

## *ASSIGNMENT-2*

*(STAT-101)*

### Section-I

1. True
2. False
3. True
4. True
5. False

### Section-II

1. The time it take a randomly selected student to complete an exam
2. 0.39
3. 52.5
4. The sample size will decrease
5.  $68.8 < \mu < 72.2$

### Section-III

1. a)  $P(x)$  is a probability distribution if
  1. There is numerical random variable  $x$  and its value are associated with corresponding probability.
  2.  $\Sigma P(X) = 0.6 + 0.33 + 0.07 = 1$
  3.  $0 \leq X \leq 1$ , for every individual value of the random variable  $X$All three conditions are satisfied.

b)

| $X$   | $P(X)$ | $X \cdot P(X)$ | $X^2 \cdot P(X)$ |
|-------|--------|----------------|------------------|
| 0     | 0.6    | 0              | 0                |
| 1     | 0.33   | 0.33           | 0.33             |
| 2     | 0.07   | 0.14           | 0.28             |
| Total |        | 0.47           | 0.61             |

The mean  $= \mu = \Sigma[x \cdot P(x)] = 0.47$

The variance  $= \sigma^2 = \Sigma[x^2 \cdot P(x)] - \mu^2 = 0.61 - (0.47)^2 = 0.3891$

The Standard deviation  $= \sigma = 0.624$

2. Here  $n = 5, x = 4, p = 0.3$  and  $q = 0.7$

$$P(x) = \frac{n!}{(n-x)!x!} \cdot p^x \cdot q^{n-x}$$

$$P(x = 4) = \frac{5!}{(5-4)!4!} \cdot (0.3)^4 \cdot (0.7)^{5-4} = 0.0284$$

mean  $\mu = np = 5 \times 0.3 = 1.5$

Variance  $\sigma^2 = npq = 5 \times 0.3 \times 0.7 = 1.05$

Standard deviation  $\sigma = \sqrt{npq} = 1.024$

3. By reading the Z-table

a)  $P(z < 2.37) = 0.9931$

b)  $P(z > 1.82) = 1 - P(z < 1.82) = 0.0344$

c)  $P(-1.18 < z < 2.1) = P(z < 2.1) - P(z < -1.18) = 0.9821 - 0.1190 = 0.8631$