MATHEMATICS 10 Class 2018

Time: 2 ½ Hours **Max. Marks: 60**

SECTION B (SHORT-ANSWER QUESTIONS)(36)

NOTE: Attempt 9 questions from this Section.

2.(i) If $U = \{0,1,2,3,4,5,6,7,8,9,10,11,12\}$, $A = \{1,2,4,6\}$, $B = \{1,2,5,10\}$ then prove that $(A \cap B)' = A' \cup B'$

(ii) Simplify: $\sqrt{\dfrac{(216)^{2/3}(25)^{1/2}}{(1/25)^{-3/2}}}$

(iii) With the help of logarithmic table find the value of the following: $\dfrac{\sqrt{431.5 \times (1.2)^2}}{\sqrt[3]{36.98}}$

3.(i) If $a + b = 7$ and $ab = 11$ then find the value of $a - b$.

(ii) Solve the following equation with the help of Cramer's rule. $5x - 2y = 1$; $2x - y = 0$

(iii) What should be added to $x^4 + 4x^3 + 10x^2 + 5$ so that it may become a perfect square?

4.(i) Find the standard deviation if $x = 10,15,20,25,30,35$.

(ii) Find the values of all trigonometric ratios of an angle of $45°$ with the help of right angle triangle.

(iii) If two sides of a triangle are congruent the angles opposite to them are also congruent. Prove it.

5.(i) If $\dfrac{a}{b} = \dfrac{c}{d} = \dfrac{e}{f}$, Prove that $\dfrac{a^4b^2 + a^2e^4 - e^4f}{b^6 + b^2f^2 - f^5} = \dfrac{a^4}{b^4}$

(ii) Find the relation independent of "x" from the equations by the formula: $x - \dfrac{1}{x} = 2a$, $x^2 + \dfrac{1}{x^2} = b^2$

(iii) Find the solution set of the following inequation:

$$\frac{x+5}{10} < \frac{25-4x}{5}, \forall x \in N.$$

6.(i) Prove that $\dfrac{\sin\theta}{1+\cos\theta} + \dfrac{1+\cos\theta}{\sin\theta} = 2\operatorname{Cosec}\theta$

(ii) Resolve into factors: $r^2(s-t) + s^2(t-r) + t^2(r-s)$

(iii) The line drawn from the centre of a circle which bisect a chord is perpendicular to the chord. Prove it.

SECTION C (DETAILED-ANSWER QUESTIONS)(24)

NOTE: Attempt 3 questions from this Section including the compulsory question No. 7 .

7. In a correspondence of two right triangles, if their hypotenuses are congruent and one more side of one triangle is congruent to the corresponding side of the other, the two triangles are congruent. Prove it.

8. Find the solution set of the following equations graphically: (Find four ordered pairs for each equation.)

$x - 2y = -3$, $2x + y = 14$

9.(a) Congruent chords of a circle are equidistant from its centre. Prove it.

(b) The sum of three angles of a triangle is equal to $180°$. Prove it.

10. Factorize the following:

(i) $(a-b)^2 - (c+d)^2$ (ii) $x^2 + 15x + 36$

(iii) $8a^3 + b^3 + 27c^3 - 18abc$ (iv) $a^4 + a^2 + 1$

11. Construct a triangle PQR in which $m\overline{PQ} = 6cm$, $m\overline{QR} = 5cm$ and $m\angle Q = 70°$. Draw the circum circle of the triangle and also write the steps of construction.