Course Code: 4BSC5
Course: MATHEMATICES-IV
Credit: 4
Last Submission Date: October 31, (for January session)
April 30 (for July Session)

Max. Marks:-30
Min. Marks:-10

Note:-attempt all questions.

Que1. If $z^3 - 3yz - 3x = 0$, show that $z\frac{\partial z}{\partial x} = \frac{\partial z}{\partial y}$ and $z\left(\frac{\partial^2 z}{\partial x \partial y} + \left(\frac{\partial z}{\partial x}\right) = \frac{\partial^2 Z}{\partial y^2}\right)$

Que2. If $y_1 = \frac{x_2\, x_3}{x_1}$, $y_{2=} \frac{x_1\, x_3}{x_2}$ $y_{3=} \frac{x_1 x_2}{x_3}$ then shot that

the Jacobian of y_1, y_2, y_3 w.r.t x_1, x_2, x_3 is 4.

Que3. State and prove relation between Beta & Gamma function.

Que4. Evaluate $\int_0^2 \int_0^x \int_0^{x+y} e^x (y + 2z) de\ dy\ dz.$

Que5. Solve:- $\frac{\partial^3 z}{\partial x^3}$ -7 $\frac{\partial^3 z}{\partial x \partial y^2}$ -6 $\frac{\partial^3 z}{\partial y^3}$ = sin (x+2y).

Que6. Solve:- $(x^2 - y^2 - z^2)$ p + 2xyq=2xz.

Que7. Find the point where the Cauchy mann Equations are satistied for the function

f(z) = $xy^2 + ix^2y$. where does f'(z) exiot ? where f(z) ia analytic.

Que8. Find the bilinear transformation which maps the points

Z_1 =i, Z_2 = 0, Z_3 =i into the points w_1 = -1, w_2 = i, w_3 = 1 respectively.

Que9. Let G be a finite group, aϵG ther

$0(cl\ (a)) = \frac{0(G)}{0(n(a))}$

Were, cl (a) is the conjugate class of a .

Que10. If G is an abelian group and f:$G \to G$ such that f(x) = x^{-1}, ∀xϵG then show that f is automorphism.