**Subject code:- 3320002/03**
**Subject Name:- Advance Mathematics**
**Branch:- Civil and Computer**
**Chap.4:- Integration and its Applications**
**Date:-10/04/2015**
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**Section : 1 Questions for mark 1**

1. $\int e^{x \log a} dx =$.....
2. $\int e^x \left(\frac{1}{x} - \frac{1}{x^2}\right) =$.....
3. $\int_{-1}^{1} \sin^3 x \cos^4 x dx =$.....
4. $\int \sqrt{1 + \sin 2x} dx =$.....
5. $\int \frac{1}{1+x^2} dx =$.....
6. $\int (\sin^2 x + \cos^2 x) dx =$.....
7. $\int \frac{1}{\sqrt{a^2 - x^2}} dx =$.....
8. $\int \frac{1}{x^2 + 25} dx =$.....
9. $\int \cos(ax + b) dx =$.....
10. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x dx =$

**Section : 2 Questions for mark 3**
**Integrate the followings:**

1. $\int x^3 \tan^5(x^4) \sec^2(x^4) dx.$
2. $\int \frac{e^x(1+x)}{\sin^2(xe^x)} x$
3. $\int \sin 5x \sin 6x dx.$
4. $\int \frac{3x^2 - 2x}{x+4} dx.$
5. $\int \cos(\log x) dx.$
6. $\int e^x \left(\frac{1 + \sin x}{1 - \cos x}\right) dx.$
7. $\int \frac{x^4 + x^2 + 1}{x^2 + 1} dx.$
8. $\int \frac{2 + 3 \sin x}{\cos^2 x} dx.$
9. $\int e^{\tan x} \sec^2 x dx.$
10. $\int x e^x dx.$
11. $\int_1^e \frac{(\log x)^n}{x} dx.$

**Section : 3 Questions for mark 4**
**Do as direct:**

1. $\int_0^{\frac{\pi}{2}} \frac{\cos x - \sin x}{1 + \sin x \cos x} dx.$
2. $\int_0^1 \frac{1}{1 + \sqrt{1 - x^2}} dx.$
3. $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\cos x} + \sqrt{\sin x}} dx.$
4. $\int_0^{\frac{\pi}{2}} \log(\tan x) dx.$
5. Find the area of a region bounded by $y = 3x^2$, $x = 2$, $x = 3$ and $x$-axis.
6. Find the area of a region bounded by the curve $y^2 = 4x$ and $x = 2$.
7. Find the volume of a sphere of radius $r$ by method of integration.
8. Using integration find the area of circle $x^2 + y^2 = a^2$.