

Total No. of Questions : 4]

SEAT No. :

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[6032]-623

T.Y. B.Com.

366(f) : BUSINESS STATISTICS - III

(2019 Pattern) (Semester - VI)

Time : 2 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Attempt Fill in the blanks any five of the following : **[5]**

- i) We can maximize profit function by using computation of _____ function.
- ii) If $C(x) = 3x^4 + 2x^3 - 7x + 22$ is the manufacturer's total cost equation then variable cost is _____.
- iii) PERT is _____ model.
- iv) FCFS is called _____ discipline.
- v) Long form of PERT is _____.
- vi) If the total float is zero then corresponding activity is called as _____ activity.

b) State whether each of the statement given below is true or false: **[5]**

- i) Random numbers are used in simulation theory.
- ii) CPM is non-deterministic model.
- iii) In queuing theory, we always assume that, average no. of arrivals is less than average no. of departures.
- iv) If $C(x) = 31x^4 + 42x^2 - 71x + 12$ is the manufacturer's total cost equation then 12 is called variable cost.
- v) Collections of critical activities is called critical path

P.T.O.

Q2) Attempt any two of the following:

[10]

- a) Explain the following terms:
- i) Node
 - ii) Revenue function.
 - iii) Simulation
 - iv) Distribution of arrivals
 - v) Service channel
- b) If $C(x) = 2x^4 - x^3 + 7x - 12$ is the manufacturer's total cost equation, find the :
- i) average cost
 - ii) fixed cost
 - iii) variable cost
 - iv) marginal cost
- c) Explain the following terms:
- i) Pessimistic time in PERT.
 - ii) Calling population
 - iii) Traffic intensity
 - iv) Market Equilibrium,
 - v) Optimistic time in PERT.
- d) Explain the maxima function with an illustration.

Q3) a) The following table gives the activities in a project and other relevant information : **[8]**

Activity	1-2	1-3	2-5	2-4	3-4	4-5	4-6	5-6	6-7
Duration	5	9	14	4	3	10	12	6	10

Find the earliest start, earliest finish, latest start, latest finish, total float, free float and independent float for each activity. Also find critical path.

- b) Following is the probability distribution of daily production of items. [7]

Production	0	5	10	15	20	25
Probability of Production	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 find average daily production.

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

Activity	1-2	1-5	2-3	2-4	3-4	4-5	5-6
t_0 :	2	3	6	5	5	3	1
t_m :	5	12	9	14	8	6	4
t_p :	8	21	12	17	11	9	7

- Determine expected time estimate and variance for each activity.
- Given the total estimated completion time as 32 days with variance 5 days.

What is the probability that the project will be completed within 29 days?

- b) A self service employees one cashier at its counter. Ten customers arrive on an average per hour while the cashier can serve 30 customers per hour. Find: [7]

- Probability that cashier is idle.
- Average time a customer waits before being served.
- Average number of customers in queue.
- Average number of customers in the system.
- Probability that a customer has to wait before he gets service.

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