

COMMON PRE-BOARD EXAMINATION -2023

CLASS 10 MATHEMATICS(STD) ( 041) MM: 80

3HOURS Marking Scheme :SHAILAJA SREEKUMAR

**SECTION- A**

Questions :

marks

1. (a) 1    2. (a)  $2k^3$     3. (d)  $1/6$     4. (c) 60    5. (a)  $\sqrt{2} - 1$   
6. (b) 5    7 (c) 12.5    8 (a)  $-4$     9. (b)  $\frac{1-\cos\theta}{\sin\theta}$     10. (a) 2

1 mark each

11.(c) no real root    12.(d) 36 feet    13. (b) similar not congruent

14. (d) 33    15. (d) 6    16. (d)  $2\sqrt{7}$     17. (c)  $(400 - 100\pi)$  sq.m

18. (c) 3.466666.....    19. (b) A and R are true but R is not the explanation for A  
20. (a) A and R are true and R is the explanation for A

**SECTION -B**

21. Rough figure + Given :

To prove that :

$\frac{1}{2}$  mark

Proof of  $\Delta PTS \sim \Delta PRQ$  with proper reasons

1  $\frac{1}{2}$  marks

22. rough figure + given :, to prove that :

$\frac{1}{2}$  mark

Proof of  $XA + AR = XB + BR$  with proper reasons  
and theorem

1  $\frac{1}{2}$  marks

23. If  $\tan \theta = \frac{5}{12}$ , find  $\sin \theta$  and  $\sec \theta$

$$\sin \theta = \frac{5}{13} \quad 1 \text{ mark}$$

$$\sec \theta = \frac{13}{12} \quad 1 \text{ mark}$$

OR

$3 \cot A = 4$ , find the value of  $\sin A + \cos A$ .

$$\sin A = \frac{3}{5}, \cos A = \frac{4}{5} \quad 1 \text{ mark}$$

$$\sin A + \cos A = \frac{3}{5} + \frac{4}{5} = \frac{7}{5} \quad 1 \text{ mark}$$

24. minor sector.

$$= \frac{\pi r^2 \theta}{360} = 3.14 \times 4 \times 4 \times \frac{30}{360} = 4.19 \text{ approximate} \quad 1 \text{ mark}$$

$$\text{Major sector} = 3.14 \times 4 \times 4 \times \frac{330}{360} = 46.1 \text{ approximate} \quad 1 \text{ mark}$$

OR

$$\text{Distance travelled in 1 revolution} = 2 \times \frac{22}{7} \times 40 \quad \frac{1}{2} \text{ mark}$$

$$\text{Distance travelled in 10 minutes} = \frac{66 \times 100000 \times 10}{60} = 1100000 \text{ cm} \quad \frac{1}{2} \text{ mark}$$

Number of complete revolutions =

$$1100000 \div 2 \times \frac{22}{7} \times 40 = \frac{70000}{16} = 4375 \quad 1 \text{ mark}$$

$$25. \text{ ratio } k : 1 \frac{-2k+6}{k+1} = 0, k = 3 \quad 1 \text{ mark}$$

$$Y = \frac{3x-7+1x-4}{3+1} = \frac{-25}{4} \quad \frac{1}{2} \text{ mark}$$

$$\text{Point is } \left( 0, \frac{-25}{4} \right) \quad \frac{1}{2} \text{ mark}$$

### SECTION -C

26. area of the triangle =  $\frac{1}{2} \cdot 12 \cdot 5 = 30$ sq cm (1mark)

Area of the triangle also =  $\frac{1}{2} \cdot 12 \cdot (x) + \frac{1}{2} \cdot 5 \cdot (x) + \frac{1}{2} \cdot 13 \cdot (x) = 30$  ( 1 mark)

$\frac{1}{2} (x) \cdot 30 = 30$  sq cm i.e  $x = 2$  cm (1 mark)

OR

Figure , given , to prove that =  $\frac{1}{2}$  mark

To prove  $\angle AOB = 90^\circ$  step by step proof with proper reasons and theorems = 2 mark .

Therefore proved that  $\angle AOB = 90^\circ$   $\frac{1}{2}$  mark

27. Poof of  $\sqrt{2}$  is irrational = 2 marks

Proof of  $3 + \sqrt{2}$  is irrational = 1 mark

28.Expanding  $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$  1 mark

$$= \sin^2 A + \operatorname{cosec}^2 A + 2 + \cos^2 A + \sec^2 A \quad \frac{1}{2} \text{ mark}$$

$$= 1 + 1 + \cot^2 A + 1 + \tan^2 A + 4 \quad 1 \text{ mark}$$

$$= 7 + \tan^2 A + \cot^2 A \quad \frac{1}{2} \text{ mark}$$

29. to find the zeroes of  $6x^2 - 7x - 3$  zeroes are  $-\frac{1}{3}, \frac{3}{2}$  2marks

Relation ship between the zeroes and coefficients 1 mark

30 To find the points of trisection of AB where  $A = (4, -1)$ ,  $B = (-2, -3)$

Points be P and Q finding  $P = (2, \frac{-5}{3})$ ..... 1  $\frac{1}{2}$  marks

Finding  $Q = (0, \frac{-7}{3})$ ... 1  $\frac{1}{2}$  marks

31. 3 different coins tossed .....sample space

P ( exactly 2 heads) 1 mark

P( atleast 2 heads) 1mark

P( at most 2 heads ) 1 mark

OR

Two dice thrown simultaneously

Sample space 1 mark

P( sum =8 ) 1mark

P (sum at least 8) 1 mark

### SECTION -D

32. median is given 28.5

Making the cf table 1 mark

$$x + y = 15 \quad 1 \text{ mark}$$

substituting the median formula 2 marks

$$x = 8 \text{ and } y = 7 \quad 1 \text{ mark}$$

OR

Making the table with classes, frequency, cf ...2 marks

Substituting in the median formula and calculation ....2 marks

Median height = 149 .03cm.....1 mark

33.  $\frac{9000}{x} - \frac{9000}{x+20} = 160$  2 marks

Quadratic equation  $x^2 + 20x - 125 = 0 \dots$  1 mark

Solving 1 mark

$x = 25, -45$  ½ mark

number of persons = 25 ½ mark

OR

7 years ago, Swati be  $x$  years and varun be  $5x^2$

Swati..... present age =  $x + 7$  1 mark

Varun.... Present age =  $5x^2 + 7$

3 years later

Swati.....  $x + 10$  1 mark

Varun =  $5x^2 + 10$

$x + 10 = \frac{2}{5}(5x^2 + 10)$  1 mark

QE.....  $2x^2 - x - 6 = 0$  and solving 1 mark

Swati = 9 years , varun = 27 years 1 mark

34 Proof of Basic proportionality theorem

Figure 1 mark

Drawing the altitudes ..... 1 mark

Area of triangles..... 1 mark

Equating the area of 2 triangles..... 1 mark

Final statement .....1 mark

35. figure 1 mark .

Volume of gulab jamuns =  $\frac{22}{7} \times 1.96 \times \frac{12.2}{3}$  2mark

Volume of 45 gulab jamuns ..... 45 x volume of 1 gulab jamun

Quantity of syrup in 45 jamuns = 30 % of their volume 1 mark

Ans  $338\text{cm}^3$  approximate 1 mark

### SECTION-E

36 i) b 3cm 1 mark ii) 10 th bar 1 mark iii ) 76 cm 2marks

37 i) c the swimmer come close to the island

ii) c the swimmers distance from the island increases 3 times 2 marks

iii ) b  $45^\circ$

38 i) b  $x + y = 500$

ii) c  $x + 2y = 700$

iii) 300 2 marks