Total No. of Pages: 2

5th SEMESTER

MID SEMESTER EXAMINATION

Roll No.....MC/.53

B. Tech. (MC)

(SEPTEMBER-2018)

MC 301: Operating System

Time: 1:30 Hours **Max. Marks: 30**

Note: All questions are compulsory. Assume suitable missing data, if any.

Q1. Briefly describe six different types of Operating Systems starting with the batch system. (6)

Q2. For the processes listed below draw the Gantt chart illustrating their execution and also find out the average turnaround time (rounding to the nearest hundredth) and average waiting time (rounding to the nearest hundredth) using: (6)

a) Round Robin (quantum 1)

b) Round Robin (quantum 2)

c) Priority preemptive (smaller priority number has higher priority)

Process	Arrival Time	CPU Burst Time	Priority
A	0.000	3	5
B	1.001	6	4
C	4.001	4	2
D	6.001	2	3

PTO

Q3. Discuss bounded Bounded-Buffer problem with its solution and explain how the solution satisfies all the three requirements of critical section? (6)

Q4. a) Explain different process states with diagram (4)

b) Explain First Come First Served (FCFS) CPU scheduling algorithm with an example. (2)

Q5. Write a short note on the following: (2*3 = 6)

a) Independent and Cooperative process.

b) Busy waiting.

c) Semaphore.

- END –

Total pages: 1

Roll No: MC153

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

Mid Semester Exam, *Sept. 2018*

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.

1. Find the probability that in case of a simple random walk with two absorbing barriers the particle is at the one of the barrier at time n. Calculate this by taking the values of different parameters of your choice.

2. Describe the behaviour of the particle in case of unrestricted simple random walk for all the three case $p > q$, $p < q$, and $p = q$ as n tends to large.

3. What is a renewal process? Give examples. How does it differ from a Poisson 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. Describe 'pure birth process' and 'pure death process' as special case of general birth and death process.

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

$1/2 + 1/3 = \frac{5}{6}$

Total No. of Pages: 03

B. Tech. [MC]

Mid Semester Examination

Roll No. 2K16/MC/53

5th *Semester*

(September-2018)

MC305 Operations Research

***Time 1h* 30 min.**

Max. Marks: 30

NOTE: ***Attempt all Questions. Assume suitable missing data if any.***

1. Formulate the LPP for the following problem.

   a. JOBCO produces two products on two machines. A unit of product 1 requires 2 hours on machine 1 and 1 hour on machine 2. For product 2, a unit requires 1 hour on machine 1 and 3 hours on machine 2. The revenues per unit of products 1 and 2 are $30 and $20, respectively. The total daily processing time available for each machine is 8 hours. Formulate the LPP to maximize the revenues. 2

   b. TOYCO assembles three types of toys namely trains, trucks, and cars using three operations. The daily limits on the available times for the three operations are 430,460, and 420 minutes, respectively, and the revenues per unit of toy train, truck, and car are $3, $2, and $5, respectively. The assembly times per train at the three operations are 1, 3, and 1 minutes, respectively. The corresponding times per trucks and per car are (2,0,4) and (1,2,0) minutes (a zero time indicates that the operation is not used). 2

P.T.O.

2. Solve the following LPP using simplex method: 6

$$\text{Maximize } z = 5x_1 + 4x_2$$

Subject to

$$6x_1 + 4x_2 \leq 24$$

$$-x_1 - 2x_2 \geq -6$$

$$-x_1 + x_2 \leq 1$$

$$x_2 \leq 2$$

$$x_1, x_2 \geq 0$$

3. Write the dual problem corresponding to following primal LPP model.

a.

$$\text{Maximize } z = 5x_1 + 12x_2 + 4x_3$$

Subject to

$$x_1 + 2x_2 + x_3 \leq 10$$

$$2x_1 - x_2 + 3x_3 = 8$$

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

b.

$$\text{Minimize } z = 15x_1 + 12x_2$$

Subject to

$$x_1 + 2x_2 \geq 3$$

$$2x_1 - 4x_2 \leq 5$$

$$x_1 \geq 0$$

3 + 3

4. Solve the following LPP using simplex method:

$$\text{Maximize } z = 4x_1 + x_2$$

Subject to

$$4x_1 + 3x_2 \geq 6$$

$$3x_1 + x_2 = 3$$

$$x_1 + 2x_2 \geq 4$$

$$x_1, x_2 \geq 0$$

6

5. Solve and perform graphical sensitivity analysis on the LLP formulation of JOBCO problem in 2.a and answer the following queries:

a. Find the feasibility range for the resources and objective coefficient.

b. If JOBCO can increase the capacity of both machines, which machine should receive higher priority (NOTE: increasing additional resource of any time costs $6)?

8

ALL THE BEST

Total No. of Pages: 01

FIFTH SEMESTER

Roll No: MC153

B.Tech.[Elective]

MID SEMESTER EXAMINATION

Sept., 2018

MC307, Object Oriented Programming

Time: 1.5 Hours

M.M.: 25

Note: *Attempt **ALL** questions. Assume suitable missing data, if any. Write your answer concisely.*

1. Discuss briefly the following with examples:
   (a) Objects
   (b) Friend Classes
   (c) Constructors and Destructors
   (d) Self referential classes
   (e) Virtual functions. [10]
2. Write a c++ program to calculate the variance and standard deviation of N numbers.
3. Write a program to compute the area of a triangle and a circle by overloading the area() function.
4. Write a program using dynamic initialization of objects.

Total No of Pages 02

SIXTH SEMESTER

Roll. No. MC/53

MID SEMESTER EXAMINATION

B.TECH

Sept.2018

HU301 TECHNICAL COMMUNICATION

Time: 1.50 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

i) Clandestine
- a) abortive
- b) tangible
- → c) secret
- d) doomed

ii) Abstruse
- a)exciting
- b)recondite
- → c)profound
- d) suspended

iii) objurgate
- a) scold
- → b) assuage
- c) disgraceful
- d) vicious assault

iv) Immaculate
- → a)unsullied
- b) angered
- c) chastened
- d) chewed

v) perfunctory
- → a) demanding
- b) disinterested
- c) thorough
- d) superficial

2. Write short notes on (any two) the following: 10

i) Importance of body language
iii) Group communication
iv) Technical communication

3. Write an essay on one of the following: **10**

Digital economy

Decriminalization of beggary

My Indianness is reflected through…..

-END-

Total No. of Pages: 1

Roll No……

5th SEMESTER

B. Tech.

MID SEMESTER EXAMINATION

(SEPTEMBER-2018)

MC 315: Modern Algebra

Time: 1:30 Hours

Max. Marks: 25

Note: All questions are compulsory. Assume suitable missing data, if any.

Q1. (a) Give an example of a finite semigroup which is not a group. **(2)**

(b) Show that the cyclic subgroup of S_3 generated by (1 2) is not normal in S_3. **(3)**

Q2. "If $(ab)^n = a^n b^n$ holds for 3 consecutive integer value of n, then G is Abelian." Show that the above conclusion does not follow if we assume the relation $(ab)^n = a^n b^n$ for just two consecutive integers. **(5)**

Q3. (a) If U(n) (the reduced residue system of integers mod n) is a cyclic group, then find the number of generators of U(n). **(2)**

(b) Let (G,+) be a group written additively, if a and b be two elements of G, then show that $o(a) = o(x + a - x) \quad \forall x \in G$. **(3)**

Q4. Give an example of a group G having a subgroup H and two elements $a, b \in G$ such that $aH = bH$ but $Ha \neq Hb$. **(5)**

Q5. Verify Caley's Theorem for the group $G = \{1, -1, i, -i\}$, $i^2 = -1$ and find the permutations group isomorphic to the above group. **(5)**

- END –