

II Sessional

B.Tech. I Sem.

BEM - C 102

Sec. A (Attempt any two questions) 6 x 2

1. If $u = z - x$, $v = y - z$, $w = x + y + z$, find $\frac{\partial(x,y,z)}{\partial(u,v,w)}$.
2. Examine the function $x^2 + 2y^2 - 4x + 4y + 6$ for extreme.
3. Define the rank of a matrix and find the rank of the matrix $A = \begin{bmatrix} 4 & 0 & 2 & 1 \\ 2 & 1 & 3 & 4 \\ 2 & 3 & 4 & 7 \end{bmatrix}$.
4. Expand x^2y about the point $(1, -2)$.

Sec. B (Attempt any one question) 8 x 1

1. Test for consistency and solve $x + 2y + 3z = 6$, $2x + y - z = -3$, $3x - y + 2z = 11$

2. If $u = \sin^{-1} \left[\frac{x^{1/4} + y^{1/4}}{x^{1/6} + y^{1/6}} \right]$ then evaluate

$$x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$$

$z - u - v$
 $y - z - v$
 $u + y + z - w$