PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MCom DEGREE EXAMINATION DECEMBER 2023
(First Semester)

Common to Branches – **COMMERCE & COMMERCE WITH COMPUTER APPLICATIONS**

<u>QUANTITATIVE TECHNIQUES</u>

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following are types of correlation? (a) Positive and Negative (b) Simple, Partial and Multiple (c) Linear and Nonlinear (d) All of the above	K1	CO1
	2	In a Binomial Distribution, if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by _____ (a) np (b) nq (c) npq (d) np(1-p)	K2	CO1
2	3	The degree of freedom for paired t-test based on n pairs of observations is: (a) 2n - 1 (b) n - 2 (c) 2(n - 1) (d) n – 1	K1	CO2
	4	A statement about a population developed for the purpose of testing is called: (a) Hypothesis (b) Hypothesis testing (c) Level of significance (d) Test-statistic	K2	CO2
3	5	A hypothesis that specifies all the values of parameter is called: (a) Simple hypothesis (b) Composite hypothesis (c) Statistical hypothesis (d) None of the above	K1	CO3
	6	As variability due to chance decreases, the value of F will _____ (a) increase (b) stay the same (c) decrease (d) can't tell from the given information	K2	CO3
4	7	In the Kruskal-Wallis test of k samples, the appropriate number of degrees of freedom is (a) K (b) K–1 (c) (n_{c_k}) (d) n–k	K1	CO4
	8	A time series is asset of data recorded (a) Periodically (b) at time or space intervals (c) at successive points of time (d) all of the above	K2	CO4
5	9	In graphical representation the bounded region is known as _____ region. (a) objective (b) optimal (c) feasible solution (d) basic solution	K1	CO5
	10	North – West corner refers to _____. (a) top left corner (b) top right corner (c) both of them (d) none of these	K2	CO5

SECTION - B (35 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks   (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Compare the correlation and regression analyses.	K2	CO1
		(OR)		
	11.b.	Outline the properties of Binomial distribution.		

Module No.	Question No.	Question	K Level	CO
2	12.a.	Construct the general procedure of testing of hypothesis.	K3	CO2
		(OR)		
	12.b.	A sample size 25 yielded mean equal 1 to 33 and an estimated variance equal to 100. At the 1% level would we have reasons to doubt the claim that the population mean is not greater than 27?		
3	13.a.	Explain the Chi-square test for goodness of fit also Write the merits and demerits of chi square test.	K3	CO3
		(OR)		
	13.b.	Explain the one way layout for the ANOVA.		
4	14.a.	Describe the Mann Whitney U test.	K3	CO4
		(OR)		
	14.b.	Explain the ratio to moving method.		
5	15.a.	Explain the classification schemes of models of operations research.	K2	CO5
		(OR)		
	15.b.	Solve the following problem by simplex method. $$\text{Minimize } Z = 2x_1 + 3x_2,$$ $$\text{Subject to } x_1 + x_2 \geq 5,$$ $$x_1 + 2x_2 \geq 6,$$ $$x_1, x_2 \geq 0$$		

SECTION -C (30 Marks)
Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks $(3 \times 10 = 30)$

Module No.	Question No.	Question	K Level	CO
1	16	Calculate the Karl Pearson's correlation coefficient from the following data X: 12, 9, 8, 10, 11, 13, 7 Y: 14, 8, 6, 9, 11, 12, 3	K2	CO1
2	17	Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and drug B indigenous. The decrease in weight after using the drugs for six months was as follows. Drug A: 10, 12, 13, 11, 14, -, - Drug B: 8, 9, 12, 14, 15, 10, 9	K2	CO2
3	18	Based on information on 1,000 randomly selected fields about the tenancy status of the cultivation of these fields and use the fertilizers, collected in agro economic survey, the following classification was noted:	K3	CO3
4	19	Fit a straight line trend for the following series. Estimate the value for 1998.	K3	CO4
5	20	Find the basic feasible solution of the following transportation problem by North-west corner rule. Also find the optimal transportation plan.	K3	CO5

Question 18 table:

	Owned	Rented	Total
Using fertilizers	416	184	600
Not Using fertilizers	64	336	400
Total	480	520	1000

Carryout Chi-square test as per testing procedure (for 5% value of χ^2 for one degree of freedom=3.84)

Question 19 table:

Year	1991	1992	1993	1994	1995	1996	1997
Production	60	72	75	65	80	85	95

Question 20 table:

	1	2	3	4	5	Available
A	4	3	1	2	6	80
B	5	2	3	4	5	60
C	3	5	6	3	2	40
D	2	4	4	5	3	20
Required	60	60	30	40	10	200

Z-Z-Z   END