

**Statistics**

**Note:** Time allowed for Section-B and Section-C is 2 Hours and 40 minutes.

**SECTION-B**

**Q2:** Answer any NINE parts. Each part carries FOUR marks.

- 1) Find the value of: (i)  ${}^{25}P_5$  (ii)  ${}^{19}C_4$
- 2) Differentiate between mutually Exclusive events and not Mutually Exclusive events.
- 3) Find probability distribution for the number of heads when 2 balanced coins are tossed.
- 4) If  $n=5$  and  $p=3/8$  find the complete Binomial probability Distribution.
- 5) Define Binomial Frequency Distribution.
- 6) Write any four properties of Normal Distribution.
- 7) Determine the Z-value in the following statements.  
(i)  $P[Z > z] = 0.005$  (ii)  $P[Z > z] = 0.1075$
- 8) Differentiate between sampling with and without replacement techniques.
- 9) Distinguish between point and interval estimates.
- 10) What is the difference between Type-I and Type-II error.
- 11) Discuss the association between two attributes say A and B, when  $(A) = 245$ ,  $(AB) = 147$ ,  $(\alpha) = 285$ ,  $(\alpha\beta) = 190$ .
- 12) Write a short note on analysis of variance.

**SECTION-C**

**Note:** Attempt any THREE questions. All questions carries equal marks.

**Q3:** Let 'X' be a continuous random variable with Pdf given by,

$$f(x) = \begin{cases} \frac{x}{2} & 0 \leq x \leq 2 \\ 0 & \text{o.w} \end{cases}$$

Find the Mean, Variance, and Standard Deviation.

**Q4:** The Peshawar Municipal corporation installs 10,000 electric lamps in the streets of Peshawar, Average life of these lamps is 1850 hours with a Standard Deviation of 200 hours. How many lamps may be expected to burn for more than 2000 hours?

**Q5:** Draw all possible samples of size 2 with replacement from a population consisting of units 1,2,5,6 and find the proportion of even numbers in the samples. Construct the sampling distribution of sample proportion  $\hat{p}$  and check that  $E(\hat{p}) = P$  i.e.  $\hat{p}$  is an unbiased estimator of P.

**Q6:** Past records show that the average sum of score of students in statistics is 57 with standard deviation 10. A new method of teaching is employed and a range random sample of 70 students is selected. The sample average is 60. Can we conclude on the basis of these results, at 5% level of significance, that the average score has increased?