FYBCOM Math 5/4/24

Seat No. _____

DURATION: - 3hrs **22605424** **MARKS:- 100**

Note: - (1) All questions are compulsory.
(2) Figures to the right indicate full marks
(3) Answer to each question must being on a new page

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

a) Mr. Sadan, Invested Rs. 40000 for 4 years @ 12% p.a.s.i. Find the simple interest and amount on maturity. (C01,A,U)

b) Mr. Khandekar, Invested Rs. 250000 for 4 years @ 12% p.a.c.i. find the amount if the interest compounded (i) annually (ii) Quarterly basis. (C01,A)

c) Mr. Deepak started an annuity investment by investing Rs. 20000 for 5 year @ 12 % p.a.c.i. find the accumulated value of immediate annuity on monthly basis. (C01,A)

d) Ms. Kumkum has taken a loan of Rs. 300000 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 $Y = (3x^2 + 9)(6x + 8)$ (C01,2,A)

b) Find dy/dx of $Y = (5x + 4) / (7x + 4)$ (C01,2,A)

c) Find d^2y/dx^2 of $y = 6x^3 + 7x^2 + 4x + 50$ (C01,2,A)

d) If the Cost function is given $C = 8x^2 + 5x + 8$. Find TC, AC, MC if $x = 4$. (CO3,A)

e) Find dy/dx of $Y = 5x^3 + 5.\log x + 8x + e^x + \sqrt{x} + \pi$ (CO1,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	14	16
Y	7	9	12	15	18

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

X	27	54	32	45	68	40	22	65
Y	33	37	48	67	56	30	22	55

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

X	5	6	8	7	4
Y	3	4	6	5	4

d) Find two regression equation, when X bar = 40, Y bar = 90, S.D. of X = 8, SD of Y = 5, r = 0.3, also find x when y is 25, find y when x is 20. (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	34	40	45	58	60	52	54	62	66

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

Year	2018	2019	2020	2021	2022	2023	2024
Profit	24	28	30	36	38	39	40

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

Commodity	P0	P1	Q0	Q1
A	24	25	15	12
B	26	30	12	10
C	30	40	14	12
D	33	40	12	10

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

Commodity	Index no.	Weight

A	111	20
B	113	40
C	114	80
D	119	60

e) Find seasonal indices. (C01,4,A)

Year	Q-I	Q-II	Q-III	Q-IV
2018	40	55	54	55
2019	45	60	58	58
2020	50	55	62	52
2021	55	40	60	45

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

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

b) In the Poisson distribution, m = 5, e = 2.71828184, Find probability when x =3. (C02,3,A,U)

c) A pen manufacturer knows that 5% of his product is defective. If he sells pens in boxes of 100, what is the approximate probability that the box will contain (i) 2 defective pens (ii) less than 3 defective pens.(C02,3,A)

d) It is observed that 60% of students of a class are vegetarians. If 7 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)