Exam. Code : 206702
Subject Code : 5235

M.Sc. Computer Science 2nd Semester

IMAGE PROCESSING

Paper–MCS-202

Time Allowed—3 Hours] [Maximum Marks—100

Note :— Attempt any **FIVE** questions. Each question carries equal marks.

1. Explain the term Image Digitization. Discuss different technologies involved in Image Digitization. Also write the properties of a digital image. 20

2. Define the following terms :

   (a) Image Enhancement

   (b) Image Data Compression

   (c) Image Restoration

   (d) Statistical Pattern Recognition. 4×5

3. Discuss Digital Image Restoration System. Write different Digital Image Restoration models. Explain the concept of image formation system, a detector and a recorder. 20

4. What do you understand by a Computer Vision System? Explain Computer Vision application areas. Explain at least one in detail. 20

5. Discuss the term Data Redundancy in Image Processing ? Explain its three types in detail with the help of an example. 20

6. Write short notes on the following :

   (a) Statistical Pattern Recognition 10

   (b) Color System Transformations. 10

7. Discuss the role of Image processing in the field of medical image analysis. 20

8. Discuss :

   (a) Convolution 10

   (b) Correlation in Fourier Transform. 10

Exam. Code : 206702
Subject Code : 5236

M.Sc. Computer Science 2nd Semester
DESIGN & ANALYSIS OF ALGORITHMS
Paper—MCS-203

Time Allowed—3 Hours] [Maximum Marks—100

Note :— Attempt any ***five*** questions. All questions carry equal marks.

1. Define algorithm. What are the parameters to judge the efficiency of an algorithm ? Explain various notations for representation of time complexity of an algorithm with suitable examples. 20
2. How is binary search different from linear search ? Write the binary search algorithm and compute its time complexity. 20
3. Explain the Quick sort algorithm for sorting the elements and show that the Quick-sort's best case running time is $\Omega(n \lg n)$. 20
4. What is meant by minimum spanning tree ? What are its applications ? Prove that Kruskal's algorithm generates a minimum-cost spanning tree for every connected undirected graph G. Analyze the time complexity of Kruskal's algorithm. 20
5. What is 0/1 Knapsack problem ? Describe, by giving an algorithm, how 0/1 Knapsack problem can be solved by using dynamic programming technique of designing an algorithm. 20

6. What do you mean by forward and backward approach of problem solving in Dynamic Programming ? What are the differences between Greedy and dynamic programming method of problem solving techniques ? Explain in detail how the technique of backtracking can be applied to solve the 8-queens problem. Present an algorithm for this and explain. 20

7. Define multistage graphs problem. Name the algorithms, which solve the problem. Write one of the algorithms and explain its working with an example. 20

8. Write short notes on :

   (a) Traversal techniques for graphs

   (b) Travelling salesman problem. 10,10

Exam. Code : 206702
Subject Code : 5237

M.Sc. Computer Science 2nd Semester

CLOUD COMPUTING

Paper — MCS-204

Time Allowed—3 Hours] [Maximum Marks—100

Note :— There are **eight** questions, attempt any **five**. **All** questions carry equal marks.

1. Which are different types of Cloud computing services ? Which are various desired features of a cloud ?
2. What is virtualization ? Discuss the role and importance of virtualization and virtual appliance in cloud computing ?
3. Explain cloud computing architecture. What is SLA and QoS in cloud computing ?
4. Explain various security issues and their solutions in cloud computing.
5. What is Big-Data Analytics ? What is Federated Cloud Computing ?
6. Which are various service models ? Explain security as a service on cloud.
7. Explain the concept of energy efficiency in cloud. What is market oriented cloud computing.
8. What do you mean by programming models in Cloud? What is Thread programming and Map-Reduce programming ?

Exam. Code : 206702
Subject Code : 5238

M.Sc. Computer Science 2nd Semester

DISTRIBUTED DATABASE SYSTEMS

Paper–MCS-205

Time Allowed—3 Hours] [Maximum Marks—100

Note :— Attempt any **FIVE** questions. All questions carry equal marks.

1. Define distributed database system. What are the problems in distributed database system ? Tabulate the differences in distributed database and centralized database. 20

2. (a) What is fragmentation. What are various methods of fragmentation ? Discuss in detail. 10

   (b) What are different types of schemes ? Explain with suitable examples. 10

3. What is a query ? How a database operation can be represented in form of a query ? What are various operations which can be performed in a query ? Discuss with suitable examples. 20

4. Elaborate the process of query optimization. 20

5. Define transaction. What are the termination conditions for a transaction ? What are various goals of transaction management ? Discuss in detail with suitable examples. 20

6. (a) Two-phase locking increases concurrency in transaction execution relative to static locking. However what problems are associated with the two phase locking ? 10

(b) What are various integrity constraints ? Discuss briefly. 10

7. What do you mean by deadlock ? Discuss in detail various control organizations for distributed deadlock detection. 20

8. Discuss the following in detail :

(a) Distributed database administration 10

(b) Authorization and protection in distributed database. 10

Exam. Code : 206704
Subject Code: 5259

M.Sc. Computer Science 4th Semester

ADVANCED WEB TECHNOLOGIES USING ASP.NET

Paper—MCS-401

Time Allowed—3 Hours] [Maximum Marks—100

Note :— Attempt **FIVE** questions. All questions carry equal marks.

1. What are various standard controls to display image and text information in ASP.NET ? How hyperlink controls are used ? 20

2. Discuss the procedure for applying validation controls in form data. How regular expressions are used in validations ? Explain by taking an example. 20

3. What are different calendar operations ? State and explain the method of displaying advertisement. 20

4. What is master page ? Discuss the method of loading master page dynamically. 20

5. How ASP.NET makes connection with database ? Explain the data retrieval using SQL commands. 20

6. What are various parameters available in dropdown list control ? How it differs from bulleted list ? Create a form by inserting dropdown list and bulleted list in it. 20

7. Discuss the following :—

   (a) Grid view control.

   (b) ADO.NET

   (c) Cookies

   (d) User Profiles. 4×5

8. Explain different methods of caching application pages ? What is SQL dependency on cache ? Explain. 20

Exam. Code : 206704
Subject Code : 5260

M.Sc. Computer Science 4th Semester

MICROPROCESSOR AND ITS APPLICATIONS

Paper–MCS-402

Time Allowed—3 Hours] [Maximum Marks—100

Note :– Attempt any **five** questions. All questions carry equal marks.

1. Discuss the detail of different units of Microprocessor and general architecture of microcomputer system. 20
2. (a) Explain the description of different pins of 8088 microprocessor for minimum mode system. 10
   (b) Describe the sequence of instruction execution of 8088 microprocessor. 10
3. (a) How memory address apace is organized for 8086/8088 microprocessor ? Explain. 10
   (b) What are the major memory control signal for 8088 memory interfacing ? Describe their role. 10
4. Explain the following :
   (a) Dynamic RAM system
   (b) Read write Bus cycles. 20
5. What is the role of USART chip ? Discuss the block diagram of this chip and role of different units of this chip. 20

6. What is the role of interrupt interface ? Explain the need of IVT in detail. 20

7. Discuss the following :
   (a) Read bus cycle of 8086
   (b) Write bus cycle of 8086. 20

8. Write short notes on the following :
   (a) RS 232 C
   (b) UART. 20

Exam. Code : 206704
Subject Code : 5261

M.Sc. Computer Science 4th Semester

MCS-403 OBJECT ORIENTED MODELLING, ANALYSIS & DESIGN

Time Allowed—3 Hours] [Maximum Marks—100

Note :— Attempt any **five** questions. All questions carry equal marks.

1. (a) What is meaning of behaviour of an object ?

   (b) What is Object Oriented Analysis and Design ?

2. What is difference between Specialization, Generalization and Aggregation ? Explain with the help of an example and diagram.

3. (a) What is multiple inheritance ?

   (b) What is association ? Explain the difference between unary, binary, ternary or n-ary associations.

4. (a) What is data dictionary ? What is its use ?

   (b) Explain the difference between primary, foreign and composite keys.

5. What is Scenario in dynamic modelling ? What is use of Event trace diagram ?

6. What is difference between object model, dynamic model and functional model ? Explain with an example.

7. Draw and explain a DFD for University admission system. Make and write your own assumptions.

8. What do you mean by class diagram ? Where it is used ? Also discuss the steps to draw the class diagram with any one example.