

CLASS - XII

VNR COACHING CENTER

MATHSCHAPTER 8,9CHOSE $20 \times 1 = 20$ PART - B

21. Find partial derivative $g(x, y) = 3x^2 + y^2 + 5x + 2$ at $(1, -2)$
22. If $w(x, y, z) = x^2 + y^2z + z^2x$ $x, y, z \in \mathbb{R}$ find dw
23. Three fair coins tossed simultaneously. Find probability mass function number of heads.
24. Compute $P(X=k)$ Binomial distribution $n=9$ $p=\frac{1}{2}$ $k=7$
25. Using linear approximation find approximate value $\sqrt[4]{15}$
26. If the radius of sphere with radius 10 cm, has to decrease by 0.1 cm. approximately how much will its volume decrease
27. Show that $f(x, y) = \frac{x^2 + 5xy - 10y^2}{3x + 7y}$ Homogeneous function of degree 1
28. $f(x) = \begin{cases} 0 & -\infty < x < -1 \\ 0.15 & -1 \leq x < 0 \\ 0.35 & 0 \leq x < 1 \\ 0.60 & 1 \leq x < 2 \\ 0.80 & 2 \leq x < 3 \\ 1 & 3 \leq x < \infty \end{cases}$ Find pmf
29. Write properties of distribution function
30. Two balls are chosen randomly from an urn contain 6 white and 4 black balls. Suppose we win 30 for black ball, and we lose 20 white - Inverse Image

PART - C 3 mark

31. Find the expected of x $E(x)$, $Var(x)$

$$f(x) = \begin{cases} \lambda e^{-\lambda x} & x > 0 \\ 0 & \text{otherwise} \end{cases}$$

32. Find c $f(x) = \begin{cases} cx^2 & 1 < x < 4 \\ 0 & \text{otherwise} \end{cases}$

(i) $P(1.5 < x < 3.5)$

(ii) $P(x \leq 2)$

33. If μ , σ^2 mean and Variance of discrete random variable x and $E(x+3) = 10$, $E(x+3)^2 = 116$
Find μ , σ^2

34. Find binomial distribution

Five fair coin tossed once and x denotes number of head.

| | | | | | | |
|--------|-----|------|------|------|------|-------|
| x | 1 | 2 | 3 | 4 | 5 | 6 |
| $f(x)$ | k | $2k$ | $6k$ | $5k$ | $6k$ | $10k$ |

(i) $P(2 < x < 6)$

(ii) $P(2 \leq x < 5)$

(iii) $P(x \leq 4)$

36. $U(x, y, z) = x^2 - xy + 3 \sin z$ Find linear approximation U at $(2, -1, 0)$

37. $G(x, y) = 2y + x^2$, $x = 2s - 5$, $y = s^2 + 2s$

Find $\frac{dg}{ds}$, $\frac{dg}{dx}$

38. The radius of circular plate is measured as 12.65
Instead length 12.5 cm. Find Absolute error,
relative error, Percentage error.

39. $U(x, y) = \frac{x^2 + y^2}{x + y}$ $x \frac{\partial U}{\partial x} + y \frac{\partial U}{\partial y} = \frac{3}{2} U$

40. $V(x, y, z) = x^3 + y^3 + z^3 + xyz^3$ Show $\frac{\partial^2 V}{\partial y \partial z} = \frac{\partial^2 V}{\partial z \partial y}$

PART-D

41. $U = \sin^{-1}\left(\frac{x+y}{\sqrt{x+y}}\right)$ Show $x \frac{\partial U}{\partial x} + y \frac{\partial U}{\partial y} = \frac{1}{2} \tan U$

42. $F(x, y) = \sin(xy)^2 + e^{x^2+5y}$ Find $\frac{\partial F}{\partial x}, \frac{\partial F}{\partial y}, \frac{\partial^2 F}{\partial y \partial x}$
and $\frac{\partial^2 F}{\partial x \partial y}$

43. $w(x, y, z) = \frac{1}{\sqrt{x^2+y^2+z^2}}$ $\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} + \frac{\partial^2 w}{\partial z^2} = 0$

44. $F(x, y) = \frac{y^2 - xy}{\sqrt{x-y}}$ (x, y) $\lim_{x \rightarrow y \rightarrow 0, 0} F(x, y) = 0$

(i) Find DF and dF

$F(x) = x^3 - 2x^2$

$x=2$

$\Delta x = dx = 0.1$

45. $F(x) = \begin{cases} k e^{-2x} & \text{for } x > 0 \\ & x \leq 0 \end{cases}$

(i) find k (ii) Distribution function (iii) $P(x < 2)$

(iv) x is at least four unit (v) $P(x=3)$

46. A six sided die is marked '1' on face '2' on two faces, '3' on three faces.

find PMF, CDF, $P(3 \leq x < 6)$ (vi) $P(x \geq 4)$

47. If the probability that a fluorescent light has useful of atleast 600 hours is 0.9, find probability among 12 such light

(i) exactly 10 will have a useful life atleast 600 hours.

(ii) atleast 11 will atleast 600 hours.

(iii) atleast 2 will not have atleast 600 hours.

48. $f(x) =$

| | | | | | | |
|--------|-------|--------|--------|--------|-----|------|
| x | 1 | 2 | 3 | 4 | 5 | 6 |
| $f(x)$ | c^2 | $2c^2$ | $3c^2$ | $4c^2$ | c | $2c$ |

Find c , mean, variance.