Q1] find first 4 Raw moments for the following data

x	-1	0	1	2	3	4.
f	2	4	3	7	3	1

Q2] for the following ungrouped data find Karl pearson's ~~of~~ coefficient of skewness.

12, 18, 25, 15, 16, 10, 18, 8, 15, 27, 14.

Q3] The avg income of 100 men in a city is ₹15,000 with S.D ₹8500 and the avg income of 100 women is ₹12,000 and S.D. ₹9000 ~~and~~ can it be said at 5% level of confidence that there is a significant difference between the avg income of men & women.

Q4] A manufacturer claims that 10% of his products is ~~def dif~~ defective ~~A~~ sample of 300 is selected at random ~~at~~ has 32 defective. product. Test his claim at 1% level of significance.

SOLUTION

Q3]

men	women
$n = 100$	$n = 100$
$S.D = 8500$	$SD = 9000$
$\bar{x}_1 = 15000$	$\bar{x}_2 = 12000$

$$SE = \sqrt{\frac{(\sigma_1)^2 + (\sigma)^2}{n_1 + n_2}} = \sqrt{\frac{(8500)^2}{100} + \frac{(9000)^2}{100}}$$

$$= \cancel{875.35} \quad \boxed{875.36} \quad = $$

Page No.
Date

Q.1

x	f	fx	fx^2	fx^3	fx^4
-1	2	-2	2	-2	2
0	4	0	0	0	0
1	3	3	3	3	3
2	7	14	28	56	112
3	3	9	27	81	243
4	1	4	16	64	256
	$N=20$	28	76	202	616

$$\mu'_r = \frac{\Sigma f(x_i)^r}{N}$$

$$\mu_1 = \frac{\Sigma fx}{N} = \frac{28}{20} = 1.4$$

$$\mu_2 = \frac{76}{20} = 3.8$$

$$\mu_3 = \frac{202}{20} = 10.1$$

$$\mu_4 = \frac{616}{20} = 30.8$$

Q.2. Mean:

$\Sigma x = 12+18+25+15+16+10+8+15+27+14$
$= 160$

$$\bar{x} = \frac{\Sigma x}{n} = \frac{160}{10} = \boxed{16}$$

Mode : 15 repeated 2 times.

$\boxed{\therefore \text{ Mode} = 15}$

For Standard Deviation (σ).

$$\Sigma x^2 = (12)^2 + (18)^2 + (25)^2 + (15)^2 + (16)^2 + (10)^2 + (8)^2 + (15)^2 + (27)^2 + (14)^2$$

$$= 144 + 324 + 625 + 225 + 256 + 100 + 64 + 225 + 729 + 196$$

$$= \boxed{2888}$$

$$\sigma = \sqrt{\frac{\Sigma x^2}{n} - (\bar{x})^2}$$

$$= \sqrt{\frac{2888}{10} - (16)^2} = \sqrt{\frac{2888}{10} - 256}$$

$$= \sqrt{32.8}$$

$$\boxed{\sigma = 5.727}$$

Karl Pearson's Coefficient of Skewness

$$Sk = \frac{\text{Mean} - \text{Mode}}{\sigma}$$

$$= \frac{16 - 15}{5.727} = \frac{1}{5.727}$$

$$= 0.1746$$

$$0.1746 > 0$$

$$\boxed{\therefore Sk = 0.1746}$$

Q.3. Mean

~~x~~ $n = 100$

$x = 15000$

$SD = 8500$

$$S.E = \sqrt{\frac{\sigma_1^2}{n} + \frac{\sigma_2^2}{n}}$$

$$= \sqrt{\frac{(8500)^2}{100} + \frac{(9000)^2}{100}}$$

$$= 1237.94$$

$$|z| = \left| \frac{x_1 - x_2}{S.E.} \right|$$

$$= \frac{15000 - 12000}{1237.94}$$

$$= 2.42 > 1.96$$

Ho is Rejected.

$$= 4.2071$$

$$|z| = \left| \frac{x_1 - x_2}{S.E} \right|$$

$$= \frac{120 - 90}{4.2071}$$

$$= 7.130$$

Q7. A manufacturer claims that 10% of hi[s] is defective. A sample of 300 items select[ed at] random had 32 defective items. Test his [claim] at 1% level of significance (At 1% significance the value of 2.58)

$$\Rightarrow H_0 = \pi = 10\% = \frac{10}{100} = 0.1$$

$$H_1 = \pi \neq 10\% = 0.1$$

$$n = 300, \quad p = \frac{32}{300} = 0.1067$$

$$q = 1 - 0.1067 = 0.8933$$

$$z_\alpha = 1\% = 2.58$$

$$SE = \sqrt{\frac{pq}{n}}$$

$$= \sqrt{\frac{0.1067 \times 0.8933}{300}}$$

$$= 0.0178$$

$$z_{cal} = \frac{n-p}{S.E}$$

$$= \frac{\cancel{\text{B...}}\ 0.1 - 0.1067}{0.0178}$$

$$= \cancel{\text{4}}\ 0.3764 < 2.58$$

Ho is appected.

Q. An old machine produced 10
batch of 300. After the servi