Total No. of Questions : 4]

SEAT No. :

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T.Y.B.Com.
366F : BUSINESS STATISTICS-III
(2019 Pattern) (Semester-VI)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Use of calculator statistical table is allowed.***

Q1) a) Fill in the blanks of the following (Any five) **[5]**

i) Node is the collection of two or morethan two _____

ii) Shortest possible time to complete the activity is known as _____ time in PERT.

iii) _____ is a method of imitating of real system with artificial data using computers.

iv) The number of customers waiting in a queue is called_____

v) A group of individuals or units from where the customers arrive in the queuing system is called as _____

vi) We can maximize profit function by using computation of _____ function.

b) State whether each of the following statements are true or false. (Any five)**[5]**

i) CPM is non-deterministic model.

ii) For project, we can get morethan one critical path.

iii) Random numbers generated using computer are called Pseudo random numbers.

iv) In queuing theory, service rate and arrival rate should be expressed in same units.

v) The calling population may be infinite.

vi) If C $(x)=3x^4+12x^2-3x+10$ is the manufacture's total cost equation, then fixed cost is zero.

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Q2) Attempt any two of the following: **[2×5=10]**

a) Explain the following terms: 'Most likely time' in PERT,
'Pessimistic time' in PERT,
Simulation,
Calling Population,
Demand function.

b) Explain the following terms: Probability of completion of project,
How simulation can be used in business,
Traffic intensity,
Cost function,
Profit function.

c) Explain the minima and maxima function with an illustration.

d) If C $(x) = 3x^4 + 2x^3 - 7x + 132$ is the manufacturer's total cost equation, then find average cost, fixed cost, variable cost and marginal cost.

Q3) a) The following table gives the activities in a project and other relevant information.

Activity	1-2	1-3	1-4	2-5	3-4	3-7	4-6	5-7	6-7
Duration	20	23	8	19	16	24	18	4	10

Find earliest start, earliest finish, latest start, latest finish, total float, Free float and independent float for each activity. Also find critical path. **[8]**

b) A departmental store has one cashier at its counter. Twenty customers arrive on an average per hour while the cashier can serve 24 customers per hour. Find:

i) Probability that cashier is idle.

ii) Average time a customers wait before being served.

iii) Average no. of customers in queue.

iv) Average no. of a customers in the system.

v) Probability that a customer has to wait before he gets service. **[7]**

Q4) a) Given below is the information about project regarding different activities. All estimates (time) are in days.

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
to	5	1	2	3	1	2	1
tm	6	1	4	6	1	2	4
tp	7	2	12	15	1	8	7

i) Draw the network diagram of PERT and find expected time estimate and variance for each activity.

ii) Given that the total estimated project completion time is 17 days with S.D.3. 14 days. What is the probability that the project will be completed within 12 days? **[8]**

b) A company manufacturer's 200 car cycles per day which changes according to availability of raw material:

Production	196	197	198	199	200	201	202	203	204
No. of days	5	9	12	14	20	15	11	8	6

Consider the following sequence of random numbers:

82, 89, 78, 24, 52, 61, 18, 45, 04, 23, 50?

Using the sequence simulate the production for next 12 days. Use monte-Carlo simulation method. **[7]**

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