

## Topic :-INTEGRALS

1. The value of the integral  $\int_{1/e}^e |\log x| dx$ , is  
 a)  $2\left(\frac{e-1}{e}\right)$                       b)  $2\left(\frac{1-e}{e}\right)$                       c)  $2 - \frac{1}{e}$                       d) None of these
  
2.  $\int_0^{\pi/8} \cos^3 4\theta d\theta$  is equal to  
 a)  $\frac{5}{3}$                       b)  $\frac{5}{4}$                       c)  $\frac{1}{3}$                       d)  $\frac{1}{6}$
  
3.  $\int_{-1}^1 \frac{\cosh x}{1+e^{2x}} dx$  is equal to  
 a) 0                      b) 1                      c)  $\frac{e^2-1}{2e}$                       d)  $\frac{e^2+2}{2e}$
  
4. If  $u_{10} = \int_0^{\pi/2} x^{10} \sin x dx$ , then the value of  $u_{10} + 90 u_8$ , is  
 a)  $9\left(\frac{\pi}{2}\right)^8$                       b)  $\left(\frac{\pi}{2}\right)^9$                       c)  $10\left(\frac{\pi}{2}\right)^9$                       d)  $9\left(\frac{\pi}{2}\right)^9$
  
5.  $\int \frac{x^3 \sin[\tan^{-1}(x^4)] dx}{1+x^8}$  is equal to  
 a)  $\frac{1}{4} \cos[\tan^{-1}(x^4)] + c$                       b)  $\frac{1}{4} \sin[\tan^{-1}(x^4)] + c$   
 c)  $-\frac{1}{4} \cos[\tan^{-1}(x^4)] + c$                       d)  $\frac{1}{4} \sec^{-1}[\tan^{-1}(x^4)] + c$
  
6.  $\left[\sum_{n=1}^{10} \int_{-2n-1}^{-2n} \sin^{27} x dx\right] + \left[\sum_{n=1}^{10} \int_{2n}^{2n+1} \sin^{27} x dx\right]$  equals  
 a)  $27^2$                       b)  $-54$                       c) 54                      d) 0
  
7.  $\int \frac{1}{\sin^2 x \cdot \cos^2 x} dx$  is equal to  
 a)  $\sin x - \cos x + c$                       b)  $\tan x + \cot x + c$                       c)  $\cos x + \sin x + c$                       d)  $\tan x - \cot x + c$
  
8. The value of the integral  $\int_{-1}^1 (x - [2x]) dx$ , is  
 a) 1                      b) 0                      c) 2                      d) 4
  
9. The function  $F(x) = \int_0^x \log\left(\frac{1-x}{1+x}\right) dx$ , is  
 a) An even function                      b) An odd function                      c) A periodic function                      d) None of these

10. If  $\int \frac{1}{x\sqrt{1-x^3}} dx = a \log \left| \frac{\sqrt{1-x^2}-1}{\sqrt{1-x^2}+1} \right| + b$ , then  $a$  is equal to

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

11.  $\frac{d}{dx} \left( \int_{f(x)}^{g(x)} \phi(t) dt \right)$  is equal to

- a)  $\phi(g(x)) - \phi(f(x))$   
 b)  $\frac{1}{2}[\phi(g(x))]^2 - \frac{1}{2}[\phi(f(x))]^2$   
 c)  $g'(x)\phi(g(x)) - f'(x)\phi(f(x))$   
 d)  $\phi'(g(x))g'(x) - \phi'(f(x))f'(x)$

12.  $\int_1^3 (x-1)(x-2)(x-3) dx$  is equal to

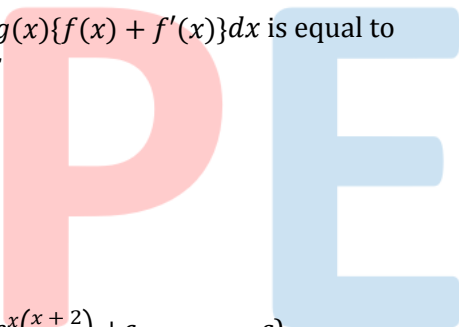
- a) 3                                    b) 2                                    c) 1                                    d) 0

13. If  $f(x) = \left| \begin{matrix} \sin x + \sin 2x + \sin 3x & \sin 2x & \sin 3x \\ 3 + 4 \sin x & 3 & 4 \sin x \\ 1 + \sin x & \sin x & 1 \end{matrix} \right|$ , then the value of  $\int_0^{\pi/2} f(x) dx$  is

- a) 3                                    b)  $\frac{2}{3}$                                     c)  $\frac{1}{3}$                                     d) 0

14. If  $\int g(x) dx = g(x)$ , then  $\int g(x)\{f(x) + f'(x)\} dx$  is equal to

- a)  $g(x)f(x) - g(x)f'(x) + C$   
 b)  $g(x)f'(x) + C$   
 c)  $g(x)f(x) + C$   
 d)  $g(x)f^2(x) + C$



15.  $\int \left( \frac{x+2}{x+4} \right)^2 e^x dx$  is equal to

- a)  $e^x \left( \frac{x}{x+4} \right) + c$                     b)  $e^x \left( \frac{x+2}{x+4} \right) + c$                     c)  $e^x \left( \frac{x-2}{x+4} \right) + c$                     d)  $\left( \frac{2xe^x}{x+4} \right) + c$

16. If  $P = \int_0^{3\pi} f(\cos^2 x) dx$  and  $Q = \int_0^{\pi} f(\cos^2 x) dx$ , then

- a)  $P - Q = 0$                     b)  $P - 2Q = 0$                     c)  $P - 3Q = 0$                     d)  $P - 5Q = 0$

17. If  $I_1 = \int_0^{3\pi} f(\cos^2 x) dx$  and  $I_2 = \int_0^{\pi} f(\cos^2 x) dx$  then

- a)  $I_1 = I_2$                     b)  $I_1 = 2I_2$                     c)  $I_1 = 5I_2$                     d) None of these

18. For any  $n \in N$  and  $x \in R^+$ , the value of the integral  $\int_0^{n[x]} (x - [x]) dx$ , is

- a)  $n[x]$                     b)  $[x]$                     c)  $\frac{n}{2}[x]$                     d) None of these

19.  $\int_0^1 \frac{x^3 dx}{(x^2+1)^{3/2}}$  is equal to

- a)  $(\sqrt{2} - 1)^2$                     b)  $\frac{(\sqrt{2}-1)^2}{2}$                     c)  $\frac{\sqrt{2}-1}{2}$                     d) None of these

20. The value of  $\int_0^{2\pi} |\cos x - \sin x| dx$ , is

a)  $\frac{4}{\sqrt{2}}$

b)  $2\sqrt{2}$

c)  $\frac{2}{\sqrt{2}}$

d)  $4\sqrt{2}$

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