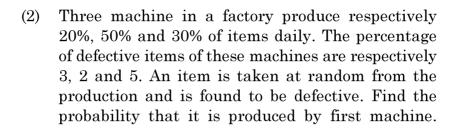


(d) Write any **one**: (1) How many

is red.

(1) How many three digit numbers can be formed from the digits 0, 1, 2, 3, 4, 5, 6. If each digit can be used once only? How many of these are odd numbers? How many are greater than 330?

5



2 Give the answer of following question: 4

- $\beta_2 < 3; \gamma_2 < 0$  then curve is known as \_\_\_\_\_.
- (2)The probability density function f(x) cannot exceed
- (3)The third moment about mean measures
- (4) If  $V(2x \pm 2)$  then equal to\_\_\_\_\_.
- (b) Write any one:

2

- If X and Y are two independent continuous random variables then prove that E(XY) = E(X)E(Y) provided all the expectations
- (2)10,000 tickets each of Re. 1 are sold in a lottery. There is only one ticket in the lottery bearing a prize of Rs. 8000. A person is having one ticket of the lottery. Find his expectation.
- (c) Write any one:

3

If  $X_1, X_2, X_3, \dots, X_n$  be n random variables then

$$V\left(\sum_{i=1}^{n} a_i X_i\right) = \sum_{i=1}^{n} a_i^2 V\left(X_i\right) = 2\sum_{i=1}^{n} \sum_{\substack{j=1\\i < j}}^{n} a_i a_j Cov\left(X_i, X_j\right)$$

- Obtain relation between rth central moment and rth (2)raw moment. Also obtain relation between first four central moment and raw moment.
- (d) Write any one:

5

- First, second and third raw moments are a, b and c respectively which obtain from point t, then prove that (i)  $\bar{x} = a + t$  (ii)  $\mu_2 = b - a^2$ 
  - (iii)  $\mu_3 = c 3ab + 2a^3$ .
- Obtain relation between cumulants and moments. (2)Also show that  $\mu_4 = k_4 + 3k_2^2$ .

3	(a)	Give the answer of following question: (1) If Binomial distribution function is	4
		$p(x) = {16 \choose x} \left(\frac{1}{4}\right)^x \left(\frac{3}{4}\right)^{16-x} $ then variance are	
		(2) If $x_1 \sim B(p, n_1)$ and $x_2 \sim B(p, n_2)$ two independent	
		Binomial variates then $x_1 + x_1 \sim$	
		(3) The central moment generating function (c.m.g.f.) of Binomial distribution is	
		(4) If $p < \frac{1}{2}$ then Binomial distribution is	
	(b)	Write any one:	2
	()	(1) Obtain mean and variance of Bernoulli distribution.	
		(2) For a Binomial variate $n = 10$ and	
		P(x = 5) = 2 P(x = 4) find value of p.	
	(c)	Write any one:	3
		(1) Obtain moment generating function of Binomial	
		distribution and find its mean and variance.  (2) Obtain cumulants generating function of Binomial	
		distribution and find $k_1$ , $k_2$ and $k_3$ .	
	(d)	Write any <b>one</b> :	5
	` /	(1) For Binomial distribution prove that	
		$\mu_{(r+1)} = pq \left[ nr\mu_{(r-1)} + \frac{d\mu_r}{dp} \right]$	
		(2) For Binomial distribution prove that $k_{(r+1)} = pq \frac{dk_r}{dp}$ .	
4	(a)	Give the answer of following question:	4
•	(α)	(1) In Poisson distribution mean variance.	•
		(2) The central moment generating function (c.m.g.f.) of Poisson distribution	
		4	
		(3) If Poisson distribution $p(x) = \frac{e^{-4} 4^x}{x!}; x = 0, 1, 2,$	
		then standard deviation is	
		(4) For Poisson distribution, if $p(2) = p(3)$ , then its probability function will be $p(x)$	
	(b)	Write any one:	2
		(1) Between the hours of 2 and 4 p.m. the average number of phone calls per minute coming into the switch board of a company is 2.5. Find the probabilities that during one particular minute	

there will be exactly 3 calls.

and standard deviation. Write any one: 3 (c) Without using moment generating function obtain mean and variance of Poisson distribution. Obtain moment generating function and central (2)generating function of Poisson distribution. (d) Write any one: 5 For Poisson distribution prove that  $\mu_{(r+1)} = rm \,\mu_{(r-1)} + m \frac{d\mu_r}{dm}$ (2)Prove that Poisson distribution is limiting case of the Binomial distribution. 5 Give the answer of following question: (a) 4 The mode of Normal distribution is 60 with S.D. 10, and then its median is \_ Negative Binomial distribution NB(r, p) reduces to Geometric distribution when Under shifting of time origin in Geometric distribution, the p.d.f. remains the same. This property is known as \_ The probability of a success changes from trial to (4) trial in 2 (b) Write any one: Obtain moment generating function of Negative Binomial distribution. (2)The probability that a person can hit a target is 0.6. Find the probability that he will hit the target first time at the fifth trial. (c) Write any one: 3 Obtain moment generating function of Geometric distribution and find its mean and variance. (2)The probability that a person can hit a target is 0.6. He is to be given a prize when he hits the target for the 4th time. Find the probability that he will require more than 8 trials to obtain the prize. (d) Write any one: 5 In a normal distribution 31% of the observations are less than 45 and 8% are more than 64. Find mean and standard deviation of the distribution. (2)Show that Hyper Geometric distribution is approximation to Binomial distribution.

For a Poisson variate 3P(x=2) = P(x=4). Find mean

(2)