6E6021

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6E6021

B.Tech. VI - Semester (Main&Back) Examination, April-2019
Computer Science &Engineering
6CS1A Computer Networks
Common with CS, IT

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

UNIT-I

1. a) Explain distance vector routing algorithm in detail. **(8)**

   b) Differentiate leaky bucket and token bucket algorithm. **(8)**

(OR)

1. a) Describe the concept of congestion control in detail. **(8)**

   b) Explain Dijkstra routing technique.Write the complete procedure to find shortest path. **(8)**

UNIT-II

2. a) What is tunneling? Explain with example. **(8)**

   b) Differentiate IPv4 and IPv6.? **(8)**

(OR)

2. a) Explain fragmentation in networking. **(8)**

   b) Differentiate POP3 and IMAP protocols with suitable example. **(8)**

UNIT-III

3. a) Explain the term "Upward Multiplexing" and "Downward Multiplexing" with reference to transport layer. **(8)**

   b) Discuss the term connection establishment in transport layer. **(8)**

(OR)

3. Explain the working of "Go-Back-N" protocol also compare it with "Selective Repeat" protocol. **(16)**

UNIT-IV

4. a) Draw and explain TCP header and segment structure. **(8)**

   b) Explain TCP service model in detail. **(8)**

(OR)

4. a) Explain the concept of Round Trip Time (RTT) and Retransmission Time Out (RTO). **(8)**

   b) Explain the working of transport layer in internet. **(8)**

UNIT-V

5. a) What is proxy server and how it is related to HTTP. **(8)**

   b) Draw and explain Domain Name System (DNS) record structure. **(8)**

(OR)

5. Write Short Notes on the followings: **(2×8=16)**

   a) Compare SMTP and HTTP.

   b) Explain File Transfer Protocol (FTP) and P2P File Sharing.

6E 6022

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6E 6022

B.Tech. VI-Semester (Main & Back) Examination, April - 2019
Computer Science & Engineering
6CS2A Design and Analysis of Algorithms
Common with CS,IT

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly).*

Unit - I

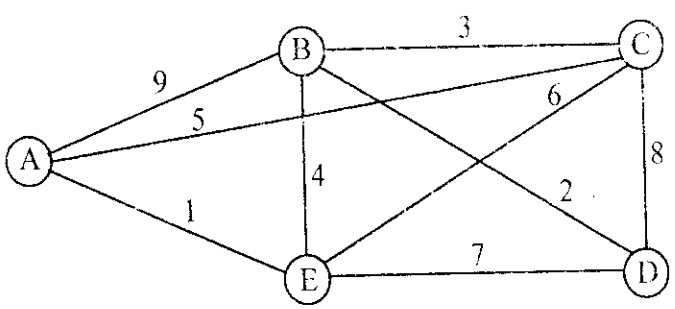
1. a) Sort the following sequence using quick sort method.

   16, 56, 63, 3, 10, 17, 22, 18, 24, 4, 11. **(10)**

   b) Compare and contrast merge sort and Quick sort Algorithms. **(6)**

(OR)

1. Find minimum spanning Tree for the following graph using Prim's and Kruskal's Algorithm. **(16)**



Unit - II

2. Find longest common subsequence of the given sequences x_1 and x_2 using steps of Dynamic Programming **(16)**

   $x_1 = 101011$

   $x_2 = 01101$

(OR)

2. a) Discuss Branch and Bound Technique for Travelling salesman problem. (8)

   b) Differentiate between Greedy Algorithm and Dynamic programming. (8)

Unit - III

3. Using KMP algorithm find whether pattern

   $P = <aabab>$ is present in Text

   $T = <aaababaabaababaab>$ (16)

(OR)

3. Discuss Boyer - Moore Algorithm for pattern matching using bad character and Good suffix heuristics. (16)

Unit - IV

4. a) Explain Randomized Algorithm and its Advantages. (8)

   b) Differentiate between Quick sort and Randomized Quick sort. (8)

(OR)

4. a) Explain Min - cut problem and associated algorithm. (8)

   b) Differentiate between Monte carlo and las Vegas Algorithm. (8)

Unit - V

5. Write short notes on following : (2×8)

   a) NP hard and NP complete problems.

   b) Cook's Theorem.

(OR)

5. a) Vertex cover and set cover problem (2×8)

   b) Classification of problems.

6E 6023

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6E 6023

B.Tech. VI Semester (Main&Back) Examination, April - 2019
Computer Science & Engineering
6CS3A Theory of Computation
Common with CS,IT

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

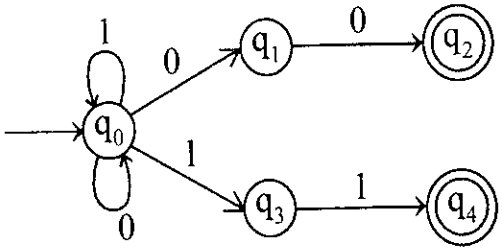
Unit - I

1. a) Design a finite automata (FA) over {0, 1} which checks whether a given binary number is even. **(08)**

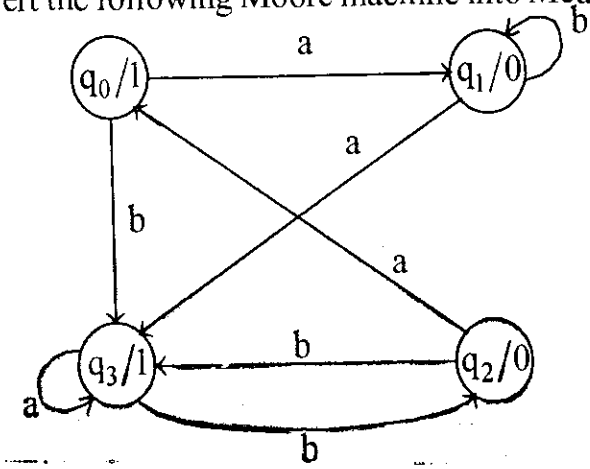
   b) Define NDFA. Compare it with DFA. **(08)**

(OR)

1. a) Convert the below NDFA to its equivalent DFA. **(10)**



   b) Convert the following Moore machine into Mealy machine. **(6)**



Unit - II

2. a) A grammar G has the following productions:

$S \rightarrow SS / aa / \in$

Find the language generated L(G). **(10)**

b) Find regular expression for the language of all words over (a, b) which accept all the strings with atleast two b's. **(6)**

(OR)

2. a) Construct a grammar for language **(10)**

$L = \{a^n b^n c^i / n \geq 1, i \geq 0\}$

b) Prove that $(a^* ab + ba)^* a^* = (a + ab + ba)^*$. **(6)**

Unit - III

3. Convert the following grammar into Greibach normal form: **(16)**

$S \rightarrow AA / a$

$A \rightarrow SS / b$

(OR)

3. a) What is Push Down Automata? Explain all its tuples. **(6)**

b) Construct a PDA accepting the language

$L = \{a^n b^{2n} / n \geq 1\}$ **(10)**

Unit - IV

4. a) Design a Turing machine that accept the language over (0,1) of all strings which contain 010 as a substring. **(8)**

b) Explain Rice theorems in detail. **(8)**

(OR)

4. a) Design a TM that accepts $\{0^n 1^n / n \geq 1\}$. **(8)**

b) Explain following in respect of TM. **(8)**

i) Multiple tracks

ii) Subroutine

Unit - V

5. a) What is linear bounded Automata? Explain its model and organization. **(8)**

   b) Find LBA for $L = \{a^n, \text{where } n \text{ is a prime no}\}$. **(8)**

(OR)

5. Write short notes on **Any Four.** **(4×4=16)**

   a) Chomsky Hierarchy of languages.

   b) Context Free language.

   c) Decision Algorithms for regular sets.

   d) Universal turing machine.

   e) Derivation trees.

   f) Moore Machines.

6E 6024

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6E 6024

B.Tech. VI - Semester (Main & Back) Examination, April-2019
Computer Science and Engineering
6CS4A Computer Graphics And Multimedia Techniques

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **one question** from **each unit.** All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly).*

Unit - I

1. a) Draw a circle having radius $r = 10$, using mid-point circle generation algorithm. **(8)**

   b) Write short note on : **(2×4=8)**

      i) Cathod Ray Tube

      ii) Anti aliasing Technique.

(OR)

1. a) Draw a line using Bresenham's line algorithm with end points (10, 5) and (15, 9). **(8)**

   b) Write short note on : **(2×4=8)**

      i) Shadow mask technique.

      ii) Beam Penetration technique.

Unit - II

2. a) Translate a polygon with coordinates A (2, 5), B (7, 10) and C (10, 12) by tw units in X-direction and two units in y-direction. (

   b) Describe cohen sutherland line drawing algorithm with region code detail.

(OR)

2. a) A point (4, 3) is rotated counter clockwise by an angle of 45°. Find the rotation matrix and resultant point. **(8)**

   b) Show that a reflection about a line $y = -x$ is equivalent to a reflection relative to y-axis followed by counter clockwise rotation of 90°. **(8)**

Unit - III

3. a) Differentiate between the object space method and image space method of detecting visible surface. **(8)**

   b) Explain Back face Detection/Removal algorithm. **(8)**

(OR)

3. a) Explain depth buffer method for visible surface detection. **(8)**

   b) Discuss properties of Bezier curve. **(8)**

Unit - IV

4. a) Explain in brief about RGB, CMY and HSV colour modes. **(8)**

   b) Explain Gouraud shading and compare it with phong shading. **(4+4=8)**

(OR)

4. a) Explain various aspects of illumination models. **(8)**

   b) Write short note **(any two)** : **(2×4=8)**

      i) Phong shading.

      ii) Principles of Animation.

      iii) Ray tracing Algorithm.

Unit - V

5. a) Explain different types of data compression technology. **(6)**

   b) Explain TIFF file format. **(4)**

   c) Explain working of MPEG and JPEG. **(6)**

(OR)

5. Write short note on **(any two)** : **(2×8=16)**

   a) Authoring tools.

   b) Rich Text Format.

   c) Animation Technique.

   d) TIFF file format.

6E 6025

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6E 6025

B.Tech. VI Semester (Main&Back) Examination, April - 2019
Computer Science & Engg.
6CS5A Embedded System Design

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly Units of quantities used/calculated must be stated clearly).*

Unit - I

1. a) What is Embedded System? What are the hardware needs before designing an embedded system? **(8)**

   b) What is the difference between an embedded system and a general computing system? **(8)**

(OR)

1. What are programmable logic devices? Also explain field programmable gate arrays and complete programmable logic devices. **(16)**

Unit - II

2. a) What do you understand by Interrupt in Embedded system? Discuss some common interrupts sources. **(8)**

   b) Discuss function Queue Scheduling Architecture in brief. **(8)**

(OR)

2. a) Elaborate setting up Interrupt service Routines and Interrupt vectors. **(8)**

   b) Contrast between Interrupt Vectoring and Polling. **(8)**

Unit - III

3. a) Discuss Real time performance Issues. **(8)**

   b) Discuss Interprocess communication and Synchronization in RTOS. **(8)**

(OR)

3. a) Write short note on the following

   i) Scheduler

   ii) Reentrancy. **(8)**

   b) How inter task communication process is done by mailboxes and pipes? **(8)**

Unit - IV

4. a) What are the advantages of using RTOS software architecture for an embedded system? **(8)**

   b) Discuss Hard Real time scheduling consideration. **(8)**

(OR)

4. a) How to save memory space in Embedded system? **(8)**

   b) How to avoid creation and destruction of tasks in Embedded system? **(8)**

Unit - V

5. Write short notes on following

   a) Compilers and Linkers for Embedded System. **(8)**

   b) Instruction set Emulators. **(8)**

(OR)

5. a) Debugging techniques **(8)**

   b) Testing on Host machine. **(8)**

6E 6095

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6E 6095

B.Tech. VI Semester (Main&Back) Examination, April.2019
Information Technology
6IT5A Information Theory and Coding

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly).*

Unit - I

1. a) A channel has the following channel matrix.

$$[\,P(y/x)\,] = \begin{bmatrix} 1-p & p & 0 \\ 0 & p & 1-p \end{bmatrix}$$

i) Draw the channel diagram.

ii) If the source has equally likely outputs, compute the probabilities associated with channel outputs for p=0.2 **(10)**

b) Verify the following expression:

$H(X,Y) = H(X/Y) + H(Y)$ **(6)**

(OR)

1. a) For a lossless channel prove that $H(X/Y) = 0$. **(8)**

b) A discrete source emits one of five symbols once every millisecond with probabilities $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$, *and* $\frac{1}{16}$ respectively. Determine the source entropy and information rate. **(8)**

Unit - II

2. a) Derive channel capacity expression for a binary symmetric channel (BSC). **(8)**

b) A voice grade channel of the telephone network has a bandwidth 3.4 KHz. Calculate the information capacity of the telephone channel for a signal-to-noise ratio of 30 dB. **(8)**

(OR)

2. a) Construct a binary Huffman code of the following message. Find out its efficiency. **(10)**

Message	m_1	m_2	m_3	m_4	m_5	m_6
Probability	.30	.25	.15	.12	.10	.08

b) Verify the following expression :

$C_s = 1+p\log_2 p+(1-p)\log_2(1-p)$.

Where C_s is the channel capacity of a BSC. **(6)**

Unit - III

3. For a (6,3) systematic linear block code, the three parity check digits C_4, C_5, C_6 are

$C_4 = d_1+d_2+d_3$

$C_5 = d_1+d_2$

$C_6 = d_1+d_3$

i) Construct the appropriate generator matrix for this code.

ii) Construct the code generated by this matrix.

iii) Determine the error correcting capabilities of this code. **(16)**

(OR)

3. a) Define systematic and non systematic block codes. Give examples of each. **(8)**

b) Explain the coding and decoding of linear Block codes. **(8)**

Unit - IV

4. a) Explain Galois field with its properties. **(8)**

b) Find all cyclic binary codes of block length 5. Find the minimum distance of each code. **(8)**

(OR)

4. a) Explain cyclic code and its generation. **(8)**

b) The generator polynomial of a (6,3) cyclic code is $g(x) = 1+x^2$. Find all the codewords for this code. How many errors can this code correct? **(8)**

Unit - V

5. a) i) What are convolution codes? Enumerate their advantages over other coding methods.

ii) Define constraint length, code tree, Trellis and state diagram. **(10)**

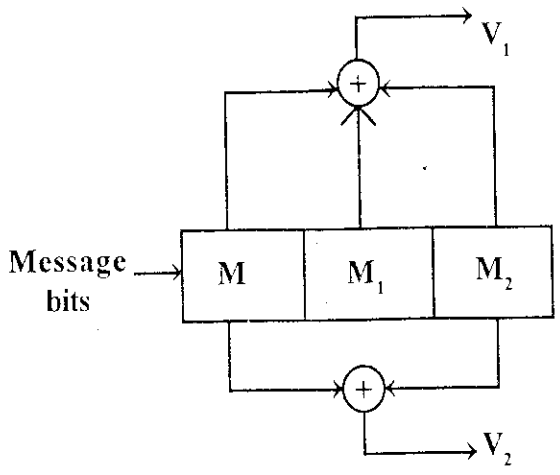
b) Write short note on.

i) Sequential decoding.

ii) Viterbi decoding. **(6)**

(OR)

5. a) Given the following coder obtain the convolutional code for the bit sequence 11011011 and decode it by constructing the corresponding code tree. **(8)**



b) Write short notes on any **two**: **(8)**

i) Burst error.

ii) Transfer function.

iii) Standard Array.

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6E 6026

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6E 6026

B.Tech.VI-Semester (Main&Back) Examination, April.2019
Computer Science & Engg.
6CS6.1A Advance Topics In Operating Systems
Common with CS,IT

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.) Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) How message passing is implemented in Operating System? Describe its design issues in detail. Write the advantage of message passing system in Windows and Linux Operating system. **(12)**

   b) What is the functions of Operating System? **(4)**

(OR)

1. a) Explain client server model with diagram in detail. **(8)**

   b) Explain clock synchronization in distributed system of agreement algorithm **(8)**

Unit - II

2. a) What are different problems faced during system security? Explain system network threats regarding RAID system. **(8)**

   b) Explain disk management and disk formatting in detail. **(8)**

(OR)

2. a) How directories are implemented in file system? Explain reliability and integrity in file system. **(8)**

   b) Explain distributed shared memory with its advantages and disadvantages. **(8)**

Unit - III

3. a) Explain design principles and Kernel structure of LINUX operating system. **(8)**

   b) What is shell? Explain its usage and types of shell. **(8)**

(OR)

3. a) What is network file system? Also explain inter-process communications in detail. **(8)**

   b) Explain memory management and thread management in LINUX. **(8)**

Unit - IV

4. a) Explain the FAT and NTFS file system in context with WINDOWS OS. **(8)**

   b) How process scheduling and threads are maintained in WINDOWS OS? **(8)**

(OR)

4. a) How volume management and fault tolerance are done in WINDOWS Operating system? **(8)**

   b) What are security features of WINDOWS Operating System? Explain environment subsystem and its security mechanisms **(8)**

Unit - V

5. a) Explain the concept of Data compression and also explain the techniques of data compression. **(8)**

   b) Explain process management and real time scheduling. **(8)**

(OR)

5. Write short notes on following: **(4×4=16)**

   a) Video Server Organization.

   b) Window CE and JAVA card.

   c) Multimedia file systems.

   d) Symbian OS.

6E6027

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6E6027

B.Tech. VI - Semester (Main & Back) Examination, April-2019
Computer Science & Engg.
6CS6.2A Artificial Intelligence

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **Five questions**, selecting **One question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

UNIT - I

1. a) What is AI and AI techniques? Briefly explain how AI techniques can be represented. List out some of task domain of AI? **(8)**

   b) Define production system. Explain the elements of production system and also explain the characteristics of production system? **(8)**

(OR)

1. a) Discuss comparison between DFS and BFS with various types of control strategies. **(8)**

   b) Enumerate classical "water Jug problem". Describe the state space for this problem. Solve this problem by giving its operation sequence. **(8)**

UNIT - II

2. a) What is knowledge representation and also differentiate knowledge and knowledge base? **(8)**

   b) What are KBS independent technologies? Explain in brief. Also write the business benefits of KBS. **(8)**

(OR)

2. a) What are the various approaches & issues in knowledge representation? **(8)**

   b) Define the following terms: **(8)**

      i) Mapping

      ii) Homomorphic

      iii) Horn clause

      iv) Reasoning

UNIT - III

3. a) How fuzzy logic is different from conventional binary logic? Explain it with appropriate example. **(8)**

   b) Differentiate forward and backward reasoning. **(8)**

(OR)

3. a) What are the frames? Explain with suitable example. **(8)**

   b) Define the theory of Conceptual dependency. Explain with diagram. **(8)**

UNIT - IV

4. a) What are game playing techniques? Explain minimax procedure with example. **(8)**

   b) What is natural language processing ? Explain with example. **(8)**

(OR)

4. a) What is Alpha -- Beta planning strategy? Explain its need with example. **(8)**

   b) Explain the goal stack panning approach for solving the compound goals. **(8)**

UNIT - V

5. a) What do you mean by learning ? Explain any one technique which is used in learning? **(8)**

   b) Define neural network and explain its application. **(8)**

(OR)

5. a) Explain single layer perception model of the neural network. What are its features? **(8)**

   b) Differentiate the "Learning by taking advice" and "Learning by example" with and example. **(8)**

6E 6094

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6E 6094

B.Tech. VI - Semester (Back) Examination, April-2019
Computer Science & Engineering
6CS4(O) Programming in Java
(Common with CS, IT)

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly*

UNIT - I

1 a) Explain java virtual machine. What is the significance of java byte code in java Programming Language? **(8)**

b) Explain Type conversion and Type casting in Java with an Example. **(8)**

(OR)

1. a) What is multithreading? How does it improve the performance of JAVA. **(8)**

b) How can you implement an array in Java , whose size may change during execution of a program? **(8)**

UNIT - II

2. a) Write a program to compute the sum of the digits of a given integer number **(8)**

b) Write object oriented program in java which covers following concept **(8)**

i) Using break

ii) Using Continue

iii) Return

(OR)

2. a) What is method overloading ? What are the important points which should be taken care of while overloading methods? **(8)**

b) What is multilevel inheritance? Demonstrate a multilevel inheritance with a program code. **(8)**

UNIT - III

3. a) What is an interface? Describe the purpose and applications of interface . **(8)**

   b) What is string buffer? Give the three ways of creating a string object. **(8)**

(OR)

3. a) Define package in java ? What are the benefits of using package ? Explain with suitable example. **(8)**

   b) Write short notes on the following string operation. **(8)**

      i) CharAT()

      ii) indexOf()

      iii) substring

      iv) append

UNIT - IV

4. a) What is main difference between Readers/Writers and Input / Output streams? Give a few sub classes of Reader and writer class. **(8)**

   b) What is exception handling ? What are the types of exception? Write a code to handle ArrayIndexOutOfBounds Exception. **(8)**

(OR)

4. Write short notes on the following : **(4×4=16)**

   i) try and catch

   ii) throws

   iii) Finally

   iv) I/O streams.

UNIT - V

5. a) Explain the structure of applet, with the help of example. **(8)**

   b) Describe complete life cycle of thread. How thread is different from process? **(8)**

(OR)

5. a) What are the difference between multiprocessing and multithreading? What is to be done to implement these in a program? **(8)**

   b) Write a applet program to draw a filled circle with in an oval. **(8)**
