Users express their sentiments through their **Activity Type**: either **Comments (C)** or **Shares (S)**. The likelihood of these activity types, given the sentiment state, is described by the emission probabilities $P(C|E)=0.8$, $P(S|E)=0.2$, $P(C|D)=0.4$, and $P(S|D)=0.6$. Given the observed sequence of activities [C,S,S], use the Hidden Markov Model (HMM) to identify the most likely sequence of user sentiment states. Calculate the probability of the observation sequence using the Forward Algorithm.

 SASTRA <small>SASTRANATHAN UNIVERSITY</small> DEEMED TO BE UNIVERSITY <small>U.S. Nat. Ac. (UGC) Act 1956</small> THINK MIT THINK TRANSPARENCY THINK SASTRA	School of Computing Third CIA Exam – MAY 2025 Course Code: INT434 Course Name: Advanced Social Text Media Analytics Duration: 90 minutes Max Marks: 50
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PART A

SOC - A13 - ASTMA - 20

Answer any Two questions

2x15=30

1. a. Explain the concepts of the conversion funnel and session analysis in the context of clickstream analysis. Outline the key steps involved in conducting such an analysis. **(10 marks)**

b. Explain the process of building a text categorization model, starting from data collection to evaluation **(5 marks)**

2. a. What is meant by stop word removal and stemming? Relate its necessity in text mining? **(8marks)**

b Illustrate the concept of web crawler ethics and conflicts. **(7marks)**

3. a. How does structural balance theory predict the evolution of relationships in a network? Provide examples to support your explanation. **(10 marks)**

b. How might homophily influence the development of friendships or relationships? **(5 marks)**

Part – B

1x20=20

4. Write a Python program to simulate the spread of an epidemic in a population represented as an Erdős–Rényi random graph. Initialize the graph with nodes in Susceptible (S), Infected (I), and Recovered (R) states, with a few nodes randomly infected initially. Implement the disease spread dynamics, where a susceptible node becomes infected based on a specified infection probability if it has an infected neighbor, and infected nodes recover after a fixed recovery time. Simulate the epidemic over multiple steps, updating node states at each step. Visualize the graph at each step with different colors for S, I, and R states, print the counts of nodes in each state, and save these counts to plot an epidemic curve showing the progression of the infection over time.