

*Answer any Five Questions One Question for One UNIT*

*ALL the Question Carry Equal Marks*

*Statistical Tables are to be Provided*

		UNIT-I	Marks	CO	BL																
1.a)	If $A$ and $B$ be events with $P(A) = \frac{1}{3}$ , $P(B) = \frac{1}{4}$ and $P(A \cup B) = \frac{1}{2}$ . Find $P(A B^c)$ , $P(B A)$ and $P(A B)$ .		7M	CO.1	L3																
b)	Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards are drawn one after other with replacement.		7M	CO.1	L4																
<b>OR</b>																					
2.a)	For a discrete probability distribution			CO.1	L5																
	<table border="1" style="margin-left: 20px;"> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>F</td> <td>0</td> <td>2K</td> <td>2K</td> <td>3k</td> <td>K<sup>2</sup></td> <td>2K<sup>2</sup></td> <td>7K<sup>2</sup>+K</td> </tr> </table>	X	0	1	2	3	4	5	6	F	0	2K	2K	3k	K <sup>2</sup>	2K <sup>2</sup>	7K <sup>2</sup> +K		7M		
X	0	1	2	3	4	5	6														
F	0	2K	2K	3k	K <sup>2</sup>	2K <sup>2</sup>	7K <sup>2</sup> +K														
	Find (i) K (ii) mean (iii) Variance																				
b)	Find the mean and S.D. of the normal distribution in which 7% of the items are under 35 and 89% are under 63.		7M	CO.1	L5																
		UNIT-II	Marks	CO	BL																
3.a)	A population consists of five numbers 2, 3, 6, 8 and 11. Consider all possible samples of size 2 that can be drawn with replacement from this population. Find (i) The mean of the population. (ii) The standard deviation of the population. (iii) The mean of the sampling distribution of means (iv) The standard deviation of the sampling distribution of means		7M	CO.2	L4																
b)	Determine a 95% confidence interval for the mean of a normal distribution with variance $\sigma^2 = 0.25$ , using a sample of $n = 100$ values with mean $\bar{x} = 212.3$ .		7M	CO.2	L5																
<b>OR</b>																					
4.a)	The mean of a certain normal population is equal to the standard error of mean of the sample of 64 from that distribution. Find the probability that the mean of the sample size 36 will be negative.		7M	CO.2	L4																
b)	Explain Point estimation and Interval estimation.		7M	CO.2	L2																
		UNIT-III	Marks	CO	BL																
5.a)	From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees.		7M	CO.3	L3																

Employees					
Soft drinks		Clerks	Teachers	Officers	Total
	Pepsi	10	25	65	100
	Thums up	15	30	65	110
	Fanta	50	60	30	140
	Total	75	115	160	350

- b) A random sample of 100 recorded deaths in a country showed an average life span of 71.8 years. Assuming a population standard deviation of 8.9 years, does this seem to indicate that the mean life span today is greater than 70 years? Use a 0.05 level of significance. CO.3 L4  
7M

**OR**

- 6.a) A study of TV viewers was conducted to find the opinion about the mega serial 'Ramayana'. If 56% of a sample of 300 viewers from south and 48% of 200 viewers from north preferred the serial, Test the claim at 0.05 level of significance that there is a difference of opinion between south and north. CO.3 L4  
7M
- b) The mean heights of two large samples of sizes 100 and 200 members are 72 inches and 69.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D. 2.5 inches? CO.3 L4  
7M

**UNIT-IV**

- 7.a) Prove that  $Z_{11}^* = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$  is an abelian group with respect to multiplication modulo 11. Marks CO BL  
7M CO.4 L5
- b) Prove that a non-empty subset  $H$  of a group  $G$  is a subgroup of  $G$  if and only if the following conditions are satisfied CO.4 L5  
7M
- i)  $ab \in H$ , for all  $a, b \in H$  ii)  $a \in H \Rightarrow a^{-1} \in H$ , for all  $a$

**OR**

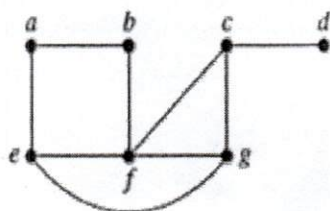
- 8.a) Explain i) The Greatest Common Divisor ii) Euclidean Algorithm with example. 7M CO.4 L2
- b) Show that in a group  $G$ , for all  $a, b \in G$ ,  $(ab)^2 = a^2b^2 \Leftrightarrow G$  is abelian. 7M CO.4 L5

**UNIT-V**

- 9.a) Prove that the number of vertices of odd degree in a graph is always even Marks CO BL  
7M CO.5 L5
- b) Explain Prim's Algorithm to find a minimal spanning with an example 7M CO.5 L2

**OR**

- 10.a) Write the algorithm to Breadth First Search for a Spanning tree of the following graph. CO.5 L3



7M

- b) How to determine adjacency matrix for a graph? Explain the properties of the adjacency matrix. 7M CO.5 L2

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