Duration:3 hours   FXBCom / Maths   **Marks: 100**

Note:- 1) **All questions are compulsory.**
      2) **Figures to the right Indicate maximum marks.**

Q:1) Solve the following. (Any 4)   **(5+5+5+5= 20)**

a) Mr. Rakesh, Invested Rs. 10000 for 4 years @ 10% p.a.s.i. Find the simple interest and amount on maturity. (C01,A,U)

b) Mr. Kishore, Invested Rs. 200000 for 5 years @ 12% p.a.c.i. find the amount if the interest compounded (i) annually (ii) Quarterly basis. (C01,A)

c) Mr. Sudhir started an annuity investment by investing Rs. 80000 for 5 year @ 12 % p.a.c.i. find the accumulated value of immediate annuity on monthly basis. (C01,A)

d) Ms. Sunny has taken a loan of Rs. 100000 for 4 years @ 12% p.a.c.i. Find EMI (i) RBM or (ii) FIR method.(C01,A)

e) Distinguish between Simple Interest and Compound interest. (C01,)

Q:2) Solve the following. (Any 4)   **(5+5+5+5= 20)**
a) Find dy/dx of $Y = (3x^2 + 5)(7x + 4)$ (C01,2,A)

b) Find dy/dx of $Y = (4x + 9) / (4x + 2)$ (C01,2,A)

c) Find d^2y/dx^2 of $y = 4x^3 + 8x^2 + 5x + 100$ (C01,2,A)

d) If the Cost function is given $C = 6x^2 + 5x + 4$. Find TC, AC, MC if $x = 2$. (C03,A)

e) Find dy/dx of $Y = 4x^3 + 4.\log x + 4x + e^x + \sqrt{x} + \pi$ (C01,A)

Q:3) Solve the following. (Any 4)   **(5+5+5+5= 20)**
a) Find the Karl pearsons coefficient of correlation. (C03,A)

X	8	10	12	9	5
Y	5	6	8	7	4

b) Find Rank correlation from the following data. (C03,A)

X	64	70	72	89	98	77	60	55
Y	51	56	78	87	89	95	49	66

c) Find bxy and byx for the following data also find r. (C03,A)

X	15	11	16	18	20
Y	14	15	17	20	13

d) Find two regression equation, when X bar = 70, Y bar = 50, S.D. of X = 5, SD of Y = 8, r = 0.4, also find x when y is 20, find y when x is 25. (C03,A)

e) What is scattered diagram? (C01,3,R,U)

Q:4) Solve the following. (Any 4)   (5+5+5+5= 20)

a) Calculate 3 yearly moving average for the following data. (C04,A)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sales	65	62	67	66	73	76	80	84	85

b) Fit a trend line using least square method. Also find the profit for year 2018. (C04,A)

Year	2011	2012	2013	2014	2015	2016	2017
Profit	40	45	50	54	60	64	69

c) Find Fishers Index number for the following data. (C04,A)

Commodity	P0	P1	Q0	Q1
A	25	30	8	6
B	30	40	7	5
C	35	40	6	4
D	40	50	5	3

d) Find the cost of living index number of the following. (C04,A)

Commodity	Index no.	Weight
A	112	140
B	118	130
C	120	120
D	123	110

e) Find Seasonal Indices. (C01,4,A)

Year	Q-I	Q-II	Q-III	Q-IV
2019	60	56	54	63
2020	58	69	66	60
2021	65	61	65	54
2022	62	65	61	58

Q:5) Solve the following. (Any 4)   (5+5+5+5= 20)

a) If $p = 0.4$, $q = 0.6$, $n = 5$, Find binomial distribution when $x = 3$. (C02,A)

b) In the Poisson distribution, $m = 4$, $e = 2.71828184$, Find probability when $x = 2$. (C02,3,A,U)

c) A pen manufacturer knows that 3% of his product is defective. If he sells pens in boxes of 100, what is the approximate probability that the box will contain (i) 3 defective pens (ii) less than 2 defective pens. (C02,3,A)

d) It is observed that 60% of students of a class are vegetarians. If 5 students from the class are selected at random, find the probability that (i) 2 are vegetarian (ii) less than 2 vegetarian (C02,3,A)

e) What is normal curve? Show diagram also. (C01,2,4,U,R)