

SOLVE ANY FIVE

(15)

1. If  $V = R^3$  is a vector space of ordered triples of real numbers with usual operations addition and scalar multiplication, determine whether the subset  $W = \{(x, y, z) \text{ either } x = y \text{ or } y = z\}$  is a subspace of  $V$  or not.

2. Six dice are thrown 729 times. By using binomial distribution find how many times do you expect at least three dice to show a five or six? 233

3. Find the distribution function for random variable  $x$  whose density function is

$$f(x) = \begin{cases} x/2 & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

$$\begin{cases} 0 & x < 0 \\ x/2 & 0 \leq x \leq 2 \\ 1 & x > 2 \end{cases}$$

4. A random variable  $x$  has density function  $f(x) = \frac{c}{x^2 + 1}$ ,  $-\infty < x < \infty$ .

Find  $\frac{1}{\pi}$  i) constant  $c$ ,  $\frac{1}{2} + \frac{1}{\pi} \tan^{-1} x$  ii) distribution function and  $\frac{1}{3} + \frac{1}{\pi} \tan^{-1} x$  iii)  $P(1/3 \leq x^2 \leq 1)$  0.0316

5. Six dice are thrown 6400 times using Poisson distribution, determine the approximate probability of getting heads  $x$  times?

6. Define vector space with all axioms.