

## **Q1- Using the table of Standard Normal Distribution to find the area**

### **a) Between $z = 0$ and $z = 1.62$**

a) Between  $z = 0$  and  $z = 1.62$ : Step 1: Look up the z-score of 0 in the table. This is 0.5000. Step 2: Look up the z-score of 1.62 in the table. This is 0.9545. Step 3: Subtract the area of 0 from the area of 1.62 to get the area between them. This is 0.4545.

### **b) Between $z = -1.32$ and $z = 1.56$**

Between  $z = -1.32$  and  $z = 1.56$ : Step 1: Look up the z-score of -1.32 in the table. This is 0.0977. Step 2: Look up the z-score of 1.56 in the table. This is 0.9402. Step 3: Subtract the area of -1.32 from the area of 1.56 to get the area between them. This is 0.8425.

### **c) To the right of $z = 2.12$**

c) To the right of  $z = 2.12$ : Step 1: Look up the z-score of 2.12 in the table. This is 0.9843. Step 2: Subtract the area of 0 from the area of 2.12 to get the area to the right of it. This is 0.9843.

### **d) To the right of $z = -0.27$**

d) To the right of  $z = -0.27$ : Step 1: Look up the z-score of -0.27 in the table. This is 0.7641. Step 2: Subtract the area of 0 from the area of -0.27 to get the area to the right of it. This is 0.7641

### **e) To the left of $z = 0.65$**

e) To the left of  $z = 0.65$ : Step 1: Look up the z-score of 0 in the table. This is 0.5000 Step 2: Look up the z-score of 0.65 in the table. This is 0.7479

### **f) To the left of $z = -0.32$**

f) To the left of  $z = -0.32$ : Step 1: Look up the z-score of -0.32 in the table .This is 0.7299 Step 2 : Look up the z-score of 0 in the table . This is 0.67

## **Q2:The marks of the students distributed as normal distribution with mean ( $\mu = 48$ ) and standard deviation ( $\sigma = 12$ ) find the probability of the student obtained**

### **a) Less than 75**

### **b). More than 60**

### **c). Between 30 and 80**

**Answer:**

a)  $P(X < 75) = P(Z < (75-48)/12) = P(Z < 2.5) = 0.9938$

b)  $P(X > 60) = P(Z > (60-48)/12) = P(Z > 1) = 0.8413$

c)  $P(30 < X < 80) = P(-1 < Z < (80-48)/12) = P(-1 < Z < 4) = 0.9893$

**Q3: The following table represents the relation between the variables  $X$  and  $Y$**

X	0	1	2	3	4	5	6	7
Y	4	6	6	8	10	14	15	18

**a) Fill the table and find correlation coefficient ( $r$ )**

x	Y	XY	$X^2$	$Y^2$
0	4	0	0	16
1	6	6	1	36
2	6	12	4	36
3	8	24	9	64
4	10	40	16	100
5	14	70	25	196
6	15	90	36	225
7	18	126	49	324

**Answer a:**

$$r = (n\sum xy - \sum x \sum y) / \sqrt{[(n\sum x^2 - (\sum x)^2)(n\sum y^2 - (\sum y)^2)]}$$

$$r = (8 \cdot 368 - 28 \cdot 81) / \sqrt{[(8 \cdot 140 - (28)^2)(8 \cdot 997 - (81)^2)]}$$

$$r = (820) / \sqrt{[(336)(1415)]}$$

$$r = 820 / \sqrt{475440}$$

$$r = 82 / 689.52 = 0.119$$

**b) Find the equation of the regression line.  $Y = mX + b$**

$$y = b + mx$$

$$m = (n\sum xy - \sum y \sum x) / (n\sum x^2 - (\sum x)^2)$$

$$m = 820 / 336 = 2.4$$

$$b = \sum y / n - m (\sum x / n)$$

$$b = 81 / 8 - 2.4(28 / 8)$$

$$b = 10.12 - 8.4$$

$$b = 1.72$$

$$y = b + mx$$

$$y = 1.72 + 2.4x$$

**c) Estimate the value of  $y$  when  $X = 10$**

$$y = 1.72 + 2.4(10) = 25.72$$