18MAT41 - Mod 3

Super Imp

(1) African Macquee

(6) - afair

Q1. A random variable X has the following probability function for various values of x:

X = (x_i)	-2	-1	0	1	2	3
P(x)	0.1	k	0.2	2k	0.3	k

Find value of i) k ii) $P(x<1)$ iii) $P(x \geq -1)$

— (7)

Q2. The probability density function of a random variable X(=x) is

$$f(x) = \begin{cases} kx^2, & 0<x<3 \\ 0, & \text{otherwise} \end{cases}$$

Find (i) the value of k.

(ii) $P(1<x<2)$

and (iii) $P(x \leq 1)$

— (10)

Q3. The probability that a pen manufactured by a company be defective is $\frac{1}{10}$. If 12 such pens are manufactured, what is the probability that

i) Exactly 2 are defective

ii) Atleast 2 are defective

iii) none of them are defective.

— (13)

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Video soln

Topic Binomial distribution

Q4. In a certain factory manufacturing the razor blades, there is a small chance of 0.002 for a blade to be defective. The blades are supplied in packets of 10. Use poisson distribution to calculate the approximate no. of packets containing i) no defective
ii) one defective
iii) two defective blades,
in a consignment of 10,000 packets. — (17) Model QP

Q5. In a certain city, the duration of the shower is exponentially distributed with mean 5 minutes.
What is the probability that a shower will last for.
(i) 10 mins or more (ii) less than 10 mins (iii) between 10 to 12 mins
— (21) : Model QP

Q6. The marks of 1000 students in an examination follow a normal distribution with mean 70 and standard deviation 5. Find the number of the students whose marks will be (i) less than 65 (ii) more than 75 (iii) between 65 & 75.
Model QP
— (25)