Total No. of Questions : 4]

SEAT No. :

P3002

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[5801]-623
T.Y. B.Com.
STATISTICS
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 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 $C(x)=13x^4+12x^3+2$ is the manufacturer's total cost equation then variable cost is _____.

iii) CPM is _____model.

iv) FCFS is called_____discipline.

v) If the total float is zero then corresponding activity is called as_____activity.

vi) Node is collections of two or more than two_____.

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

i) Random numbers are not used in simulation theory.

ii) CPM is deterministic model.

iii) In queuing theory, no. of arrivals follows Poisson distribution.

iv) If $C(x) = x^4 + 92x^2 - x + 120$ is the manufacturer's total cost equation then 120 is called variable cost.

v) For Project, we can get more than one critical path.

P.T.O.

Q2) Attempt any two of the following. **[10]**

a) Explain the following terms:

i) Project network

ii) Revenue function.

iii) Simulation

iv) Service rate

v) Calling population

b) If $C(x)=3x^4+12x^2-3x+10$ is the manufacturer's total cost equation, find the:

i) average cost

ii) Fixed cost

iii) variable cost

iv) marginal cost

c) State the condition that cost function can be determined as maxima and minima function.

d) Explain the following terms:

i) Pessimistic time in PERT.

ii) Event

iii) Service channel

iv) Market Equilibrium,

v) Activity

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

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.

b) A road transport company has one reservation clerk 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 number of customers waiting for the service.

ii) Average number 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.

Q4) a) A project has the following activities and other characteristics. **[8]**

Activity	Time Estimates		
	t_o	t_p	t_m
1-2	6	24	6
1-3	6	18	12
1-4	12	30	12
2-5	6	6	6
3-5	12	48	30
4-6	12	42	30
5-6	18	54	30

i) Draw the project network and calculate the length and variance of the critical path.

ii) What is the probability that project will be completed within 80 days?

b) Following is the probability distribution of daily demand of cakes. **[7]**

Demand of cake	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Random numbers given below estimate demand of cake using Monte-Carlo simulation method for next 10 days : 25,39,65,76,12,05,73,89,19,49. Also find average daily demand of cake.

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