OP3AGX

Syzbsc 5 march 2016
stats practical

Time: 1 Hrs.30 Mins. Marks: 40

N.B. (i) All questions are compulsory.

(ii) Attempt ANY TWO-sub questions out of THREE in each question.

(ii) Figures to the right indicate marks.

Q.1. (a) In a continuous distribution, the density function is **5**

$f(x) = k \times (2-x) \quad 0 \le x \le 2$

$= 0 \quad$ otherwise

Find k, mean and variance of the distribution.

(b) X is a continuous random variable with p.d.f. **5**

$f(x) = \frac{k}{x2} \quad x \ge 100$

$= 0 \quad x < 100$

Find k and the prob.$(x < 150)$

(c) Find the cumulative distribution function F(x) for the random variable X with p.d.f. as **5**

$f(x) = x \quad 0 < x < 1$

$= 2 - x \quad 1 \le x \le 2$

$= 0 \quad$ otherwise

Draw a sketch of f(x) and F(x).

Q.2. (a) The distribution of number of words written per day by a certain writer over a period of one year showed Rectangular distribution over (1000, 2000). Find the chance that on a randomly chosen day of the year he wrote **5**
(i) at least 1200 words (ii) anywhere from 1250 to 1750 words.

(b) A study of divorced men showed that the interval of time (in years,x) between the day of their marriage and the day of their divorce has the following p.d.f. **5**

$f(x) = 0.2\, e^{-0.2x} \quad x > 0$

$= 0 \quad$ otherwise

Find the probability that one Mr.X who got divorced during the last year spent (i) at most one year
(ii) at least 5 years of marital life before the divorce.

(c) If the marks in a particular subject are assumed to follow normal distribution with mean 40 and variance 9, find how many out of 1000 students get marks : **5**
(i) below 35 (ii) between 43 and 46.

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Q.3. (a) 20% of apples in a large consignment are found to be bad. Find the probability that at least 25% apples are bad in a sample of size 400 drawn from it. **5**

(b) An urn contains 8 marbles of which an unknown number m are white. To test the hypothesis $H_0 : m = 4$ against $H_1 : m = 5$, following procedure is used. Draw two marbles from the urn without replacement and reject $H_0$ if both are white. Find the probability of the two types of error. **5**

(c) The mean life time of a sample of 100 fluorescent light bulbs produced by a company is found to be 1570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean lifetime of bulbs produced by the company is 1600 hours against the alternative hypothesis that it is less than 1600 hours at 5% level of significance. **5**

Q.4. (a) For a continuous random variable , p.d.f. is **5**

$$f(x) = k\,x \qquad 0 < x < 2$$

$$= 0 \qquad \text{otherwise}$$

Find k , mean and standard deviation of X.

(b) On an average 9 accidents are recorded in Mumbai every week. Find the chance that at the end of a certain week 12 to 15 accidents are recorded. Use Normal approximation to Poisson distribution. **5**

(c) An advertising firm claims that 20% of all TV viewers watch a specific TV programme. In a random sample of 1000 viewers only 184 were found to be watching this TV programme. Test at 5% level whether this is sufficient evidence to dismiss the advertiser's claim. **5**

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