Total No. of Pages: 2

5th SEMESTER
MID SEMESTER EXAMINATION

B. Tech. (MC)
(SEPTEMBER-2017)

MC 301: Operating System

Max. Marks: 30

Time: 1:30 Hours

Note: All questions are compulsory and carry equal weightage.
Assume suitable missing data, if any.

Q1. What are the basic functions of an operating system with respect to process management, main memory management, file management, I/O system management, protection system and secondary storage management? (6)

Q2. What are Semaphores? What is the role of critical section in process synchronization? Describe readers-writers problem with its possible solution. (6)

Q3. For the processes listed in the table:

Process	Arrival Time	CPU Burst Time
A	0.000	4
B	2.001	7
C	3.001	2
D	3.002	2

Draw a chart illustrating their execution using the algorithms mentioned below and also find out the average turnaround time (rounding to the nearest hundredth) and average waiting time (rounding to the nearest hundredth) in each case.

a) First-come First-served
b) Shortest Job First
c) Shortest Remaining Time
d) Round Robin (quantum 1) (6)

Q4. Consider the following snapshot of a system.

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	2	1	0	0
P_1	2	0	0	0	2	7	5	0				
P_2	0	0	3	4	6	6	5	6				
P_3	2	3	5	4	4	3	5	6				
P_4	0	3	3	2	0	6	5	2				

Using Banker's algorithm answer the following questions:

i) How many total resources of type A, B, C and D are there?

ii) Calculate the need matrix?

iii) Is the system in safe state? If yes, give safe sequence.

iv) If a request from process P_2 arrives for (0, 1, 0, 0), can it be granted safely? Show the new system state. (6)

Q5. Write a short note on the following:

a) Race condition (with an example).

b) Resource allocation graph.

c) Necessary conditions for the Deadlock. (6)

Total pages: 1 Roll No: .....

FIFTH SEMESTER **B.Tech. Mathematics & Computing**

Mid Semester Exam, *Sept. 2017*

Code & Title: MC 303 Stochastic Processes

Time: One and half hrs. *Max. Marks : 30*

Note : Answer all questions. All questions carry equal marks. Assume suitable missing data, if any. You can ask for statistical tables.

1. Define simple random walk. In case of unrestricted simple random walk find the probability that at time n the particle is found in one of states from j to k, $j < k$. Apply this to find the probability of particle being in one of states from 20 to 50 at $n = 60$, when $p = 0.6$ and $q = 0.4$; letters having usual meaning.

2. Define Poisson process. Give example of homogeneous and non-homogeneous Poisson processes. In case of a Poisson process with rate $\lambda > 0$, find the distribution of the inter-arrival times of successive events.

3. What is a renewal process? Give examples. How does it differ from a Poission process? In case of a renewal process if inter renewal process is uniformly distributed over the interval [0, c], then find the renewal function and renewal distribution.

4. Define birth and death process. A barber shop serves one customer at a time and provides three seats for waiting customers. If the place is full, customers go elsewhere. Arrivals occur according to a Poisson distribution with mean of 4 per hour. The time to get a haircut is exponential with mean 15 minutes. Determine, (i) steady-state probabilities, (ii) expected number of customers in the shop, (iii) probability that customers will go elsewhere because the shop is full.

5. Define Bernoulli process. Give example. Find the distribution for the number of successes in n Bernoulli trials when trials are, (i) homogeneous, (ii) non homogeneous.

Total No of pages: 01

B. Tech Fifth Sem. Mid Semester Examination September-2017, Roll Number--MC/40

Subject code: MC-305

Subject Name: Operations Research

Time 1:30 Hours

Maximum marks: 30

Answer all questions and each question is of equal marks

1. Solve the following LPP by graphical method and explain where the objective function value will be maximum

   Max $x_1 - 2x_2$

   Subject to $\frac{1}{2}x_1 - x_2 \leq 2\,; -3x_1 + x_2 \leq 3$

   And $x_1,\ x_2,\ x_3 \geq 0$

2. A power trading company produces Electricity using mainly three resources coal, oil and gas. (The other resources labor and administrative expenses, transmission grid parameters are not to be considered in this problem). In the following table, the first row synthesize the numeric value and quantify the ton of coal, oil and gas are used in the thermal power plant to produce electricity for a week sustain. The second row synthesizes the numbers representing the ton of material extracted within scheduled hours in a week constrained to store capacity.

	Tons of Coal	Tons of Oil	Tons of Gas	Total in tons
Utilized mater for electricity generation in a week	3	2	1	30
Material extracted within scheduled hours in a week	2	1	2	20

   If the revenue concerned to generate electric utilizing coal, oil, and gas are 1, 1. & 3 Crores of rupees respectively. Decide which material with how much quantity to be utilized to maximize the revenue, using simplex method.

3. Determine the optimal value & optimal solution using the sensitivity analysis to the problem synthesized from the question answer of Question 2, if the revenue from coal i.e., $c_1 = 1$ is increased to Rs12/.

4. Use Two Phase method mentioned in the OR book, to solve the following Linear Programming Problem,

   Min $z = x_1 - 2x_2 - 3x_3$,

   Subject to $-2x_1 + x_2 + 3x_3 \leq 2;\ 2x_1 + 3x_2 + 4x_3 \leq 1$; and $x_1,\ x_2,\ x_3 \geq 0$

5. Solve the given LPP using Branch and bound method, such that the optimal solutions and maximum value are integers

   Max $z = 3x_1 + 2x_2$

   Subject to $x_1 \leq 2\,; x_2 \leq 2$,

   And $x_1 + x_2 \leq 3.5; x_1, x_2 \geq 0$

Total No. of Pages 02

Roll No.--------

B. Tech

Vth Semester

MID SEMESTER EXAMINATIO2017-18 (Odd) **September -2017**

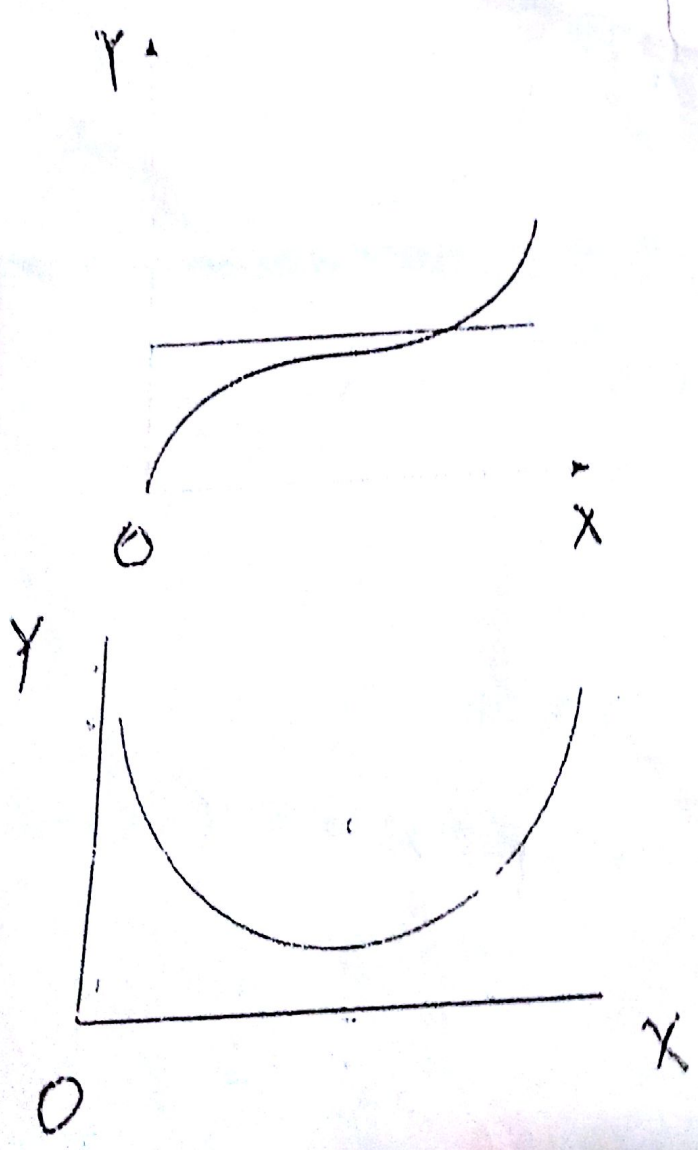
HU - 351 Mathematical Economics and Econometrics (University Elective)

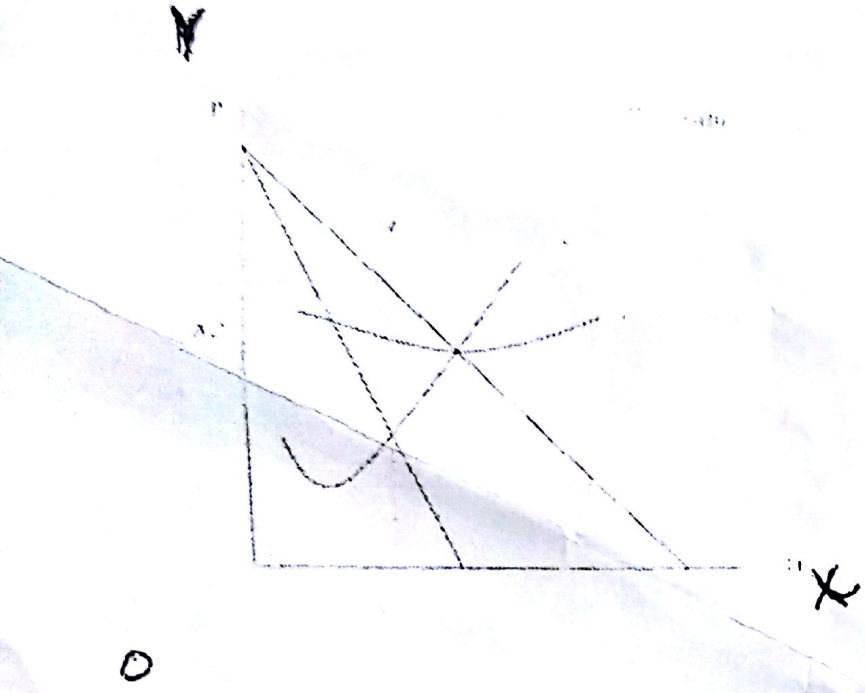
Time: 1Hours30 Minutes

Max Marks: 25

Note:	Answer all questions. Assume suitable missing data, if any

1. Which relationship of Economics may be discussed with following graphs. Write suitable equation also for the same. (9)





2. Discuss difference between: (6)

   i. Nominal Data and Ratio Data

   ii. Cross-Sectional Data and Time-Series Data

   iii. Primary Data and Secondary Data

3. Discuss Mathematical Economics and Econometrics with example and also discuss its five applications for engineering students. (5)

4. Discuss the business application which may be discussed with Differential Calculus and Matrix . (5)

Total No. of Pages 1 Roll No. ME/40

Fifth SEMESTER B. Tech.

Mid sem Examination **Sept 2017**

HU-301 Technical communication

Time: 1.30 hours *Max Marks: 25*

Note: **Answer all the questions**
Assume suitable missing data, if any

1. Choose the correct synonym for the words given below: 5

1 Criterion

(a) Probability (b) Conjecture (c) Standard (d) Corpulent

2- Acrimony

(a) Benevolence (b) Obdurate (c) Appendage (d)Bitterness

3-Circumlocution

(a) Tranquillity (b) Incongruous (c) Verbosity (d) Conspicuous

4-Innocuous

(a) Harmless (b) Deleterious (c) Perfidious (d) Precarious

5-Piquant

(a) Insipid (b) Pick (c)Tasteful (d) Pique

2. Write short notes on any one of the following: 5

a) Listening barriers

b) Effective presentation

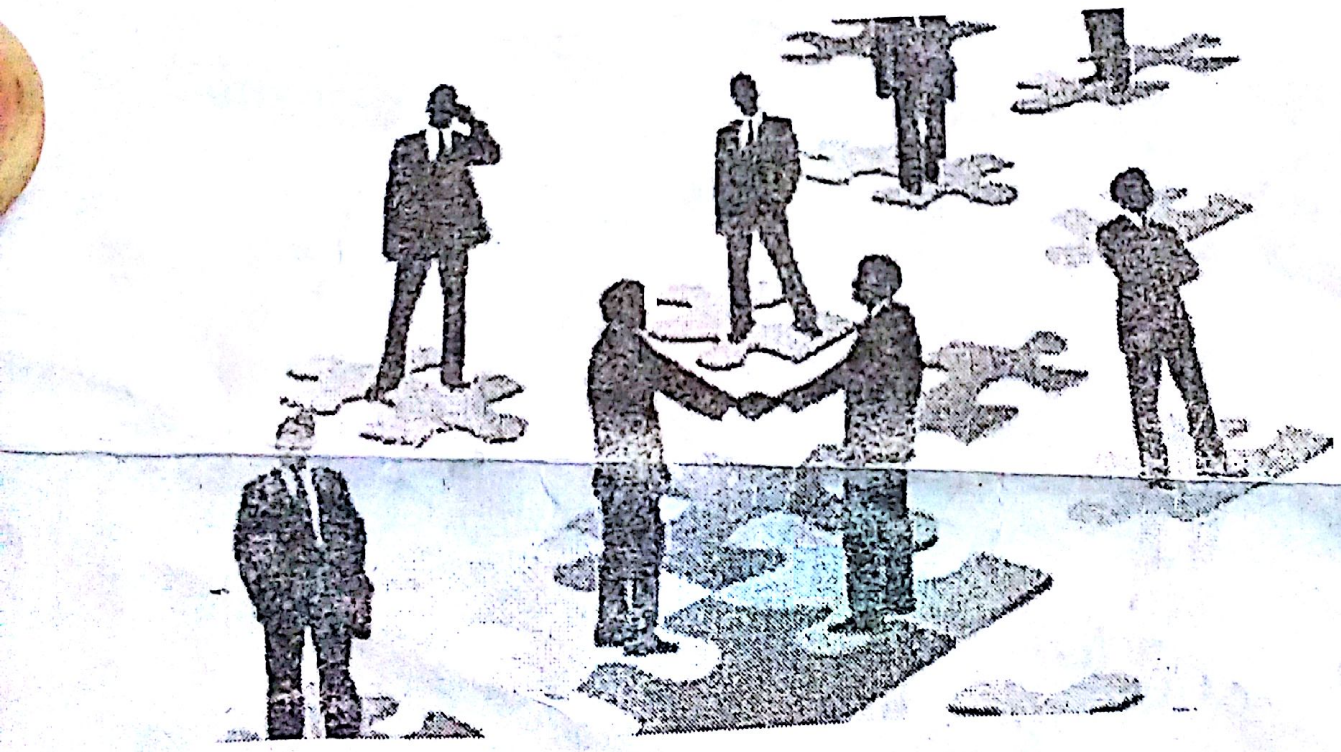
3. Choose one dream company/organization and write a formal introduction for a job interview. 5

4. The topic given to you in a GD Session is "Free education for poor students at university level."

   i) Analyse the consequences of such a step. 2

   ii) Give recommendations and defend your position on the issue. 3

5. Look at the picture given below:



   i) Interpret the picture presented here. 1

   ii) Analyse the body language of people in picture. 2

   iii) Justify your response with the help of available details. 2