



**Unique Science Academy, 60 – D Nawab Town, Lahore**

### **Statistics 12 Monthly Test**

(Chapter 10 – Normal Distribution – Subjective Type)

14 September 2024

Allowed Time: 50 minutes

Total Marks: 30

#### **(Section 1)**

**Question Number 1.** Assuming that the number of marks scored by a candidate is normally distributed, find the mean and the standard deviation, if the number of first class students (60% or more marks) is 25, the number of failed students (less than 30% marks) is 90 and the total number of candidates appearing for the examination is 450. **(10)**

**Question Number 2.** The mean inside diameter of a sample of 250 washers produced by a machine is 5.05 *mm* (millimeters) and the standard deviation is 0.05 *mm* (millimeters). The purpose for which these washers are intended allows a maximum tolerance in the diameter of 4.95 *mm* to 5.10 *mm*, otherwise the washers are considered defective. Determine the percentage of defective washers produced by the machine assuming the diameters are normally distributed. **(10)**

**(Section 2)**

**Question Number 3.** Let  $X \sim N(100, 225)$ . Find the following probabilities

(Areas Under Normal Curve). **(10)**

(i)  $P(X \leq 92.5)$

(ii)  $P(X \leq 107.5)$

(iii)  $P(X \geq 124)$

(iv)  $P(112 \leq X \leq 128.5)$

(v)  $P(91 \leq X \leq 127)$

(vi)  $P(X \geq 76)$