Choose the correct answer.

1. If $y = f(x)$, then differential of y is denoted by

   (a) dx 　　　　 (b) dy 　　　　 (c) $\dfrac{dy}{dx}$ 　　　　 (d) $\dfrac{dx}{dy}$

2. If $y = f(x)$, $f(x + \delta x)$ is closely related to

   (a) $f(x) + f(\delta x)$ 　　(b) $f(x) + dy$ 　　(c) $f(x) \cdot f(x + \delta x)$ 　(d) $f(x) + \delta x$

3. Differentials are used to find :

   (a) approximate value (b) exact value 　　(c) Both a and b (d) None of these

4. $x\,dy + y\,dx =$

   (a) $d(x + y)$ 　　　 (b) $d\left(\dfrac{x}{y}\right)$ 　　　 (c) $d(x - y)$ 　　　 (d) $d(xy)$

5. If $dy = \cos x\,dx$, then $\dfrac{dx}{dy}$ is

   (a) $\sin x$ 　　　 (b) $\cos x$ 　　　 (c) $\operatorname{cosec} x$ 　　　 (d) $\sec x$

6. $\int [f(x)]^n f'(x)\,dx =$

   (a) $\dfrac{[f(x)]^{n+1}}{n+1} + c, n \neq -1$ 　　(b) $\dfrac{[f(x)]^{n-1}}{n-1} + c, n \neq 1$ 　　(c) $n.[f(x)]^{n-1} + c$ 　　(d) $\ln.|f(x)| + c$

7. If $\int e^{ax}[af(x) + f'(x)]dx =$

   (a) $e^{ax} f(x) + c$ 　　(b) $e^{ax} f'(x) + c$ 　　(c) $ae^{ax} + c$ 　　(d) $af(x) + c$

8. If $\varphi'(x) = f(x), then \displaystyle\int_a^b f(x)dx$ is

   (a) $\varphi(b) + \varphi(a)$ 　(b) $\varphi(b) - \varphi(a)$ 　(c) $\varphi(a) - \varphi(b)$ 　(d) $b - a$

9. An equation containing at least one derivative is called _____ equation

   (a) Integral 　　　 (b) Differential 　　 (c) Exact 　　　 (d) None of these

10. Order of the differential equation $\dfrac{dy}{dx} - 2x = y^2$

    (a) 1 　　　　 (b) 2 　　　　 (c) -2 　　　　 (d) None of these

11. $\dfrac{dy}{dx} \displaystyle\int f(x)dx = $ _____

    (a) $f'(x)$ 　　　 (b) $f(x)dy$ 　　　 (c) $f(x)$ 　　　 (d) $f(x)dx$

12. $\displaystyle\int_a^b f(x)dx$ is equal to

    (a) $\displaystyle\int_a^b f(t)dt$ 　　(b) $\displaystyle\int_a^b f(y)dy$ 　　(c) $\displaystyle\int_b^a f(x)dx$ 　　(d) Both a & b

13. The order of the highest derivative is called _____ of differential equation.

    (a) Power 　　　 (b) Degree 　　　 (c) Order 　　　 (d) None of these

14. A _____ is a relation between the variables which satisfies the differential equation.

    (a) solution 　　(b) integral equation 　(c) differential equation (d)

15. If $x = a \sin \theta$ then $dx =$ _____
    (a) $a \cos \theta$
    (b) $a \sin \theta d\theta$
    (c) $a \cos \theta d\theta$
    (d) $a \sin(d\theta)$

16. If $\dfrac{dy}{dx} = -y$, then y = _____
    (a) e^{-cx}
    (b) $e^{-x} + c$
    (c) $-e^{x}$
    (d) ce^{-x}

17. $\displaystyle\int_a^c f(x)dx - \int_b^c f(x)dx =$
    (a) $\displaystyle\int_b^a f(x)dx$
    (b) $\displaystyle\int_a^b f(x)dx$
    (c) $\displaystyle\int_a^c f(x)dx$
    (d) $\displaystyle\int_c^a f(x)dx$

18. The definite integral is closely related to the _____ of certain regions.
    (a) volume
    (b) area
    (c) Centre
    (d) None of these

19. $\displaystyle\int_{-a}^a f(x)dx = 2\int_0^a f(x)dx$, when f is _____ function.
    (a) Even
    (b) Odd
    (c) Polynomial
    (d) Rational

20. $\displaystyle\int [f(x)]^{-1} f'(x)dx =$
    (a) $f'(x) + c$
    (b) $f(x).f'(x) + c$
    (c) $\ln.|f(x)| + c$
    (d) $\ln.|f'(x)| + c$

21. Suitable substitution for $\sqrt{x^2 - a^2} =$
    (a) $x = a \sin \theta$
    (b) $x = a \sec \theta$
    (c) $x = a \tan \theta$
    (d) $x - a = a \sec \theta$

22. $\displaystyle\int u dv =$ _____
    (a) $uv - \displaystyle\int u dv$
    (b) $uv - \displaystyle\int v du$
    (c) $uv + \displaystyle\int v du$
    (d) $u - \displaystyle\int dv$

23. The integral $\displaystyle\int_a^b f(x)dx$ is called _____
    (a) Definite
    (b) Indefinite
    (c) Improper
    (d) None of these

24. If $\displaystyle\int a^x dx =$
    (a) $a^x . \ln a$
    (b) $.a^x$
    (c) $\dfrac{\ln a}{a^x}$
    (d) $\dfrac{a^x}{\ln a}$

25. If $\varphi_1(x), \varphi_2(x)$ are the two anti-derivative of a same function $f(x)$, then $\varphi_1(x) - \varphi_2(x) =$
    (a) 1
    (b) 0
    (c) x
    (d) constant

26. $\displaystyle\int_{-a}^a f(x)dx = 0$, when f is _____ function
    (a) Even
    (b) Odd
    (c) Polynomial
    (d) Rational

27. $x^2 \dfrac{d^2 y}{dx^2} + (\dfrac{dy}{dx})^3 - 2 = 0$
    (a) 1
    (b) 2
    (c) 3
    (d) None of these

28. If $\varphi'(x) = f(x)$, then $\varphi(x) =$
    (a) $f'(x)$
    (b) $f(x)$
    (c) $\displaystyle\int f(x)dx$
    (d) $\displaystyle\int dx$

29. If $y = f(x)$, then $\dfrac{dy}{dx} = f'(x)$ represents _____ of the tangent to the curve $y = f(x)$
    (a) Slope
    (b) gradient
    (c) length
    (d) Both a & b

30. Integration and derivative are the _____ process of each other.
    (a) Same
    (b) reverse
    (c) Both a & b
    (d) None of these

31. $\displaystyle\int_{-\pi}^{\pi} \sin x\, dx =$

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

32. $\displaystyle\int \frac{1}{(x-a)^2}\, dx =$

    (a) $\dfrac{-2}{(x-a)^3} + c$ (b) $\ln(x-a)^2 + c$ (c) $\ln(x-a) + c$ (d) $\dfrac{-1}{(x-a)} + c$

33. If $y = f(x) + c$ is the solution of any differential equation, then it is called _____
    (a) General   (b) Particular   (c) Imaginary   (d) Both a & c

34. The arbitrary constant in a solution of D.E is determined by some given conditions, such conditions are called __
    (a) Initial   (b) Exact   (c) boundary   (d) none of these

35. Integration by parts of two functions $f(x)$ and $g'(x)$ is i.e. $\int f(x)g'(x)dx =$

    (a) $f(x)g(x)$ (b) $f(x)g(x) - g(x)\int f(x)dx$ (c) $f(x)g(x) - f'(x)\int g(x)dx$ (d)
    $f(x)g(x) - \int f'(x)g(x)dx$

36. If $\displaystyle\int_{-2}^{1} f(x)dx = 5,$ and $\displaystyle\int_{1}^{3} f(x)dx = 3$ then $\displaystyle\int_{-2}^{3} f(x)dx =$ _____
    (a) 8   (b) 2   (c) 0   (d) None of these

37. $\displaystyle\int_{0}^{3} \frac{dx}{x^2 + 9} =$ _____

    (a) $\pi/4$ (b) π (c) $\pi/12$ (d) 0

38. $\displaystyle\int_{1}^{2} \ln x\, dx =$ _____

    (a) 2.ln2   (b) 2.ln2-1   (c) -1/2   (d) 0

39. Any solution obtained by putting different values of arbitrary constant is called _____ solution
    (a) General   (b) Particular   (c) Imaginary   (d) Both b & c

40. $\displaystyle\int_{a}^{a} f(x)dx =$

    (a) 1   (b) $f(a)$ (c) a (d) 0

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