0110N638

Candidate's Seat No :_____

B.Sc Sem.-6 (Rep) Examination

SE 311

Statistics (1) A-MS

Time : 2-30 Hours] **October-2024** **[Max. Marks : 70**

1. *All questions carry equal marks.*
2. *Figures to the right indicates marks of the questions or sub questions.*

Q. 1	(a)	With respect to population, explain, population growth and discrete population growth.	*9*
	(b)	State various factors that affect growth pattern of a population.	*9*
		OR	
Q. 1	(a)	Describe continuous time population growth model, role of Weibull distribution and its survival function.	*9*
	(b)	Explain, in details, Population growth,	*9*
Q. 2	(a)	Discuss interpretation of odds ratio.	*9*
	(b)	A survey was conducted to study lever cancer caused by consuming wine and oily food on a group of people. 58 of 157 people consuming wine but did not expose oily food, compared with 44 of 137 people consuming wine and had oily food. Present the data in a tabular form and find odds ratio.	*9*
		OR	
Q. 2	(a)	Write a note on odds, odds ratio.	*9*
	(b)	Describe, in brief, epidemiology	*9*
Q. 3	(a)	Explain risk ratio and give its formula.	*9*
	(b)	With reference to epidemiology, answer the following: (i) Explain utility of measures of association. (ii) Define relative risk.	*9*
		OR	
Q. 3	(a)	Describe term: "Clinical Trials" In how many phases, clinical studies are carried out? State importance of first phase of clinical trials..	*9*
	(b)	Explain, in details, Simpson's paradox.	*9*
Q. 4	(a)	Write a note on clinical trials.	*9*
		Give, in brief, general history of drug discovery.	*9*
		OR	
Q. 4	(a)	Give importance of Cross over design in clinical trials.	*9*
	(b)	Answer the following: (i) What is evidence based design? (ii) State uses of longitudinal studies.	*9*
Q. 5		Answer **ANY EIGHT (08)** from the following:	*16*
	1	State two uses of clinical trials.	
	2	Give two advantages of epidemiology.	
	3	Define relative risk, also state one use of relative risk.	
	4	define birth and death rates	
	5	Write a note on Exponential population growth and give its application.	
	6	Define discrete population growth.	
	7	What is change in population size during a fixed time?	
	8	*Define Hazard Rate.*	
	9	What is change in population size during a fixed time? How to calculate it?	
	10	With reference to epidemiology, what types of risks are included and explained by measures of association?	

(P.T.O)

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B.Sc Sem.-6 (Rep) Examination
SE 311
Statistics (2) B-OR
October-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Q-1 (A) Write steps to convert any primal LPP in to its Dual (9)

(B) (1) Convert following LPP into it's Dual (9)

Maximize $Z= 3x+4y$

s.t.c. $x+y \leq 5$

$2x-5y \leq 15$

$2x \leq 47$

Where, $x,y \geq 0$.

(2) Maximize $Z = 3x_1 + 2x_2 + x_3$

Subject to the constrains

$2x_1 + 5x_2 + x_3 = 12$
$3x_1 + 4x_2 = 11$
where, $x_2 , x_3 \geq 0$ and x_1 unrestricted

OR

Q-1 (A) Write a short note on revised simplex method. (9)

(B) By using revised simplex method Maximize $Z = 3x_1 + 2x_2$ (9)

Subject to the constraints

$2x_1 + x_2 \leq 10$
$-x_1 - 3x_2 \geq -6$
where, $x_1 , x_2 \geq 0$

Q-2 (A) Write the steps of n jobs through m machines for sequencing problem. (9)

(B) A book binder has one printing press, one binding machine and the manuscripts of a number of different books. The time required to perform the printing and binding operations for each books are (9)

shown below. Determine the order in which books should be proceed in order to minimize the total time? Also find idle time.

books	1	2	3	4	5	6
Printing time (hours)	15	60	25	10	45	55
Binding time (hours)	40	50	45	30	15	05

OR

Q-2 (A) Define sequencing problem and write assumptions of it. (9)

(B) There are 5 jobs each of which is to be proceed through two machines A and B in the order A and B processing are as follows: (9)

Job	1	2	3	4	5
Machine A	3	8	5	7	4
Machine B	4	10	6	5	8

Determine the optimum sequence for 5 jobs and minimum elapsed time. Also find the idle time of machine A and B.

Q-3 (A) Write a short note on group replacement problem. (9)

(B) The cost price of a machine is Rs. 16,100. Its maintenance cost is as follows and scrap value is Rs. 1000, a constant. When should the machine be replaced? (9)

year	1	2	3	4	5	6	7	8
Maintenance cost in Rs.	200	350	500	1000	1400	2700	4000	5000

OR

Q-3 (A) Explain replacement model for items which deteriorate with time when value of money does not change with time and time is discrete variable. (9)

(B) Cost price of an item is rupees 7000 annual operating cost is rupees 300 for the first year and then increases by rupees 1500 every year after how many years should the item be replaced? (9)

Q-4 ATTEMPT ANY EIGHT FROM THE FOLLOWING. (16)

(1) Describe the changes in the right side constants of dual constraints when it is converted to the primal.

(2) Describe the changes in the signs of inequality of the dual constraints when it is converted to the primal.

(3) If One of the non-negative restrictions is un restricted in sign in the primal problem then what will be the corresponding change in it's Dual LPP?

(4) what is sudden failure and random failure?

(5) If the primal variable is unrestricted in sign, what would be the type of associate dual constraint?

(6) Explain the meaning of group replacement of items

(7) If for the given replacement problem the average maintenance cost increases continuously then what decision is taken for that data?

(8) How replacement theory is useful in real life situations?

(9) How dual simplex method is different from simplex method?

(10) Write formula of total annual cost.

(11) Give the meaning of total elapsed time.

(12) Describe the changes in cost coefficients of the objective function of the primal constraints when it is converted to the dual.