

SECTION "B" (Short Answer Question) Marks: 30

NOTE: Answer any SIX (06) questions from this section.

All questions carry equal marks.

2. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 5, 7, 9\}$ and $B = \{2, 4, 6, 8\}$ Prove that $(A \cup B)' = A' \cap B'$

3. If $a:b = c:d = e:f$ then show that:

$$\frac{a^4b^2 + a^2e^2 - e^4f}{b^6 + b^2f^2 - f^5} = \frac{a^4}{b^4}$$

4. Prove that $\frac{\cot\theta + \operatorname{cosec}\theta}{\sin\theta + \tan\theta} = \operatorname{cosec}\theta \cot\theta$

5. If α, β are the roots of the equation $px^2 + qx + q = 0$, $p \neq 0$, find

the value of $\sqrt{\frac{\alpha}{\beta}} + \sqrt{\frac{\beta}{\alpha}}$

6. Resolve into partial fractions: $\frac{4(x-4)}{x^2-2x-3}$

7. The marks obtained by students in a subject (out of 50) are given in the following grouped table. Find Arithmetic Mean (A.M).

Marks	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49
No. of Students	9	18	35	17	5

8. A ladder makes an angle 60° with the ground and reaches a height of 6 m on the wall, Find the length of the ladder.

9. A straight line, drawn from the centre of a circle to bisect a chord (which is not a diameter) is perpendicular to the chord. Prove it.

10. If two arcs of a circle (or congruent circles) are congruent then the corresponding chord are equal. Prove it.

11. The central angle of a minor arc is double in measure of the inscribed angle of the corresponding major arc. Prove it.

OR

Find the standard deviation (S.D.) of the marks of students which are 90, 30, 85, 50, 25.

SECTION 'C; (Detailed -Answer Question) (30)

NOTE: Attempt any THREE(03) questions from this Section.

All questions carry equal marks.

12. Find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 1 \\ -4 & 1 & -1 \\ 6 & -2 & 1 \end{bmatrix}$ by adjoint

method.

13. In a right angled triangle, the square of the length of hypotenuse is equal to sum of the squares of the length of the other two sides. Prove it.

14. If a line segment intersects the two sides of a triangle in the same ratio then it is parallel to the third side. Prove it.

15. Draw two unequal circle of radii 3.4 cm and 2.1 cm with centres A and B respectively such that $m\overline{AB} = 7.5$ cm. Draw direct common tangents to these circles (Also write steps of construction).

16. If two circles touch internally, the distance between their centres is equal to the difference of their radii. Prove it.

OR

If a line is drawn perpendicular to a radial segment of a circle at its outer end point, it is tangent to the circle at that point. Prove it.