

Course Code: 3BSC5
Course: Mathematics –III
Credit: 4
Last Submission Date: April 30 (for January Session)
October 31, (for July session)

Max. Marks:-30

Min. Marks:-10

Note:-attempt all questions.

Que1. Show that the sum and product of two Cauchy sequences are cauchy sequence.

Que2. Define convergent & divergent sequence show that if

$$a_n = \sqrt{n+1} - \sqrt{n}, \text{ then } \lim_{n \rightarrow \infty} a_n = 0$$

Que3. State & prove cauchy mean value theorem.

Que4. Evaluate $\lim_{x \rightarrow \infty} \frac{x^2-2}{x^2+7x+12}$

Que5. Express $f(x) = 4x^3 + 6x^2 + 7x + 2$ in terms of Legendre polynomials.

Que6. Find the power series solution of

$$(1-x^2)y'' - 2xy' + 2y = 0 \text{ about } x=0$$

Que7. Evaluate $\int_0^{\infty} \frac{e^{-t} \sin t}{t} dt$

Que8. Using convolution theorem, find $l^{-1} \left[\frac{5^2}{(s^2+a^2)(s^2+b^2)} \right], a \neq b.$

Que9. Six forces each equal to p , act along the edges of a cube, taken in order which do not meet a given diagonal, taken in order which do not meet a given diagonal show that their resultant is a couple of moment $\sqrt{3} pa$, where a is the edge of the cube.

Que10. State and prove Lami's theorem.