General Instructions:
i) All questions are compulsory.
ii) The question paper consists of 31 questions divided into four sections A, B, C \& D. Section - A comprises of 4 questions of 1 mark each, Section - B comprises of 6 questions of 2 marks each, Section - C comprises of 10 questions of 3 marks each \& Section - D comprises of 11 questions of 4 marks each.

## Section - A [1x4 = 4 marks]

1. Find two irrational numbers between $0 . \overline{72}$ and $0 . \overline{83}$.
2. Find the value of $a^{3}+2 a+7$ at $a=-1$.
3. Write the co-ordinates of a point
i) above $x$-axis \& lying on $y$-axis at a distance of 5 units.
ii) with ordinate -2 \& abscissa 3.
4. Lines PQ \& RS intersect each other at point O. If $\angle \mathrm{POR}: \angle \mathrm{ROQ}=5: 7$, then find $\angle \mathrm{QOS} \& \angle \mathrm{POS}$.


## Section - B [2x6 = $\mathbf{1 2}$ marks]

5. Simplify :
i) $\quad 2^{2 / 3} \times 2^{-5 / 3}$
ii) $64^{2 / 3}$
6. $\quad A D \& B C$ are equal perpendiculars to a line segment $A B$. Show that $C D$ bisects $A B$.

7. Check whether the polynomial $\mathrm{q}(\mathrm{t})=4 \mathrm{t}^{3}+4 \mathrm{t}^{2}-\mathrm{t}-1$ is a multiple of $2 \mathrm{t}+1$.
8. Evaluate $93 \times 95$ without actual multiplication.
9. Find the value of $k$ for which the polynomial $a^{4}-a^{3}-11 a^{2}-a+k$ is divisible by $a+3$.
10. In the fig, if $A C=B D$, then prove that $A B=C D$.


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\text { Section - C } \quad[3 \times 10 \text { = } 30 \text { marks }]
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11. Prove that the sum of the angles of a triangle is $180^{\circ}$.
12. Rationalise the denominator of
i)
$\frac{6}{\sqrt{5}-\sqrt{2}}$
ii) $\frac{31}{7+3 \sqrt{2}}$
13. In an isosceles triangle $A B C$ with $A B=A C$, $D \& E$ are points on $B C$ such that $B E=C D$. Show that AD=AE.
14. 

Std. 9


In the fig, if $\mathrm{PQ} \perp \mathrm{PS}, \mathrm{PQ} \| \mathrm{SR}$, $\angle \mathrm{SQR}=28^{\circ} \& \angle \mathrm{QRT}=65^{\circ}$, find the values of $x \& y$.

MATHEMATICS
15. A triangle and a parallelogram have the same base \& same area. If the sides of the triangle are $26 \mathrm{~cm}, 28 \mathrm{~cm} \& 30 \mathrm{~cm}$ and the parallelogram stands on the base 28 cm , find the height of the parallelogram.
16. Find the product using identities
i) $\quad[(a+3)(a-3)]^{2}$
ii) $\quad(3 p-2 q)(3 p-2 q)(3 p-2 q)$
17. Show that the angles of an equilateral triangle are $60^{\circ}$ each.
18. Express $0.2 \overline{45}$ in the form of $\frac{p}{q}$, where $p \& q$ are integers and $q \neq 0$.
19. Factorise :
i) $\quad 64 a^{3}-27 b^{3}$
(ii) $125 p^{3}+8 q^{3}+r^{3}-30 p q r$.
20. Plot the points $A(1,3), B(1,-1), C(6,-1) \& D(6,3)$ on the Cartesian plane. Join them in order \& name the figure so formed.

## Section - D [4×11 = 44 marks]

21. State whether the following statements are true or false. Give reason.
i) Every natural number is a whole number.
ii) Every irrational number is a real number.
iii) Every whole number is a rational number.
iv) Every integer is a whole number.
22. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.
23. Using factor theorem, factorise $m^{3}-2 m^{2}-5 m+6$.
24. Express $\sqrt{4.3}$ on the number line.
25. Using remainder theorem, find the remainder when $4 a^{4}-3 a^{3}-2 a^{2}+a-7$ is divided by $a+1$ and verify it by long division method.
26. In the fig, $A B\|C D, C D\| E F$. Also $E A \perp A B$. If $\angle B E F=55^{\circ}$, find the values of $p, q \& r$.

27. Verify that $a^{3}+b^{3}+c^{3}-3 a b c=\frac{1}{2}(a+b+c)\left[(a-b)^{2}+(b-c)^{2}+(c-a)^{2}\right]$.
28. $P Q \& R S$ are respectively the smallest \& largest sides of a quadrilateral $P Q R S$. Show that
i) $\quad \angle \mathrm{P}>\angle \mathrm{R}$
ii) $\quad \angle \mathrm{Q}>\angle \mathrm{S}$
29. The sides $A B \& A C$ of $\triangle A B C$ are produced to points $E \& D$ respectively. If bisectors $B O$ $\& C O$ of $\angle C B E \& \angle B C D$ respectively meet at point $O$, then prove that $\angle B O C=90^{\circ}-\frac{1}{2} \angle B A C$.
30. A rhombus field has grass for 20 cows to graze. If each side of the rhombus is 52 m \& longer diagonal is 96 m , how much area of the grass field will each cow be getting? Why is greenary important for the environment?
31. $\triangle \mathrm{ABC}$ is isosceles in which $A B=A C$.

Side $B A$ is produced to $D$ such that $A D=A B$. Show that $\angle \mathrm{BCD}$ is a right angle.


