Total No. of Questions : 4]

SEAT No. :

PE-1127

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T.Y. B.Com.
366 (f) : 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 and statistical table is allowed.***
4) ***Symbols have thier usual meaning.***

Q1) **A) Fill in the blanks (Any five)** **[5 × 1 = 5]**

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

ii) If $C(x) = 21x^4 - 18x^3 + 12x - 9$ is the manufacturer's total cost equation then variable cost is _____

iii) PERT is _____model.

iv) If the total float is zero then corresponding activity is called as _____ activity.

v) FCFS is called _____ discipline.

vi) In queuing theory, interarrival service times follows _____ distribution.

B) State whether each of the following statement is true or false (Any five) **[5 × 1 = 5]**

i) Random numbers are used in simulation theory.

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

iii) CPM is non-deterministic model.

iv) In queuing theory, no. of arrivals follows poisson distribution.

v) In queuing theory, traffic density may be greater than one.

vi) Collections of critical activities is called critical path.

P.T.O.

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

a) Explain the terms :

Network,

Simulation,

Queue discipline

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

c) If C $(x) = 3x^4 + 12x^3 - 3x + 10$ is the manufacturer's total cost equation, then find :

average cost, fixed cost, variable cost, marginal cost.

d) Explain the terms :

Event, Activity,

Most likely time in PERT,

Optimistic time in PERT

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

Activity	1-2	1-4	1-3	2-5	3-5	3-6	4-6	5-7	6-7
Duration	3	4	5	2	3	7	9	8	9

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) Following is the probability distribution of daily production of items.

Production	0	5	10	15	20	25
Probability	0.04	0.22	0.16	0.42	0.10	0.06

Using random numbers given below estimate production for next 10 days :

35, 52, 90, 13, 23, 73, 34, 57, 35, 83.

Also estimate average daily production. **[7]**

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Q4) a) Given below is the information about a project regarding different activities. All time estimate are in days. **[8]**

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
t_o :	5	1	2	3	1	2	1
t_m :	6	1	4	6	1	2	4
t_p :	7	2	12	15	1	8	7

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

ii) Given 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?

b) A road transport company has one reservation derk on duty at a time. He handles information of bus schedules and makes reservations. Customers arrive at a rate of 8 per hour and the clerk can service 12 customers on an average per hour. Under assumption of queuing theory, find **[7]**

i) Average No. of customers waiting for the service.

ii) Average No. of customers in a queue.

iii) Average waiting time of customer for the service.

iv) Probability that the reservation clerk is idle.

v) Probability that a customer has to wait before he gets service.

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