Reg. No. : ....

Name : ....

First Semester M.Com. Degree (Reg./Supple./Imp.)
Examination, October 2018
(2014 Admn. Onwards)
COM 1C02 : QUANTITATIVE TECHNIQUES AND OPERATIONS
RESEARCH

Time : 3 Hours   Max. Marks : 60

SECTION – A

Answer **any four** questions. **Each** question carries **1** mark for Part **(a)**, **3** marks
for Part **(b)** and **5** marks for Part **(c)**.

1. a) What is expectation of a random variable ?

   b) State the density function of a discrete random variable.

   c) In the game of rolling two dice simultaneously, a person is to get as many
      rupees as the sum of the numbers on the faces of the two dice. What is
      the mathematical expectation of his earnings ?

2. a) What are static models ?

   b) Discuss in brief the role of OR models in decision making.

   c) Discuss the various phases in solving an OR problem.

3. a) What is sample space ?

   b) State Baye's theorem.

   c) An illiterate servant is given 5 cards addressed to 5 different persons
      residing in the same city. What is the probability that the servant hands
      over the card to a wrong person ?

4. a) What is level of significance ?

   b) When and for what purpose 'z' test is used ?

   c) Explain the procedure for testing statistical hypothesis.

P.T.O.

5. a) Define a Poisson distribution.

   b) State the properties of Poisson distribution.

   c) Five coins are tossed 3200 times. Find the expected frequencies of heads. Also calculate mean and standard deviation.

6. a) What is dummy activity ?

   b) Distinguish between CPM and PERT.

   c) State the practical applications of network techniques. $(4 \times 9 = 36)$

SECTION – B

Answer the **two** questions. **Each** question carries **12** marks.

7. a) Solve the following LPP graphically.

   Maximise $z = 8000x_1 + 7000x_2$
   Subject to $3x_1 + x_2 \leq 66$;
   $x_1 + x_2 \leq 45$;
   $x_1 \leq 20$; $x_2 \leq 40$;
   $x_1, x_2 \geq 0$

   OR

   b) The following table lists the jobs of a network with their estimates.

Job	Duration (days)		
	Optimistic	Most likely	Pessimistic
(1-2)	3	6	15
(1-6)	2	5	14
(2-3)	6	12	30
(2-4)	2	5	8
(3-5)	5	11	17
(4-5)	3	6	15
(6-7)	3	9	27
(5-8)	1	4	7
(7-8)	4	19	28

   a) Draw the project network.

   b) Calculate the length and variance of the critical path and

   c) What is the approximate probability that the jobs on the critical path will be completed in 41 days.

8. a) The following table gives the number of units manufactured per day by two employees A and B for a number of days.

Worker A	41	38	39	40	34	39	33	32
Worker B	38	41	35	40	30	38		

Should these results be accepted as evidence that the two employees are equally stable ? (Use F test).

OR

b) In test given to two groups of workers, the scores obtained were as follows.

Group I	44	46	35	30	29	26	28			
Group II	49	50	36	41	49	36	29	26	34	28

Assuming that the group standard deviations are the same and that the scores are normally distributed, test the hypothesis that the group means are equal. Use 0.05 level of significance. (2×12=24)