

قسم الرياضيات

(20 درجة)

السؤال الأول:

$$P(C|A) = \frac{1}{3} \Rightarrow \frac{P(C \cap A)}{P(A)} = \frac{1}{3} \quad (2)$$

$$\Rightarrow P(C \cap A) = \frac{1}{3} \times \frac{3}{4} = \frac{1}{4} \quad (2)$$

$$P(A|C) = \frac{P(A \cap C)}{P(C)} \quad (2)$$

$$P(C|\bar{A}) = \frac{1}{4} \Rightarrow \frac{P(C \cap \bar{A})}{P(\bar{A})} = \frac{1}{4} \quad (2)$$

$$\Rightarrow \frac{P(C) - P(C \cap A)}{1 - P(A)} = \frac{1}{4} \quad (2)$$

$$\Rightarrow P(C) - \frac{1}{4} = \frac{1}{4} \times \left(1 - \frac{3}{4}\right) \quad (2)$$

$$P(C) = \frac{1}{4} + \frac{1}{16} = \frac{5}{16} \quad (2)$$

$$\Rightarrow P(A|C) = \frac{\frac{1}{4}}{\frac{5}{16}} = \frac{16}{4 \times 5} = \frac{4}{5} \quad (2)$$

$$P(A) \cdot P(C) = \frac{1}{4} \times \frac{5}{16} = \frac{5}{64} \neq \frac{1}{4} = P(A \cap C) \quad (2)$$

انما A و C غير متعلقين.

← 1 →

السؤال الثاني :
نرتب البيانات تصاعدياً :

3 - 4 - 5 - 6 - 7 - 7 - 8 - 9
10 - 10 - 11 - 16

$$\bar{x} = \frac{\sum x_i}{n} = \frac{96}{12} = 8 \quad (5)$$

$$\bar{x} = \frac{7+8}{2} = 7.5 \quad (5)$$

$$x^0 = 7.10 \quad (5)$$

$$R = \text{أقصى} - \text{أدنى} = 16 - 3 = 13 \quad (5)$$

x_i	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
3	5	25
4	4	16
5	3	9
6	2	4
7	1	1
7	1	1
8	0	0
9	1	1
10	2	4
10	2	4
11	3	9
16	8	64
مجموع	32	138

$$\text{الانحراف المتوسط} = \frac{\sum |x_i - \bar{x}|}{n} \quad (5)$$

$$= \frac{32}{12} = 2.66$$

$$\text{الانحراف المعياري} = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}} \quad (5)$$

$$\sqrt{\frac{138}{12}} = \sqrt{11.5} = 3.39$$

← 2 →

سوال الثالث:

25) عدد عشوائي

لغز أ ب

X : متحول عشوائي يمثل عدد الملاحظات عندئذ

$$X \sim B(5, \frac{1}{3})$$

$$P(X < 3) = P(X=0) + P(X=1) + P(X=2)$$

$$= {}^5C_0 \left(\frac{1}{3}\right)^0 \left(\frac{2}{3}\right)^{5-0} + {}^5C_1 \left(\frac{1}{3}\right)^1 \left(\frac{2}{3}\right)^{5-1} + {}^5C_2 \left(\frac{1}{3}\right)^2 \left(\frac{2}{3}\right)^{5-2} = \frac{192}{243} \approx 0.79$$

عدد عشوائي

25)

السؤال الرابع:

$$\sum_k p_k = 1 \Rightarrow 0.30 + 0.10 + 0.2 + \beta = 1$$

$$\Rightarrow \boxed{\beta = 0.40}$$

← 3 →

$$E(X) = 0 \Rightarrow \sum_k x_k p_k = 1$$

$$\Rightarrow (-2)(0,30) + (-1)(0,10) + (0)(0,20) + x(0,40) = 0$$

$$\Rightarrow \boxed{x = \frac{7}{4}} \quad (5)$$

X	-2	-1	0	$\frac{7}{4}$
p	0,30	0,10	0,20	0,40

$$\sigma^2 = E(X^2) - \underbrace{(E(X))^2}_{=0} \quad (10)$$

$$= 4(0,30) + (1)(0,10) + \frac{49}{16}(0,40)$$

$$= 2,52$$

$$\sigma = \sqrt{2,52} = 1,58 \quad (5)$$

← 4 →