MALINI KISHOR SANGHVI COLLEGE OF COMMERCE & ECONOMICS		
SUBJECT: MATHEMATICAL & STATISTICAL TECHNIQUES		
CLASS: F.Y.B.COM.	SEM-II	
	SECTION II	50 MARKS

Note: (i) All Questions are compulsory with internal choice.
(ii) Simple Calculator is allowed.
(iii) Graph papers will be provided on request.

Q:2 Solve the following: **(ANY-ONE)** **10 Marks**

[1]

Find $\frac{dy}{dx}$ of the following function:

(i) $y = (1 + 2^x)(4 - 5^x)$

(ii) $y = \frac{x^3 - 2x^2 + 1}{3x^2 + 4}$

[2]

(i) The cost of manufacturing x items of a product is given by $C = 2x^2 + 3x + 10$. Find the total cost, average cost, marginal cost & the marginal average cost of 10 items are manufactured.

(ii) Find the elasticity of demand with respect to price for the function $D = 2000 - 10P - p^2$ when the price is 10 units.

Q:3 Solve the following: **(ANY-ONE)** **10 Marks**

[1]

(i) Find the present value of an immediate annuity of Rs.16, 000 per year for 3 years at 10% p.a.

(ii) Mr. XYZ wants to purchase a smartphone after 4 years which will cost him Rs. 25,000. How much money he should invest in the bank at present so as to receive Rs. 25,000, If the bank is giving a 12% per year rate of compound interest?

[2]

(i) Find the accumulated value after 4 years of an immediate annuity of Rs. 8,000 if the interest rate is 8%. p.a.

(ii) The simple interest at 20% p.a. on a certain sum of money for 4 years is Rs. 25,600. Find the compound interest on the sum at the same rate for the same period?

Q:4 Solve the following: **(ANY-ONE)** **10 Marks**

[1]

What is correlation? Explain various types of correlation. How it is different from the regression?

Compute the correlation coefficient.

X	30	50	40	55	30	25	60	25	50	55
Y	28	25	25	23	30	32	21	35	26	25

[2]

Calculate Spearman`s rank correlation coefficient for the following.

X	: 25	28	32	36	40	39	42	45
Y	: 70	80	85	72	75	59	65	78

The city council of Dadar, Mumbai, has gathered data on the number of minor traffic accidents and the number of youth soccer games that occur in town over a weekend.

Soccer games **(X)**	20	33	10	12	15	25	34
Minor accident **(Y)**	6	9	4	5	7	8	9

Estimate the least square regression equation of the number of minor traffic accidents **(Y)** on the number of youth soccer games**(X)**.

Q:5 Solve the following: **(ANY-ONE)** **10 Marks**

[1]

(i) From the following data calculate the cost of living index number by using Family Budget Method

Commodity	**Weight**	**Price in Rs.**	
		Base year	**Current year**
A	60	15	36
B	5	48	96
C	10	30	90
D	15	60	180
E	10	45	90

(ii)For the following data calculate Laspeyre's and Paasche's Index Number:

Commodity	**Base year**		**Current year**	
	Price	**Quantity**	**Price**	**Quantity**
A	6	50	9	55
B	2	100	3	125
C	4	60	6	65
D	10	30	14	25

[2]

What is Time series? Explain the various components of time series.

Find the 3-yearly moving average for the following data. Plot the original time series and moving average on the same graph paper.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Export	15	20	25	32	40	48	56	64	70	75

Q:6 Solve the following : **(ANY-ONE)** **10 Marks**

[1]

An unbiased cubical dice is thrown 5 times and the number appearing on its uppermost face is noted. Find the probability that the number of times an even appear is (1) 3 times (2) all 5 times.

Further from past data if it is known that the average (Mean) number of flights getting delayed is 4 per day. Find the probability that on a random day, the probability of the number of flights getting delayed is: **Given:** $e^{-4} = 0.0183$

i. Exactly 1
ii. At least 1

[2]

Enumerate the important properties of Normal distribution.

If X follows the normal distribution with a mean 120 and a standard deviation of 40, Find

(i) $P(X \leq 140)$

(ii) $P(X \geq 110)$

Given: Area between z = 0 and z = 0.5 is 0.1916 and

Area between z = 0 and z = 0.25 is 0.0987

----------x----------x----------x----------x----------