

Library.

30/4/2015

SYBA Stats II
Pract.

OP10A FA

- Q.3. (a) A uniform die is rolled four times. Find the chance that it will show 5
(i) no six
(ii) at least one six
(iii) all sixes.
- (b) A variate X follows Poisson distribution with variance 3. What is the 5
probability that
 $X = 0$ (ii) $x > 1$? Given that $e^{-1.5} = 0.223$, $e^{-3} = 0.05$.
- (c) A die is thrown with six numbers on its faces as 1,2, 3, 4, 5 and 6. Let X 5
denotes the number on the uppermost face of the die. Find the probability
distribution of X . Also find $E(X)$ and $V(X)$.
- Q.4. (a) An unbiased coin is tossed thrice and it showed up more heads than tails. 5
Find the probability that-
(i) there are all heads
(ii) exactly two heads
(iii) the first two tosses give heads.
- (b) If X and Y are two stochastically independent random variables with $E(X) =$ 5
 5 , $V(X) = 2$, $E(Y) = 12$ and $V(Y) = 3$, Find --
i) $E(X+Y)$
ii) $E(2X + 3Y)$
iii) $E(XY)$
iv) $V(2X+3Y)$.
- (c) For a Binomial variate if mean = 3 and $15 p(x = 0) = 2 p(x = 1)$. 5
Find $p(x = 5)$.

0.10	0.05	0.10	0.10
0.30	0.30	0.15	0.10
0.20	0.05	0.10	0.10
0.10	0.05	0.10	0.10

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) Tickets numbered from 1 to 100 are well shuffled and a ticket is drawn from it. What is the probability that the selected ticket has: 5

- (i) an odd number
- (ii) number 9 or multiple of 9
- (iii) a number which is a perfect square?

(b) Preet has three plain shirts, four checked shirts and two striped shirts. On a certain day he chooses two of them at random – one for his office dress and the other for evening party dress. Find the probability that – 5

- (i) both are plain
- (ii) one plain and one checked
- (iii) None is plain.

(c) 60% of persons staying in a building read 'Express', 50% read 'Times' while 30% of them read both. Find the probability that a randomly chosen person staying in the building reads at least one of the two. 5

Q.2. (a) Find k for the following so that p(x) can be regarded as a probability distribution function: 5

$$\begin{array}{l}
 x \quad : \quad -1 \qquad \qquad 0 \qquad \qquad \qquad 1 \\
 p(x) : \quad (k+2)/10 \quad (3k+1)/10 \quad (5-2k)/10
 \end{array}$$

(b) The probability mass function of a random variable X is 5

$$\begin{array}{ll}
 P(x) = 1/2 & \text{when } x=2 \\
 = 3/10 & \text{when } x=5 \\
 = 1/5 & \text{when } x=6 \\
 = 0 & \text{otherwise}
 \end{array}$$

Find (i) p(2) (ii) p(x is even) (iii) p(x is multiple of 3)
Also find its cumulative probability distribution function.

(c) Following is joint probability mass function of X and Y. 5

x\y	1	2	3
5	---	0.05	0,10
10	0.15	0.20	0.20
15	0,10	0,05	0.05
20	---	---	0.10

- Obtain- i) Marginal probability distributions of X and Y.
 ii) Conditional probability distribution of Y when $X \geq 3$.
 iii) Conditional probability distribution of X when $Y \leq 2$.