# Image result for srm logo downloadSRM Institute of Science and Technology- Ramapuram campus

Department of Mathematics

18MAB204T- Probability and Queuing Theory

Year/Sem: II/IV Branch: CSE, IT

**Unit I - PROBABILITY AND RANDOM VARIABLES**

**PART-B**

1. A lot consists of 10 good articles, 4 with minor defects and 2 with major defective. Two articles are chosen from the lot at random (without replaced). Find the probability that both are good.
2. 3/8 (b) 7/8 (c) 5/8 (d) 1/8

Answer: a

Solution:

P (both are good)=

2.

2

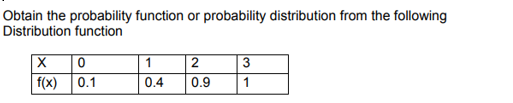
1. 46 (b) 64 (c) 66 (d) 66.5

Answer: c

Solution:

We knoe that

3.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 |
| P(x) | 0.1 | 0.3 | 0.5 | 0.1 |

(a)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 |
| P(x) | 0.1 | 0.4 | 0.5 | 0.1 |

(b)

(c)

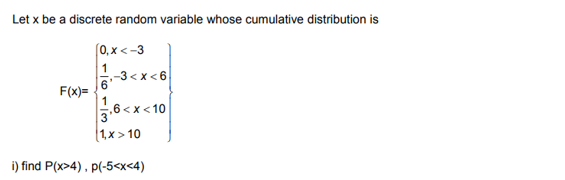
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 |
| P(x) | 0.1 | 0.3 | 0.9 | 0.1 |

(d)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 |
| P(x) | 0.1 | 0.3 | 0.5 | 1 |

Answer: a

4.



Answer : b

Solution:

5.



1. 33 (b) 44 (c) 66 (d) 36

Answer: d

We know that

6. The first four moments of a distribution about A = 4 are 1, 4 , 10 , and 45 respectively.

Find the value of .

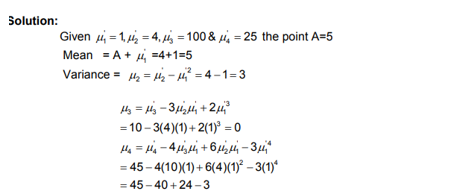
(a)

(b)

(c)

(d)

Answer: a



7.



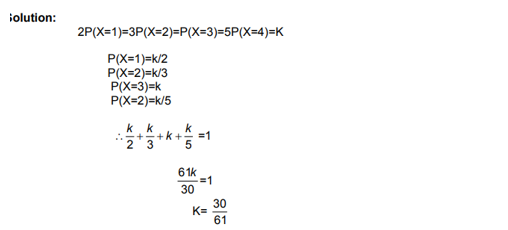
(a)

(b)

(c)

(d)

Answer: d

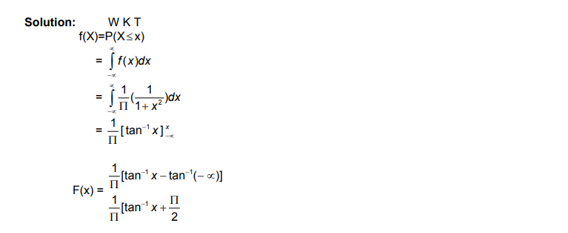


|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 |
| P(X) | 15/61 | 10/61 | 30/61 | 5/61 |

8.



Answer: a



9. A random variable X has and and unknown probability distribution.

Find .

(a)(b) (c) (d)

Answer: a

Solution:

Lower bound for the probability by using Tcebycheffs inequality

taking

Putting =6

10.



(a)

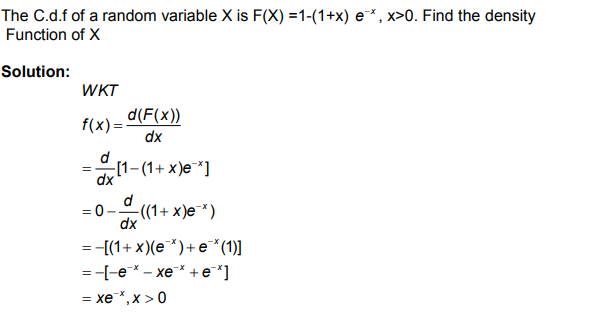
(b)

(c)

(d)

Answer: d

11.



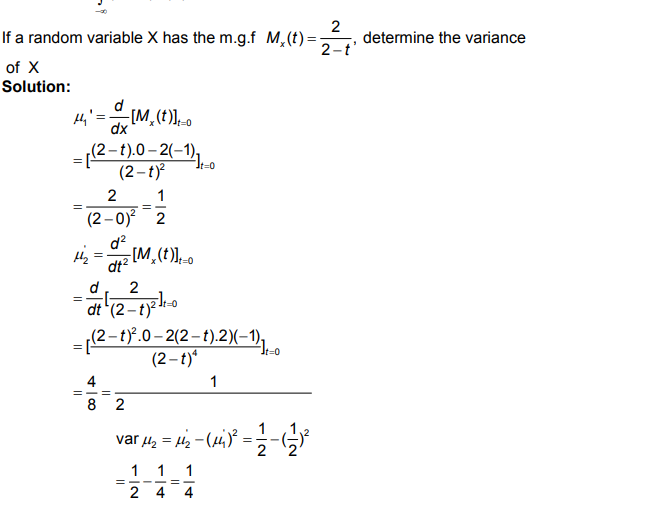
12. There are 20 boys and 15 girls in a class of 35 students. A students is chosen at random find the probability that the chosen students is a (i) boy (ii) girl

Solution

Probability of choosing a boy is

Probability of choosing a girl is

**13.**



**14.** A continuous random variable X has the distribution function  Determine k

and the pdf.

**Solution:**



**15.**The diameter of an electric cable X is a continuous R.V with PDF

.Find the (i) value of ‘ k ‘

**Solution**



**16.** Find the m.g.f and the r th moment for the distribution whose p.d.fis f(x) = k e-x, 0 < x <∞. Find also the standard deviation.

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**17** Let X be a random variable with p.m.fFind the m.g.f of X.



18. (i) Find the moment generating function of the continuous probability distribution whose density is also find first four raw and central moments.

Solution :

**(i)** Given f(x) = we know that = 2 =

=

= -------- (1)

-------- (2) comparing (1) & (2) we get the first four raw moments , ,& and the first four central moments , = ,

19.A discrete random variable X has M.g.f = find E(X) , Var (X) and P(X=2)

The given m.g.fis of the form which is the m.g.f of the Binomial distribution whose p.m.f is P(X=x)= , mean E(X) = np and Variance = npq

Here q = , p = and n = 5

=> P(X=2)=

Mean , Var(X) =

20. Find the cdf for the following pdf f(x) = 

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