جمهورية العراق

وزارة التعليم العالي والبحث العلمي

جامعة البصرة

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ملاحظة : الأسئلة صفحتان وتكون الإجابة عن خمسة أسئلة فقط

Q1) a) Team (W) has probability ($\frac{2}{3}$) of winning whenever it plays , if (W) plays (4) games , find the Probability mass function that (W) wins :

1. Exactly (2) games ?

2. At least one game ?

3. Mean and Variance of X ? (5 degree)

Q1) b) Let Xi =1,2,3,…, 10 be independent random variable , each uniformly distribution over (0 , 1) calculate an approximation to ($\sum_{i=1}^{10} X_i > 6$) by using central limit theorem , Hint / $p_r(Z < 1.0955) = 0.84$? (5 degree)

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Q2) a) The average number of claims filed against an insurance company is (2) claims per day , what is the probability that on any given day , exactly one claim are filed against an insurance company ? (5 degree)

Q2) b) A box contains (20) radio tubes of which (12) are defectives , select a random sample of (10) items and let X be the number of defectives in the sample , find the probability mass function of X ? (5 degree)

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Q3) a) let the percentage of betters who make money of the race on a given day has beta distribution with parameters (a=1) and (b=5) , find the probability that fewer than ten percent comment winners on given day ? (5 degree)

b) In a sequence of independent rolls of a fair die , we find that the first four is observed on the twice trial , find the probability function of the twice trial ?(5 degree)

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Q4) a) If X is uniformly distributed over (0, 10) , Find the probability that :

1. $p_r(X > 6)$, 2. $F(X)$? (5 degree)

يتبع لطفاً ←

Q4) b) If X has probability density function is given by :

$$f(x) = \begin{cases} (\frac{1}{4})\, X \ \exp^{\frac{-X}{2}} & , 0 < x < \infty \\ 0 & , \quad O.W \end{cases}$$

find the :

1. distribution of X ?

2. Mean and Variance of X ? **(5 degree)**

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Q5) a) let X is normally distributed with mean («) and variance ($\pm^2$) find :

$p_r(\mu-\sigma < X < \mu+\sigma)$. Hint / $p_r(Z<1)=0.841$ **?** **(5 degree)**

Q5) b) Let x_1 , x_2 , x_3 ,..... , x_n be a random sample of size n drawn from a population with a finite mean («) , let ($\overline{X}_n$) be the simple mean of the random sample , then for any ($\in > 0$)

Prove that :

$p_r\left(\left|\overline{X}_n - \mu\right| > \in\right) \ \rightarrow \ 0$ as $n \rightarrow \infty$ **?** **(5 degree)**

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Q6) IF the function of X is given by :

$$f(x) = \begin{cases} x\, e^{-x} & , 0 < x < \infty \\ 0 & , O.W \end{cases}$$

Find :

1 . the moment generating function of X ?

2 . the mean and variance of X by using the moment generating function method ?

(10 degree)

مع دعائي لكم بالنجاح .

مدرس المادة

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