B.E. Sem VII (R) (I.T) 2/6/15

Simulation and Modeling **QP Code : 8614**

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. 1 is compulsory
(2)Attempt any four questions out of remaining six questions.

Q-1 a) Define System state, Event notice, Activity, Event list, Delay and Clock. (10)
b) Explain different steps in simulation study. (10)

Q-2 a) Describe the Event Scheduling Time Advanced Algorithm. (10)
b) How would you select simulation software? Mention the features of any one simulation software. (10)

Q-3 a) State the properties of random numbers. How are random numbers generated? (10)
b) What do you understand by "Goodness of Fit Test"? Write the procedure for the same. (10)

Q-4 a) Perform the simulation of the Inventory System. Daily demand is represented by the random numbers 4, 1,8,5,2 and demand probability is given by (10)

Demand	Probability
0	0.2
1	0.5
2	0.3

If the initial inventory is 4 units, determine on which day the shortage condition occurs.

b) Explain Poisson Process along with its properties (10)

Q-5 a) Explain the following with example (10)
I. Terminating Simulation
II. Non-terminating Simulation
b) Define Correlation and Covariance.Explain Time series Model. (10)

Q-6 a) Give the equation for steady state parameters of M/G/1 queue and Derive M/M/1 from M/G/1. (10)
b) Explain in detail verification of simulation model. (10)

Q-7 Write Short note on (any two) (20)
a) Inverse Transform Technique.
b) Issues in the simulation of manufacturing system.
c) Cobweb Model.

BE Sem. VII | I.T. | DSIP

~~8 May 2015~~

08 | June | 2015

Q.P. Code : **8747**

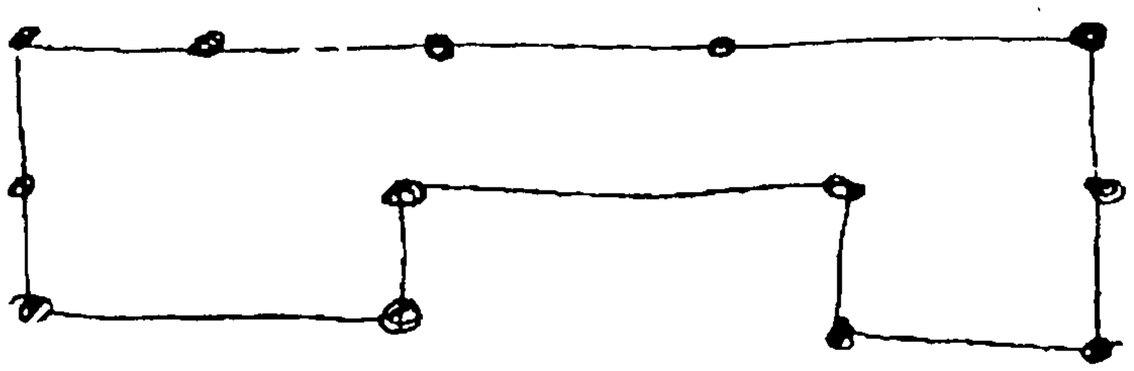
(3 Hours) [**Tota! Marks : 80**

N.B.: (1) Question **No.1** is **compulsory**.
(2) **Attempt** any **four** out of remaining questions.
(3) **Figures** to the **right** indicate **full** marks.

1. (a) Prove that Highpass : Original - Lowpass. **5**
   (b) Extreme contrast straching is thresholding. **5**
   (c) Explain discrete time systems with example. **5**
   (d) Diffentiate between spatial resolution & tonal resolution. **5**

2. (a) $x(t) = \sin(480\pi t) + 3\sin(720\pi t)$ is sampled with Fs = 600 times per second. **10**
   (i) What are the frequencies in radians in the resulting DT signal x [n] ?
   (ii) If x [n] is passed through an ideal interpolator, what is the reconstructed signal.
   (b) Perform following operations on given signal. **10**
   $x(n) = \{ 1, 2, 3, 5 \}$
   (i) $x(-n-1)$
   (ii) $x(n-2)$
   (iii) $x(n+1)$
   (iv) $x(-n+2)$
   (v) $2x(n)$

3. (a) Obtain four directional chain code & shape number representation of following image. **5**



   (b) Classify the signal as energy or power signal **5**

$$x(n) = \begin{cases} \left(\frac{1}{2}\right)^n & n \geq 0 \\ (2)^n & n \leq 0 \end{cases}$$

[TURN OVER

(c) Consider the image given below. Calculate direction of edge at the centre point of image. **10**

$$I = \begin{bmatrix} 50 & 80 & 70 \\ 5 & 50 & 90 \\ 7 & 9 & 50 \end{bmatrix}$$

4. (a) For the following brinary image perform marphological operation opening followed by closing **10**

$$A = \begin{matrix} 1 & 0 & 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 1 & 1 & 1 \end{matrix} \qquad B = [\,\textcircled{1}\ 1\,]$$

(b) Derive Fast Walsh Transform Flowgraph for N = 4 **10**

5. (a) If x [n] = { 1, 2, 3, 4 } & h {n} = [1, 7] **10**
Find linear convalution using circular convalution.

(b) Compare lossless and lossy compression techniques. **5**

(c) Object detecting using correlation principle. **5**

6. Write short note on any two. **10**
   (a) Digital watermaking with application.
   (b) Sampling & quontizations.
   (c) Explain various frequency domain law pass filters in detail.

7. (a) Perform histogram strcting 50 that the new image has a dynamic range of [0, 7] **10**

Gray level	0	1	2	3	4	5	6	7
No. of pixels	80	90	75	100	0	0	0	0

(b) State & prove any four properties of DFT **10**
