[Total No. of Printed Pages-2

[R25104]

M.C.A. DEGREE EXAMINATIONS

SECOND SEMESTER

Paper - IV : FORMAL LANGUAGES AND AUTOMATA THEORY

(W.E.F. 2020-21 Admitted Batch)

Time : 3 Hours **Maximum : 75 Marks**

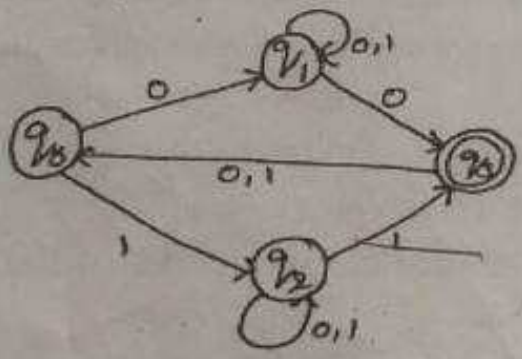
SECTION - A

Answer all the questions. (4×15=60)

1. a. Let r be a regular expression. Then there exists some NFA with ∈ -Transitions that accepts L(r). Explain. **(15)**

(OR)

b. What is the significance of NFA? Convert the following NFA to DFA. **(15)**



2. a. Design a PDA for accepting the context free language $a^n b^n, n > 0$. **(15)**

(OR)

b. State and prove pumping Lemma for CFL's? (8)

c. Explain any Five closure properties of Regular sets. (7)

3. a. Construct a TM to acccept. $L = \{a^n b^n c^n / n >= 1\}$, (15)

(OR)

b. Explain Briefly about Halting problem of a Turing Machine. (7)

c. Compare and contrast Decidable and Undecidable problems. (8)

4. a. Explain the concept of Truth Assignments. (8)

b. Discuss syntax of predicate calculus. (7)

(OR)

c. Elaborate about Normal Forms. (15)

SECTION - B

Answer any **five** questions. (5×3=15)

5. a. Write the differences between DFA and Non DFA.

b. Write about any three closure properties of Regular sets.

c. Define Finite Automata.

d. Define Transition system.

e. Write short note on syntax of the preposition calculus.

f. Discuss NP - completeness.

g. Define Turing machines.

h. Explain Normal Forms.

[Total No. of Printed Pages-2

[R25103]

M.C.A. DEGREE EXAMINATIONS

SECOND SEMESTER

Paper - III : DATABASE MANAGEMENT SYSTEMS

(W.E.F. 2020-21 Admitted Batch)

Time : 3 Hours **Maximum : 75 Marks**

SECTION - A

Answer **ALL** the questions. (4×15=60)

1. a. Explain in detail the various data models in DBMS with a neat diagram.

(OR)

b. Discuss on centralized and client/server architecture for DBMS with an example case study.

2. a. Explain ER modeling with an example case study.

(OR)

b. Discuss about DDL, DML, DCL commands with syntax and examples.

3. a. What is normal form? Explain about various normal forms with an example.

(OR)

b. Discuss about secondary storage devices.

4. a. Explain the algorithms for PROJECT and SET Operations.

(OR)

b. Explain about concurrency control techniques.

SECTION - B

Answer any **FIVE** questions. **(5×3=15)**

5. a. What are schemas and instances.

b. Describe the components of ER - model.

c. What is Domain Relational Calculus.

d. What is ER and ERR Relational mapping.

e. What is Functional Dependences.

f. What is RAID technology.

g. What is query processing and optimization.

h. Give an introduction to transaction processing.

[Total No. of Printed Pages-2

[R25102]

M.C.A. DEGREE EXAMINATIONS

SECOND SEMESTER

Paper - II : OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(W.E.F. 2020-21 Admitted Batch)

Time : 3 Hours **Maximum : 75 Marks**

SECTION - A

Answer **ALL** the questions. (4×15=60)

1. a. Illustrate constructor overloading with a Java program.

(OR)

b. Explain in detail the types of inheritance with a neat sketch.

2. a. What is a package? Explain about creating a package with a Java program.

(OR)

b. What is exception handling? Explain about exception handling implementing try, catch, throw, throws and findly blocks with a java program.

3. a. What are applets? Discuss an example applet program.

(OR)

b. Discuss the following.

a. Applet class and methods. (5)

b. Applet structure. (5)

c. Applet life cycle. (5)

4. a. Discuss about AWT and SWING packages and methods with syntax and example.

(OR)

b. Give an introduction to event handling? Discuss about event delegation model and event listeners.

SECTION - B

Answer any **FIVE** questions. (5×3=15)

5. a. Describe the principles of object oriented languages.

b. Write about primitive data types in Java.

c. Differentiate interface and abstract classes.

d. What is Exception, Encapsulation and Enrichment.

e. What is multithreading.

f. What is paint ( ), update ( ) and repaint ( ) in applet programming.

g. What are adapter classes and inner classes.

h. What are components and containers in AWT.

[Total No. of Printed Pages-2

[R25101]

M.C.A. DEGREE EXAMINATIONS

SECOND SEMESTER

Paper - I : COMPUTER NETWORKS

(W.E.F. 2020-21 Admitted Batch)

Time : 3 Hours **Maximum : 75 Marks**

SECTION - A

Answer **ALL** the questions. (4×15=60)

1. a. Explain in detail about the various reference models with a neat diagram.

(OR)

b. Explain the various transmission media available for data communication with a neat sketch.

2. a. Explain about error detection and error correction concept with an illustration.

(OR)

b. Discuss about any two routing algorithms.

3. a. What is transport service? Explain about the elements of transport protocols and internet transport protocols.

(OR)

b. Write on the following.

a. FTP

b. TFTP.

c. BOOTP.

4. a. Give an overview on the following.
   a. Repeaters.
   b. Bridges.
   c. Routers.

(OR)

b. Give an overview on the following with a neat sketch.
   a. Cellular networks.
   b. Ad hoc networks.
   c. Sensor networks.

SECTION - B

Answer any **FIVE** questions. (5×3=15)

5. a. Differentiate Network hardware and network software.
   b. What is multiplexing and switching.
   c. Give a note on sliding window protocols.
   d. What is internetworking.
   e. Describe quality of service model.
   f. Give a note on WWW and firewalls.
   g. Write about modems and gateways.
   h. Give a note on DSV and NIC.

[Total No. of Printed Pages-3

[R25106C]

M.C.A. DEGREE EXAMINATIONS

SECOND SEMESTER

ELECTIVE - I

Paper - VI(c) (Optional) : IMAGE PROCESSING

(W.E.F. 2020-21 Admitted Batch)

Time : 3 Hours **Maximum : 75 Marks**

SECTION - A

1. Answer **ALL** the questions. **(4×15=60)**

1. a) What is the purpose of a digital image? How digital images can be represented? List and explain various applications of digital image processing.

(OR)

b) What are the various components of image processing systems? Explain.

c) Explain the basic relationships between pixels with suitable example.

2. a) State and explain with suitable examples the arithmetic/logic operations among pixels. Compare and contrast various smoothing filters.

(OR)

b) Differentiate between high pass and low pass filters. Illustrate that a high pass-filtered image in the frequency domain can be obtained by using the method of subtracting a low pass filtered image from the original.

3. a) Explain about image compression, its significance and drawbacks.

b) Explain in detail about compression at the time of image transmission.

(OR)

c) What are the various smoothing and sharpening spatial filters? List and explain any three of them.

d) Explain the advantages of filters in frequency domain.

4. a) What is meant by image segmentation? Discuss various areas of applications of it.

b) Discuss about region based segmentation with a suitable example.

(OR)

c) Explain the preliminaries of morphological image processing.

d) What is meant by Hit or miss transformation? Discuss various applications of this transformation?

SECTION - B

II. Answer any **FIVE** questions. (5×3=15)

a) Explain about sampling in image processing.

b) What is Image stretching? Explain.

c) Explain about Counter Coding.

d) What are the image sharpening filters.?

e) What are Butterworth filters? Write their significance.

f) What kind of size operations carried out for image enhancement?

g) Write the applications of morphology in Image processing.

h) What are the differences between Thinning and Thickening?
