K21P 0510

Reg. No. : .....

Name : .....

First Semester M.Com. Degree (CBSS – Reg./Suppl. (Including Mercy Chance)/Imp.) Examination, October 2020
(2014 Admission Onwards)
COM1C02 : QUANTITATIVE TECHNIQUES AND OPERATION RESEARCH

Time : 3 Hours

Max. Marks : 60

SECTION – A

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

1. a) Define Random Experiment.
   b) What are the general characteristics of Poisson distribution ?
   c) A card is drawn from a pack of cards. What is the probability that it is a spade king ?
2. a) State Addition theorem of probability.
   b) State the salient features of Binomial distribution.
   c) Three coins whose two faces are marked 1 and 2 are thrown. Find the expectation of the number obtained.
3. a) Define an 'event'.
   b) State four limitations of Operations Research.
   c) Distinguish between CPM and PERT.
4. a) What is standard error ?
   b) When and for what purpose 't' test is used ?
   c) What is LPP ? What are the major limitation ?
5. a) What are type I and type II errors ?
   b) Distinguish between one tailed and two tailed tests.

P.T.O.

c) Draw the network diagram to the following activities.

Activity (i, j)	Time duration
1 – 2	2
1 – 3	4
1 – 4	3
2 – 5	1
3 – 5	6
4 – 6	5
5 – 6	7

6. a) What is dummy activity ?

b) Distinguish between 'slack' and 'float'.

c) What are the uses of t-test ? **(4×9=36)**

SECTION – B

Answer the **two** questions in this Section. **Each** question carries **12** marks.

7. a) In a test given to two groups of students the marks obtained were as follow :

Group I :	18	20	36	50	49	36	34	49	41
Group II :	29	26	28	35	35	44	46		

Assuming that the group standard deviations are the same and that the marks normally distributed, test the hypothesis that the group means are equal.

OR

b) Between the hours of 2 and 4 P.M. the average number of phone calls per minute coming into the switch board of a company is 2.5. Find the probability that during one particular minute there will be (i) no phone call at all (ii) at least 5 calls.

Given ($e^{-2} = 0.13534$ and $e^{-0.5} = 0.6065$)

8. a) Solve graphically the following linear programming problem.

Minimize : $Z = 3x_1 + 5x_2$

Subject to $-3x_1 + 4x_2 \leq 12$

$2x_1 - x_2 \geq -2$

$2x_1 + 3x_2 \geq 12$

$x_1 \leq 4, x_2 \geq 2$

$x_1, x_2 \geq 0.$

OR

b) The following table gives the activities in a construction project and other relevant information :

Activity :	1 – 2	1 – 3	2 – 3	2 – 4	3 – 4	4 – 5
Duration :	20	25	10	12	6	10

i) Draw the network for the project.

ii) Find free, total and independent floats for each activity.

iii) Which are the critical activities ? **(2×12=24)**