

DISCRETE MATHS (Q 6 & 7, PAPER 2)

1997

- 6 (a) How many different four digit numbers greater than 5000 can be formed from the digits 2, 4, 5, 8, 9 if each digit can be used only once in any given number?
How many of these numbers are odd?

- (b) Solve the difference equation

$$u_{n+2} - 4u_{n+1} + u_n = 0, n \geq 0$$

where $u_0 = 4$ and $u_1 = 8$.

- (c) The following data give the age and gender of twenty five pupils in a class on a given day:

	Boys	Girls
Number of pupils aged sixteen years	5	7
Number of pupils aged seventeen years	7	6

- (i) One of the pupils is picked at random. What is the probability that a boy aged sixteen years or a girl aged seventeen years is picked?
- (ii) Each pupil in the class is given his/her examination results. Only three pupils scored full marks. Determine the probability that these three pupils are of the same age and the same gender.

- 7 (a) In how many ways can a group of four people be selected from three men and four women?

In how many of these groups are there more women than men?

- (b) Two persons look at the letters in the word DISCOVERY.

Independently of one another, each person writes down two of the letters from the word DISCOVERY.

What is the probability that

- (i) one person writes down two vowels and the other person two consonants?
(ii) the two persons write down different letters, that is, they have no letters in common?

- (c) The data in the set $\{1, 2, 5, x, y\}$ have a mean of 5.

Express, in terms of x ,

- (i) y
(ii) σ , the standard deviation of the data.

If the standard deviation is $\sqrt{\frac{99}{100}}$, find the value of x and the value of y .

ANSWERS

6 (a) 72, 24

6 (b) $u_n = 2(2 + \sqrt{3})^n + 2(2 - \sqrt{3})^n$

6 (c) (i) $\frac{11}{25}$ (ii) $\frac{1}{23}$

7 (a) 35, 13

7 (b) (i) $\frac{5}{72}$ (ii) $\frac{7}{12}$

7 (c) (i) $y = 17 - x$ (ii) $\sigma = \sqrt{\frac{2x^2 - 34x + 194}{5}}$, $x = y = \frac{17}{2}$