साधना देवी विद्यापीठ

Punjabi Colony (Dharampur) Samastipur. 848101 (Bihar)

Half Yearly Examination-2019-20

Class :- X
Sub :- Maths

Time :-3hrs
F.M. :-100

* All questions are comkpulsory.
* There is no overall choice. You have to attempt all the questions.

Section (A)

1. Find the 25th term of the AP: $-5, \frac{-5}{2}, 0, \frac{-5}{2}, \ldots\ldots\ldots$
2. Find the discriminant of quadratic equation $x^2-4x+1=0$
3. If the sun's angle of elevation is 30^0 and height of the pole is 8m, then find the length of the shadow.
4. Explain why $7x11x13x+13$ is a composite number.
5. Write $0.\overline{32}$ in fraction form.
6. If secA - 5/3 the find other trigonaetric rations.

Section (B)

7. Find a quadratic polynomial the sum and product of whose zeroes are 0 and -3/5 respectively. Hence find the zeros.
8. Which term of the Ap: 15,27,39 ..... will be 144 more than. Its 54th term ?
9. Use Euclid's division algorithm to find the HCF of 867 and 255.
10. Find the value of $\frac{\cos 18^0}{\sin 72^0}$
11. If the HCF of 85 and 153 is expressible in the form of 85m - 153 then find the value of m.
12. Prove that $\frac{\sin\theta}{1-\cos\theta} = \text{cosec}\theta + \cot\theta$

Section (c)

13. Evaluate $\frac{\sec^2(90^0-\theta)-\cot^2\theta}{2(\sin^2 25+\sin^2 65)} + \frac{2\cos^2 60^0 x \tan^2 28 x \tan^2 62}{3(\sec^2 43^0-\cot^2 47^0)}$
14. A motor boat whose speed is 15km/h in still water, goes 30km down stream and comes back in a total time of 4h 30minute. Find the speed of th stream.
15. Without using trigonometric tables, evaluate the following.
    (i) $\sin 39^0-\cos 51^0$ (b) $\text{cosec}25^0-\sec 65$
16. If -4 is a root of the equation $x^2+px-4=0$ and the equation $x^2+px+q=0$ has equal roots, then find the valued of p & q.
17. Prove that $\left(\frac{1+\tan^2 A}{1+\cot^2 A}\right) = \left(\frac{1-\tan A}{1-\cot A}\right)^2 = \tan^2 A$
18. Solve the following pari of equations graphically:
    $2x-y=3$ and $3x+2y=8$
19. Obrtain other zeros of the polynomial $4x^4+x^3-72x^2-18x$, If two of its zeros are $3\sqrt{2}$ and $-3\sqrt{2}$
20. The sum of two numbers a and b is 15 and the sum of their reciprocals 1/a and 1/b is 3/10. Find the numbers a and b.
21. Find the greatest number that will devide 445, 572 and 699 leaving remainders 4,5 and 6 respectiverly.

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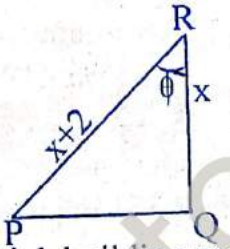
22. In a two digit number, the ten's digit is three times the unit's digit. When the number is decreased by 54, the digits are reversed. Find the number.

Section (d)

23. Prove that $\sqrt{5}$ is an irrational.

24. If the edquation $(1+m^2)x^2 + (2mc)x+(c^2-a^2) = 0$ has equal roots, the prove that $c^2 = a^2(1+m^2)$

25. In the figure of PQR, $\angle P = \phi$ and $\angle K = \theta$ Find.
(i) $\sqrt{x+1}\cot\phi$ (ii) $\sqrt{x^3+x^2}\tan\theta$ (iii) $\cos\theta$



26. Two men or either side of a 75m high building and in line with base of suilding observe the angles of elevation of the top of the building ad 30^0 and 60^0 find the distance b/w the tow men.

27. If the sum of the first m terms of an AP is n and the sum of first n terms is m. then show that the sum of its first (m+n) terms is -(m+n).

28. Use Euclid's division lemma to show that the cube of any positive integer is of the form 9m, 9m+1 or 9m+8

29. Prove that.

$$\frac{1}{\text{cosec}\theta - \cot\theta} - \frac{1}{\sin\theta} = \frac{1}{\sin\theta} - \frac{1}{\text{cosec}\theta + \cot\theta}$$

30. State and prove thales theorem.