VCD 15-3-4 FYBFM- SEM II- STATS-60- 2HRS-150

Note:-

1. All questions are compulsory & carry equal marks.
2. Use of simple calculator is allowed.
3. Figures to right indicate full marks.

Q.1

A) Differentiate the following:- **8**

i) One tail test & two tail test
ii) Type I error & Type II error
iii) Statistics & Parameter.
iv) Null Hypothesis & Alternative Hypothesis.

B) Explain briefly the Hypothesis testing for equality of two population proportions. **7**

In a random sample of 600 men taken from a big city 400 are found to be Smokers. In another simple random sample 900 men taken from another city 450 are Smokers. Do the data indicate that there is a significant difference in the habit of Smoking in the two cities at 1% level? (From table: Z at 1% l.o.s. is 2.58)

OR

A) Define chi-square statistic. Give properties of chi-square statistic. **8**

An advertising firm is trying to study market research for a new product. They have randomly selected 75 people in each of 5 different age groups & introduced the product to them. The results of the survey are given below.

	Age Group				
Estimated Activity	15-24	25-34	35-44	45-54	55-64
Purchase frequently	12	18	17	22	32
Rarely Purchase	18	25	29	24	30
Never Purchase	45	32	29	29	13

State the null hypothesis appropriately & test it at 0.01 l.o.s.(From table: χ^2tab at 0.01=20.09)

(P10)

B) Explain the χ^2- test as a test of goodness of fit.

Test the hypothesis that the following observations following a Poisson distribution with mean 3. Use α=0.1 as l.o.s.

Number of arrivals per hour	0	1	2	3	4	5 more
Number of hours	20	57	98	85	78	62

Q.2 **8**

A) Explain Basic Assumptions of LPP. & Give Applications areas of LPP.

B) Write General statement of LPP. Solve the following LPP graphically. 7

Min $Z = 2X_1+4X_2$

s.t.

$6X_1+X_2 \geq 18$

$X_1+4X_2 \geq 12$

$2X_1+X_2 \geq 10$

$X_1+X_2 \geq 0$

$X_1 \geq 0, X2 \geq 0$

OR

A) Explain terms with example :- **8**

i) Unbounded Solution

ii) Infeasibility Solution

B) By Using Big-M Method. 7

Max $Z = 4X_1+5X_2-3X_3$

s.t.

$X_1+X_2+X_3 = 10$

$X_1+X_2 \geq 1$

$2X_1+3X_2+X_3 \leq 30$

$X_1, X2, X3 \geq 0$

(P10)

Q.3 8

A) Find the compound interest of the sum of Rs. 50,000 at 12% p.a. when compounded.
i) Half Yearly ii) Quarterly iii) Monthly

For the period of 3 years.

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B) The Simple interest at 10% p.a. on a certain sum of money for 4 yrs. is Rs. 8000. Find the compound interest on the sum at the same rate for the same period.

OR

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A) Sum of Rs. 5000 is deposited @ 15% p.a. Find effective rate of interest if it is compounded twice a year. Also verify the answer using relationship between effective & nominal rate of interest.

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B) Given following Cash flows internal rate of return.

Year	0	1	2	3	4	5	6
Cash flow	(300)	150	100	120	80	50	40

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Q.4

A) Consider the details of project as shown in the table
a) Construct the CPM Network.
b) Determine the Critical Path.
c) Determine Project Completion Time.

Activity	Immediate Predecessors(s)	Duration (months)
A	-	4
B	-	7
C	-	6
D	A	4
E	A	6
F	B	6
G	B	4
H	C	9
I	D	2
J	E,F	6

(P10)

K	E,F	5
L	G,H	4
M	K,L	11
N	I	8

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B) The following information is available with respect to Jindal Ltd & Special Ltd.

Jindal Ltd.		Special Ltd.	
Return (%)	Probability	Return (%)	Probability
250	0.3	150	0.2
200	0.5	130	0.3
100	0.2	60	0.1

OR

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A) Dr. Varma's Portfolio returns are tabulated below.

Year	Security Returns		Standard Deviation
	X	Y	
1	8	12	$\sigma_x = 2.5$
2	14	16	$\sigma_y = 3.0$

Calculate

1) Expected rate of return on his portfolio if it is made up of 60% of X & 40% of Y.
2) Covariance of X & Y.
3) Portfolio Variance.

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B) Mr. X has to pay Rs. 50,000 to Y after 3 yrs. Hence & another Rs. 60,000 at the end of 5 yrs. Hence if he decides to settle the payment in lieu of the above payments if the interest is compounded at 12% p.a.