1.

i) 4, 7, 9, 9, 11, 15, 18, 18, 18, 25

$N = 10$

$\text{Mean}(\bar{X}) = \frac{\text{Sum of all observations}}{\text{total no of observations}} = \frac{\Sigma X}{N}$

$= \frac{134}{10} = 13.4$

$\boxed{\bar{X} = 13.4}$

$\text{Median} = \frac{\text{Size of } (N/2)^{th} \text{ item} + \text{Size of } (\frac{N}{2}+1)^{th} \text{ item}}{2}$

$= \frac{\text{Size of } 5^{th} \text{ item} + \text{Size of } 6^{th} \text{ item}}{2}$

$= \frac{11+15}{2} = \boxed{13}$

Mode = 18 (By Inspection)

Inter Quartile Range $= Q_3 - Q_1$

$Q_1 = \text{Size of } \left(\frac{N+1}{4}\right)^{th} \text{ item} = \text{Size of } 2.75^{th} \text{ item}$

2021

When someone can't understand your SILENCE... They can't understand your WORDS

Q_1 = Size of 2nd item + ~~Size of~~ 0.75 (3rd term − 2nd term)

$Q_1 = 7 + 0.75(2)$

$Q_1 = 8.5$

Q_3 = Size of $3\left(\frac{N+1}{4}\right)^{th}$ term

= Size of 8.25^{th} term

= 8th term + 0.25th (8th term − 8th term)

= 18 + 0.25(0)

$\Rightarrow 18$

Inter Quartile Range

$= Q_3 - Q_1 = 18 - 8.5$ ~~$= 9.5$~~

$= \boxed{9.5}$

X	4	7	9	9	11	15	18	18	18	25
$(X-\bar{X})^2$	-9.4	-6.4	-4.4	-4.4	-2.4	1.6	4.6	4.6	4.6	11.6
$(X-\bar{X})^2$	88.36	40.96	19.36	19.36	5.76	2.56	21.16	21.16	21.16	134.56

$\sqrt{\frac{\Sigma(X-\bar{X})^2}{N}} = S.D. = \sqrt{\frac{374.4}{10}} \Rightarrow \boxed{6.11882341 6 = \sigma}$

JULY AUGUST

2021

Silence is the best way to react while angry. Matovu joseph

ii)

No. of households (X)	cf	No of people (f)	fX
0	5	5	0
1	16	11	11
2	42	26	52
3	57	15	45
4	60	3	12
		60	120

Mean $(\bar{X}) = \frac{\Sigma fX}{\Sigma f} = \frac{120}{60}$ = 2

Median = Size of $\left(\frac{N+1}{2}\right)$ th item

= Size of 30.5 th item

= 2

Mode = 2 (By Inspection method)

Inter Quartile Range = $Q_3 - Q_1$

Q_1 = Size of $\left(\frac{N+1}{4}\right)^{th}$ term = 15.25 th item

$Q_1 = 1$

Core

27 SUNDAY

2021

18 19 20 21 22 23 24
25 26 27 28 29 30 31

Q_3 = Size of $3\left(\frac{N+1}{4}\right)^{th}$ term = 45.75 th

$Q_3 = 3$

Inter Quartile Range = $Q_3 - Q_1 = 3 - 1 = \boxed{2}$

X	F	$x(X-\bar{X})$	x^2	fx^2
0	5	-2	4	20
1	11	-1	1	11
2	96	0	0	0
3	15	1	1	15
4	3	2	4	12
	60			58

$\bar{X} = 2$

$$\sigma = \sqrt{\frac{\Sigma f x^2}{N}} = \sqrt{\frac{58}{60}} = \boxed{0.9832}$$

JULY
AUGUST

2021

Silence is one of the great arts of conversation. – Marcus Tullius Cicero

(2) $\lambda = 0.5$ (per year) rate

i) $x = 0$

$P(x=0) \Rightarrow 0.60653$] using table

ii) Year I: $1 \leq \underbrace{x}_{\text{no. of claim}}$ Year II: $x=0$ Year III: $x=0$

(168-197) WK 25

17 JUNE • THURSDAY

MAY 2021

S	M	T	W	T	F	S
30	31					1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

JULY 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Q3. $X \sim \text{Gamma}(2, 1/2)$

$\alpha = 2, \quad \lambda = \frac{1}{2}$ $\qquad 0 < x < \infty$

i) mean $(\bar{X})$ or $E(X)$, $SD = \sqrt{V(X)}$

$E(X) = \frac{\alpha}{\lambda} = \frac{2}{1/2} = \boxed{4}$

$V(X) = \frac{\alpha}{\lambda^2} = \frac{2}{(1/2)^2} = \frac{2}{1/4} = \boxed{8}$

S.D. $= \sqrt{V(X)} = \sqrt{8} = 2\sqrt{2} = 2.8284$

iii) $F_X(x) = ?$] cumulative distribution function

$P(X > 0) = P(2\lambda X > 2\lambda . 0)$] $2\lambda X \sim \chi^2_{2\alpha}$

$= P(X > 0)$

$= P(\chi^2_4 > 0)$

$= 1 - P(\chi^2_4 < 0)$

value not in table

2021

Silence and reserve will give anyone a reputation for wisdom. – Myrtle Reed

ii)

True silence is the

Q3. $X \sim \text{Gamma}(2, 1/2)$

$\alpha = 2, \quad \lambda = \frac{1}{2} \qquad 0 < x < \infty$

i) Mean $(\bar{X})$ or $E(X)$, $SD = \sqrt{V(X)}$

$$E(X) = \frac{\alpha}{\lambda} = \frac{2}{1/2} = \boxed{4}$$

$$V(X) = \frac{\alpha}{\lambda^2} = \frac{2}{(1/2)^2} = \frac{2}{1/4} = \boxed{8}$$

$$S.D. = \sqrt{V(X)} = \sqrt{8} = 2\sqrt{2} = 2.8284$$

iii) $F_x(x) = ?$] cumulative distribution function

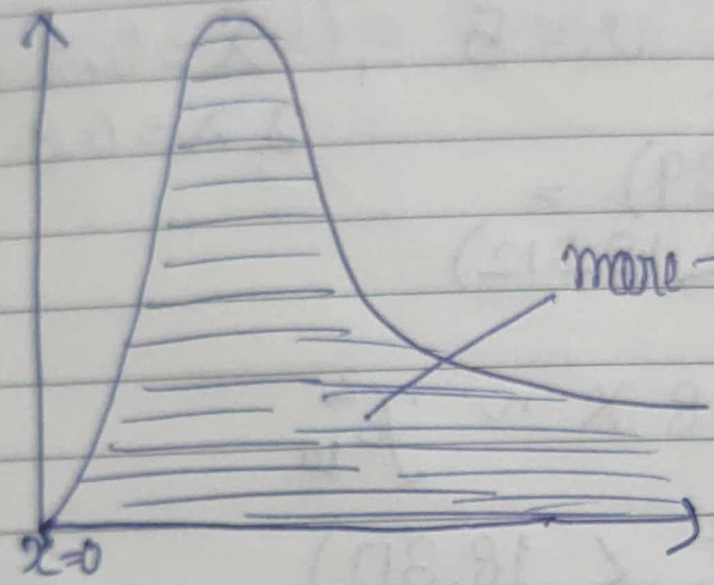
$$P(X > 0) = P(2\lambda X > 2\lambda . 0) \quad] \; 2\lambda X \sim \chi^2_{2\alpha}$$
$$= P(X > 0)$$
$$= P(\chi^2_4 > 0)$$
$$= 1 - \underbrace{P(\chi^2_4 < 0)}_{\text{value not in table}}$$

2021

Silence and reserve will give anyone a reputation for wisdom. – Myrtle Reed

$P(\chi^2_4 < 0)$

ii)



more than probability
$\Rightarrow F_X(X)$

2021

25 26 27 28 29 30 31

4. 10 Male / 6 Fully Qual

8 Female / 7 Fully Qual.

P(A∩B) → ___

+ +
7/18 x 6/17

P(A) = two workers selected are females, qualified

$P(A) = \frac{42}{306} = 0.137255$ P(A∩B) = P(A)

B = team contains at least one female

F F or M F

$(8/18 \times 7/17) + (\frac{10}{18} \times \frac{8}{18}) = P(B)$

$P(B) = \frac{56}{306} + \frac{80}{324} = 0.42992$

$P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{0.137255}{0.42992} =$ **0.31925**

2021

"If you're presenting yourself with confidence, you can pull off pretty much anything." Katy Perry

JULY AUGUST

01 JULY • THURSDAY

5. Levels — 40% Level 1 — late 20%.
50% Level 2 — late 40%.
10% Level 3 — late 10%.

P[late package was sent via Level 2 service]

$$= \frac{50}{100} \times \frac{40}{100} = \frac{2000}{10000} = \frac{1}{5} \Rightarrow \boxed{0.2}$$

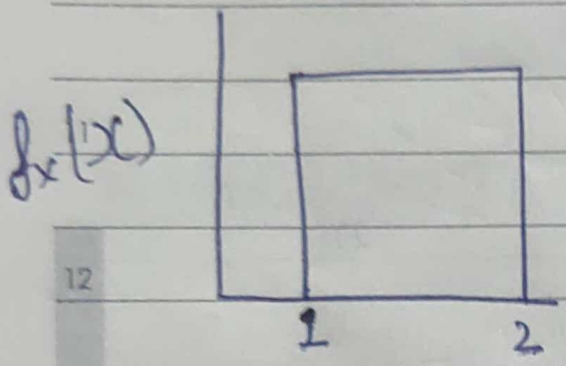
$$\frac{\left(\frac{40}{100}\times\frac{20}{100}\right)+\left(\frac{50}{100}\times\frac{40}{100}\right)+\left(\frac{10}{100}\times\frac{10}{100}\right)}{} = \frac{800+2000+100}{10000} = \frac{2900}{10000} = \boxed{0.29}$$

$$\Rightarrow \boxed{0.689655} \text{ Ans.}$$

2021

6. $X \sim U(1,2)$ $\quad Y = \frac{3}{6-X}$

$a=1,\ b=2$



29 30 31

7. | X | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| $P(X=x)$ | 0.05 | 0.15 | 0.35 | 0.4 | 0.05 |

i) $F(3) = F(x \leq 3) = P(1)+P(2)+P(3)$

$= 0.05 + 0.15 + 0.35$

$\Rightarrow \boxed{0.55}$

ii) $E(X) = \sum X \cdot P(X=x)$

$= \sum (1 \times 0.05) + (2 \times 0.15) + (3 \times 0.35) + (4 \times 0.4) + (5 \times 0.05)$

$= 0.05 + 0.3 + 1.05 + 1.6 + 0.25$

$\boxed{E(X) \Rightarrow 3.25}$

iii) $V(X) = E(X^2) - [E(X)]^2$

$E(X^2) = \sum X^2 \cdot P(X=x)$

$= \sum (1^2 \times 0.05) + (2^2 \times 0.15) + (3^2 \times 0.35) + (4^2 \times 0.4) + (5^2 \times 0.05)$

$= 0.05 + 0.6 + 3.15 + 6.4 + 1.25$

$= 11.45$

$V(X) = E(X^2) - [E(X)]^2 = 11.45 - (3.25)^2$

$\boxed{V(X) = 0.8875}$

SUNDAY 04

AUGUST

2021

Pride is holding your head up when everyone around you has theirs bowed. Courage is what makes you do it.

iv) Coefficient of skewness

$$= E(X_i - \bar{X})^3$$

$$= E(X^3) - [E(\bar{X})]^3$$

$$E(X^3) = \Sigma x^3 . P(X = x)$$

$$= \Sigma (1^3 \times 0.05) + (2^3 \times 0.15) + (3^3 \times 0.35) + (4^3 \times 0.4) + (5^3 \times 0.05)$$

$$= \Sigma 0.05 + 1.2 + 9.45 + 25.6 + 6.25$$

$$= 42.55$$

$$[E(X)]^3 = (3.25)^3 = 34.328125$$

$$E(X^3) - [E(X)]^3 = 42.55 - 34.328125$$

$$\Rightarrow \boxed{8.221875}$$

The deepest feeling always shows itself in silence. – Marianne Moore

12. $\lambda = 10$ (per day)

P(time b/w 2 trains < 0.1 days)

$P(x < 0.1)$

~~P(x=0)~~ $P(x=0) = 0.00005$

$P(x=1) = 0.00050$

$x \geq 1 = 0.00045$ T P

$P(x < 0.1) = 1 - 0.00045$

$\Rightarrow 0.999955$

AUGUST

13. $X \sim U(75, 120)$] uniform distribution

$a = 75, b = 120$] Given

$P(80 < x < 100)$ → To Find

$$P(80 < x < 100) = \int_{80}^{100} f_x(x)\, dx$$

$$f_x(x) = \frac{1}{b-a} = \frac{1}{45} = 0.02222$$

$$P(80 < x < 100) = \int_{80}^{100} 0.02222\, dx$$

$$= [0.02222x]_{80}^{100}$$

$$\geq 0.4444$$

14. $X \sim \text{Gamma}(5, 0.4)$

$P(X < 22.89)$

Given → $\alpha = 5$, $\lambda = 0.4$

$2\lambda = 0.8$

$= P(X < 22.89) =$

$= P(0.8X < 18.312)$

$0.8X \sim \chi^2_{10}$

$= P(\chi^2_{10} < 18.312)$

Here, $\nu = 10$, $x = 18.312$

$P(\chi^2_{10} < 18) = 0.9450$

$P(\chi^2_{10} < 18.5) = 0.9529$

20 SUNDAY

0.5 $x \uparrow$ = 0.0079 ↑ (Prob.)

1 $x \uparrow$ = 0.0158 ↑

0.312 $x \uparrow$ = 0.0049296 ↑

2021

Quiet and silence is a form of power. Thoughtful and wise people are not talkati

$$P(\chi^2_{10} < 18.312) = P(\chi^2_{10} < 18) + 0.0049296$$

$$P(\chi^2_{10} < 18.312) = 0.9499296$$