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C022511(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

AICTE

(~~New~~ Scheme)

(CSE Branch)

MICROPROCESSORS & INTERFACES

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) carries 4 marks and is compulsory. Attempt any* **two** *from part (b), (c) and (d) carrying 8 marks.*

Unit-I

1. (a) Explain the flag register of 8085. 4

(b) Compare : 8

(i) Harvard and Princeton architecture.

(ii) 8085 and 8088 microprocessor

(c) Explain the internal architecture of 8085 microprocessor with basic functional block. 8

(d) Explain the functions of the following signals of 8085. 8

(i) ALE

(ii) IO/$\overline{M}$

(iii) $\overline{RD}$

(iv) READY

(v) TRAP

(vi) INTR & $\overline{INTA}$

(vii) HOLD & HLDA

(viii) $\overline{RESET\ IN}$

Unit-II

2. (a) Explain the following instructions : 4

(i) XCHG

(ii) CLD

(iii) AAA

(iv) CMPS

(b) Explain BIU & EU of 8086 microprocessor. 8

(c) Explain the various addressing modes of 8086 with suitable example. 8

(d) WAP to find the smallest number among a string of 10 data bytes starting from location 2000H : 3000H and store the result in 2000H : 0500H. 8

Unit-III

3. (a) What are Maskable and Non-Maskable interrupts? 4

(b) Draw Interrupt vector table of 8086 microprocessor and explain it's various kinds of interrupts. 8

(c) Draw the timing diagram of the read and write cycle in minimum mode. 8

(d) Write a program that uses a character string defined with C and display it so that each word is listed on a separate line. 8

Unit-IV

4. (a) What do you understand by Address Decoding Technique? 4

(b) Design an interface between 8086 and two chips of 16K × 8 EPROM and two chips of 32K × 8 RAM. Select the starting location of the EPROM suitably. RAM location must start from 00000H. 8

(c) Explain the internal architecture of DMA 8257 and also its various operating modes. 8

(d) Explain the control word format of 8255 in I/O and BSR mode. 8

Unit-V

5. (a) What are segment descriptors? 4

(b) Explain the internal architecture of 80386 and register organization. 8

(c) Explain and compare real, protected and virtual mode operation of 80386 microprocessor. 8

(d) Compare core i3, i5 and i7 and atom processors. 8

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C022512(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

(Computer Science & Engineering Branch)

COMPUTER NETWORK

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

***Note** : Attempt all questions. Part (a) is compulsory & solve any **two** from (b), (c) & (d) of each questions. Assume any missing data. Use diagrams wherever required.*

Unit-I

1. (a) Write a short note on network topology. 4

(b) What is Switching? Explain circuit switching, packet switching and message switching. 8

(c) Compare OSI and TCP/IP model. 8

(d) Compare guided and unguided media. 8

Unit-II

2. (a) What is a Brouter? Write its use. 4

(b) Explain sliding window protocol. 8

(c) What is HDLC? Explain the features of HDLC. 8

(d) What is ATM reference model? Explain all the layers of ATM. 8

Unit-III

3. (a) Write the functions of network layer. 4

(b) What is IP? Relate IPv4 to IPv6. 8

(c) Define Routing. Explain distance vector routing and link state routing with diagram. 8

(d) Write short notes on : 8

(i) ICMP

(ii) OSPF

Unit-IV

4. (a) Write the functions of transport layer. 4

(b) Differentiate between TCP and UDP protocols. 8

(c) Explain UDP header format in detail. 8

(d) What is Congestion? How it is controlled in transport layer? Explain with example. 8

Unit-V

5. (a) What are Cookies? Explain briefly. 4

(b) Write short notes on : 8

(i) Cryptography

(ii) Firewall

(iii) MIME

(iv) Proxy server

(c) What is Email? Explain the architecture of email. 8

(d) What is HTTP? Explain persistent and non-persistent connection with suitable example. Explain why HTTP is a stateless protocol. 8

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C022512(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

(Computer Science & Engineering Branch)

COMPUTER NETWORK

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

***Note** : Attempt all questions. Part (a) is compulsory & solve any **two** from (b), (c) & (d) of each questions. Assume any missing data. Use diagrams wherever required.*

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Unit-V

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(i) Cryptography

(ii) Firewall

(iii) MIME

(iv) Proxy server

(c) What is Email? Explain the architecture of email. 8

(d) What is HTTP? Explain persistent and non-persistent connection with suitable example. Explain why HTTP is a stateless protocol. 8

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C022513(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

AICTE (~~New~~ Scheme)

(Computer Science & Engineering Branch)

FORMAL LANGUAGE and AUTOMATA THEORY

(BT3022)

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) is compulsory & solve any* ***two*** *from (b), (c) & (d) of each questions.*

Unit-I

1. (a) Prove that for any transition function δ and for any two intput string x & y, 4

$$\delta(q, xy) = \delta(\delta(q, x), y)$$

(b) Construct a DFA accepting all strings w over $\{0, 1\}$, such that number of 1's in w is 3 mod 4. 8

(c) Construct Transition System which can accept strings over the alphabet a, b, ... containing either cat or rat. 8

(d) Construct Mealy M/c which is equivalent to the Moore machine defined by table given. 8

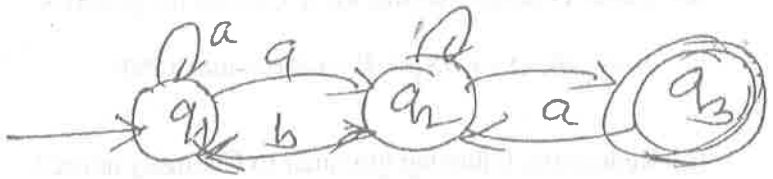
Next state

	$a = 0$	$a = 1$	Output
$\rightarrow q_0$	q_1	q_2	1
q_1	q_3	q_2	0
q_2	q_2	q_1	1
q_3	q_0	q_3	1

Unit-II

2. (a) Write and explain Arden's Theorem for Regular expression. 4

(b) Consider the following transition system identify the string recognised. 8



(c) What is pumping Lemma? Write its application. Show that $L = \{a^{2n} \mid n \geq 1\}$ is regular. 8

(d) Construct a transition system corresponding to the regular expression. 8

(i) $(ab + c^*)^* b$

(ii) $a + bb + bab^* a$

Unit-III

3. (a) Find a grammar generating

$L = \{a^n b^n c^i \mid n \geq 1, i \geq 0\}$. Define grammar. 4

(b) Construct a grammar G generating

$\{xx \mid x \in \{a, b\}^*\}$

Give Chomsky hierarchy of grammar. 8

(c) Define Greibach Normal form. Convert the grammar

$S \to AB,\ A \to BS|b,\ B \to SA|a$ into GNF. 8

(d) Reduce the following grammar to Chomsky normal form : 8

(i) $G = (\{S\}, \{a, b, c\}, \{S \to a|b|cSS\}, S)$

(ii) $S \to abSb|a|aAb,\ A \to bS|aAAb$

Unit-IV

4. (a) Construct a pda A accepting the set of all string over $\{a, b\}$ with equal number of $a'S$ and $b'S$. 4

(b) Define Turing Machine Model. Explain representation using Turing Machine. 8

(c) Write short notes on : 8

(i) Halting problem of Turing machine

(ii) Acceptance of push down Automata

(d) Design a TM that accept 8

$\{0^n 1^n | n \geq 1\}$

Unit-V

5. (a) What is post correspondance problem. Prove that the PCP with {(01, 011), (1, 10), (1, 11)} has no solution. 4

(b) Show that : 8

(i) $f(x, y) = x^y$ is primitive recursive

(ii) $f_2(x, y) = x * y$ is primitive recursive

(c) Compute A (1, 1); A (2, 1); A (1, 2); A (2, 2) using Ackersmann's function. 8

(d) Write short notes on : 8

(i) Turing model for computation

(ii) Construct TM that can compute the zero function Z.

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C022531(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

(CSE Branch)

COMPUTER GRAPHICS

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Attempt any* ***two*** *parts from (a), (b) and (c) of each unit. Each part carries 10 marks.*

Unit-I

1. (a) Explain DDA algorithm for drawing line. Also calculate all the point in the path of the line using P1 (1, 1) and P2 (10, 7) respectively. 10

(b) Explain storage tube graphics display in detail with its advantages and disadvantages. 10

(c) Explain Boundary fill algorithm and Flood fill algorithm with example. Also differentiate between Boundary fill algorithm and Flood fill algorithm. 10

Unit-II

2. (a) What is 3-D transformation? Write homogneous 3-D transformation matrix for translation, rotation and reflection. 10

(b) Translate the square ABCD" whose coordinate A (0, 0) B (3, 0) C (3, 3) and D (0, 3) by 2 unit in both the direction and then scale it by 1·5 unit in X-direction and 0·5 unit in Y-direction. 10

(c) Define the term "windows" and "viewport". Also explain window to viewpoint transformation in detail. 10

Unit-III

3. (a) What do you mean by Radiometry? Explain the difference between Radiometry and Photometry in detail. 10

(b) Write short notes on : 10

(i) Colorimetry

(ii) Color spaces

(c) Explain Canonical View Volume (CVV) in detail with example. 10

Unit-IV

4. (a) Explain characteristics of B-spline curves. Also explain Knot values of B-Spline curve and generate question for blending function for the cubic Spline considering d = 3 10

(b) Find out any 5 points of a Bezier curve where control points are A (1, 1) B (2, 3) C (4, 3) and D (6, 4). 10

(c) Explain Painter's algorithm with example. How the depth of a polygon is determined by Painter's algorithm? 10

Unit-V

5. (a) Explain Ray Tracing method with its intersection with a generic plane and an object using appropriate equation. 10

(b) What do you mean by Animation? Write different kinds of techniques of Animation. 10

(c) What do you mean by Fractals? Explain Koch curves in detail. 10

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C022532(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

AICTE (~~New~~ Scheme)

(Computer Science Engg. Branch)

OBJECT ORIENTED ANALYSIS & DESIGN

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) is compulsory & solve any two from (b), (c) & (d) of each questions.*

Unit-I

1. (a) What are the benefits of object oriented technology in real life? 4

(b) What are the basic key aspects of OO DEVELOPMENT? 8

(c) What is N-ary associations? List the various benefits of N-ary association. 8

(d) What is Inheritance? Explain the different types of inheritance by giving example. 8

Unit-II

2. (a) Explain System Sequence Diagram. 4

(b) Draw a state diagram for submission of examination form. Following are some of the considerations : 8

(i) All alignment pertaining to the semester needs to be submitted within the due date.

(ii) Demand draft for all the courses to be approved need to be taken @ Rs. 60/- per course.

(iii) Examination form needs to be filled up.

(iv) It should be verified by the study centre Co-ordinator.

(v) The attested from should be submitted to the Regional center concerned.

(c) Draw the use case diagram for health care system. 8

(d) Explain Integrated Object-oriented Models. 8

Unit-III

3. (a) What is domain analysis and application analysis? 4

(b) Explain the different stages for software development process. 8

(c) Explain development life cycle for process. 8

(d) What do you mean by Devising a System Concept and Elaborating a Concept. 8

Unit-IV

4. (a) Write class design steps. 4

(b) Draw and explain Architecture of the ATM System. 8

(c) How do you estimate the performance for deign? 8

(d) Write short notes on : 8

(i) Making a reuse plan, and

(ii) Breaking a system in sub system.

Unit-V

5. (a) What is a Design Pattern? 4

(b) How design patterns solve design problems? 8

(c) How do you organize and design catalogue of deign pattern? 8

(d) What are Creational Patterns? Also write the properties of Creational patterns for Software Architecture. 8

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C022533(022)

B. Tech. (Fifth Semester) Examination Nov.-Dec. 2021

(Computer Science & Engg. Branch)

DIGITAL IMAGE PROCESSING

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) from each question is compulsory and answers any* ***two*** *of the remaining (b), (c) and (d).*

Unit-I

1. (a) What is the digital image processing? Listed the various elements of digital image processing. 4

(b) Explain image sampling and quantization. Also explain the effects of reducing sampling and quantization in digital image processing. 8

(c) Discuss about the fundamentals models of image formation. Explain image acquisition. 8

(d) Explain basic relationships between pixels (neighbours and connectivity). 8

Unit-II

2. (a) What do you mean by spatial filters smoothing and sharpening? 4

(b) What is the image restoration? Draw and explain the basic block diagram of the restoration process. 8

(c) Write short notes on : 8

(i) Histogram equalization

(ii) Histogram specification

(d) Differentiate between image enhancement and image restoration process. Mention some important causes of image degradation. 8

Unit-III

3. (a) What do you mean by dialation and erosion? 4

(b) What do you mean by image segmentation? What are various image segmentation techniques? Describe due image segmentation technique. 8

(c) What is morphological image processing? Explain edge linking and boundary detection in brief with proper example. 8

(d) Discuss the technique with example used for the following : 8

(i) Line detection

(ii) Edge detection

Unit-IV

4. (a) What is concept of descriptors and regional descriptors? 4

(b) What is image descriptors? Discuss various image classification techniques in detail. 8

(c) Explain the following boundary descriptors : 8

(i) Shape numbers

(ii) Texture

(iii) Feature extraction

(d) Write short notes on : 8

(i) Neural networks and

(ii) Deep learning

Unit-V

5. (a) What do you mean by run length coding? Define JPEG image. 4

   (b) Discuss about the principle of video compression with suitable examples. 8

   (c) What is the difference between lossy compression and lossless compression with example. 8

   (d) Write short note on : 8

   (i) Huffman coding and

   (ii) LZW coding

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C022534(022)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

(CSE Branch)

MULTIMEDIA & VIRTUAL REALITY

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) of each question is compulsory and carries 4 marks. Attempt any* ***two*** *parts from (b), (c) and (d) & carrying 8 marks.*

Unit-I

1. (a) Write the difference between ARP & RARP.

(b) Write the details of class full addressing?

(c) Explain the characteristics and layered architecture diagram of TCP/IP model.

(d) Write the note on the application of Internet.

Unit-II

2. (a) What is DIAS? Explain the working of DIAS system with each component.

(b) Describe the ATM reference model with diagram.

(c) Draw and explain the ISDN networks also write about the principal and function of ISDN network.

(d) Explain the different types of cable media.

Unit-III

3. (a) What are ultra wide band technology, explain the characteristics and advantages of UWT?

(b) Explain the IEEE 802.11 architecture along with WLAN type.

(c) What is Bluetooth? Explain the security issues related to Bluetooth.

(d) Write short notes of following : (Attempt any **two**)

- LMDS
- Mobile IP

- IPv6

Unit-IV

4. (a) What is Temporal media?

(b) What is MPEG4? Explain the working of MPEG-4 encoder and decoder.

(c) Write the feature, characteristics and advantages and compression steps of JPEG 2000?

(d) Write short notes on following : (any **two**)

- MP3 compression Scheme
- Video Compression technique (mpeg1&2)
- Hyper Text and Hyper Media

Unit-V

5. (a) What is MMX? Explain the word of multimedia and Multimedia PC Workstation Architecture.

(b) Explain the multimedia data base design with the following terms : Content, Types and different areas.

(c) Explain the term of MPEG-7?

(d) Write short notes on following : (any **two**)

- Image retrieval
- IEEE 1394 Interface
- VOD. (Video on Demand)