

QUESTION BANK OF APPLIED MATHEMATICS (17301)

1. $\int \sin x dx$
a. $-\cos x$ b. $\cos x$ c. $\sin x$ d. $-\sin x$
2. To apply integration parts rule, we select u in the order of _____
a. EITLA b. BLTEA c. LETAI d. LIATE
3. $\int \log x dx =$ _____
a. $\text{Log } x$ b. $1/x$ c. $x(\log x - 1) + c$ d. $\log x + 1/x$
4. $dy/dx (\sec x) =$ _____
a. $\sec x \cot x$ b. $\tan x \cot x$ c. $\cos x \cot x$ d. $\sec x \tan x$
5. $\int a^x dx =$ _____
a. $a^x \cdot \log a$ b. $a^x / \log a$ c. $x^a \cdot \log x$ d. $x^a / \log x$
6. $\int f'(x)/f(x) dx =$ _____
a. $\log|f(x)|$ b. $f(\log x)$ c. $\log|x|$ d. $\log[f'(x)]$
7. $dy/dx (uv) =$ _____
a. $uv + u'v'$ b. $u + v + u' + v'$ c. $v'u' + u'v'$ d. $uv' + vu'$
8. If the question is in the form of $\int f(x) \cdot f'(x) dx$ then to solve this we use _____
a. integration by parts method b. substitution method c. partial fraction method
d. none of above
9. 10. degree of a differential equation is the _____
a. degree of x b. degree of y c. degree of highest order derivative d. same as order of derivative
10. Derivative of a constant 'k' is _____
a. K b. 1 c. 0 d. both 1 and 0
11. $\int k dx =$ _____ where 'k' is a constant
a. $k + c$ b. $1 + c$ c. 0 d. $kx + c$

12. To form a differential equation, we are differentiating the equation as many times as the _____

- a. order of y b. order of x c. number of fixed constants d. number of arbitrary constants

13. Solution of a linear differential equation is given as _____

- a. IF b. $\int IF \, dx$ c. $y \cdot IF = \int Q \cdot IF \, dx + c$ d. $IF = \int Q \, dx + c$

14. $\int \tan x \, dx =$ _____

- a. $\log |\sec x|$ b. $\log |\sin x|$ c. $\log |\tan x|$ d. none of above

15. Area under the curve $y=2x+1$ and the ordinates $x=0$ & $x=2$ will be _____

- a. 4 sq. cm. b. 9 sq. cm. c. 6 sq. cm. d. none of above

16. $\int uv \, dx =$ _____

- a. $u \int v \, dx - \int [\int v \, dx \cdot u'] \, dx$ b. $\int v \, dx - \int v \, dx \cdot u' \, dx$ c. $v \cdot \int u \, dx + \int [\int u \, dx \cdot v'] \, dx$ d. none of above

17. What is the probability of getting a sum 9 from two throws of a dice?

- a. $1/6$ b. $1/8$ c. $1/9$ d. $1/12$

18. Three unbiased coins are tossed. What is the probability of getting at most two heads?

19. $\frac{3}{4}$ b. $\frac{1}{4}$ c. $\frac{3}{8}$ d. $\frac{7}{8}$ In a Binomial

Distribution, if 'n' is the number of trials & 'p' is the Probability of Success, then the mean value is given by _____

- a. np b. n c. p d. np (1-2)

20. If 'x' is random variable, taking values 'x', probability of success & failure being 'p' and 'q' respectively and 'n' trials being conducted, then what is the probability that 'x' takes value 'x' ?

Use Binomial Distribution

- a. $P(X=x) = {}^n C_x \cdot p^x \cdot q^{n-x}$ b. $P(X=x) = {}^n C_x \cdot p^x \cdot q^{n-x}$ c. $P(X=x) = {}^x C_n \cdot p^{(n-x)} \cdot q^x$

- d. $p(x=x) = {}^x C_n \cdot p^n \cdot q^x$

In a binomial distribution, the mean and variance are equal

- a. True b. False

21. It is suitable to use binomial distribution only for _____

a) large value of 'n' b) factorial value of 'n' c) small value of 'n' d) any value of 'n'

22. Binomial distribution is a _____

- a. continuous distribution b. discrete distribution c. irregular distribution
d. not a probability distribution

23. If 'm' is the mean of a Poisson distribution, then variance is given by _____

- a. m^2 b. $m^{1/2}$ c. m d. $m/2$

24. In a Poisson distribution the mean and variance are equal

- a. true b. false

25. If 'm' is the mean of a Poisson distribution, the $p(0)$ is given by _____

- a. e^{-m} b. e^m c. e d. m^{-e}

26. In a Poisson distribution the mean and standard deviation are equal

- a. true b. false

27. For a Poisson distribution, if mean (m)=1, then $p(1)$ is ?

- a. $1/e$ b. e c. $e/2$ d. indeterminate

29. The shape of the normal curve is _____

- a. Bell Shaped b. Flat c. Circular d. spiled

30. For a Standard normal variate, the value of mean is ?

- a. ∞ b. 1 c. 0 d. not defined

31. Normal distribution is symmetric about _____

- a. Variance b. mean c. standard deviation d. covariance

32. The area under a standard normal curve is ?

- a. 0 b. 1 c. ∞ d. not define

33. The standard normal curve is symmetric about the value _____

- a. 0.5 b. 1 c. ∞ d. 0

34. Probability lies between _____

- a. $-1 \leq P(A) \leq 1$ b. $0 \leq P(A) \leq 1$ c. $-3 \leq P(A) \leq 3$ d. $1 \leq P(A) \leq \infty$

35. The sum of all probabilities equal to :

- a. 4 b. 1 c. 3 d. 2

36. If $P(A) = 0.44$ then $P(A') = ?$

- a. 0.44 b. 0.55 c. 0.50 d. 0.56

37) Find the slope of the curve $y = x^2 + 3x + 8$ at $x = 1$

- a) 7 b) 5 c) 2.3 d) 1

38) Equation of tangent to the curve $y = x^2$ at point (1, 1) is

- a) $2x - y - 1 = 0$ b) $2x + y - 1 = 0$ c) $2x + y + 1 = 0$ d) $2x + y = 0$

39) At what point on the curve $y = e^x$, the slope is 1.2

- a) (1, 1) b) (-1, 1) c) (0, 1) d) None

40) Divide 80 into two parts such that their product is maximum

- a) (40, 40) b) (20, 60) c) (50, 30) d) (1, 79)

41) Given two real numbers where the function $y = x^3 - 9x^2 + 24x$ is maximum
or minimum

- a) (2, 4) b) (1, 2) c) (2, 2) d) (0, 0)

42) Formula of radius of curvature depends on

- a) only $\frac{dy}{dx}$ b) only $\frac{d^2y}{dx^2}$ c) Both $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ d) None

43) Evaluate $\int_1^e \frac{1}{x} dx$

a) 0 b) 2 c) 1 d) -1

44) Evaluate $\int \frac{dx}{\sqrt{1-x^2}}$

a) $\sin^{-1}x + c$ b) $\cos^{-1}x$ c) $\tan^{-1}x + c$ d) $\cot^{-1}x$

45) Evaluate $\int \cos(2x + 5) dx$

a) $\frac{\sin(2x+5)}{2} + c$ b) $\sin(2x + 5)$ c) $2 \cdot \sin(2x + 5) + c$ d) None

46) Which method can evaluate $\int \frac{1}{(x-1)(x-2)(x-3)} dx$

a) Substitution b) By parts c) Partial fraction d) Derivative

47) Which is correct substitution to solve Bernoulli's differential equation $\frac{dy}{dx} + \frac{y}{x} = y^2$

a) $\frac{1}{y} = t$ b) $y = t$ c) $y^2 = t$ d) $\frac{1}{x} = t$

48) What is integrating factor of linear differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$

a) x b) x^2 c) x^3 d) $x \cdot y$

49) What is the order of the differential equation $\frac{d^2y}{dx^2} - x \cdot \frac{dy}{dx} = 0$

a) One b) Two c) Three d) One & Two

50) Formation of differential equation from solution is based on...

a) Differentiation b) Integration c) By parts d) None

51) What is the order of differential equation for the solution $y = ax^2$

a) One b) Two c) Three d) Four

52) Area between the curve $y = x$ and $y = x^2$ is by integration

a) $\int_0^1 y dx$ b) $\int_0^1 x^2 dx$ c) $\int_0^1 x - x^2 dx$ d) $\int_0^0 x - x^2 dx$

53) Which is the correct substitution to evaluate $\int \frac{e^x(x+1)}{\cos^2(xe^x)} dx$

- a) $x = t$ b) $e^x = t$ c) $x + 1 = t$ d) $x \cdot e^x = t$

54) To evaluate $\int \frac{1}{2 \sin x + 3 \cos x} dx$, put

- a) $\sin x = t$ b) $\cos x = t$ c) $\tan\left(\frac{x}{2}\right) = t$ d) $\tan x = t$

55) Evaluate $\int x \cdot e^x dx$

- a) $e^x(x + 1)$ b) $e^x(x + 1) + c$ c) $x \cdot e^x + 1 + c$ d) None

56) Evaluate $\int_4^9 \frac{dx}{\sqrt{x}}$

- a) 1 b) 2 c) 3 d) 4

57) Evaluate $\int_{-1}^1 x^2 dx$

- a) $\frac{2}{3}$ b) -1 c) 5 d) $\frac{3}{2}$

58) Evaluate $\int_0^a \frac{\sqrt{x}}{\sqrt{x} + \sqrt{a-x}} dx$

- a) Substitution b) By parts c) Partial fraction d) By properties

59) Evaluate $\int_{\pi}^{\pi} \frac{dx}{5 + 3 \cos^2 x}$

- a) 0 b) 4 c) π d) 2π

60) Area under the curve $y = \sin x$ and x-axis from $x = 0$ to $x = \pi$ is

- a) 2 sq. units b) 4 sq. units c) 5 sq. units d) 0 (zero)

61) Area of the circle $x^2 + y^2 = 32$ by integration is

- a) π sq. units b) 36π sq. units c) 36 sq. units d) 3 sq. units

62) Area of Ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ by integration is

a) πa sq. units b) πb sq. units c) π sq. units d) πab sq. units

63) Which method is applicable to solve differential equation $\frac{dy}{dx} = e^{3x-2y} + x^2 \cdot e^{-2y}$

a) Variable separation b) Substitution c) Linear D.E d) Exact D.E

64) Evaluate $\int \tan^{-1}(\tan x) dx$

a) $x + c$ b) $\frac{x^2}{2} + c$ c) $2x + c$ d) 1

65) Which is the correct substitution to solve differential equation $\frac{dy}{dx} = (4x + y + 1)^2$

a) $x = t$ b) $4x = t$ c) $4x + y = t$ d) $4x + y + 1 = t$