

- Objective-type questions: (1 marks)

1. If $u = f(x, y) = C$ (const.) then $\frac{dy}{dx} =$ _____
2. In Taylor's expansion, $f(x, y) = f(0, 0) + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$
3. If $x = r \cos \theta$, $y = r \sin \theta$; then $\frac{\partial(x, \theta)}{\partial(x, y)} =$ _____
4. If $\frac{\partial(u, v)}{\partial(x, y)} = 0$, then u and v are functionally related.
(T/F)
5. If $rt - s^2 > 0$ and $r < 0$, then $F(x, y)$ will have minimum.
(T/F)
6. $F(x, y) = x^2y + xy^2 - axy$ have $(\frac{a}{3}, \frac{a}{3})$ as one of its stationary point. (T/F)
7. Any point (a, b) is said to be point of maxima if _____

8. If $y = x e^x$ then $y_n =$ _____
9. If $f = f(x, y, z)$ then $df =$ _____
10. A matrix A is said to be involutory matrix if _____
11. ~~Self-adjoint~~ Any matrix is said to be complex matrix if _____

12. Rank of matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \end{bmatrix}$ is _____

13. The eigen values of $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 2 \\ 0 & 0 & 3 \end{bmatrix}$ are _____, _____, _____.

15. The modulus of each characteristic root of a unitary matrix is unity. (T/F)

16. If λ is eigen value of an orthogonal matrix then _____ is also ~~also~~ its eigen value.

17. Change the order of integration: $\int_0^1 \int_0^{1-x} f(x,y) dy dx =$ _____

18. Area in polar coordinates is given by = _____

19. Volume in cylindrical ~~pro~~-ordinates is given by

20. $\int_0^{\infty} e^{-x^2} dx =$

21. $\Gamma(m) \Gamma(m+1/2) =$ _____

22. $\Gamma(7/2) =$

23. If $\int_0^{\infty} \frac{x^m (1+x^5)}{(1+x)^5} dx = 2 B(m, n)$ ~~where~~ where $m =$ _____

and $n =$ _____

24. Vectors having zero divergence are called _____

25. A vector is said to be irrotational if _____

26. $\text{div. } \hat{r} = \underline{\hspace{2cm}}$

27. According to Green's theorem $\oint (\phi dx + \psi dy) =$