## BLOOM PUBLIC SCHOOL

## Sample Paper of Periodic Assessment- II (2018-2019) MATHEMATICS - X

Time :- 3 hours
M.M. :- 80

Date :- / / 18

## General Instructions:

(i) All questions are compulsory.
(ii) The question paper consists of $\mathbf{3 0}$ questions divided into four sections $\mathbf{A}, \mathbf{B}, \mathbf{C}$ and $\mathbf{D}$.
(iii) Section A contains 6 questions of 1 mark each. Section $\mathbf{B}$ contains 6 questions of 2 marks each. Section C contains $\mathbf{1 0}$ questions of $\mathbf{3}$ marks each. Section D contains $\mathbf{8}$ questions of 4 marks each.
(iv) There is no overall choice. However, an internal choice has been provided in four questions of $\mathbf{3}$ marks each and three questions of $\mathbf{4}$ marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculators is not permitted.

## Section A

## Question numbers 1 to 6 carry 1 mark each.

Q1. Find the Value of $q$ when $2 \sin 2 q=\sqrt{3}$.
Q2. Find the ratio in which the $y$-axis divides the line segment joining the points $(5,-6)$ and $(-1,-4)$.
Q3. In a $\triangle A B C, D$ and $E$ are points on the sides $A B$ and $A C$ respectively such that $D E$ II $B C$. If $A D=4 x-3, B D=3 x-1, A E=8 x-7$ and $E C=5 x-3$, then find the value of $x$.

Q4. Is 51 a term of the AP $5,8,11,14 \ldots$ ?
Q5. Using Euclid's algorithm, find H.C.F of 240 and 228.
Q6. If one of the zeroes of the quadratic polynomial $(k-1) x^{2}+k x+1$ is -3 , then find the value of k.

## Section B

## Question numbers 7 to 12 carry 2 marks each.

Q7. Find point on $y$-axis which is equidistant from the points $(5,-2)$ and $(-3,2)$.
Q8. Prove that the area of the triangle described on one side BC of a square ABCD as base is half the area of the similar triangle ACF produced on the diagonal AC as base.

Q9. The $4^{\text {th }}$ term of an A.P. is zero. Prove that the $25^{\text {th }}$ term of an A.P. is three times its $11^{\text {th }}$ term.
Q10. Without actual division, show that $\frac{17}{625}$ has a terminating decimal expansion. Also express it in decimal form.
Q11. If $\alpha, \beta$ and $\gamma$ are the zeros of the polynomial $f(x)=3 x^{3}-5 x^{2}-11 x-3$, then find the value of $\frac{1}{\alpha \beta}+\frac{1}{\beta \gamma}+\frac{1}{\gamma \alpha}$.

Q12. Given the linear equation $3 x+4 y=9$ write another linear equation in these two variables such that the geometrical representation of the pair so formed is:
(i) Intersecting lines
(ii) Coincident lines

## Section C

## Question numbers 13 to 22 carry 3 marks each

Q13. Solve for $x$ and $y$ :
$p x+q y=p-q$
$q x-p y=p+q$

## OR

Solve for $x$ and $y$ :
$43 x+67 y=-24$
$67 x+43 y=24$
Q14. Evaluate : $\frac{\sin 30^{\circ}+\tan 45^{\circ}-\operatorname{cosec} 60^{\circ}}{\sec 30^{\circ}+\cos 60^{\circ}+\cot 45^{\circ}}$
Q15. Find the roots of the quadratic equation $5 x^{2}-6 x-2=0$ by the method of completing the square.

## OR

Solve for $\mathrm{x}: ~ a b x^{2}+\left(b^{2}-a c\right) x-b c=0$
Q16. Find the lengths of the medians of the triangle whose vertices are $(1,-1),(0,4)$ and $(-5,3)$.
OR
Do the points $(3,2),(-2,-3)$ and $(2,3)$ form a triangle? If so, name the type of triangle formed.

Q17. Solve for $\mathrm{x}: 2\left(\frac{2 x-1}{x+3}\right)-3\left(\frac{x+3}{2 x-1}\right)=5$ if it is given that $\mathrm{x} \neq-3, \mathrm{x} \neq 1 / 2$.
Q18. Prove that the ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

Q19. Check whether $\mathrm{x}^{2}+2 \mathrm{x}+2$ is a factor of $\mathrm{x}^{4}+3 \mathrm{x}^{3}+7 \mathrm{x}^{2}+\mathrm{x}+13$ or not.
Q20. If the equation $\left(1+m^{2}\right) x^{2}+2 m c x+\left(c^{2}-a^{2}\right)=0$ has equal roots, prove that $c^{2}=a^{2}\left(1+m^{2}\right)$.
Q 21 . If $\mathrm{x}=\mathrm{psec} \theta+\mathrm{q} \tan \theta$ and $\mathrm{y}=\mathrm{p} \tan \theta+\mathrm{q} \sec \theta$, then prove that $\mathrm{x}^{2}-\mathrm{y}^{2}=\mathrm{p}^{2}-\mathrm{q}^{2}$
Q22. If the sum of $m$ terms of an A.P. is the same as the sum of its $n$ terms, show that the sum of its $(\mathrm{m}+\mathrm{n})$ terms is zero.

OR
If the $\mathrm{p}^{\text {th }}$ term of an A.P is q and the $\mathrm{q}^{\text {th }}$ term is p , prove that its $\mathrm{n}^{\text {th }}$ term is $(\mathrm{p}+\mathrm{q}-\mathrm{n})$.

## Section D

Question numbers 23 to 30 carry 4 marks each
Q23. Name the type of quadrilateral formed if any, by the points $(-1,-2),(1,0),(-1,2)$ and $(-3,0)$ and give reasons for your answer.

Q24. If sum of first 6 terms of an AP is 36 and that of the first 16 terms is 256 , find the sum of first 10 terms.

## OR

Find the sum of first 17 terms of an AP whose $4^{\text {th }}$ and $9^{\text {th }}$ terms are -15 and -30 respectively.

Q25. Solve for $\mathrm{x}: \quad \frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x}$.

## OR

Some students planned a picnic. The budget for food was Rs.480. But eight of them failed to go and thus the cost of food for each member increased by Rs.10. How many students attended the picnic?
Q26. Find all the zeroes of $x^{4}+4 x^{3}-2 x^{2}-20 x-15$, if it is given that two of its zeroes are $\sqrt{5}$ and $-\sqrt{5}$.
Q27. In Fig., ABC and AMP are two right triangles, right angled at B and M respectively. Prove that:
(i) $\quad \triangle \mathrm{ABC} \sim \Delta \mathrm{AMP}$
(ii) $\frac{C A}{P A}=\frac{B C}{M P}$

Q28. Prove that $4-2 \sqrt{7}$ is irrational.


Q29. Prove that $\frac{\sin \theta-\cos \theta+1}{\sin \theta+\cos \theta-1}=\frac{1}{\sec \theta-\tan \theta}$, using the identity $\sec ^{2} \theta=1+\tan ^{2} \theta$.

## OR

If $\tan \mathrm{A}=\mathrm{n} \tan \mathrm{B}$ and $\sin \mathrm{A}=\mathrm{m} \sin \mathrm{B}$, prove that $\cos ^{2} \mathrm{~A}=\frac{m^{2}-1}{n^{2}-1}$
Q30. Three rivers along the lines $x+3 y=6,2 x-3 y=12$ and $x=0$ are enclosing a beautiful triangular park. Find the points of intersection of the rivers graphically and area of the park if all measurements are in km .

