2017

M.Sc.

1st Semester Examination

COMPUTER SCIENCE

PAPER—COS-103

Subject Code—26

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Computer Networks)

Answer any *four* questions. 4×10

1. (a) Briefly describe the functions of Presentation and Session layers of ISO/OSI reference model.

   (b) What are the advantages of multipoint connection over point to point connection ?

   (c) What are the criteria necessary for an effective and efficient network ? (3+3)+2+2

2. (a) Find the bandwidth required to achieve the bit rate of 200 Kbps if the first three harmonics are used to form the digital signal.

(b) Compare the two methods of serial transmission.

(c) Name three types of transmission impairments and describe any one of them. 3+3+(1+3)

3. (a) What is the disadvantage of using NRZ line encoding technique ? How does RZ encoding attempt to solve the problem ? Represent the following binary data using RZ encoding : 01001110.

(b) Describe the concept of interleaving and bit-padding in Time Division Multiplexing technique. (2+2+2)+(2+2)

4. (a) Draw two different constellation diagrams of a 16-QAM transmission.

(b) A receiver receives the code 11110101101. Using the Hamming encoding algorithm, find the original code sent.

(c) What is piggybacking ? $(1\frac{1}{2}+1\frac{1}{2})5+2$

5. (a) Briefly discuss how does Go-Back-N-ARQ differ from Selective Repeat ARQ ?

(b) How the chip sequences are generated in CDMA ? Describe with an example.

(c) What is bit stuffing used in HDLC ? 5+3+2

6. Write short notes :

(a) Class C address domain in IPV4 ;

(b) UDP ;

(c) Hierarchical Routing ;

(d) Congestion control. $4\times2\frac{1}{2}$

[Internal Assessment — 10 Marks]

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2017

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PAPER—COS-104

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Module — 1

(Computer Graphics)

Answer any *two* questions. 2×10

1. (a) With precise narrative description write the algorithm of Bresenham's line drawing for all type of slope. 5

(b) Find out (using Bresenham's algorithm) the pixel location approximating the first octant of a circle having centre at (4, 5) and radius 4. 5

2. (a) Explain all the standards of 2D reflections. 5

(b) A triangle is defined by

$$\begin{bmatrix} 20 & 40 & 40 \\ 20 & 20 & 40 \end{bmatrix}$$

Find the transformed coordinates after the following transformation :

(i) 90° rotation about origin ;

(ii) reflection about line $y = -x$. 5

3. (a) What is projection ? Why we need projection ? Explain the different form of projection. 1+1+5

(b) A polygon has 4 vertices located at A(20, 10), B(60, 10), C(60, 30), D(20, 30). Find the transformation matrix to double the size of the polygon with point A located at same place. 3

4. Write short notes on (any *two*) :

(a) Raster Scan display System ;

(b) Shadow Mask Method ;

(c) 2D-Shear ;

(d) 3D-rotation. 2×5

[Internal Assessment — 05 Marks]

Module — 2

(Image Processing)

Answer any *four* questions. 4×5

1. (a) What is Image ? What do you mean by image processing ? 1+1

(b) Define the terms :

(i) Resolution ;

(ii) Neighbour of pixel ;

(iii) Checker board effect. 1+1+1

2. Explain three basic gray level transformation for image enhaunt. 5

3. What is histogram ? How it works for image enhaunt ? 2+3

4. Explain three frequency domain filtering technique for image sharpening. 5

5. What do you mean by Image segmentation ? Explain the following operators for Image enhaunt :

(i) Sobel ;

(ii) Roberts. 5

6. Write short notes (any *two*) :

(a) Thresholding ;

(b) Bit plane slicing ;

(c) Connectivity ;

(d) Contrast stretching. $2 \times 2\frac{1}{2}$

[Internal Assessment -- 05 Marks]
