Q.17 Find the Standard Deviation for the following data:

4,7,8,9,10,12,13,17

Q.18 If A and B are events such that

p(A) = 1/4, p(B) = 1/2 and P(A and B) = 1/8.

Determine the following :

i) p (not A and not B) and

ii) P (A or B).

## SECTION-C

**Note:** Long answer questions. Attempt any one questions out of two questions. (1x10=10)

Q.19 Use the principle of mathematical induction to prove that

$1^3+2^3+3^3+ .... + n^3 = \left(\frac{n\,(n+1)}{2}\right)^2$ for all natural members n, i.e. $n \in N$.

Q.20 Find the coordinates of the focus, axis of the parabola, the equation of the directrix and the length of the latus rectum of the parabola $x^2 = -16y$.



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**1st Sem / DVOC**

**Subject : Applied Mathematics - I**

Time : 2 Hrs. M.M. : 50

## SECTION-A

**Note:** Very short questions. Attempt all ten questions. (10x2=20)

Q.1 The roster form of the set { x :x is a whole number an $-1 < x < 3$} is

a) $\{-1, 0, 1, 2, 3, 4\}$ b) $\{1, 2, 3\}$

c) $\{0, 1, 2, 3\}$ d) None of these

Q.2 The set of all first elements of the ordered pairs in a relation R from a set A to a set B is called the domain of the relation R.

Select the right option for the above statement.

a) The above statement is TRUE

b) The above statement is FALSE

c) None of these

Q.3 What is the Geometric mean of 4 and 16?

a) 8 b) 16

c) 10 d) None of these

Q.4 The missing term in the A.P 2,5,8,____,14 is_____.

a) 12 b) 10

c) 11 d) 13

Q.5 What is the real part of the complex number $z = 5i - 2$ ?

a) 5 b) 2

c) -5 d) -2

Q.6 ${}^{7}C_{6}$=_____

a) 0 b) 6

c) 7 d) 1

Q.7 What is the slope of the straight line, which makes an angle of 30° with the positive direction of x-axis measured anticlockwise?

a) 0 b) 1

c) 3 d) $1/\sqrt{3}$

Q.8 If the centre of a circle is (p,q) and radius is m, then the equation of the circle is_____.

a) $(x-p)^2+(y-q)^2=m^2$

b) $(x+p)^2+(y+q)^2=m^2$

c) $(x-p)^2+(y-q)^2+m^2=0$

d) none of these

Q.9 If $\bar{x}$ is the mean of the discrete frequency distribution for the data $x_i$'s with the corresponding frequencies fi's ($1 \le I \le n$), then the mean deviation about mean is _____.

a) $\frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i}$ b) $\frac{\sum_{i=1}^{n} f_i |x_i - \bar{x}|}{\sum_{i=1}^{n} f_i}$

c) $\frac{\sum_{i=1}^{n} f_i |x_i + \bar{x}|}{\sum_{i=1}^{n} f_i x_i}$ d) none of these



Q.10 If an event has more than one sample point, then it is called a simple event. Select the right option for the above statement.

a) The above statement is TRUE

b) The above statement is FALSE

c) None of these

## SECTION-B

**Note:** Short answer type questions. Attempt any four questions out of eight questions. (4x5=20)

Q.11 In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. How many like tennis only and not cricket? How many like tennis?

Q.12 Let F (x) = $\sqrt{x}$ and g(x) = x be two functions defined over the set of non-negative real numbers. Find

(f+g) (x), (f - g) (x), (f g) (x) and (f/g) (x)

Q.13 Find the $n^{th}$ and $12^{th}$ terms of the G.P. $\frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \ldots\ldots$

Q.14 Find the sum of the n terms of the series whose $n^{th}$ term is (n + 1) ( n+ 2)

Q.15 Using Binomial theorem to evaluate $(101)^4$.

Q.16 i) Find the equation of the straight line which passes through the point (-5, -2) with slope 10.

ii) Describe the Sample Space of the experiment. A die is thrown and then A coin is tossed.