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6E6094

Roll No. : _____ Total Printed Pages : 3

6E6094

B. Tech. (Sem. VI) (Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS4(O) Programming in Java CS, IT

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) What is JAVA Virtual machine ? Explain the features of JAVA. **8**

(b) What are JAVA byte code ? Explain different JAVA applications in detail. **8**

OR

1 (a) Explain relational, bitwise and assignment operators with a suitable example. **8**

(b) Write a JAVA program to implement matrix multiplication if matrix is the order of 2×2. **8**

UNIT - II

2 (a) What is constructor ? Write a program to pass an object as a parameter. 8

(b) What is abstract class ? Explain in detail. 8

OR

2 (a) What is inheritance ? Explain its type in detail. 8

(b) What is the use of final keyword in inheritance ? Also explain method overloading with a suitable example. 8

UNIT - III

3 (a) What is package ? Explain various inbuilt packages in detail. 8

(b) What are the advantages of interface in JAVA ? Explain with a suitable example. 8

OR

3 (a) What is string Buffer Class ? Explain. 8

(b) Explain atleast 5 string functions and its operation in detail. 8

UNIT - IV

4 (a) What is exception ? What are the difference between error and exception ? 8

(b) What are the different keywords used to handle an exception in exception handling ? 8

OR

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4 (a) What are the types of exception in a user program ? 8

(b) Explain different file modes in detail with a suitable example. 8

UNIT - V

5 (a) What are applets ? Write an applet program to draw a polygon. 8

(b) What are threads ? Explain the life cycle of thread with different thread functions. 8

OR

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

(i) Thread synchronization

(ii) Applet Architecture

(iii) Thread object and thread priority

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6E6028

Roll No. _____ Total No. of Pages : 3

6E6028

B. Tech. (Sem. VI) (Main & Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS6.3A Human Computer Interface
CS, IT

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Describe various positioning, pointing and drawing devices. **8**

(b) Explain following :
(i) Deductive reasoning
(ii) Inductive reasoning
(iii) Gestalt theory
(iv) Problem space theory **4×2=8**

OR

1 (a) Explain following :
(i) The execution – evaluation cycle
(ii) The interaction framework **2×4=8**

(b) Discuss the paradigms for interaction. 8

UNIT - II

2 (a) What is design ? Explain navigation design. 8

(b) What is usability engineering ? Discuss the problems with usability engineering. 8

OR

2 (a) Describe the principles affecting flexibility and robustness. 8

(b) Describe Shneiderman's eight golden rules of interface design. 8

UNIT - III

3 (a) What is evaluation ? Discuss the factors that should be taken into account when selecting evaluation techniques. 8

(b) Discuss different approaches to evaluation through user participation. 8

OR

3 (a) Describe adaptive help systems. 8

(b) How the user support system is presented to the user and this will be affected by implementation issues ? Explain. 8

UNIT - IV

4 (a) Explain GOMS and CCT models. **8**

(b) Compare and explain BNF and TAG. **8**

OR

4 Explain following :
(a) Keystroke-level model
(b) Three-state model
(c) The problem space model
(d) Interacting cognitive subsystems. **4×4=16**

UNIT - V

5 Explain following : (any **two**)
(a) Face-to-Face Communication
(b) Conversation
(c) Text-based communication. **2×8=16**

OR

5 (a) What is task analysis ? Describe the uses of task analysis. **8**

(b) Describe the sources of information and data collection. **8**

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6E6026

Roll No. : _____

Total Printed Pages : 3

6E6026

B. Tech. (Sem. VI) (Main & Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS6.1A Advance Topics in Operating Systems
CS, IT

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) What is Operating System ? Explain the functions of operating system. **8**

(b) Explain client-server model. **8**

OR

1 (a) What is message passing system ? Also explain the need of message passing. **8**

(b) Explain the following :
(i) Mail boxes
(ii) RPC and RME
(iii) System call
(iv) Buffering

2×4=8

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UNIT - II

2 (a) What is file system layouts and how can we supplement file system ? 8

(b) Explain link list allocation and also explain index allocation. 8

OR

2 (a) What is disk management disk formatting ? Explain. 8

(b) Explain system security and also explain system network's threats. 8

UNIT - III

3 (a) Explain linux architecture with suitable diagram. 8

(b) What is shell ? Explain various types of shells with examples. 8

OR

3 (a) What is thread management and scheduling ? Explain in brief. 8

(b) Write short notes on following :
(i) Memory Management
(ii) Process scheduling in linux

4×2=8

UNIT - IV

4 (a) What is exceptions and interrupts ? Explain. 8

(b) Explain in file systems internal layouts and recovery. 8

OR

4 (a) What is the difference between FAT and NTFS file system ? Explain. **8**

(b) What is process synchronization ? Explain queued lock and spin lock. **8**

UNIT - V

5 (a) What is data compression ? Explain the various methods for data compression. **8**

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

OR

5 Write short notes on following :

(i) Multimedia DS

(ii) Window CE

(iii) Video Server Organization

(iv) Java Cards. **4×4=16**

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6E6025

Roll No. : _____

Total Printed Pages : 3

6E6025

B. Tech. (Sem. VI) (Main & Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS5A Embedded System Design

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Explain the Embedded System I/O Architecture and also explain the requirements before designing an embedded system. **10**

(b) Discuss the selection criterias of a microcontroller. Explain in detail. **6**

OR

1 (a) What is the difference between microcontroller, microprocessor and DSP and what is the use of Microcontroller ? **8**

(b) Define the Embedded System. What are the programmable logic devices ? Explain the field programmable gate arrays. **8**

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UNIT - II

2 (a) What operations are performed by CPU for solving sharing data problem ? **8**

(b) Explain the Round Robin scheduling. **8**

OR

2 (a) What is context and why context saving occurs in multitasking system ? **8**

(b) Explain interrupt in embedded system and also give the brief idea of Function Queue scheduling Architecture. **8**

UNIT - III

3 (a) Short note on :

(1) Reentrancy

(2) Mutex

(3) Scheduler

(4) RTOS **4×4=16**

OR

3 (a) What is interprocess communication and synchronization in RTOS ? **8**

(b) Explain the role of timer functions in RTOS. **8**

UNIT - IV

4 (a) Difference between hard real time and soft real time system. **8**

(b) Explain the architecture of RTOS Kernel. **8**

OR

4 (a) Short note on :

(1) RT Linux

(2) Locator

4×2=8

(b) Brief idea to save memory space in embedded system.

8

UNIT - V

5 (a) Explain following terms :

(i) Emulator

(ii) CPU performing issue

4×2=8

(b) Explain the Debugging Techniques.

8

OR

5 (a) What is the process of software code development in Embedded System?

8

(b) Explain the in-circuit emulators and monitors.

8

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6E6024

Roll No. : _____ Total Printed Pages : 3

6E6024

B. Tech. (Sem. VI) (Main/Back) Examination, April-May 2018
Computer Science
6CS4A Computer Graphics & Multimedia Techniques

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Explain scan conversion. Write Bresenham's algorithm for line m>1. What are major adverse side effects of scan conversion? **8**

(b) Write short note on Antialising techniques. **8**

OR

1 (a) Explain the architecture of random scan system. **8**

(b) What do you mean by Computer Graphics System ? Define aspect ratio. What do you mean by pinel and frame buffer ? Explain the basic operation of a CRT. **8**

UNIT - II

2 (a) What do you mean by homogeneous coordinates ? How these coordinates are useful in transformation ?

8

(b) Explain 3D projection and its types.

8

OR

2 (a) Write the following :

(i) Composite transformations

(ii) Inverse transformations

16

UNIT - III

3 (a) What are Bezier cubic curves ? Derive their properties. Also show that the sum of the blending functions is identical to 1 for all values of K why is it important ?

8

(b) Write the two methods of Curve generation.

8

OR

3 (a) Write a procedure of display 2D, cubic Bezier Curves given a set of 4 central points in XY plane.

8

(b) Explain the depth comparison method for displaying the visible surface of a given polyhedran.

8

UNIT - IV

4 (a) Discuss about half toning. Explain in brief about RGB, CMY and HSQ color models. **8**

(b) What is ray tracing ? How can you render polygon surface using Gour and Shading. **8**

OR

4 (a) Explain the diffuse reflection and specular reflection. **8**

(b) Explain phong and fast phong shading using a suitable object. **8**

UNIT - V

5 (a) What do you mean by frame rate and pixel depth in digital video ? **8**

(b) Explain the structure of TIFF file format. **8**

OR

5 (a) What is MIDI ? Define the components, devices software, channels and MIDI timing standard. **8**

(b) What is MPEG and JPEG ? Describe its working. **8**

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6E6023

Roll No. : _____

Total Printed Pages : 4

6E6023

B.Tech. (Sem. VI) (Main & Back) Examination, April-May, 2018
Computer Sc. & Engg.
6CS3A Theory of Computation
CS, IT

Time : 3 Hours] **[Maximum Marks : 80**
[Min. Passing Marks : 26

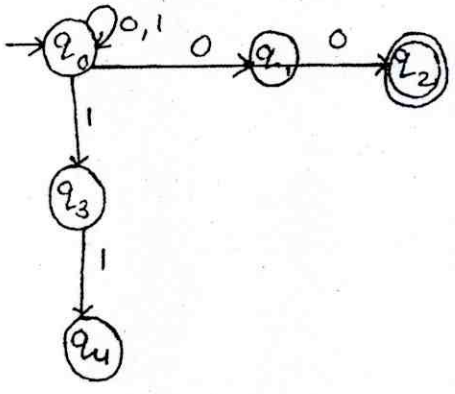
*Attempt any **five questions** selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Nil 2. Nil

UNIT - I

1 (a) Given the NDFA as shown in figure below determine the equivalent DFA :



6

(b) Construct a Moore Machine equivalent to the Mealy machine M given below.

Present State	Next State			
	Input a = 0		Input a = 1	
	State	Output	State	Output
q_1	q_1	1	q_2	0
q_2	q_4	1	q_4	1
q_3	q_2	1	q_3	1
q_4	q_3	0	q_1	1

10

OR

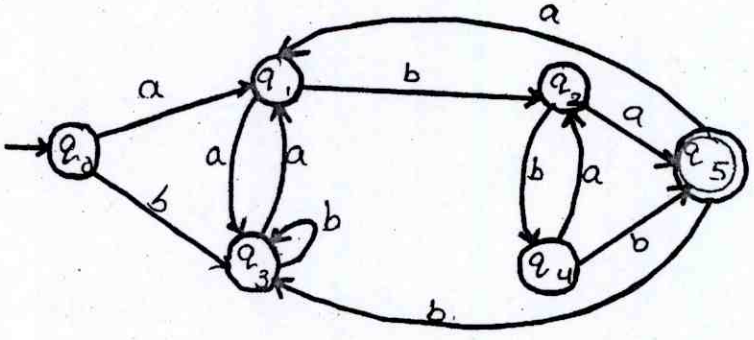
1 (a) Design a finite automation M over {0, 1} to accept all string satisfying the following conditions :

(a) containing exactly two 0'S.

(b) containing at least two 0's.

6

(b) Minimize the given finite automation.



10

UNIT - II

2 (a) Let G = ({S, C}, {a, b}, {S → aCa, C → aCa, C → b}), find L (G).

8

(b) Show that $L = \left[0^i \,|\, i \,|\, i \geq 1 \right]$ is not regular.

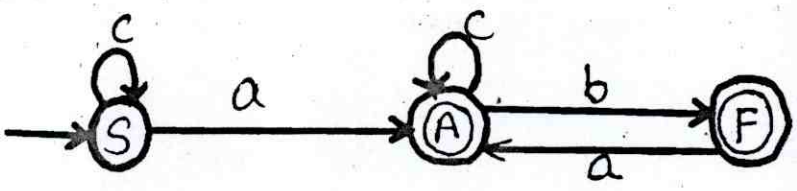
8

OR

2 (a) Find the regular grammar and corresponding to regular expression $(011 + 1)^* (01)^*$.

8

(b) Find the regular expression corresponding to the finite automation given to figure :



8

UNIT - III

3 (a) Find a grammar chomsky normal form equivalent to :

$S \rightarrow V, aAbB$

$A \rightarrow aA / a$

$B \rightarrow bB / b$

10

(b) What is pumping Lemma for C.F.G's ? Explain.

6

OR

3 (a) Construct a push down automation (PDA) accepting $\{WCW^T$ where $W = \{a, b\}\}$

10

(b) Show the grammar is ambiguous or not.

$S \rightarrow aSSb \mid bSSa \mid \in$

6

UNIT - IV

4 Design a Turing Machine over $\sum=\{a,b,c\}$ to accept the language $L = \{a^n\ b^n\ c^n \mid n > a\}$

16

OR

4 Explain Recursive and Recursively Enumerable Language, also write down the properties.

16

UNIT - V

5 (a) Find a content sensitive grammar generating the language : $\{SS \mid S \in \{a, b\}^+\}$.

8

(b) Explain the Linear Bounded Automation Model.

8

OR

5 Write short notes on :

(a) Arden's Theorem

(b) Chomsky Hierarchy of Language

(c) Properties of context sensitive language

(d) Myhill_Nerad Theorem.

4×4=16

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6E6022

Roll No. : _____

Total Printed Pages : 4

6E6022

B. Tech. (Sem. VI) (Main & Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS2A Design & Analysis of Algorithms
CS, IT

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Solve the recurrence relation for time complexity.

$T(n) = 2$ If $n = 2$

$= 2\ T(n/2) + 3 * n$ If $n > 2$

(b) Derive the recurrence relation for merge sort algorithm's time complexity. Also solve it.

(c) Describe various asymptotic notations.

5+8+3

OR

1 (a) Explain Strassen's matrix multiplication and derive its complexity also justify how it is better than ordinary multiplication.

8

(b) Solve the following recurrence relations and their complexities using Master's Theorem.

$T(n) = 2T\left(\sqrt{n}\right) + Ig_2 n$

$T(n) = 4T(n/2) + n^2$

4+4

UNIT - II

2 (a) Find optimal parenthesization of matrix chain product whose sequence of dimensions is (4, 10, 4, 40, 5).

10

(b) What is dynamic programming ? How it gives optimal solutions ?

6

OR

2 (a) Solve the following instance of LCS through Dynamic Programming.

X = ABCDCDBCAD

Y = BACCDCABBD

8

(b) Solve the TSP problem having the following cost matrix using branch and bound technique.

$$\begin{array}{c} \\ A \\ B \\ C \\ D \end{array} \begin{array}{c} \begin{array}{cccc} A & B & C & D \end{array} \\ \begin{bmatrix} x & 5 & 2 & 3 \\ 4 & x & 2 & 3 \\ 4 & 2 & x & 3 \\ 7 & 6 & 8 & x \end{bmatrix} \end{array}$$

8

UNIT - III

3 (a) Given the text $T = \langle 2,3,5,9,0,2,3,1,4,1,5,2,6,7,3,9,9,2,1 \rangle$ $P = \langle 3,1,4,1,5 \rangle$ and modulo q = 13 m = 5. Choose the pattern matching with average case complexity and explain the search process. Justify the answer for choosing such algorithm.

10

(b) Discuss the formulation of simple assignment problem of size n.

6

OR

3 (a) Describe Naive string matching algorithm in detail.

8

(b) Write short note on :

(i) Quadratic Assignment problem

(ii) Prefix function for string matching.

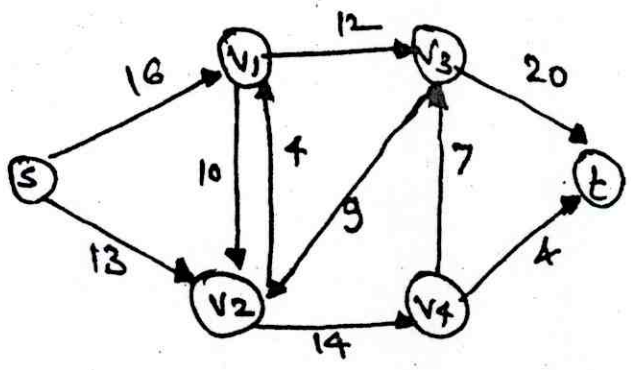
4+4

UNIT - IV

4 (a) Explain randomized min cut theorem with example.

8

(b) What do you mean by multi commodity flow in the network ? Find max flow path by Ford-Fulkerson method for given network.



2+6

OR

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4 (a) Explain Las Vegas algorithm with example. 8

(b) Solve $f = (x_1 v \overline{x_2})(x_3 v \overline{x_4})(\overline{x_1} v x_3)(x_4 v x_6)$ using randomized algorithm. 8

UNIT - V

5 (a) Prove the Hamilton cycle problem is NP-complete. 8

(b) Explain Cook's theorem with suitable example. 8

OR

5 (a) Write an algorithm for approximation for set cover problem with suitable example. 8

(b) Prove that TSP is NP-complete. 8

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6E6021

Roll No. : _____

Total Printed Pages : 3

6E6021

B. Tech. (Sem. VI) (Main & Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS1A Computer Networks
CS, IT

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) What is routing ? Explain broadcast routing in detail. **8**

(b) What is the basic requirement of network layer ? Explain its services in detail. **8**

OR

1 (a) Explain leaky bucket algorithm in detail. **8**

(b) What is load shedding ? Also discuss jitter control in brief. **8**

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UNIT - II

2 (a) What is tunneling ? 8

(b) What are the difference between IPV4 and IPV6 ? 8

OR

2 (a) Describe a way to resemble IP fragments at the destination. 8

(b) Discuss mobile host and mobile IP in detail. 8

UNIT - III

3 (a) Differentiate between multiplexing and demultiplexing. 8

(b) Explain UDP protocol in detail. 8

OR

3 (a) What do you mean by perfectly reliable channel ? Explain lossy channel with bit error. 10

(b) Explain flow control and buffering in detail. 6

UNIT - IV

4 (a) Explain TCP service model in detail. 10

(b) What is Round Trip time ? 6

OR

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6E6021

Roll No. : _____ Total Printed Pages : 3

6E6021

B. Tech. (Sem. VI) (Main & Back) Examination, April-May 2018
Computer Sc. & Engg.
6CS1A Computer Networks
CS, IT

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) What is routing ? Explain broadcast routing in detail. **8**

(b) What is the basic requirement of network layer ? Explain its services in detail. **8**

OR

1 (a) Explain leaky bucket algorithm in detail. **8**

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UNIT - II

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UNIT - III

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3 (a) What do you mean by perfectly reliable channel ? Explain lossy channel with bit error. 10

(b) Explain flow control and buffering in detail. 6

UNIT - IV

4 (a) Explain TCP service model in detail. 10

(b) What is Round Trip time ? 6

OR

4 . (a) How the TCP connection establishment process is done ? Discuss transmission policy in brief. **8**

(b) Explain TCP congestion control in detail. **8**

UNIT - V

5 (a) What is DNS ? **8**

(b) Explain the working of file transfer protocol. **8**

OR

5 Write short notes on : (any **two**)

(a) Query Flooding

(b) P2P file sharing

(c) WWW and SMTP. **2×8=16**

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6E6095

Roll No. : _____ Total Printed Pages : 4

6E6095

B. Tech. (Sem. VI) (Main / Back) Examination, April-May - 2018
Information Technology
6IT5A Information Theory & Coding

Time : 3 Hours] **[Maximum Marks : 80**
[Min. Passing Marks : 26

*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.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) If there are M equally likely and independent symbols then prove that amount of information carried by each symbol will be

$I(X_i) = N$ *bits*

where $M = 2^N$ [N is integer] 6

(b) Verify the following expression :

$0 \leq H(X) \leq \log_2 M$

where M is size of alphabet of X. 10

OR

1 (a) Given a Binary channel in Fig. 1.

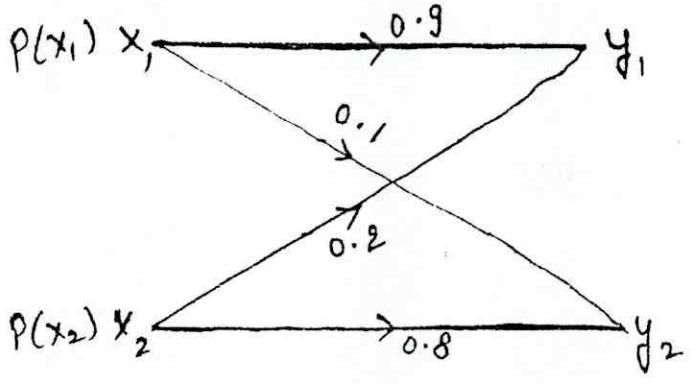

Fig. 1

(i) Find channel matrix of the channel.

(ii) Find $P(y_1)$ and $P(y_2)$ when $P(x_1) = P(x_2) = 0.5$

(iii) Find the point probability $P(x_1 y_2)$ and $P(x_2 y_1)$ when $P(x_1) = P(x_2) = 0.5$.

10

(b) Define entropy and derive the expression of it.

6

UNIT - II

2 (a) Prove that the channel capacity of additive white Gaussian Noise channel is given by :

$$C = B \log_2 \left(1 + \frac{S}{N}\right)$$

where B = Bandwidth of channel
N = Noise power
S = Signal power.

10

(b) Explain Lempel Ziv coding.

6

OR

2 (a) A DMS X has four symbols x_1, x_2, x_3, x_4, x_5 with probability $P(x_1)=\frac{1}{2}$, $P(x_2)=\frac{1}{4}$ and $P(x_3)=P(x_4)=\frac{1}{8}$. Construct a Shannon fano code and calculate the code efficiency. **8**

(b) What is the meaning of implications of Shannon Hartley theorem ? **8**

UNIT - III

3 (a) Explain working of syndrome decoder for (n, k) block code. **8**

(b) Prove that $GH^T = HG^T = 0$ for a systematic linear block code. **8**

OR

3 The parity check matrix of a (7, 4) LBC is given by

$$H=\begin{bmatrix}1 & 1 & 1 & 0 & 1 & 0 & 0\\ 1 & 1 & 0 & 1 & 0 & 1 & 0\\ 1 & 0 & 1 & 1 & 0 & 0 & 1\end{bmatrix}$$

(i) Find the Generator Matrix (G).
(ii) List all the code vectors.
(iii) What is minimum distance between the code vector ?
(iv) How many errors can be detected ? And how many can be corrected ? **16**

UNIT - IV

4 (a) Design an Encoder for (7, 4) cyclic code generated by generator polynomial $G(P)=P^3+P+1$. Also verify its operation for any one message words. **8**

(b) How error correction in systematic cyclic code is done ? Explain in detail. **8**

OR

4 (a) Compare cyclic code and linear block code. **8**

(b) The generator polynomial of a (7, 4) cyclic code is given by $G(P) = P^2 + P + 1$. Then find the code vector in non-systematic form by assuming M = {0 1 0 1}. **8**

UNIT - V

5 (a) What are advantages of Viterbi decoding algorithm ? Explain in detail. **8**

(b) Consider the convolution encoder shown in Fig. 2.

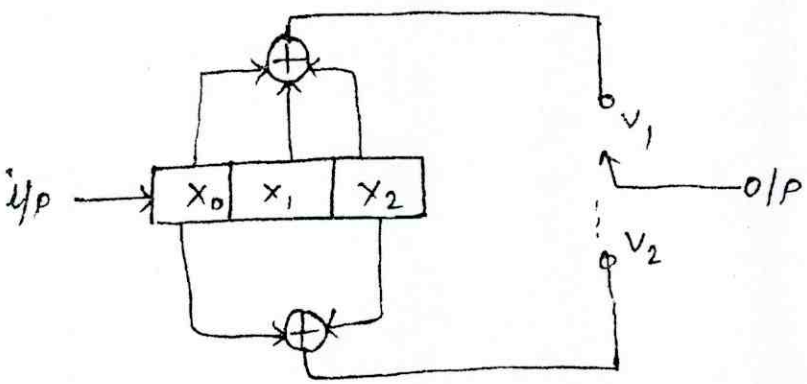

Fig. 2

(1) Find the impulse response of encoder.

(2) Find the output code word if the i/p sequences is all 1's. (111111....). **8**

OR

5 (a) Describe maximum likelihood of decoding of convolutional code. **8**

(b) Explain following with examples :

(i) Code tree

(ii) Code trellis

(iii) Free distance

(iv) State diagram. **8**