

Con. 5622-10.

GT-8484

(3 Hours)

[ Total Marks : 100

**N.B.** (1) Question No. 1 is **compulsory**.(2) Attempt any **four** from the remaining **six** questions.(3) Assume **suitable** data wherever **required**.

1. (a) Draw and explain the workstation based architecture for multimedia systems. Also specify hardware and software expected at each layer (if any) considering an example. 10
- (b) Explain lossy and lossless compression techniques. 10
2. (a) Explain RTP, RTCP, RSVP, RTSP and IP multicast. 10
- (b) Explain Level 0 through Level 05 of RAID functionality. 10
3. (a) Describe the algorithm for CCITT group 3 standard. How does CCITT group 4 differ from CCITT group 3 ? 10
- (b) Explain different scheduling and policing mechanism in multimedia networking. 10
4. (a) What are different types of workflow ? Suggest application of Mail enabled workflow. 10
- (b) Explain JPEG DIB file format for still and motion images. 10
5. (a) Explain virtual reality design considerations. 10
- (b) Explain MPEG compression in detail. 10
6. (a) You are appointed as a Consultant to develop an implementation strategy for an automated tourist system that helps its customers to plan this tours. The system has agencies that provides services like air, railway, luxury, economic planning of tour, hotels, services etc. For such a system design the multimedia authorising system and also specify the multimedia data base scheme for the same. 10
- (b) Explain hypermedia messaging with suitable example. 10
7. Write short notes on any **two** of the following :— 20
  - (a) Video conferencing : Design Issues
  - (b) Architectural and telecommunications considerations
  - (c) Distributed multimedia system.

Con. 5668-10.

GT-8610

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) **All** questions carry **equal** marks.  
(3) Attempt any **four** questions out of remaining **six**.  
(4) **Figures** shown in the **right** indicates marks.

- 1.a) Write short notes on various malicious code that create vulnerability in a network. [20]  
b) Mention five parameters of risk analysis for better network administration.  
c) Mention how SSL/TLS is responsible for network failure .  
d) Mention the proposal for multilevel database security.
- 2.a) Compare IDS & firewall. Mention in detail with an example about types of IDS . [10]  
b) Explain various schemes of memory and address protection for OS security. [10]
- 3.a) Explain the issues of database security requirements with an application. [10]  
b) Write about Secure E-mail and explain the design with its requirements that can provide better security solutions . [10]
- 4.a) Explain the concept of Salami attack with an example. [10]  
b) Explain various denial of service attacks for a network. [10]
- 5.a) Explain about Link encryption and End-to-End encryption with an example each. [10]  
b) Explain various attacks on passwords and its proper selection. [10]
- 6 a) Write in detailed about various targeted malicious code with examples. [10]  
b) Explain various types of Covert channels and mention how they are created. [10]
7. Write short notes on any **four** : [20]
- a) RSA algorithm
  - b) Access control list
  - c) Direct and Indirect attack on database security
  - d) Design of firewalls
  - e) Ethical issues in computer security
  - f) Keystroke logging with an example

- N.B.** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of the remaining.  
 (3) Figures to the **right** indicate **full** marks.

1. (a) Determine the  $\alpha$ -level sets and strong  $\alpha$ -level sets for the following fuzzy set. 08  
 $A = \{(2,1), (4,0.2), (5,0.3), (6,0.4), (7,0.6), (8,0.8), (10,1), (12,0.8), (14,0.6)\}$   
 for  $\alpha = 0.3, 0.5, 0.8$
- (b) Model the following as fuzzy set using suitable membership function - "numbers close to 6". 06
- (c) Define with examples the following terms. 06  
 (i) Convex and non-convex fuzzy set  
 (ii) Nucleus and height of fuzzy set
2. Design a fuzzy controller to determine the wash time of a domestic washing machine. Assume that the inputs are dirt and grease on clothes. Use three descriptors for each input variable and five descriptors for the output variable. Device a set of rules for control action and defuzzification. The design should be supported by figures wherever possible. Clearly indicate that if the clothes are soiled to a smaller degree the wash time required will be less. 20
3. (a) What is learning? Explain the different types of learning with examples. Compare different learning rules. 10
- (b) Explain error back propagation training algorithm with the help of a block diagram. 10
4. Determine the weights after one iteration for Hebbian learning of a single neuron network starting with initial weights  $w = [1, -1, 0, 0.5]$ , inputs as  $x_1 = [1, -2, 1.5, 0]$ ,  $x_2 = [1, -0.5, -2, -1.5]$ ,  $x_3 = [0.1, -1, 1.5]$  and  $c = 1$ . 20  
 Use (i) Bipolar binary activation function  
 (ii) Bipolar continuous activation function
5. (a) Describe the basic Hopfield model and give the theory of energy minimization in auto-associative Hopfield network. 10
- (b) Explain the architecture of Bidirectional associative memory. How is storage and retrieval performed in BAM? 10
6. (a) Explain with examples four different defuzzification methods. 10
- (b) Explain RBF network and give the comparison between RBF and MLP. 10
7. Write notes on **any two** of the following : 20  
 (i) Fuzzy Relations  
 (ii) Medical Diagnosis using neural networks  
 (iii) Character Recognition using neural networks  
 (iv) Fuzzy Knowledge based Controller.

Leads

(3 Hours)

[Total Marks : 100

- N.B.: (1) Question no. 1 is compulsory.  
 (2) Answer any four out of the remaining questions.

1. (a) Give information package diagram for recording information requirement for "college admission" considering dimensions like time, seats, branch etc. design star schema from information package. Also draw snowflake schema. 10

(b) A database has four transactions. Let minimum support and minimum confidence is 50%.

Tid	Items Bought
1	A, B, D, E, F
2	A, D, C, B
3	A, C, D, E, F
4	B, D, E, F, C

- i) Find all frequent itemsets using Apriori Algorithm. 05  
 ii) List strong Association Rules. 05
2. (a) Define Classification. Explain decision tree for classification with an example. 10  
 (b) What is clustering? Explain K-means clustering and solve the following with K=2, for the given data {2,25,10,15,5,20,4,40}. 10
3. (a) Define datawarehouse with features. Explain DW architecture with suitable block diagram. 10  
 (b) What are the types of OLAP server? Explain the different operations of OLAP. 10
4. (a) Define Factless fact table with an example. 10  
 (b) Write a short note on outliers in data mining. 10
5. (a) Explain data mining steps in KDD? Give the architecture of typical data mining system. 10  
 (b) What is web mining? explain content mining with respect to crawlers and personalization. 10
6. (a) Define data mining. Differentiate between classification and prediction. 10  
 (b) Explain general trend in Datawarehousing. 10

7. Write short notes on (ANY Four) : - 20
- (a) Spatial Mining
  - (b) DMQL
  - (c) Visualisation
  - (d) Hypercubes
  - (e) Temporal Mining
  - (f) Regression.

Con. 5603-10.

GT-8602

(3 Hours)

[Total Marks : 100]

- N. B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of remaining **six** questions.  
 (3) **All** questions carry **equal** marks.
1. (a) State the difference between CPM & PERT. Describe how GERT overcome the limitations of CPM/PERT. **10**  
 (b) What is the role of RFP ? Describe the contents of RFP. **10**
  2. (a) What is Project Master Plan ? State and explain the content of project master plan. **10**  
 (b) What is WBS ? How it is used in project planning and control ? **10**
  3. (a) Explain the difference between statement of works and contract statement of work and work requisition or work order. **10**  
 (b) Explain system development cycle in detail. **10**
  4. (a) Describe cause-and-effect diagram. Explain with suitable example. **10**  
 (b) Explain six steps involved in process of managing risk. **10**
  5. (a) What do you understand by concept of resource allocation and resource loading in project management ? **10**  
 (b) Explain concurrent engineering in detail. **10**
  6. (a) What limitations of AOA and AON networks does PDM overcomes ? State and explain the different relationships of PDM. **10**  
 (b) List out the responsibilities of project manager in terminating the project. **5**  
 (c) What is feasibility study ? Explain its content and purpose. **5**
  7. Write short notes on any **two** :- **20**
    - (a) PMIS
    - (b) Responsibilities of project manager
    - (c) Quality function deployment.

Con. 5622-10.

GT-8484

(3 Hours)

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Con. 6295-10.

## Elective II - Robotics

GT-8385

(3 Hours)

[ Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** out of remaining **six** questions.  
 (3) Assume **suitable** data wherever **necessary**.

1. (a) Explain reach and stroke of a robot. 5  
 (b) Discuss Total Work Envelope (TWE) and Dexterous Work Envelope (DWE). 5  
 (c) Compare area and line descriptors. 5  
 (d) Differentiate between hard and soft automation. 5
  2. (a) Explain D-H algorithm. Develop D. K. analysis of 4 axis SCARA robot. 15  
 (b) Explain composite rotation matrix (CRM) algorithm. 5
  3. (a) Discuss work envelope of a 4 axis SCARA robot. 10  
 (b) Develop IK analysis of 2-axis planar articulated Robot. 10
  4. (a) Explain how straight line motion can be obtained using an articulated robot. 10  
 (b) Explain linear interpolation with parabolic blends. Discuss its advantages over piecewise linear interpolation. 10
  5. (a) 

0	0	1	1	0	0
1	1	1	1	1	1
0	0	1	1	0	0

10
- For the above image, calculate area, centroid, first order moments, second order moments, central moments and principal angle.
- (b) Discuss edge detection technique. Explain the significance of edge threshold. 10
  6. (a) Compare the joint variable vector  $q = [q_1, q_2, q_3, q_4]^T$  for the following TCV of SCARA.  $w(q) = [203.4, 662.7, 557, 0, 0, -1.649]^T$ . 10  
 (b) Explain the effect of Moment of Inertia on the dynamic performance of a robot. 10
  7. Short notes on :- 20
    - (a) Shrink and Swell operators
    - (b) Gross motion planning
    - (c) Robot classification.