AMIT KUMAR SINGH 211/MC01

① From given interval and distribution frequency

Interval	O_i	E_i	$O_i - E_i$	$(O_i - E_i)^2$	$(O_i - E_i)^2 / E_i$
0.0 - 0.1	112	100	12	144	1.44
0.1 - 0.2	101	100	1	1	0.01
0.2 - 0.3	94	100	-6	36	0.36
0.3 - 0.4	99	100	-1	1	0.01
0.4 - 0.5	108	100	8	64	0.64
0.5 - 0.6	93	100	-7	49	0.49
0.6 - 0.7	94	100	-6	36	0.36
0.7 - 0.8	100	100	0	0	0
0.8 - 0.9	104	100	4	16	0.16
0.9 - 1.0	95	100	-5	25	0.25

Calculated $\omega = 3.72$

Critical value $\chi^2_{0.05,9} = 16.919$

Calculated $\omega <$ critical value

Since, the calculated value is less than critical value, Null hypothesis is accepted.

(2)

Hours	0	1	2	3	4	5	6	7
Freq of Arrivals	22	53	58	39	20	5	2	1

Calculate λ

$$\lambda = \frac{(0\times22) + (1\times53) + (2\times58) + (3\times39) + (4\times20) + (5\times5) + (6\times2) + (7\times1)}{200}$$

$$= 2.05$$

$$P(X=x) = \frac{e^{-2.05} \times (2.05)^x}{x!} \qquad x = 0,1,..7$$

	0	1	2	3	4	5	6	7
P_i	0.128	.263	0.270	0.184	0.094	0.038	0.013	0.003
C_i	25.6	52.6	54	36.8	18.8	7.6	2.6	0.6

For 5, 6, 7 $\quad C_i = 11.2 \quad (< 5)$

$$\omega = \sum_{i=0}^{5} \frac{(O_i - E_i)^2}{E_i}$$

$$= \frac{(22-25.6)^2}{25.6} + \frac{(53-52.6)^2}{52.6} + \frac{(58-54)^2}{54} + \frac{(39-36.8)^2}{36.8}$$

$$+ \frac{(20-18.8)^2}{18.8} + \frac{(8-11.2)^2}{11.2}$$

$$\omega = 1.926$$

Critical $\chi^2_{6-1-1} = \chi^2_4$

$$\chi^2_{4,0.05} = 9.48$$

Computed ω is 1.926 which is less than 9.48

∴ So we will accept the null hypothesis.