

- N.B. : (1) Question No. 1 is **compulsory**.  
 (2) Solve any **four** questions from remaining **six** questions.

Q. 1 Solve any **Four** from following.

- |   |   |    |
|---|---|----|
| A | Compare Data Mining and Text Mining       | 05 |
| B | What is Web Usage Mining?                 | 05 |
| C | What are the Major issues in Data Mining? | 05 |
| D | Explain multilevel association rules      | 05 |
| E | Compare database and data warehouse.      | 05 |

- |      |   |   |    |
|------|---|---|----|
| Q. 2 | A | Explain mining sequence patterns in transactional Databases.    | 10 |
|      | B | Explain any one method of hierarchical clustering with example. | 10 |

- |      |   |   |    |
|------|---|---|----|
| Q. 3 | A | Explain different data stream methodologies.                | 10 |
|      | B | Explain Data Integration and Transformation with an example | 10 |

- |      |   |   |    |
|------|---|---|----|
| Q. 4 | A | Explain Hoeffding Tree algorithm with example.  | 10 |
|      | B | List the dimensions and facts for Clinical information system and design star and snowflake schema. | 10 |

- Q. 5 A Explain different OLAP operations and applications. 10
- B Use K-means algorithm to create 3- clusters for given set of values  
{ 2, 3, 6, 8, 9, 15, 18, 22 } 10
- Q. 6 A Design a BI application which will provide Retail Chain Company  
with features and performance that meet their objectives. Use any 10  
data mining technique.
- B Explain Web content Mining with reference to crawlers, harvest  
system, virtual web view and personalization 10
- Q. 7 Write short note on (any Three) 20
- A Difference between Periodic crawler and Incremental crawler
- B Spatial Data mining
- C Market segmentation
- D Outlier analysis

- N.B. :** (1) Question No. 1 is compulsory.  
(2) Answer any four questions out of remaining six questions.

- Q. 1. A) Who should define the acceptance quality attribute criteria of a test project?  
Justify your answer and give some Acceptance criteria. 5
- B) Compare McCall's quality model with ISO 9126 quality model. 5
- C) Explain Test case Design effectiveness. 5
- D) Explain different types of interface errors. 5
- Q. 2. A) Draw data flow graph for below given routine. 10
- ```
/* pow(m,n) computes m to the power of n */  
void pow(int m, n)  
{  
    float q;  
    int p;  
    if(n<0)  
        p=0-n;  
    else  
        p=n;  
    q=1.0;  
    while(p !=0)  
    {  
        q=q*m;  
        p=p-1;  
    }  
    if(n<0)  
        q=1.0/q  
    printf("%f", q)  
}
```
- B) Explain Dynamic unit testing. 10
- Q. 3. A) Briefly explain McCall's Quality Factors and Criteria. 10
- B) What are the objectives of Acceptance Testing? Explain different types of Acceptance Testing. 10
- Q. 4. A) Explain in detail Evaluation and Selection of Test Automation Tools. 10
- B) Explain different metrics used in system testing. 10

- Q.5. A) Explain boundary value analysis with the help of suitable example. 10  
 B) Discuss the advantage and disadvantage of integration testing. 5  
 C) Explain scalability testing with example. 5

- Q. 6. A) Explain the following terms 10  
 a)Verification b) Validation c)Error d)Fault e)Defect  
 B) Draw the Control Flow Graph and Show coverage criteria for given code. 10

```

Public static double ReturnAverage(int value[ ], int AS, int MIN, int MAX)
{
    int i , ti, tv, sum;
    double av;
    i=0; ti=0; tv=0; sum=0;
    while(ti<AS && value[i] != -999)
    {
        ti++;
        if(value[i] >= MIN && value[i] <= MAX)
        {
            tv++;
            sum = sum + value[i];
        }
        i++;
    }
    if(tv>0)
        av = (double) sum / tv,
    else
        av = (double) -999;
    return(av);
}

```

- Q.7. A) Explain test design preparedness matrix. 5  
 B) Differentiate Black Box and White Box testing. 5  
 C) Explain load testing and stress testing. 5  
 D) Explain different views of software quality. 5

(3 Hours)

[ Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.  
 (2) Out of remaining questions attempt any **four**.  
 (3) Assume suitable **data** wherever **required**.  
 (4) Use of **statistical table** is **allowed**.  
 (5) **Figures** to the **right** in bracket indicate **full marks**.

1. (a) State when simulation is appropriate. 5  
 (b) Define :— System and Model 5  
 (c) Explain properties of Poisson process. 5  
 (d) Distinguish between :— 5  
     (i) Activity and Delay  
     (ii) Random Numbers and Random Variant

2. (a) Explain steps in simulation study along with the flow chart. 10  
 (b) Explain Naylor and Finger validation approach. 10

3. (a) Explain different types of simulation with respect to output analysis. 10  
 (b) Explain in detail an evaluation and selection technique for simulation software. 10

4. (a) Records pertaining to monthly number of job related injuries at Chemical Plant were being studied by an NGO. The value for the past 100 months were as follows :— 10

|                                |    |    |    |    |    |    |    |    |
|--------------------------------|----|----|----|----|----|----|----|----|
| <b>Injuries per month</b>      | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| <b>Frequency of occurrence</b> | 30 | 20 | 15 | 05 | 06 | 10 | 04 | 10 |

Apply the Chi-square goodness of fit test to these data to test the hypothesis that the underlying distribution is Poisson. Use level of significance  $\alpha = 0.05$

- (b) Explain overall structure of an event scheduling for simulation program with the help of necessary flow chart. 10
5. (a) Explain in detail the method of batch means for interval estimation in steady state simulation. 10  
 (b) Explain long run measures of Performance of Queueing systems. 10
6. (a) Explain multiuser queueing system with suitable example. 10  
 (b) Explain steps involved in development of useful model of input data. 10
7. Write short notes on the following :— 20  
 (a) Inverse Transform Technique  
 (b) Terminating and Non-Terminating Simulation  
 (c) Verification and Validation Process  
 (d) Features of GPSS.

BE | IT | VII (REV) 4/6/2012  
 Digital signal & Image  
 Processing

1 : 1st half-12-(Con-4668)JP

Con. 4668-12.

(REVISED COURSE)

GN-9086

(3 Hours)

[ Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of remaining **six** questions.  
 (3) Assume **suitable** data wherever **required** and clearly **specify** it.

1. Attempt any **four** questions :—

20

- (a) Find the energy of the signal  $x(n) = \left(\frac{1}{2}\right)^n u(n) + 8^n u(n-1)$   
 (b) Prove that two dimensional DFT matrix is an unitary matrix.  
 (c) What do you understand by negative of image ?  
 (d) Show that Highpass = Original - Lowpass  
 (e) Give five different classifications for system in Digital **Signal Processing** with examples.  
 (f) Compare analog and digital filters.

2. (a) Find linear convolution of given two sequences :—

4

$$X[n] = \{1, 2, 3, 4\}$$

$$h[n] = \{1, -1\}$$

(b) For sequence :

6

$$x_1(n) = \cos\left(\frac{2\pi}{N}n\right)$$

$$x_2(n) = \sin\left(\frac{2\pi}{N}n\right)$$

Determine N point, circular convolution  $x_1(n) \otimes x_2(n)$ .

(c) A **particular digital image** with eight quantization levels has following histogram. **10**  
 Perform **histogram equalization** and give new equalized histogram.

|               |     |     |     |    |    |    |     |     |
|---------------|-----|-----|-----|----|----|----|-----|-----|
| Grey level    | 0   | 1   | 2   | 3  | 4  | 5  | 6   | 7   |
| No. of pixels | 200 | 270 | 130 | 60 | 60 | 80 | 140 | 160 |

(a) What is **Morphology** ? Name and **explain** the basic operations in morphology. **10**

(b) For the **3 bit 4 × 4** size image perform following operations :— **10**

- (i) **Negative**  
 (ii) **Thresholding** with  $T = 4$   
 (iii) **Intensity level slicing** with background  $r_1 = 2$  and  $r_2 = 5$   
 (iv) **Bit plane slicing** for MSB and LSB plane  
 (v) **Clipping** with  $r_1 = 2$  and  $r_2 = 5$

|   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 0 |
| 2 | 4 | 6 | 7 |
| 5 | 2 | 4 | 3 |
| 3 | 2 | 6 | 1 |

[ TURN OVER

**Con. 4668-GN-9086-12.****2**

4. (a) Design a Butterworth filter using Bilinear Transformation method with following specification : **10**  
 $A_p = 3\text{db}$   $A_s = 15\text{db}$   $W_p = 0.5\pi$   $W_s = 0.75\pi$   $F_s = 1\text{Hz}$
- (b) Explain the method of segmentation of images by region splitting and merging. **10**
5. (a) Explain with example the following :— **10**  
 (i) Thinning  
 (ii) Hit or Miss transformation.
- (b) Find 8 point DFT using DIT FFT algorithm with butterfly diagram for **10**  
 $X(n) = \{1, -1, -1, -1, 1, 1, 1, -1\}$
6. (a) Differentiate between the following (any **two**) :— **10**  
 (i) Convolution Vs Correlation  
 (ii) Bit plane slicing Vs Grey level slicing  
 (iii) Low pass filter Vs Median filter.
- (b) Write note on Discrete Cosine transform and its application find DCT of given image. **10**

|   |   |   |   |
|---|---|---|---|
| 2 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 |
| 2 | 1 | 2 | 3 |

7. Write short note (any **four**) :— **20**
- (a) Digital Water Marking  
 (b) Biometric Authentication  
 (c) Lossy Image Compression  
 (d) Content based Image Retrieval  
 (e) Text Compression  
 (f) Hadamard Transform  
 (g) Vector Quantization.