CLASS : XI A/B/C
SUBJECT : MATHEMATICS

M:M : 50
TIME: 1 ½ HRS

SECTION – A

I. Each question carries 2 marks.

1. Find the set of all x for which $\frac{(x+1)(3-x)}{(x-2)(3x-2)} \geq 0$.

2. If $\sin x + \sin y = a$ and $\cos x + \cos y = b$, find the value of $\tan \frac{x-y}{2}$.

3. Solve $x^2 + 2|x| - 8 = 0$.

4. Evaluate $\sin^2 24° - \sin^2 6°$.

5. Sum the series $2^{\frac{1}{4}}.4^{\frac{1}{8}}.8^{\frac{1}{16}}.16^{\frac{1}{32}}.....\infty$.

SECTION – B

II. Each questions carries 3 marks.

6. Find the value of $\sqrt{3}\cos\text{ec}\,20° - \sec 20°$. Without using tables.

7. Solve $x^{(\frac{3}{\log_2 x})}(\log_2 x - 1) = \sqrt{2}$.

OR

The sum of an infinite G.P is 4 and its second term is $\frac{3}{4}$. Find the G.P.

8. Find the sum to n terms of the series. $\frac{1}{1.4} + \frac{1}{4.7} + \frac{1}{7.10} + \ldots\ldots$

9. Evaluate $\tan 20^\circ \tan 40^\circ \tan 60^\circ \tan 80^\circ$.

10. The A.M between two positive numbers is 34 and their G.M is 16. Find the numbers.

SECTION – C

III. Each question carries 5 marks.

11. Solve $x^2 + \left(\frac{ax}{x+a}\right)^2 = 3a^2, \quad x \neq -a.$

12. Prove that $\cos\frac{2\pi}{15} \cos\frac{4\pi}{15} \cos\frac{8\pi}{15} \cos\frac{14\pi}{15} = \frac{1}{16}$.

13. Find the sum of the series 0.7 + 0.77 + 0.777 + ... to n terms.

14. Find the sum of all numbers from 1 to 200 which are not divisible by 3 or 7.

15. If m $\tan(\theta - 30^\circ) = n \tan(\theta + 120^\circ)$, show that $\cos 2\theta = \frac{(m+n)}{2(m-n)}$.