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PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION DECEMBER 2024
(Second Semester)

Branch – **COMMERCE (BUSINESS ANALYTICS)**

APPLIED BUSINESS STATISTICS - I

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	The sum of the probabilities of all the events of an experiment are a) 0 b) 0.5 c) 1 d) 2	K1	CO1
	2	If A and B are two events, the probability of occurrence of either A or B is given as a) P(A|B) b) P(AUB) c) P(A∩B) d) P(A)P(B)	K2	CO1
2	3	A _____ random variable assumes all the values in the given range a) discrete b) continuous c) both a & b d) neither a nor b	K1	CO2
	4	The distribution whose mean and variance are equal is a) Binomial b) Poisson c) Normal d) Gamma	K2	CO2
3	5	Large sample theory is applicable when: a) $n > 30$ b) $n < 30$ c) $n = 30$ d) $n \leq 30$	K1	CO3
	6	A hypothesis that completely specifies the distribution is _____ hypothesis a) simple b) composite c) null d) alternative	K2	CO3
4	7	Analysis of variance technique is applied for testing the homogeneity of a) proportions b) means c) variances d) standard deviations	K1	CO4
	8	Goodness of test of a distribution is tested by a) t-test b) F-test c) chi square test d) Z-test	K2	CO4
5	9	Distribution-free tests are also known as a) parametric tests b) non parametric tests c) z-tests d) t-tests	K1	CO5
	10	When testing for randomness, we can use a) Mann-Whitney U test b) Sign test c) Runs test d) t-test	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.	Prove the addition theorem on probability.	K2	CO1
		(OR)		
	11.b.	Explain the following terms: Axiomatic approach to probability and conditional probability.		
2	12.a.	Identify the differences between discrete and continuous random variables.	K3	CO2
		(OR)		
	12.b.	The probability that a part time student of a college will graduate is 0.6. Solve and find the probability that out of 6 students (a) none (b) one and (c) atleast one will graduate.		

Cont...

3	13.a.	Differentiate the following pairs of concepts: (i) Null hypothesis and Alternative hypothesis (ii) Type I and Type II errors	K3	CO3
		(OR)		
	13.b.	A sample of 400 male students is found to have a mean height of 171.38 cm. can it be reasonably regarded as a sample from a large population with mean height 171.17cm and standard deviation 3.3 cm.		
4	14.a.	Describe the steps involved in testing the significance of two variances.	K4	CO4
		(OR)		
	14.b.	A sample of 790 units of a manufactured product was classified according to the quality of the product and the production shift is given below: Production shift / Quality: Good / Bad Day Shift: 30 / 160 Night Shift: 140 / 460 Using Chi square test, find whether depends on shift?		
5	15.a.	Describe how to perform sign test for two samples.	K4	CO5
		(OR)		
	15.b.	Analyze the following sequence of time intervals to determine if it can be considered a random sequence of numbers using the run test. 27, 55, 57, 57, 43, 55, 51, 37, 41, 34, 40, 56, 49, 52, 14, 56, 48, 33, 49, 38.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	A company has two plants to manufacture scooters. Plant I manufactures 80% of the scooters and plant II manufactures 20%. At plant I 85% scooters and at plant II 65% of scooters are rated as standard quality. What is the probability that a scooter selected at random (if it is known that the scooter is of standard quality) came from (i) plant I, (ii) plant II?	K4	CO1
2	17	For the following density function $f(x) = Cx^2 (1-x)$, $0 \leq x \leq 1$. Find C, mean and variance.	K4	CO2
3	18	1000 articles from a factory A are examined and found to have 3% defectives. 1500 similar articles from a second factory B are found to have only 2% defectives. Can it reasonably be concluded that the product of the first factory is inferior to the second?	K4	CO3
4	19	Describe the procedure of performing an one way analysis of variance with an example	K4	CO4
5	20	Describe the steps and circumstances in which the Mann-Whitney U test is conducted.	K4	CO5

Z-Z-Z END