Program:	**F.Y.B.Sc DS**	**Semester:**	**II**	**Program Code:**	**UGDS03**
Course:	**Statistical Methods**			**Course Code:**	**NUDS208**

Duration: 1 Hour **Examination Pattern:** NEP Autonomous - External **Max. Marks:** 30

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever necessary.

Examination:

REGULAR

Q. 1		**Attempt any TWO of the following.**	[10]	Course Outcome	Knowledge Level
	(a)	If X is uniformly distributed on [0, 2], find probability density function, f(x).		**CO1**	**L3**
	(b)	For PMF $p(x) = \frac{x}{10}, x = 1,2,3,4$, find $E(X), E(X^2), V(X)$.		**CO2**	**L3**
	(c)	A coin is tossed 5 times. Find the probability of getting i) Exactly 2 heads. ii) More than 3 heads. iii) At most 3 heads.		**CO3**	**L3**
	(d)	X is normally distributed variable with mean 30 and standard deviation 4. Find (i)$P(x < 40)$(ii)$P(x > 21)$(iii)$P(30 < x < 35)$.		**CO3**	**L3**
Q. 2		**Attempt any TWO of the following.**	**[10]**	**Course Outcome**	**Knowledge Level**
	(a)	A sample of 50 files from system is selected. The sample mean size and standard deviation of file is 12.3kb and 0.5kb respectively. Whether there is evidence at the 0.05 level of significance that the populations mean of file is 12.5kb.		**CO4**	**L4**
	(b)	Two independent random samples were selected from two normal populations. For Sample 1, the variance is 16 with a sample size of 10. For Sample 2, the variance is 9 with a sample size of 12. Test, at the 5% level of significance, whether there is a significant difference between the population variances. $\left(F_{1-\frac{\alpha}{2},9,11} = 3.5879, F_{\frac{\alpha}{2},9,11} = 0.2556\right)$		**CO4**	**L4**
	(c)	By using one way ANOVA fill the ANOVA table for the following data: A: 6, 4, 5 B: 2, 5, 5 C: 1, 5, 3 ANOVA Table:		**CO5**	**L4**

6 2 2 3 2 4

		Source of Variation	Sum of Squares	df	Mean Square	F-Ratio			
		Sum of Squares due to Treatment (Between groups)	SSTR = _____	_____	MSTR = _____				
		Sum of Squares due to Error (Within groups)	SSE = _____	_____	MSE = _____	F = _____			
		Total Sum of Squares (overall variation)	SST = _____	_____	MST _____				
	(d)	Following are the marks of some students in Mumbai University and Pune University Mumbai 75 80 95 80 60 55 86 41 75 Pune 80 85 60 70 40 60 70 80 65 Do the median marks differ? Check at 5% level of significance. Use Mann Whitney U test. (Table value $U_{0.05} = 17$)						**CO5**	**L4**
Q. 3		**Attempt any TWO of the following.**					**[10]**	**Course Outcome**	**Knowledge Level**
	(a)	Short on random variable and its type.						**CO1**	**L1**
	(b)	Write properties of expectation.						**CO2**	**L1**
	(c)	What is a one-tailed and two-tailed test?						**CO4**	**L2**
	(d)	Distinguish Between Parametric Test and Non-Parametric Test.						**CO5**	**L4**

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