Tosh Rakejo
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No. of Printed Pages : 3 **MG-350**

1st Periodic Examination 2017-18

MATHEMATICS

Time : 2 hrs.] **Class X** **[M.M. 50**

General Instructions—

(i) All questions are compulsory.

(ii) Section-A, consists of 2 questions of 1 mark each.

(iii) Section-B, consists of 3 questions of 2 marks each.

(iv) Section-C, consists of 6 questions of 3 marks each.

(v) Section-D, consists of 6 questions of 4 marks each.

[SECTION-A]

1. If sum of zeroes of a quadratic polynomial $5x^2-Kx+8$ is 3. Find K.

2. If the length of the shadow of a vertical pole is equal to its height. Find the angle of elevation of sun's altitude.

[SECTION-B]

3. Find the value of K for for which pair of linear equations $Kx-2y=2$ and $3x-2y=3$ has a unique solution.

4. Find x–

$$2\cos ec^2 30° + x\sin^2 60° - \frac{3}{4}\tan^2 30° = 10$$

5. Find g(x) if on dividing x^3-5x^2+6x+4 by polynomial g(x) the quotient and remainder were x–3 and 4.

[P. T. O.

[SECTION-C]

6. As observed from the top of a 60 m high light house from sea level the angle of depression of 2 ships are 30° and 45°. If one ship is exactly behind the other on the same side of the light house. Find the distance between 2 ships.

7. If $m = a\cos\theta + b\sin\theta$, $n = a\sin\theta - b\cos\theta$
Prove $m^2+n^2 = a^2+b^2$

8. The angle of elevation of the top of a building from the foot of a tower is 30°. The angle of elevation of the top of the tower from the foot of a building is 60°. If the tower is 60 m high. Find the height of the building.

9. For what value of K one zero of polynomial $2x^2+5x+K$ is the reciprocal of its other zero. Hence find the zeroes.

10. Solve for x and y—

$$\frac{2}{3x+2y} + \frac{3}{3x-2y} = \frac{17}{5}$$

$$\frac{5}{3x+2y} + \frac{1}{3x-2y} = 2$$

11. Find the value of the following without using trigonometric tables :

$$\frac{\cos 50^\circ}{2\sin 40^\circ} + \frac{4\left(\operatorname{cosec}^2 59^\circ - \tan^2 31^\circ\right)}{3\tan^2 45^\circ}$$

$$-\frac{2}{3}\tan 12^\circ \tan 78^\circ \sin 90^\circ$$

[SECTION D]

12. Solve the following system of equations graphically

    $3x+y-12=0$

    $x-3y+6=0$

    Shade the region bounded by these lines and x axis. Also find its area.

13. If one zero of the polynomial $2x^3+x^2-7x-6$ is 2. Find other two zeroes.

14. In a school some of the students opted for the NCC and some students opted for gardening in such away that three times the number of students taking NCC are 60 less than two times the number of students who opted for gardening. One third the number of students opted for NCC is equal to one-fifth of the number of students who opted for gardening. Find the number of students who opted for NCC and gardening. What is the importance of NCC in the life of a student.

15. A man standing on the deck of a ship is 12 m above water level. He observes that the angle of elevation of the top of cliff is 45° and the angle of depression of the base of the cliff is 30°. Calculate the distance of the cliff from the ship and height of the cliff.

16. If $\sin\theta+\cos\theta=m$, $\sec\theta+\operatorname{cosec}\theta=n$

    Prove that $n(m^2-1)=2m$

17. If $\tan A=2$, prove that

$$\sin A\sec A+\tan A-\operatorname{cosec}A=\frac{8-\sqrt{5}}{2}$$