

Sec - A

1) The rational form of  $0.2\overline{54}$  is in the form of  $\frac{p}{q}$  then  $(p+q)$  is

a) 14

b) 55

c) 69

d) 79

2) If 2 and 3 are zeroes of the polynomial  $3x^2 - 2kx + 2m$ , then the values of  $k$  and  $m$  are

a)  $9, \frac{7}{2}$

b) 7, 9

c)  $9, \frac{15}{2}$

d) None

3)  $\tan \theta + \sin \theta = m$ ,  $\tan \theta - \sin \theta = n$

then  $(m^2 - n^2)$  is equal to

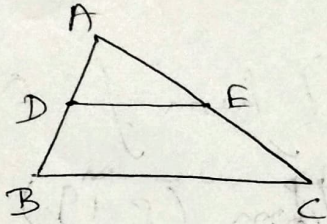
a)  $\sqrt{mn}$

b)  $\sqrt{\frac{m}{n}}$

c)  $4\sqrt{mn}$

d) None

4) In the given figure  $DE \parallel BC$ . If  $AD = 3$ ,  $DB = 4$  cm and  $AE = 6$  cm. Then  $EC$  is



a) 8 cm

b) 9 cm

c) 7 cm

d) 5 cm

5) The degree of the polynomial

$$\frac{t^8 - 3t^7 + 2t^5 - 6t^2}{t^2} \text{ is}$$

a) 4

b) 6

c) 3

d) 2

6) Consider  $kn^2 + 2n = c(n^2 + b)$  as quadratic equation. Which of this can't be the value of  $k$ ?

a)  $2c$

b)  $3c$

c)  $4c$

d)  $2c + 2b$

7) Solve for  $x$  and  $y$ .

$$41x + 53y = 135$$

$$53x + 41y = 147$$

a)  $x=2, y=3$

b)  $x=1, y=2$

c)  $x=3, y=2$

d)  $x=3, y=1$

8) If the lines given by  $3x + 2ky = 2$  and  $2x + 5y = 1$  are parallel, then  $k =$

a)  $-5/4$

b)  $2/5$

c)  $15/4$

d)  $3/2$

9) The points  $(-4, 0)$ ,  $(4, 0)$  and  $(0, 3)$  are the vertices of a

a) right angled triangle

b) Isosceles triangle

c) equilateral triangle

d) Scalene triangle

10)  $\tan \theta - \frac{4}{\tan \theta} = 3$ , then  $\sin^2 \theta$  is

a)  $\frac{4}{17}$

b)  $\frac{3}{17}$

c)  $\frac{16}{17}$

d)  $\frac{5}{17}$

11) If  $\sin \theta - \cos \theta = 0$ , then the value of  $\sin^4 \theta + \cos^4 \theta$  will be

a)  $\frac{1}{4}$     b)  $\frac{1}{2}$     c)  $\frac{3}{4}$     d)  $> 1$

12) If  $\sqrt{3} \tan \theta = 2 \sin \theta$ , then the value of  $\sin^2 \theta - \cos^2 \theta$  is

a)  $\frac{1}{2}$     b)  $-\frac{1}{2}$     c)  $\frac{3}{2}$     d)  $-\frac{3}{2}$

13) The area of a sector of a circle with radius 6 cm if angle of the sector  $60^\circ$  is (in  $\text{cm}^2$ )

a)  $\frac{132}{14}$     b)  $\frac{36}{7}$     c)  $\frac{132}{7}$     d) None

14) The probability that an ordinary year contains 53 Sundays is

a)  $\frac{2}{7}$     b)  $\frac{1}{7}$     c)  $\frac{7}{53}$     d)  $\frac{7}{52}$

15) The probability of choosing a vowel from 'ASSASSINATION' is  $\frac{6}{2n+1}$ . Then  $n =$

a) 5    b) 6  
c) 7    d) 8

The value of  $a$  for which the lines  $x=1$ ,  $y=2$  and  $x^2+2y-20=0$  are concurrent is .

- a) 1      b) 8      c) -4      d) -2

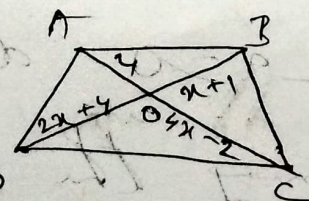
17) The distance of the point  $P(2,3)$  from the  $x$ -axis is (units)

- a) 2      b) 3      c) 1      d) 5

18) The distance between  $(a \cos \theta + b \sin \theta, 0)$  and  $(0, a \sin \theta - b \cos \theta)$  is

- a)  $a^2 + b^2$       b)  $a^2 - b^2$       c)  $\sqrt{a^2 + b^2}$       d)  $\sqrt{a^2 - b^2}$

19)



$AB \parallel CD$   
 $x = ?$

- a) 6      b) 8      c) 3      (f d) 9

20) The 20<sup>th</sup> term of the sequence

7, 3, -1, -5, ...

- a) -39      b) -69  
c) -49      d) -59

## Section B

- 21) If one of the roots of the equation  $(k-1)x^2 + kx + 1 = -3$ , find the value of  $k$ .
- 22) The 6th term of an AP is zero. Prove that 30th term of the AP is three times its 14th term.
- 23) If  $\sin \theta \cos \theta = \frac{1}{2}$ , find the value of  $\tan \theta$ .
- 24) Determine the ratio in which the line  $3x + y - 9 = 0$  divides the line segment joining the points  $(1, 3)$  and  $(2, 7)$ .
- 25) Solve (quadratic):  
$$x^2 - 59\frac{29}{30}x - 2 = 0$$

## Section C

26) If  $1 + \sin^2 \theta = 3 \sin \theta \cos \theta$

Prove that  $\tan \theta = 1$  or  $\frac{1}{2}$

27) Is it possible to have the square of all positive integers of the form  $3m+2$ , where  $m$  is a natural number. Justify your answer.

28) Five years ~~ago~~ hence, the age of Jacob will be thrice that of his son. Five years ago, Jacob's age ~~was~~ was seven times that of his son. What are their present ages?

29) A paper is in the form of a rectangle ABCD, in which  $AB = 16$  cm,  $BC = 12$  cm. A semi circle is positioned with BC as diameter is cut off. Find the area of the remaining part.

30) The weight of toffees in 70 packets are shown in table

<u>Weight</u>	<u>No of packets</u>
200 - 201	12
201 - 202	26
202 - 203	20
203 - 204	9
204 - 205	2
205 - 206	1

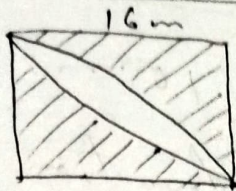
Determine the modal weight.

$$31) \frac{2 \sin 60^\circ + 4 \sin 30^\circ - \sin 45^\circ}{\sin 30^\circ + \sin 60^\circ}$$



## Section D

32)



Find the area of the shaded region

33)

A chord of a circle of radius 12 cm subtends an angle of  $120^\circ$  at the centre. Find the area of the corresponding segment of the circle.

$$[\pi = 3.14, \sqrt{3} = 1.73]$$

34) A circle touches the side BC of a  $\triangle ABC$  at P and the extended sides AB and AC at Q and R.

Prove that:

$$AQ = \frac{1}{2} (BC + CA + AB)$$

35)

Solve:  $x^2 - (x-ab)(a+b)^2 = 0$

OR

$$(x+1)(x+2) - \frac{2+1}{x} = 0$$

## Section E

- 36) From a point 100m above the lake, the angle of elevation of a stationary helicopter is  $30^\circ$  and the angle of depression of its reflection is  $60^\circ$ . Find the height of the helicopter.
- ~~37) A container is in the form of a frustum~~
- 38) Two dice are rolled together. Find the probability that the sum of the numbers on the upper most faces of two dice is
- 4 or 5
  - 7, 8 or 9
  - between 5 and 8
  - more than 10.
- 39) From a solid cylinder whose height is 12cm and diameter 10cm, a conical cavity of some height and some diameter is hollowed out. Find the volume and total surface area of the remaining solid.