

## BA Mock Quiz - 1

Q1)  $D(p) = 1500 - 20^*P$  (given)

$$E = \frac{m \times p}{D_0 - m p} \Rightarrow \frac{20 \times 50}{1500 - 20 \times 50}$$

$$= \frac{1000}{1500 - 1000}$$

$$= \frac{1000}{500}$$

$$\boxed{\text{Elasticity} = 2}$$

Q2) satiating Price,  $P_s = \frac{D_0}{m}$

$$= \frac{1500}{20}$$

$$\boxed{P_s = 75}$$

Q5)

# defects	O <sub>f</sub>	E <sub>f</sub>	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
0	18	30	144	4.8
1	12	18	36	2
2	22	20	4	0.2
3	16	20	16	0.8
4+	32	12	400	33.33
				$\Sigma = 41.13$

$$\boxed{\chi^2 = 41.13}$$

here calculate observed & Expected freq.

for 0 defects =  $100 - (12 + 22 + 16 + 32)$

Similarly,  $E_0 = (100 - 38 + \dots) = 18$

Q8)

	Brand A OA	$E_A$	Brand B OB	$E_B$	Total
chennai	288	303	124	109	412
Mumbai	622	607	204	219	826
Total	910		328		1238

$E_A \rightarrow$  expected frequency of A,  $E_B \rightarrow$  for B.

Expected freq. of chennai people preferring brand B

$$= \frac{\text{Row total for chennai} \times \text{Col. total for brand B}}{\text{Total}}$$

$$= \frac{412 \times 328}{1238}$$

$$= 109$$

Q9)

observed freq.	$E$	$(O-E)^2$	$(O-E)^2/E$
288	303	225	0.742
622	607	225	0.370
124	109	225	2.064
204	219	225	1.027
			$\Sigma = 4.203$

$$\chi^2_{\text{computed}} = 4.203$$



Q11.7  $P(A) = 0.65$  → output from machine A

$P(B) = 0.3$  " " " B

$P(C) = 0.05$  " " " C

$P(D)$  → Prob. of defective product.

$P(D|A) = 0.01$

$P(D|B) = 0.02$

$P(D|C) = 0.1$

} given, find  $P(B|D) = ?$

$$P(D) = P(D|A) \times P(A) + P(D|B) \times P(B) + P(D|C) \times P(C)$$

$$= 0.01 \times 0.65 + 0.02 \times 0.3 + 0.1 \times 0.05$$

$$= 0.0175$$

$$P(B|D) = \frac{P(D|B) \times P(B)}{P(D)}$$

$$= \frac{0.02 \times 0.3}{0.0175}$$

$$\boxed{P(B|D) = 0.34} \quad \text{Ans}$$

Q14)

Dates as Bins	Product A	Product B	Total $O_f$	Expected = $(\bar{x} - O_f)^2 / \bar{x}$
1	62	60	122	0.013
2	42	82	124	0.003
3	32	97	129	0.263
4	14	113	127	0.111
5	26	98	124	0.003
6	16	95	111	1.227
7	16	99	115	0.558
8	42	88	130	0.364
9	26	107	133	0.763
10	14	104	118	0.227
	290	943		$\chi^2 = 3.53$

Expected total sales on a given day

$$\bar{X}_A = \frac{290}{10} = 29$$

$$\bar{X}_B = \frac{943}{10} = 94.3$$

$$= \bar{X}_A + \bar{X}_B$$

$$= 29 + 94.3$$

$$\bar{X} = 123.3$$

Q15)  $\chi^2 = 3.532$

Q17)  $df = k - p - 1$

here  $k = \text{no. of bins} = 10$

$p \rightarrow \text{parameter} \Rightarrow 2$  (Normal dist<sup>n</sup>)

$$\therefore df = 10 - 2 - 1$$

$$df = 7 \quad \text{Ans.}$$

Q18)

	A	EA	B	EB	Total
AN	145	138.53	444	450.46	589
AN	145	151.46	499	492.53	644
Total	290		943		1233

O	E	$(O-E)^2/E$
145	138.53	0.302
145	151.46	0.275
444	450.46	0.092
499	492.53	0.084
		$= 0.75$

$$\chi^2_{\text{computed}} = 0.75$$



Q19)  $df = (r-1)(c-1)$   
 $= (2-1)(2-1)$

$df = 1$

Q20)  $P(A) = 0.65$   
 $P(B) = 0.35$

$P(G|A) = 0.7$  (Prob. graduated given from A)

$P(G|B) = 0.8$

$P(A \cap G) = P(G|A) \times P(A)$   
 $= 0.65 \times 0.7$   
 $= 0.455$

Q21)  $P(B \cap G) = P(G|B) \times P(B)$   
 $= 0.8 \times 0.35$   
 $= 0.28$

Q22) find Prob. of rejection from A & B resp.

$P(R|A) = 1 - P(G|A)$   
 $= 1 - 0.70$   
 $= 0.30$

$$\begin{aligned}
 P(R|B) &= 1 - P(G|B) \\
 &= 1 - 0.80 \\
 &= 0.20
 \end{aligned}$$

Since Rejection Prob. at centre A > Centre B.

So, choose centre B.

Q26)

	A	E <sub>A</sub>	B	E <sub>B</sub>	Total
Chennai	288	305	220	203	508
Mumbai	353	336	204	221	557
Total	641		424		1065

Constructing freq. Table

O	E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
288	305	289	0.947
353	336	289	0.860
220	203	289	1.423
204	221	289	1.307
			$\Sigma = 4.537$

Ans 26) = 336

Ans 27)  $\chi^2 = 4.7$



Q327

Demand (no. of units)	Price (₹)
1.0	10
0.50	20
0.33	30
0.25	40
0.20	50

Sol7 we know constant elasticity curve is given by  $D_p = C P^{-\epsilon}$

$C \rightarrow$  constant

$P \rightarrow$  price

$D_p \rightarrow$  demand

$\epsilon \rightarrow$  elasticity

take any 2 vals from table & substitute in the eq.

we get,

$$1.0 = C \times 10^{-\epsilon} \quad - (1)$$

$$0.50 = C \times 20^{-\epsilon} \quad - (2)$$

dividing (1) & (2), we get

$$2 = \frac{10^{-\epsilon}}{20^{-\epsilon}} \Rightarrow 2 = \left(\frac{1}{2}\right)^{\epsilon}$$

taking log on both sides,

$$\ln(2) = \epsilon \ln\left(\frac{1}{2}\right)$$

$$\boxed{\epsilon = -1}$$

$\rightarrow$  substitute  $\epsilon$  value to find  $C$ .

$$1.0 = C (10)^{-1}$$

$$\boxed{C = 10}$$

Thus demand at price = ₹1

$$D_p = 10 \times (1)^{-1}$$

$$\boxed{D_p = 10}$$

Q33) Elasticity = |E|

$$p = 1$$

$$\boxed{3 - 0.5 = 2.5}$$

$$\textcircled{1} - 3 - 0.1 \times 5 = 0.1$$

$$\textcircled{2} - 3 - 0.5 \times 5 = 0.5$$

① & ② are not

$$\frac{10 \times 0.1}{3 - 0.5} = 2$$

$$\ln(X) \text{ at } 5 = \ln(5)$$

$$\boxed{1 - 1 = 0}$$

$$1 - 0 = 1$$

$$\boxed{1 - 1 = 0}$$