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## SAMPLE PAPER 1

CLASS 10

## General Instructions:

1. All questions are compulsory.
2. The question paper consists of 31 questions divided into four sections $\mathrm{A}, \mathrm{B}, \mathrm{C}$ and 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 and Section - D comprises of 11 questions of 4 marks each.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

## Section - A

## Question numbers 1 to 4 carry one mark each.

1. Evaluate: $\sin ^{2} 31^{0}-\cos ^{2} 59^{0}$.
2. Evaluate: $3 \cot ^{2} 60^{0}+\sec ^{2} 45^{0}$
3. In $\triangle P Q R, S$ and $T$ are points on the sides of $P Q$ and $P R$ respectively such that $S T \| Q R$. If $\mathrm{PS}=4 \mathrm{~cm}, \mathrm{PQ}=9 \mathrm{~cm}$ and $\mathrm{PR}=4.5 \mathrm{~cm}$, then find PT .
4. Find the median of the following distribution:

| $x_{i}$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $f_{i}$ | 2 | 4 | 6 | 5 | 8 | 0 | 3 | 2 |

## Section-B

## Question numbers 5 to $\mathbf{1 0}$ carry two marks each.

5. The data regarding measurement of pulse rate of 45 students by the School Doctor is given in the following distribution table. Calculate the average pulse rate of these students:

| Pulse rate | $60-65$ | $65-70$ | $70-75$ | $75-80$ | $80-85$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Number of students | 4 | 5 | 22 | 6 | 8 |

6. After how many decimal places will the rational number $\frac{1251}{1250}$ terminate?
7. Find the quadratic polynomial, sum of whose zeroes is 9 and the product is 18 . Hence find the zeroes of the polynomial.
8. In the given figure, $\mathrm{OA}=3 \mathrm{~cm}, \mathrm{OB}=4 \mathrm{~cm}, \angle \mathrm{AOB}=90^{\circ}, \mathrm{AC}=12 \mathrm{~cm}$ and $\mathrm{BC}=13 \mathrm{~cm}$. Prove that $\angle \mathrm{CAB}=90^{\circ}$.

9. Simplify: $\frac{\tan 28^{\circ}}{\cot 62^{\circ}} \div \frac{1}{\sqrt{3}}\left[\tan 20^{\circ} \cdot \tan 60^{\circ} \cdot \tan 70^{\circ}\right]$
10. Find LCM of the numbers given below: $\mathrm{m}, 2 \mathrm{~m}, 3 \mathrm{~m}, 4 \mathrm{~m}$ and 5 m , where m is any positive integer.

## Section-C

## Question numbers 11 to 20 carry three marks each.

11. Show that $4-3 \sqrt{2}$ is an irrational number.
12. Find those integral values of $m$ for which the $x$ - coordinate of the point of intersection of lines represented by $y=m x+1$ and $3 x+4 y=9$ is an integer.
13. Life time of 400 fans are given in the following frequency distribution:

| Life time (in <br> hours) | $2000-2400$ | $2400-2800$ | $2800-3200$ | $3200-3600$ | $3600-4000$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Number of <br> fans | 50 | 70 | 150 | 100 | 30 |

Find the modal life of the fan.
14. Solve the elimination: $3 x-y=7 ; 2 x+5 y+1=0$
15. In a trapezium diagonals AC and BD intersect at O . If $\mathrm{AB}=3 \mathrm{CD}$, then find the ratio of areas of triangles COD and AOB .
16. In a right angled $\triangle \mathrm{ABC}, \angle \mathrm{B}=90^{\circ}$. If $\frac{B C}{A B}=\frac{1}{\sqrt{3}}$, then find $\frac{A B}{A C}$.
17. Prove the following identity: $(\operatorname{cosec} \theta-\sin \theta) .(\sec \theta-\cos \theta) .(\tan \theta+\cot \theta)=1$
18. Evaluate: $\frac{3 \tan 25^{\circ} \cdot \tan 40^{\circ} \cdot \tan 50^{\circ} \cdot \tan 65^{\circ}-\frac{1}{2} \tan ^{2} 60^{\circ}}{4\left(\cos ^{2} 29^{0}+\cos ^{2} 61^{0}\right)}$
19. During a medical checkup of students of class X, their weights were recorded as follows:

| Weight <br> (in kg ) | Less <br> than 35 | Less <br> than 38 | Less <br> than 41 | Less <br> than 44 | Less <br> than 47 | Less <br> than 50 | Less <br> than 53 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Number <br> of <br> students | 0 | 4 | 6 | 8 | 18 | 33 | 40 |

Draw a 'less than type' ogive for the above data, and hence obtain the median from the curve.
20. The sum of digits of a two digit number is 8 and the difference between the number and that formed by reversing the digits is 18 . Find the number.

## Section - D <br> Question numbers 21 to 31 carry four marks each.

21. The mean of the following frequency distribution is 145 . Find the missing frequencies $x$ and $y$.

| Class | $0-50$ | $50-100$ | $100-150$ | $150-200$ | $200-250$ | $250-300$ | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency | 6 | $x$ | 64 | 52 | $y$ | 14 | 200 |

22. Ridhi decided to use public transport to cover a distance of 300 km . She travels this distance partly by train and partly by bus. She takes 4 hours if she travels 60 km by train and remaining by bus. If she travels 100 km by train and the remaining by bus, she takes 10 minutes more. Find the speed of train and bus separately. Why does Ridhi decide to opt for public transport?
23. If a polynomial $9 x^{4}-6 x^{3}-35 x^{2}+p x+q$ is exactly divisible by $9 x^{2}-6 x+1$, then find the value of $p$ and $q$.
24. Draw the graph of the equations: $x+3 y=15 ; 2 x-3 y=-6$

Determine the coordinates of the vertices of the triangle formed by these lines and $y-$ axis. Also shade the triangular region.
25. Find the length of the diagonal of the rectangle BCDE if $\angle \mathrm{BCA}=\angle \mathrm{DCF}, \mathrm{AC}=6 \mathrm{~cm}$ and $\mathrm{CF}=12 \mathrm{~cm}$.

26. In $\triangle \mathrm{ABC}$ from A and B perpendiculars AD and BE are drawn. Prove that $\triangle \mathrm{ADB} \sim$ $\Delta \mathrm{BEC}$. Is $\triangle \mathrm{ADB} \sim \triangle \mathrm{AEB}$ and $\triangle \mathrm{ADB} \sim \triangle \mathrm{ADC}$ ?
27. Prove that: $\sqrt{\frac{\sec A+2 \sin A}{\sec A-2 \sin A}}=\frac{\sin A+\cos A}{\sin A-\cos A}=\frac{1+\cot A}{1-\cot A}$
28. Prove that: $(\sec \theta-\tan \theta)^{2}=\frac{\operatorname{cosec} \theta-1}{\operatorname{cosec} \theta+1}$
29. In the figure of $\triangle \mathrm{PQR}, \angle \mathrm{P}=\theta^{0}$ and $\angle \mathrm{R}=\emptyset^{0}$

Find (i) $\sqrt{x+1} \cot \emptyset$
(ii) $\sqrt{x^{3}+x^{2}} \tan \emptyset$
(iii) $\cos \theta$

30. The product of two numbers $x$ and $y$ is 217728. Find the LCM and HCF of $x$ and $y$ if it is given that $\operatorname{LCM}(x, y)=42 \operatorname{HCF}(x, y)$
31. The following distribution gives the weights of 60 students of a class. Find the mean and mode weights of the students.

| Weight <br> (in kg) | $40-44$ | $44-48$ | $48-52$ | $52-56$ | $56-60$ | $60-64$ | $65-68$ | $68-72$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |


| Number <br> of <br> students | 4 | 6 | 10 | 14 | 10 | 8 | 6 | 2 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

