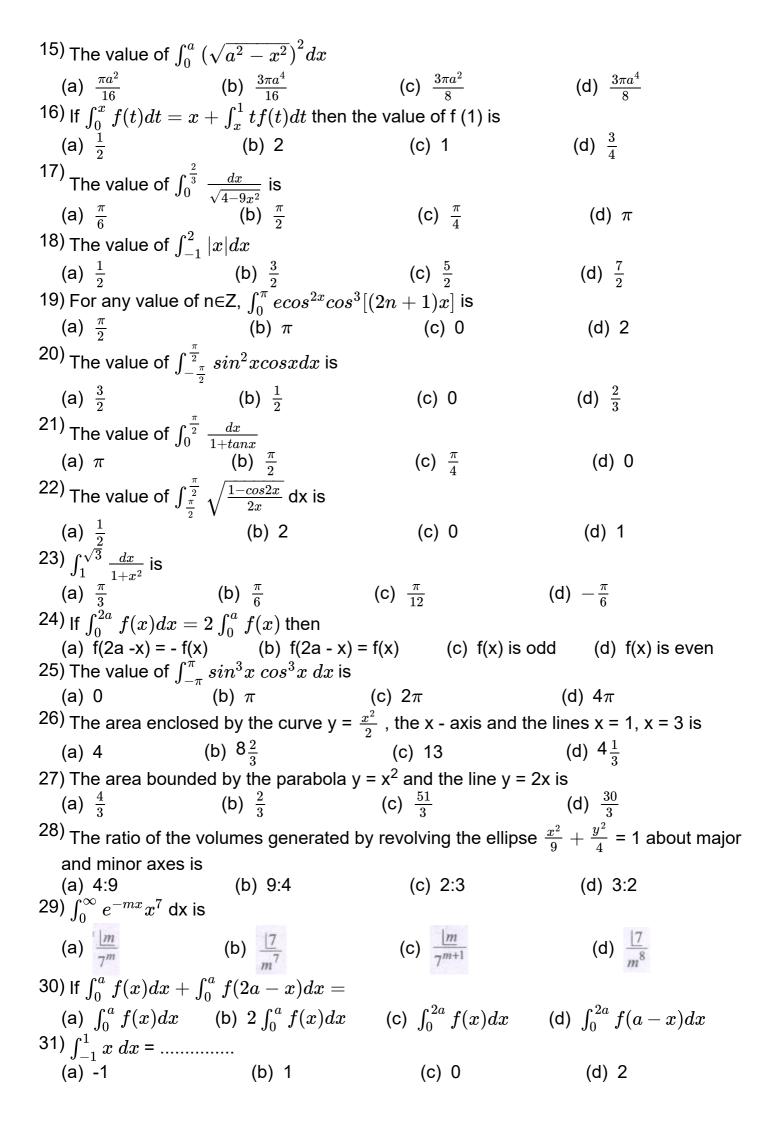
# RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CHENNAI – 82. WHATSAPP - 8056206308

### **Applications of Integration**

12th Standard

Maths					
Exam Time : 00:40:00	Hrs		Total Ma 40 x	orks : 40 x 1 = 40	
1) The value of $\int_{-4}^4 \left[ t d t \right]$	$an^{-1}\left(rac{x^2}{x^4+1} ight)+tan$	$n^{-1}\left(rac{x^4+1}{x^2} ight)  ight] dx$ is			
(a) $\pi$	b) $2\pi$	(c) $3\pi$	(d) $4\pi$		
(a) $\pi$ (2) The value of $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}}$ (	$\left(\frac{2x^7 - 3x^5 + 7x^3 - x + 1}{\cos^2 x}\right) dx$	dx is			
(a) 4	(b) 3	(c) 2	(d) 0		
3) If $f(x) = \int_0^x t \cos t$	u u				
(a) cos x-x sin x			$x \cos x$ (d) $x \sin x$	Χ	
4) The area between y		0	(d) 5		
(a) $\frac{2}{3}$	9	(c) $\frac{\circ}{3}$	(d) $\frac{5}{3}$		
5) The value of $\int_0^1 x(1)$	_	1	1		
(a) $\frac{1}{11000}$	(b) $\frac{1}{10100}$	(c) $\frac{1}{10010}$	(d) $\frac{1}{10001}$		
6) The value of $\int_0^\pi \frac{d}{1+5}$	$\frac{dx}{dx}$ is				
(a) $\frac{\pi}{2}$		(c) $\frac{3\pi}{2}$	(d) $2\pi$		
7) The value of $\frac{(n+2)}{(n)}$		2	* *		
(a) 10	(b) 5	(c) 8	(d) 9		
<sup>8)</sup> The value of $\int_0^{\frac{\pi}{6}} cos$	$s^3 3x dx$				
(a) $\frac{2}{3}$		(c) $\frac{1}{9}$	(d) $\frac{1}{3}$		
9) The value of $\int_0^{\pi} sin$	J	`	` ' 3		
(a) $\frac{3\pi}{10}$		(c) $\frac{3\pi}{4}$	(d) $\frac{3\pi}{2}$		
10) The value of $\int_0^\infty e^{-\frac{\pi}{2}}$		(3) 4	( <b>4</b> ) 2		
7	۳	(a) 4	$(d)$ $^2$		
(a) $\frac{7}{27}$	41	(c) $\frac{4}{27}$	(d) $\frac{2}{27}$		
11) If $\int_a^a rac{1}{4+x^2} dx = rac{\pi}{8}$ t			4.13		
(a) 4	(b) 1	(c) 3	(d) 2		
is	a of revolution of th	e region bounded	by $y^2 = x(a - x)$ about x	x-axis	
(a) $\pi a^2$	(b) $\pi a^2$	$(a)$ $\pi a^2$	(d) $\pi a^2$		
13) If $f(x)f(x)=\int_1^x rac{e^{si}}{a}$		$\int_1^3 rac{e^{sin x}}{x} dx = rac{1}{2}$	$\cdot [f(a) - f(1)]$ , then on	e of the	
possible value of a i		(1) 0	(1) 5		
(a) 3	(b) 6	(c) 9	(d) 5		
14) The value of $\int_0^1 (s^2)$	_	2	2		
(a) $\frac{\pi^2}{4} - 1$	(b) $\frac{\pi^2}{4} + 2$	(c) $\frac{\pi^2}{4} + 1$	(d) $rac{\pi^2}{4}-2$		



32) $\int_0^{2a} f(x) dx =$	$=2\int_0^{2a}f(x)dx$			
(a) $f(2a - x) = f($	(x) (b) f(a	-x) = f(x) (c) $f(x) = f(x)$	f(x) = -f(-x)	(d) $f(-x) = f(x)$
33) The area enc	losed by the cur	ve $y^2 = 4x$ , the x-axis	s and its latus re	ectum is
sq.uni				
(a) $\frac{2}{3}$	(b) $\frac{4}{3}$	(c) $\frac{8}{3}$	(d)	$\frac{16}{3}$
<sup>34)</sup> The area of th				
(a) 6π		<b>T</b>	(d)	36π <sup>2</sup>
35) The volume g	generated by the	curve $y^2 = 16x$ from	x = 2 to $x = 3$ re	otating about x - axis
cu. units	·	•		-
(a) 72π	(b) $\frac{256 \times 19}{3}$ TT	(c) 40	Dπ (d	) 80π
36) $\int_a^b f(x)dx =$				
(a) $2\int_0^a f(x)dx$	$dx$ (b) $\int_a^b f(a)$	$-x)dx$ (c) $\int_b^a f(b)$	$(-x)dx$ (d) $\int$	$\int_a^b f(a+b-x)dx$
37) $\int_{-rac{\pi}{2}}^{rac{\pi}{2}} rac{sinx}{2+cosx} dz$				
(a) 0	(b) 2	(c) log 2	(d) log	<b>j</b> 4
38) $\int_0^{\frac{\pi}{4}} cos^3 2x \ ds$	x =			
(a) $\frac{2}{3}$	(b) $\frac{1}{3}$	(c) 0	(d)	$\frac{2\pi}{3}$
39) $\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x}$	_			
·		(c) $\frac{\pi}{4}$	(	(d) $\pi$
40) The volume v	when $y=\sqrt{3+}$	$\overline{-x^2}$ from x = 0 to x =	4 is rotated ab	out x-axis is
(a) $100\pi$	(b) $\frac{100}{9}$	$\frac{0}{\pi}$ (c) $\frac{1}{\pi}$	$\frac{00\pi}{3}$	(d) $\frac{100}{3}$
	*****	*****	*****	

#### Applications of Integration 2 m

12th Standard

Maths

Reg.No. : Total Marks : 60

 $20 \times 2 = 40$ 

Date: 29-Oct-19

Exam Time: 00:40:00 Hrs

- 1) Find an approximate value of  $\int_{1}^{1.5} x dx$  by applying the left-end rule with the partition  $\{1.1, 1.2, 1.3, 1.4, 1.5\}$ .
- 2) Find an approximate value of  $\int_{1}^{1.5} (2-x) dx$  by applying the mid-point rule with the partition  $\{1.1, 1.2, 1.3, 1.4, 1.5\}$ .
- 3) Evaluate the following definite integrals:

$$\int_{3}^{4} \frac{dx}{x^2 - 4}$$

4) Evaluate the following definite integrals:

$$\int_{\overline{\theta}}^{\frac{\pi}{\theta}} e^x \left( \frac{1 + \sin x}{1 + \cos x} \right) dx$$

5) Evaluate the following integrals using properties of integration:

$$\int_{-5}^{5} x \cos\left(\frac{e^{x}-1}{e^{x}+1}\right) dx$$

6) Evaluate the following integrals using properties of integration:

$$\int_0^{2\pi} x log \left( \frac{3 + cos \quad x}{3 - cos \quad x} \right) dx$$

7) Evaluate the following integrals using properties of integration:

$$\int_0^{\sin^2 x} \sin^{-1} \sqrt{t} dt + \int_0^{\cos^2 x} \cos^{-1} \sqrt{t} dt$$

8) Evaluate the following integrals using properties of integration:

$$\int_{-\frac{\pi}{8}}^{\frac{3\pi}{8}} \frac{1}{1 + \sqrt{\tan x}} dx$$

9) Evaluate the following:

$$\int_0^1 \frac{\sin(3\tan^{-1}x)\tan^{-1}x}{1+x^2} dx$$

10) Evaluate the following:

$$\int_{\overline{\theta}}^{\pi} \frac{dx}{1 + 5\cos^2 x}$$

11) Evaluate the following

$$\int_0^{\pi/2} \cos^7 x \ dx$$

12) Evaluate the following

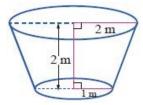
$$\int_{a}^{\frac{\pi}{4}} \sin^2 x \cos^4 x dx$$

13) Evaluate the following

$$\int_{0}^{1} x^{2} (1-x)^{3} dx$$

- 14) If  $\int_0^\infty e^{-ax^2} x^3 dx = 32$ ,  $\alpha > 0$ , find  $\alpha$
- 15) Find the area of the region bounded by the curve  $2+x-x^2+y=0$ , x-axis, x=-3 and x=3.
- 16) Find the area of the region bounded by  $y = \tan x$ ,  $y = \cot x$  and the lines x = 0,  $x = \frac{\pi}{2}$ , y = 0
- 17) The curve  $y = (x 2)^2 + 1$  has a minimum point at P. A point Q on the curve is such that the slope of PQ is 2. Find the area bounded by the curve and the chord PQ.

- 18) Find, by integration, the volume of the solid generated by revolving about the x-axis, the region enclosed by  $y = e^{-2x} y = 0$ , x = 0 and x = 1
- 19) The region enclosed between the graphs of y = x and  $y = x^2$  is denoted by R, Find the volume generated when R is rotated through 360° about x-axis.
- 20) Find, by integration, the volume of the container which is in the shape of a right circular conical frustum. 6. A watermelon has an ellipsoid shape which can be obtained by



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#### Applications of Integration 2 m [set 2]

12th Standard

Maths

Reg.No.:					
		To	tal M	<b>I</b> arks	: 50

 $25 \times 2 = 50$ 

Date: 29-Oct-19

1) Find an approximate value of  $\int_{1}^{1.5} x^2 dx$  by applying the right-end rule with the partition  $\{1.1, 1.2, 1.3, 1.4, 1.5\}$ .

2) Evaluate the following integrals as the limits of sums.

$$\int_{1}^{2} 4x^2 - 1) dx$$

Exam Time: 01:15:00 Hrs

3) Evaluate the following definite integrals:

$$\int_0^1 \sqrt{\frac{1-x}{1+x}} dx$$

4) Evaluate the following definite integrals:

$$\int_{\overline{\theta}}^{\frac{\pi}{\theta}} \sqrt{\cos\theta} \sin^3\theta d\theta$$

5) Evaluate the following integrals using properties of integration:

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (x^5 + x\cos x + \tan^3 x + 1) dx$$

6) Evaluate the following integrals using properties of integration:

$$\int_0^1 |5x - 3| \, dx$$

7) Evaluate the following integrals using properties of integration:

$$\int_0^1 \frac{\log(1+x)}{1+x^2} dx$$

8) Evaluate the following integrals using properties of integration:

$$\int_0^{\pi} \frac{x \sin x}{1 + \sin x} dx$$

9) Evaluate the following integrals using properties of integration:

$$\int_0^{\pi} x \left[ \sin^2(\sin x) + \cos^2(\cos x) \right] dx$$

10) Evaluate the following:

$$\int_0^1 x^3 e^{-2x} dx$$

11) Evaluate the following:

$$\int_{\frac{\pi}{0}}^{\frac{1}{0}} \frac{e^{a \sin^{-1}x} \sin^{-1}x}{\sqrt{1-x^2}} dx$$

12) Evaluate the following:

$$\int_{\frac{\pi}{0}}^{\frac{\pi}{0}} x^2 \cos 2x dx$$

13) Evaluate 
$$\int \frac{\pi}{\sqrt{2}} \frac{dx}{5 + 4\sin^2 x}$$

14) Evaluate the following

$$\int_0^{\pi/4} \sin^6 x \, dx$$

15) Evaluate the following

$$\int_0^{2\pi} \sin^{7} \frac{x}{4} dx$$

16) Evaluate the following

$$\int_{\overline{\theta}}^{\frac{\pi}{6}} \sin^3\theta \cos^5\theta d\theta$$

17) Evaluate the following:

$$\int_0^\infty x^5 e^{-3x} dx$$

18) Evaluate the following:

$$\int_{\frac{\pi}{6}}^{\frac{\pi}{6}} \frac{e^{-tanx}}{\cos^6 x} dx$$

- 19) Find the area of the region bounded by 3x 2y + 6 = 0, x = -3, x = 1 and x-axis.
- 20) Find the area of the region bounded by the line y = 2x + 5 and the parabola  $y = x^2 2x$ .
- 21) Find the area of the region bounded by the parabola  $y^2 = x$  and the line y = x 2
- 22) Father of a family wishes to divide his square field bounded by x = 0, x = 4, y = 4 and y = 0 along the curve  $y^2$  x = 4 and  $x^2y = 4$  into three equal parts for his wife, daughter and son. Is it possible to divide? If so, find the area to be divided among them.
- 23) Find, by integration, the volume of the solid generated by revolving about the x-axis, the region enclosed by  $y = 2x^2$ , y = 0 and x = 1.
- 24) The region enclosed between the graphs of y = x and  $y = x^2$  is denoted by R, Find the volume generated when R is rotated through 360° about x-axis.
- 25) A watermelon has an ellipsoid shape which can be obtained by revolving an ellipse with major-axis 20 cm and minor-axis 10 cm about its major-axis. Find its volume using integration.

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#### Applications of Integration 3 m

12th Standard

Maths

Reg.No.:

otal Marks: 73

Date: 29-Oct-19

Total Marks : 75

 $25 \times 3 = 75$ 

1) Evaluate : 
$$\int_{0}^{1} \frac{2x+7}{5x^2+9} dx$$

Exam Time: 01:30:00 Hrs

2) Evaluate  $:\int_0^1 [2x] dx$  where  $[\cdot]$  is the greatest integer function

3) Evaluate 
$$:\int_{\hat{\theta}}^{\frac{\pi}{6}} \frac{\sec x \tan x}{1 + \sec^2 x} dx$$

4) Evaluate : 
$$\int_{0}^{9} \frac{1}{x + \sqrt{x}} dx$$

5) Evaluate 
$$\int_{1}^{2} \frac{x}{(x+1)(x+2)} dx$$

6) Evaluate: 
$$\int_{\theta}^{\frac{\pi}{2}} \frac{\cos\theta}{(1+\sin\theta)(2+\sin\theta)} d\theta$$

7) Evaluate: 
$$\int_{\overline{\theta}}^{\frac{\pi}{\theta}} (\sqrt{\tan x} + \sqrt{\cot x}) dx$$

8) Evaluate:  $\int_0^{1.5} [x^2] dx$  where [x] is the greatest integer function

9) Evaluate: 
$$\int_{-4}^{4} [x+3]dx$$
.

10) Show that 
$$\int_{\frac{\pi}{6}}^{\frac{\pi}{6}} \frac{dx}{4 + 5sinx} = \frac{1}{3} \log_e 2$$

11) Prove that 
$$\int_{0}^{\pi} \frac{\sin 2x dx}{\sin^4 x + \cos^4 x} = \frac{\pi}{4}$$

12) Prove that 
$$\int_{0}^{\pi} \frac{dx}{a^2 \sin^2 x + b^2 \cos^2 x} = \frac{1}{ab} tan^{-1} \left(\frac{a}{b}\right) \text{ where a,b} > 0$$

13) Evaluate: 
$$\int_{0}^{\pi} \frac{1}{\sin x + \cos x} dx$$

14) Evaluate 
$$\int_0^{\pi} \frac{x}{1+sinx} dx$$

15) Evaluate: 
$$\int_{\frac{\pi}{2}}^{\frac{\pi}{2}} x \cos x \, dx$$
.

16) Prove that 
$$\int_{\frac{\pi}{6}}^{\frac{\pi}{6}} \log(1+\tan x) dx = \frac{\pi}{8} \log 2$$
.

17) Show that 
$$\int_0^1 (tan^{-1}x + tan^{-1}(1-x)) dx = \frac{\pi}{2} - \log_e 2$$

18) Evaluate 
$$\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} dx$$
.

19) Evaluate 
$$\int_{\theta}^{\frac{\pi}{2}} \frac{dx}{4sin^2x + 5cos^2x}$$

- 20) Find the volume of a sphere of radius a.
- 21) Find the volume of a right-circular cone of base radius r and height h.
- 22) Find the volume of the spherical cap of height h cut of from a sphere of radius r.
- 23) Find the volume of the solid formed by revolving the region bounded by the parabola  $y = x^2$ , x-axis, ordinates x = 0 and x = 1 about the x-axis.
- Find the volume of the solid formed by revolving the region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2}$  1, a > b about the major axis.
- 25) Find, by integration, the volume of the solid generated by revolving about y-axis the region bounded by the curves  $y = \log x$ , y = 0, x = 0 and y = 2.

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## RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CHENNAI – 82. WHATSAPP - 8056206308

### **Applications of Integration**

12th Standard

#### Maths

Exam Time: 02:00:00 Hrs

Total Marks: 90

 $30 \times 3 = 90$ 

- 1) Find an approximate value of  $\int_1^{1.5} x^2 dx$  by applying the right-end rule with the partition  $\{1.1, 1.2, 1.3, 1.4, 1.5\}$ .
- 2) Evaluate  $\int_0^1 x dx$ , as the limit of a sum.
- 3) Evaluate :  $\int_{0}^{1} \frac{2x+7}{5x^2+9} dx$
- 4) Evaluate :  $\int_0^9 \frac{1}{x+\sqrt{x}} dx$
- 5) Evaluate:  $\int_0^{\frac{\pi}{2}} \frac{\cos \theta}{(1+\sin \theta)(2+\sin \theta)} d\theta$
- 6) Show that  $\int_0^\pi g(sinx)dx=2\int_0^{\frac{\pi}{2}}g(sinx)dx$ ,where g(sin x) is a function of sin x.
- 7) If f (x) = f (a + x) , then  $\int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx$
- 8) Evaluate:  $\int_0^a \frac{fx}{fx + f(a-x)} dx$ .
- 9) Evaluate the following definite integrals:

$$\int_0^1 \sqrt{rac{1-x}{1+x}} dx$$

10) Evaluate the following definite integrals:

$$\int_0^{rac{\pi}{2}} \sqrt{cos heta} sin^3 heta d heta$$

11) Evaluate the following integrals using properties of integration:

$$\int_0^{2\pi} x log\left(rac{3+cos}{3-cos}rac{x}{x}
ight)\!dx$$

- 12) Evaluate  $\int_0^1 e^{-2x}(1+x-2x^3)dx$
- 13) Evaluate:  $\int_{-1}^{1}e^{-\lambda x}(1-x^2)dx$
- 14) Evaluate  $\int_0^{\frac{\pi}{2}} \frac{dx}{4sin^2x + 5cos^2x}$
- 15) Evaluate  $\int_0^{\frac{\pi}{\sqrt{2}}} \frac{dx}{5+4sin^2x}$
- 16) Evaluate  $\int_0^1 x^5 (1-x^2)^5 dx$
- 17) Evaluate the following

$$\int_0^{\pi/4} sin^6 x \quad dx$$

18) Evaluate the following

$$\int_0^{2\pi} sin^7 rac{x}{4} dx$$

19) Evaluate the following

$$\int_0^{rac{\pi}{2}} sin^3 heta cos^5 heta d heta$$

- 20) Evaluate  $\int_0^\infty e^{-ax} x^n dx$ , where a > 0.
- 21) If  $\int_0^\infty e^{-ax^2}x^3dx=32, lpha>0, \quad findlpha$

- 22) Find the area of the region bounded by the line 7x 5y = 35, x-axis and the lines x = -2 and x = 3.
- 23) Find the area of the region bounded between the parabola  $y^2$  ax = 4 and its latus rectum
- 24) Find the area of the region bounded by x-axis, the curve  $y = \cos x$ , the lines x = 0 and  $x = \pi$ .
- 25) Find the volume of a right-circular cone of base radius r and height h.
- 26) Find, by integration, the volume of the solid generated by revolving about y-axis the region bounded between the curve  $y=\frac{3}{4}\sqrt{x^2-16}, x\geq 4$ the y-axis, and the lines y =1 and y = 6.
- 27) Find, by integration, the volume of the solid generated by revolving about y-axis the region bounded by the curves  $y = \log x$ , y = 0, x = 0 and y = 2.
- 28) Evaluate  $\int_{0}^{1} x(1-x)^{10} dx$
- 29) Find the area bounded by  $x=0, x=6+5y-y^2$
- 30) Evaluate  $\int_0^{\frac{\pi}{2}} cos^{10} x dx$

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#### Applications of Integration 5 m

12th Standard

Maths

Reg.No.:

Total Marks: 100

Date: 29-Oct-19

 $20 \times 5 = 100$ 

Exam Time: 02:00:00 Hrs

- 1) Evaluate  $\int_{1}^{4} (2x^2 3) dx$ , as the limit of a sum
- 2) Evaluate  $\int_0^x x^2 \cos nx dx$ , where n is a positive integer.
- 3) Evaluate  $\int_{0}^{1} e^{-2x} (1 + x 2x^3) dx$
- 4) Evaluate:  $\int_{-1}^{1} e^{-\lambda x} (1 x^2) dx$
- 5) Evaluate  $\int_{\frac{\pi}{6}}^{\frac{\pi}{6}} (\sin^2 x + \cos^4 x) dx$
- 6) Find the values of the following:  $\int_{\frac{\pi}{0}}^{\frac{\pi}{0}} \sin^5 x \cos^4 x dx$
- 7) Evaluate  $\int_0^{2a} x^2 \sqrt{2ax x^2} dx$
- 8) Evaluate  $\int_{0}^{1} x^{3} (1-x)^{4} dx$
- Find the area of the region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- 10) Find the area of the region bounded between the parabola  $y^2$  ax = 4 and its latus rectum
- 11) Find the area of the region bounded by the y-axis and the parabola  $x=5-4y-y^2$ .
- 12) Find the area of the region bounded by x-axis, the curve  $y = \cos x$ , the lines x = 0 and  $x = \pi$ .
- 13) Find the area of the region bounded between the parabolas  $y^2 x = 4$  and  $x^2 y = 4$ .
- 14) Find the area of the region bounded between the parabola  $x^2$ =y and the curve y = x.
- 15) Find the area of the region bounded by  $y = \cos x$ ,  $y = \sin x$ , the lines  $x = \frac{\pi}{4}$  and  $x = \frac{5\pi}{4}$ .
- 16) The region enclosed by the circle  $x^2 + y^2 = a^2$  is divided into two segments by the line x = h. Find the area of the smaller segment.
- 17) Find the area of the region in the first quadrant bounded by the parabola  $y^2$  x=4, the line x+y=3 and y-axis
- 18) Find, by integration, the area of the region bounded by the lines 5x 2y = 15, x + y + 4 = 0 and the x-axis
- 19) Using integration find the area of the region bounded by triangle ABC, whose vertices A, B, and C are (-1,1), (3, 2), and (0,5) respectively
- 20) Using integration, find the area of the region which is bounded by x-axis, the tangent and normal to the circle  $x^2$   $y^2 + = 4$  drawn at  $(1,\sqrt{3})$

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#### RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CHENNAI – 82. WHATSAPP - 8056206308

### **Applications of Integration**

12th Standard

Maths

Exam Time: 02:30:00 Hrs Total Marks: 100  $20 \times 5 = 100$ 

1) Evaluate  $\int_{1}^{4} (2x^{2} - 3) dx$ , as the limit of a sum

- 2) Evaluate:  $\int_0^{rac{\pi}{2}} (\sqrt{tan} \ \ x + \sqrt{cot} \ \ x) dx$
- 3) Show that  $\int_0^{\frac{\pi}{2}} \frac{dx}{4+5sinx} = \frac{1}{3} \log_e 2$
- 4) Prove that  $\int_0^{\frac{\pi}{4}} \frac{dx}{a^2 sin^2 x + b^2 cos^2 x} = \frac{1}{ab} tan^{-1} \left(\frac{a}{b}\right)$  where a,b > 0 5) Evaluate  $\int_0^{\pi} \frac{x}{1 + sinx} \, \mathrm{dx}$
- 6) Show that  $\int_0^1 (tan^{-1}x+tan^{-1}(1-x)) \; \mathrm{dx}$  =  $\frac{\pi}{2}$   $\log_{\mathrm{e}}$ 2
- 7) Evaluate the following integrals using properties of integration:  $\int_0^{2\pi} sin^4x \cos^3 dx$
- 8) Evaluate the following integrals using properties of integration:  $\int_0^{sin^2x} sin^{-1}\sqrt{t}dt + \int_0^{cos^2x} cos^{-1}\sqrt{t}dt$
- 9) Evaluate the following integrals using properties of integration:  $\int_0^\pi rac{x sin x}{1+sin x} dx$
- 10) Evaluate the following integrals using properties of integration:  $\int_0^\pi x \left[ sin^2(sinx) + cos^2(cosx) 
  ight] dx$
- 11) Evaluate the following:  $\int_0^1 \frac{sin(3tan^{-1}x)tan^{-1}x}{1+x^2} dx$
- 12) Find the area of the region bounded by y = cos x, y = sin x, the lines  $x = \frac{\pi}{4}$  and  $x = \frac{5\pi}{4}$ .
- 13) Find, by integration, the area of the region bounded by the lines 5x 2y = 15, x + y + 4= 0 and the x-axis
- 14) Using integration, find the area of the region which is bounded by x-axis, the tangent and normal to the circle  $x^2 y^2 + = 4$  drawn at  $(1, \sqrt{3})$
- 15) Find the area of the region bounded between the curves  $y = \sin x$  and  $y = \cos x$  and the lines x = 0 and  $x = \pi$
- 16) Father of a family wishes to divide his square field bounded by x = 0, x = 4, y = 4 and y=0 along the curve  $y^2$  x=4 and  $x^2$ y=4 into three equal parts for his wife, daughter and son. Is it possible to divide? If so, find the area to be divided among them.
- 17) Find the area of the region common to the circle  $x^2 y^2 + =16$  and the parabola  $y^2 x$ =6x
- 18) Find the area of the loop of the curve  $3ay^2=x(x-a)^2$
- 19) Find the area of the region bounded by  $a^2y^2=a^2(a^2-x^2)$
- 20) Find the area of the region enclosed by the two circles  $x^2+y^2=1$  and  $(x-1)^2+y^2=1$ .

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#### Applications of Integration full test

Date: 29-Oct-19

Total Marks: 90 $20 \times 1 = 20$ 

Reg.No.:

(d)  $4\pi$ 

(d) 0

(d)  $\frac{5}{3}$ 

(d)  $\frac{1}{10001}$ 

(d) 9

(d)  $\frac{1}{3}$ 

(d)  $\frac{2}{27}$ 

(d) 2

(d)  $2\pi$ 

(d) x sin x

(c) x cos x

12th Standard Maths

(c)  $3\pi$ 

(c) 2

(c)  $\frac{8}{2}$ 

(c) 8

(c)  $\frac{1}{9}$ 

(c)  $\frac{4}{27}$ 

(c) 3

(b)  $\sin x + x \cos x$ 

(b) 5

(b)  $\frac{2}{9}$ 

(b)  $\frac{3\pi}{8}$ 

(b)  $\frac{5}{27}$ 

(b) 1

Exam Time: 02:30:00 Hrs

3) If  $f(x) = \int_0^x t \cos t \, dt$ , then  $\frac{dx}{dx}$ 

5) The value of  $\int_{0}^{1} x(1-x)^{99} dx$  is

6) The value of  $\int_0^{\pi} \frac{dx}{1 + 5^{\cos x}}$  is

8) The value of  $\int_{0}^{\frac{\pi}{6}} \cos^3 3x dx$ 

9) The value of  $\int_0^{\pi} \sin^4 x dx$  is

10) The value of  $\int_0^\infty e^{-3x} x^2 dx$  is

11) If  $\int_{a}^{a} \frac{1}{4+x^{2}} dx = \frac{\pi}{8}$  then a is

(a) 10

(a)  $\frac{2}{3}$ 

(a)  $\frac{7}{27}$ 

(a) 4

15)

7) The value of  $\frac{(n+2)}{(n)} = 90$  then n is

(a) cos x-x sin x

The value of  $\int_{-4}^{4} \left[ tan^{-1} \left( \frac{x^2}{x^4 + 1} \right) + tan^{-1} \left( \frac{x^4 + 1}{x^2} \right) \right] dx$  is

The value of  $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \left( \frac{2x^7 - 3x^5 + 7x^3 - x + 1}{\cos^2 x} \right) dx$  is

4) The area between  $y^2 x = 4$  and its latus rectum is

1)

2)

(a)  $\pi$ 

12)	The volume of solid of revolution of the region bounded by $y^2 = x(a - x)$ about x-axis is					
	(a) $\pi a^2$	(b)	$\frac{\pi a^2}{4}$	(c) $\frac{\pi a^2}{5}$	(d)	$\frac{\pi a^2}{6}$
13)	If $f(x)f(x) = \int_1^x \frac{e^{\sin^u}}{u} du, x > 1$	and	$\int_{1}^{3} \frac{e^{\sin x^{2}}}{x} dx = \frac{1}{2} [f(a) - f(1)],$	then one of the possible value of	of a is	s
	(a) 3	(b)	6	(c) 9	(d)	5
14)	The value of $\int_0^1 (\sin^{-1} x)^2 dx$					
	(a) $\frac{\pi^2}{4} - 1$	(b)	$\frac{\pi^2}{4} + 2$	(c) $\frac{\pi^2}{4} + 1$	(d)	$\frac{\pi^2}{4}-2$

The value of $\int_0^a (1-x)^a dx$	$\sqrt{a^2-x^2}$ ) $^2dx$					
(a) $\frac{\pi a^2}{16}$	(b) $\frac{3\pi a^4}{16}$	(c) $\frac{3\pi a^2}{8}$	(d) $\frac{3\pi a^4}{8}$			
	$\int_{x}^{1} tf(t)dt$ then the value of f (1) is	8	8			
(a) $\frac{1}{2}$	(b) 2	(c) 1	(d) $\frac{3}{4}$			
17) The value of $\int_{\hat{\theta}}^{2}$	$\frac{dx}{\sqrt{4-9x^2}}$ is		4			
(a) $\frac{\pi}{6}$	(b) $\frac{\pi}{2}$	(c) $\frac{\pi}{4}$	(d) π			
18) The value of $\int_{-1}^{2}$	x  dx					
(a) $\frac{1}{2}$	(b) $\frac{3}{2}$	(c) $\frac{5}{2}$	(d) $\frac{7}{2}$			
19) For any value of	$n \in \mathbb{Z}, \int_0^{\pi} e \cos^{2x} \cos^3[(2n+1)x]$ is	2	2			
(a) $\frac{\pi}{2}$	(b) π	(c) 0	(d) 2			
20) The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}}$	$sin^2xcosxdx$ is					
(a) $\frac{3}{2}$	(b) $\frac{1}{2}$	(c) 0	(d) $\frac{2}{3}$			
any 7	2		3	$7 \times 2 = 14$		
21) Find an approxim	nate value of $\int_{1}^{1.5} x^2 dx$ by applying	the right-end rule with the partit	tion {1.1,1.2,1.3,1.4,1.5}.			
	owing integrals as the limits of sur					
23) Evaluate the follo	owing definite integrals:					
$\int_{\overline{\theta}}^{\pi} e^{x} \left( \frac{1 + \sin x}{1 + \cos x} \right) dx$						
24) Evaluate the follo	owing integrals using properties of	f integration:				
$\int_0^{2\pi} x \log \left( \frac{3 + \cos x}{3 - \cos x} \right)$	$\left(\frac{x}{x}\right)dx$					
25) Evaluate the follo	owing integrals using properties of	f integration:				
$\int_0^1  5x - 3   dx$						
	owing integrals using properties of	f integration:				
$\int_{-\frac{\pi}{8}}^{\frac{3\pi}{8}} \frac{1}{1 + \sqrt{\tan x}} dx$						
27) Evaluate the following						
$\int_{\hat{\theta}}^{\frac{1}{2}} \frac{e^{a \sin^{-1}x} \sin^{-1}x}{\sqrt{1-x^2}} a^{\frac{1}{2}}$	lx					
28) Evaluate the following	owing					
$\int_0^{\pi/4} \sin^6 x  dx$						
	the region bounded by $3x - 2y + 6$					
	the region bounded by the line y =	$2x + 5$ and the parabola $y = x^2 -$	- 2x.			
any 7	tan y			$7 \times 3 = 21$		
Evaluate : $\int_{\hat{\theta}}^{\pi} \frac{\sec x \tan x}{1 + \sec^2 x} dx$						
32) Evaluate: $\int_{\overline{\theta}}^{\frac{\pi}{2}} \frac{1}{(1+s)^{n}}$	Evaluate: $\int_{\bar{\theta}}^{\pi} \frac{\cos \theta}{(1 + \sin \theta) (2 + \sin \theta)} d\theta$					

- 33) Show that  $\int_{\theta}^{\frac{\pi}{2}} \frac{dx}{4 + 5 \sin x} = \frac{1}{3} \log_e 2$
- Prove that  $\int_{0}^{\frac{\pi}{6}} \frac{\sin 2x dx}{\sin^4 x + \cos^4 x} = \frac{\pi}{4}$
- 35) Evaluate  $\int_0^{\pi} \frac{x}{1+sinx} dx$
- 36) Prove that  $\int_{0}^{\frac{\pi}{2}} \log(1+\tan x) dx = \frac{\pi}{8} \log 2$ .
- 37) Evaluate  $\int_{\theta}^{\pi} \frac{dx}{4\sin^2 x + 5\cos^2 x}$
- 38) Find the volume of a right-circular cone of base radius r and height h.
- Find the volume of the solid formed by revolving the region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2}$  1, a > b about the major axis.
- 40) Find, by integration, the volume of the solid generated by revolving about y-axis the region bounded between the curve  $y = \frac{3}{4}\sqrt{x^2 16}$ ,  $x \ge 4$  the y-axis, and the lines y = 1 and y = 6.

any 7  $7 \times 5 = 35$ 

- 41) Evaluate  $\int_{1}^{4} (2x^2 3) dx$ , as the limit of a sum
- 42) Evaluate  $\int_0^1 e^{-2x} (1 + x 2x^3) dx$
- 43) Evaluate  $\int_{\frac{\pi}{6}}^{\frac{\pi}{6}} (\sin^2 x + \cos^4 x) dx$
- 44) Evaluate  $\int_0^{2a} x^2 \sqrt{2ax x^2} dx$
- 45) Find the area of the region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- 46) Find the area of the region bounded by x-axis, the curve  $y = \cos x$ , the lines x = 0 and  $x = \pi$ .
- 47) Find the area of the region bounded between the parabolas  $y^2 x = 4$  and  $x^2 y = 4$ .
- 48) Find the area of the region in the first quadrant bounded by the parabola  $y^2$  x=4, the line x+y=3 and y-axis
- 49) Find, by integration, the area of the region bounded by the lines 5x 2y = 15, x + y + 4 = 0 and the x-axis
- 50) Using integration find the area of the region bounded by triangle ABC, whose vertices A, B, and C are (-1,1), (3, 2), and (0,5) respectively

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# **Applications of Integration full test** 12th Standard

Maths

Reg.No.:

Exam Time: 03:00:00 Hrs Total Marks: 90 ANSWER ALL  $20 \times 1 = 20$ 1) The value of  $\int_{-4}^4 \left[ tan^{-1} \left( rac{x^2}{x^4+1} 
ight) + tan^{-1} \left( rac{x^4+1}{x^2} 
ight) 
ight] dx$ is (d)  $4\pi$ 2) The value of  $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \left( \frac{2x^7 - 3x^5 + 7x^3 - x + 1}{\cos^2 x} \right) dx$ (c) 2 (d) 03) If  $f(x) = \int_0^x t \cos t \, dt$ , then  $\frac{dx}{dx}$ (a) cos x-x sin x (b)  $\sin x + x \cos x$ (c) x cos x (d) x sin x 4) The area between  $y^2 x = 4$  and its latus rectum is (c)  $\frac{8}{3}$ (d)  $\frac{5}{3}$ 5) The value of  $\int_0^1 x (1-x)^{99} dx$  is (a)  $\frac{1}{11000}$  (b)  $\frac{1}{10100}$ (c)  $\frac{1}{10010}$ (d)  $\frac{1}{10001}$ 6) The value of  $\int_0^{\pi} \frac{dx}{1+5^{\cos x}}$  is (c)  $\frac{3\pi}{2}$ (d)  $2\pi$ 7) The value of  $\frac{(n+2)}{(n)} = 90$  then n is (a) 10 (c) 8 (d) 9 8) The value of  $\int_0^{\frac{\pi}{6}} cos^3 3x dx$  (b)  $\frac{2}{9}$ (c)  $\frac{1}{9}$ (d)  $\frac{1}{3}$ 9) The value of  $\int_0^{\pi} sin^4 x dx$  is (a)  $\frac{3\pi}{10}$  (b)  $\frac{3\pi}{8}$ (c)  $\frac{3\pi}{4}$ (d)  $\frac{3\pi}{2}$ 10) The value of  $\int_0^\infty e^{-3x} x^2 dx$  is (a)  $\frac{7}{27}$  (b)  $\frac{5}{27}$  11) If  $\int_a^a \frac{1}{4+x^2} dx = \frac{\pi}{8}$  then a is (c)  $\frac{4}{27}$ (d)  $\frac{2}{27}$ (c) 3 12) The volume of solid of revolution of the region bounded by  $y^2 = x(a - x)$  about x-axis is (a)  $\pi a^2$  (b)  $\frac{\pi a^2}{4}$  (c)  $\frac{\pi a^2}{5}$  (d)  $\frac{\pi a^2}{6}$  $f(x) = \int_{1}^{x} rac{e^{\sin^{u}}}{u} du, x > 1 \quad and \quad \int_{1}^{3} rac{e^{\sin^{2}}}{x} dx = rac{1}{2} [f(a) - f(1)]$ , then one of the possible value of a is (c) 9 (d) 5 14) The value of  $\int_0^1 \left(sin^{-1}x\right)^2 dx$  (a)  $\frac{\pi^2}{4}-1$  (b)  $\frac{\pi^2}{4}+2$ (c)  $\frac{\pi^2}{4} + 1$ (d)  $\frac{\pi^2}{4} - 2$ 15) The value of  $\int_0^a (\sqrt{a^2 - x^2})^2 dx$  (a)  $\frac{\pi a^2}{16}$  (b)  $\frac{3\pi a^4}{16}$ (d)  $\frac{3\pi a^4}{9}$ 16) If  $\int_0^x f(t)dt = x + \int_x^1 t f(t)dt$ then the value of f(1) is

(a)	(b) 2	(c) 1	(d)				
17) The $\frac{1}{2}$ value of $\int_0^{\frac{2}{3}} \frac{a}{\sqrt{4}}$	$\frac{dx}{-9x^2}$ is		$\frac{3}{4}$				
(a) $\frac{\pi}{6}$	(b) $\frac{\pi}{2}$	(c) $\frac{\pi}{4}$	(d) $\pi$				
18) The value of $\int_{-1}^{2}  x  dx$	dx	_	_				
4	(b) $\frac{3}{2}$	(c) $\frac{5}{2}$	(d) $\frac{7}{2}$				
19) For any value of $n \in \mathbb{Z}$							
(a) $\frac{\pi}{2}$	(b) π	(c) 0	(d) 2				
20) The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} sin^{\frac{\pi}{2}}$	$n^2xcosxdx$ is						
(a) $\frac{3}{2}$	a . 1	(c) 0	(d) $\frac{2}{3}$				
ANSWER ANY 7	2		3	$7 \times 2 = 14$			
21) Find an approximate	value of $\int_1^{1.5} x^2 dx$	by applying the right-end r	rule with the				
partition {1.1,1.2,1.3,	,1.4,1.5}.						
22) Evaluate the following $\int_{1}^{2} 4x^{2} - 1)dx$	ng integrals as the li	mits of sums.					
23) Evaluate the following	ng definite integrals	:					
$\int_0^{rac{\pi}{2}} e^x \left(rac{1+sinx}{1+cosx} ight) dx$							
24) Evaluate the followin $\int_0^{2\pi} x \log \left( \frac{3 + \cos x}{3 - \cos x} \right)$		roperties of integration:					
(							
25) Evaluate the followin $\int_0^1  5x - 3  dx$	ng integrals using pi	operties of integration:					
$\int_0^{\pi/2}  \partial x ^{2} dx$ 26) Evaluate the following	no integrals using pr	onerties of integration:					
$\int_{rac{\pi}{8}}^{rac{3\pi}{8}} rac{1}{1+\sqrt{tanx}} dx$	ig integrals using pr	operates of integration.					
27) Evaluate the following	ng:						
$\int_0^{rac{1}{2}} rac{e^a - sin^{-1x} sin^{-1} x}{\sqrt{1-x^2}} dx$	c						
28) Evaluate the following $a\pi/4$	ng						
$\int_0^{\pi/4} sin^6 x  dx$							
		x - 2y + 6 = 0, $x = -3$ , $x = 1$					
	egion bounded by the	the line $y = 2x + 5$ and the para	$abola y = x^2 - 2x.$	7 2 21			
ANSWER ANY 7  31) Evaluate: $\int_0^{\frac{\pi}{3}} \frac{\sec x  ta}{1 + \sec x}$	n x 1			$7 \times 3 = 21$			
17860	$-\boldsymbol{x}$						
32) Evaluate: $\int_0^{\frac{\pi}{2}} \frac{c}{(1+\sin\theta)^{\frac{\pi}{2}}}$	$rac{\cos  heta}{ heta)(2+sin heta)}d heta$						
33) Show that $\int_0^{\frac{\pi}{2}} \frac{ds}{4+5s}$							
Prove that $\int_0^{\frac{\pi}{4}} \frac{\sin 2x dx}{\sin^4 x + \cos^4 x} = \frac{\pi}{4}$							
	35) Evaluate $\int_0^\pi \frac{x}{1+\sin x}$ dx						
36) Prove that $\int_0^{\frac{\pi}{4}} \log($	$1 + \tan x) dx = \frac{\pi}{8}  \log 2$	2.					

- 37) Evaluate Evaluate  $\int_{0}^{\frac{\pi}{2}} \frac{dx}{\int_{0}^{\frac{\pi}{2}} \frac{dx}{\int_{0}^{\frac{\pi}$
- 39) Find the volume of the solid formed by revolving the region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{k^2}$  1, a > b

about the major axis.

40) Find, by integration, the volume of the solid generated by revolving about y-axis the region bounded between the curve  $y=\frac{3}{4}\sqrt{x^2-16}, x\geq 4$ the y-axis, and the lines y = 1 and y = 6.

**ANSWER ANY 7**  $7 \times 5 = 35$ 

- 41) Evaluate  $\int_{1}^{4} (2x^2 3)$  dx, as the limit of a sum
- 42) Evaluate  $\int_0^1 e^{-2x} (1 + x 2x^3) dx$
- 43) Evaluate  $\int_0^{\frac{\pi}{2}}$  (  $\sin^2 x + \cos^4 x$  ) dx 44) Evaluate  $\int_0^{2a} x^2 \sqrt{2ax x^2} dx$
- 45) Find the area of the region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- 46) Find the area of the region bounded by x-axis, the curve  $y = \cos x$ , the lines x = 0 and  $x = \pi$ .
- 47) Find the area of the region bounded between the parabolas  $y^2 x = 4$  and  $x^2 y = 4$ .
- 48) Find the area of the region in the first quadrant bounded by the parabola  $y^2$  x=4, the line x+y=3 and y-axis
- 49) Find, by integration, the area of the region bounded by the lines 5x 2y = 15, x + y + 4 = 0 and the x-axis
- 50) Using integration find the area of the region bounded by triangle ABC, whose vertices A, B, and C are (-1,1), (3, 2), and (0,5) respectively

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# RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CHENNAI – 82. WHATSAPP - 8056206308

### **Applications of Integration**

12th Standard

Exam Time : 02:30:00 Hrs	Maths	Total M	arks : 100
4) -4 [ -4 ( 2 )			0 x 1 = 20
1) The value of $\int_{-4}^4 \left \lfloor tan^{-1} \left ( rac{x^2}{x^4+1}  ight )$	$\left(  ight) + tan^{-1} \left( rac{x^2+1}{x^2}  ight)  ight] a$	dx is	
` ,	(c) $3\pi$	(d) $4\pi$	
2) If $f(x) = \int_0^x t \cos t  dt$ , then $\frac{dx}{dx}$	,	(a) x coc x (d) x c	in v
(a) $\cos$ x-x $\sin$ x (b) $\sin$ 3) The value of $\int_0^1 x(1-x)^{99} dx$	is	(c) x cos x (d) x s	oii X
(a) $\frac{1}{11000}$ (b) $\frac{1}{10100}$		(d) $\frac{1}{10001}$	
4) The value of $\frac{(n+2)}{(n)} = 90$ the	10010	10001	
(a) 10 (b) 5		(d) 9	
5) The value of $\int_0^\pi sin^4x dx$ is	` ,	(u) 3	
(a) $\frac{3\pi}{10}$ (b) $\frac{3\pi}{8}$	(c) $\frac{3\pi}{4}$	(d) $\frac{3\pi}{2}$	
6) If $\int_a^a \frac{1}{4+x^2} dx = \frac{\pi}{8}$ then a is	<u>-</u>	2	
(a) 4 (b) 1	(c) 3	(d) 2	
7) If $f(x)$	2 sin m <sup>2</sup>		
$f(x)=\int_{1}^{x}rac{e^{sin^{u}}}{u}du,x>1$ and		f(a)-f(1)]	, then
one of the possible value of a is (a) 3 (b) 6	(c) 9	(d) 5	
8) The value of $\int_0^a \left(\sqrt{a^2-x^2}\right)^2 dx$	;	(4)	
(a) $\frac{\pi a^2}{16}$ (b) $\frac{3\pi a^4}{16}$	(c) $\frac{3\pi a^2}{8}$	(d) $\frac{3\pi a^4}{8}$	
9) The value of $\int_0^{\frac{2}{3}} \frac{dx}{\sqrt{4-9x^2}}$ is			
(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{2}$	(c) $\frac{\pi}{4}$	(d) $\pi$	
10) For any value of n∈Z, $\int_0^{\pi} e^{z} \cos^2 z$	<u> </u>	is	
(a) $\frac{\pi}{2}$ (b) $\pi$	(c) (	) (d) 2	
11) The value of $\int_0^{\frac{\pi}{2}} \frac{dx}{1+tanx}$			
(a) $\pi$ (b) $\frac{\pi}{2}$	(c) $\frac{\pi}{4}$	(d) 0	
(a) $\pi$ (b) $\frac{\pi}{2}$ 12) $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ is	-		
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{6}$	(c) $\frac{\pi}{12}$	(d) $-\frac{\pi}{6}$	
13) The value of $\int_{-\pi}^{\pi} sin^3x \ cos^3x$ of		v	
	(c) $2\pi$	(d) $4\pi$	
14) The area bounded by the parak	pola y = x <sup>2</sup> and the III (c) $\frac{51}{3}$	ne y = 2x is (d) $\frac{30}{3}$	
(a) $\frac{4}{3}$ (b) $\frac{2}{3}$ 15) $\int_0^\infty e^{-mx} x^7$ dx is	(b) ${3}$	(u) ${3}$	
(a) $\frac{ m }{7^m}$ (b) $\frac{ 7 }{m^7}$	(c) $\frac{\lfloor m \rfloor}{7^{m+1}}$	(d) $\frac{17}{m^8}$	

sq.units.			_				
(a) $\frac{2}{3}$	(b) $\frac{4}{3}$	(0	c) $\frac{8}{3}$	(d) $\frac{16}{3}$			
17) The volume gene cu. units	rated by th	ne curve y <sup>2</sup> = 1	16x from x = 2 to	x = 3 rotating ab	out x - axis		
(a) 72π (b	$\frac{256 \times 19}{3}$	π	(c) 40π	(d) 80π			
18) $\int_{-rac{\pi}{2}}^{rac{\pi}{2}} rac{sinx}{2+cosx} dx =$	Ü						
(a) 0 (b)	) 2	(c) log 2		(d) log 4			
19) $\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx$	=						
(a) $\frac{\pi}{2}$	(b) (	0	(c) $\frac{\pi}{4}$	(d) $\pi$			
(a) 0 (b) $19) \int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx$ (a) $\frac{\pi}{2}$ 20) The volume when	$y=\sqrt{3}$	$\overline{+x^2}$ from	n x = 0  to  x = 4  i	s rotated about x-	-axis is		
(a) $100\pi$	(b) -	$\frac{100\pi}{9}$	(c) $\frac{100\pi}{3}$	(d) $\frac{100}{3}$	8 x 2 = 16		
21) Evaluate the follo	wing integ	rals using prop	perties of integra	ation:			
$\int_{-rac{\pi}{4}}^{rac{\pi}{4}} sin^2x dx$							
22) Find the values of		ving:					
$\int_0^{\frac{\pi}{2}} \sin^5 x \cos^4 x dx$							
23) Evaluate the follo	wing						
$\int_0^1 x^2 (1-x)^3 dx$	on the vel	umo of the sol	id gonorated by	rovolving about th	no v ovic		
24) Find, by integration the region enclose			id generated by	revolving about ti	ie y-axis,		
25) Evaluate $\int e^{3x} 3^{2x}$		,					
26) Find the area end	losed betv	ween the paral	oola y <sup>2</sup> =4ax and	the line x=a, x=9	a.		
27) Find the area bou	-	_		of the curve.			
28) Find the area bou	inded by y	=x²+2, x-axis,	x=1 and x=2.		8 x 3 = 24		
29) Find an approxim	ate value	of $\int_{0}^{1.5} x^2 dx$	by applying th	e right-end rule w			
partition {1.1,1.2,1		0 1	~, «pp.,g	o ngin ona raio n			
30) Evaluate : $\int_0^1 \frac{2x+7}{5x^2+1}$	$\frac{7}{10}dx$						
31) Evaluate $\int_1^2 \frac{3x}{(x+1)^2}$	J						
32) If f (x) = f (a + x), then $\int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx$							
33) Evaluate $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}}$ dx.							
34) Evaluate the following definite integrals: $ \int_0^1 \frac{1-x^2}{(1+x^2)^2} dx $							
35) Evaluate the following the following the state of the following the state of the following the state of	wina						
$\int_0^{2\pi} sin^7 \frac{x}{4} dx$							
36) Find the area of the	ne region	bounded by 3x	x - 2y + 6 = 0, x	x = -3, x = 1 and x-	-axis. 8 x 5 = 40		
37) Evaluate $\int_1^4 \left(2x^2-3 ight)$ dx, as the limit of a sum							

16) The area enclosed by the curve  $y^2 = 4x$ , the x-axis and its latus rectum is

- 38) Evaluate:  $\int_{-4}^{4} [x+3] dx$ . 39) Show that  $\int_{0}^{\frac{\pi}{2}} \frac{dx}{4+5sinx} = \frac{1}{3} \log_e 2$
- 40) Prove that  $\int_0^{\frac{\pi}{4}} \log(1+\tan x) dx = \frac{\pi}{8} \log 2$ .
- 41) Find the area of the region bounded by y =cos x, y =sin x, the lines  $x = \frac{\pi}{4}$  and  $x = \frac{5\pi}{4}$ .
- 42) The region enclosed by the circle  $x^2 + y^2 = a^2$  is divided into two segments by the line x = h. Find the area of the smaller segment.
- 43) The curve  $y = (x 2)^2 + 1$  has a minimum point at P. A point Q on the curve is such that the slope of PQ is 2. Find the area bounded by the curve and the chord PQ.
- 44) A watermelon has an ellipsoid shape which can be obtained by revolving an ellipse with major-axis 20 cm and minor-axis 10 cm about its major-axis. Find its volume using integration.

#### Applications of Integration 1 m

(c)  $3\pi$ 

Date: 29-Oct-19

Total Marks : 20 $20 \times 1 = 20$ 

Reg.No.:

(d)  $4\pi$ 

12th Standard Maths

Exam Time: 00:02:00 Hrs

1) The value of  $\int_{-4}^{4} \left[ tan^{-1} \left( \frac{x^2}{x^4 + 1} \right) + tan^{-1} \left( \frac{x^4 + 1}{x^2} \right) \right] dx$  is

(a)  $\pi$ (b)  $2\pi$ 2) The value of  $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \left( \frac{2x^7 - 3x^5 + 7x^3 - x + 1}{\cos^2 x} \right) dx$  is

	(a) 4	(b) 3	(c) 2	(d) 0
3)	If $f(x) = \int_0^x t \cos t  dt$ , then	$\frac{dx}{dx}$		
	(a) cos x-x sin x	(b) $\sin x + x \cos x$		(c) $x \cos x$ (d) $x \sin x$
4)	The area between $y^2 x = 4$ and	its latus rectum is		
	(a) $\frac{2}{3}$	(b) $\frac{4}{3}$	(c) $\frac{8}{3}$	(d) $\frac{5}{3}$
5)	The value of $\int_0^1 x(1-x)^{99} dx$	; is		
	(a) $\frac{1}{11000}$	(b) $\frac{1}{10100}$	(c) $\frac{1}{10010}$	(d) $\frac{1}{10001}$
6)	The value of $\int_0^{\pi} \frac{dx}{1+5^{\cos x}}$ is			
	(a) $\frac{\pi}{2}$		$\frac{3\pi}{2}$	(d) $2\pi$
7)	The value of $\frac{(n+2)}{(n)} = 90$ then	n is		
	(a) 10	(b) 5	(c) 8	(d) 9
8)	The value of $\int_0^{\frac{\pi}{6}} cos^3 3x dx$			
	(a) $\frac{2}{3}$	(b) $\frac{2}{9}$	(c) $\frac{1}{9}$	(d) $\frac{1}{3}$
9)	The value of $\int_0^{\pi} sin^4x dx$ is	•	,	-
	(a) $\frac{3\pi}{10}$	(b) $\frac{3\pi}{8}$	(c) $\frac{3\pi}{4}$	(d) $\frac{3\pi}{2}$
10)	The value of $\int_0^\infty e^{-3x} x^2 dx$ is	3		
	(a) $\frac{7}{27}$	(b) $\frac{5}{27}$	(c) $\frac{4}{27}$	(d) $\frac{2}{27}$
	21	(6) 27	(C) 27	(d) <sub>27</sub>
11)	If $\int_a^a \frac{1}{4+x^2} dx = \frac{\pi}{8}$ then a is  (a) 4	(b) 1	(c) 3	(d) 2
12)		* *		
12)	The volume of solid of revolut (a) $\pi a^2$	(b) $\frac{\pi a^2}{4}$	$(c) \frac{\pi a^2}{\epsilon}$	(d) $\frac{\pi a^2}{\epsilon}$
13)			9	0
13)		and the second s		then one of the possible value of a is
14)	(a) 3	(b) 6	(c) 9	(d) 5
14)	The value of $\int_0^1 (sin^{-1}x)^2 dx$	(b) $\pi^2 + 2$	(c) $\frac{\pi^2}{4} + 1$	(d) $\frac{\pi^2}{4} - 2$
	(a) $\frac{\pi^2}{4} - 1$		(c) $\frac{1}{4} + 1$	(d) $\frac{1}{4}$ – 2
13)	The value of $\int_0^a (\sqrt{a^2 - x^2})^2$ (a) $\frac{\pi a^2}{16}$	$\frac{dx}{dx}$	(c) $\frac{3\pi a^2}{8}$	(d) $\frac{3\pi a^4}{9}$
16)	10	10	(c) <u>8</u>	$\left(\mathbf{u}\right)^{-\frac{1}{8}}$
10)	If $\int_0^x f(t)dt = x + \int_x^1 t f(t)dt$ (a) $\frac{1}{2}$	(b) 2	(c) 1	(d) $\frac{3}{4}$
17)		(0) 2	(c) 1	$(a)$ $\frac{1}{4}$
17)	The value of $\int_0^{\frac{2}{3}} \frac{dx}{\sqrt{4-9x^2}}$ is			
	(a) $\frac{\pi}{6}$	(b) $\frac{\pi}{2}$	(c) $\frac{\pi}{4}$	(d) π
18)	The value of $\int_{-1}^{2}  x  dx$		_	_
	(a) $\frac{1}{2}$	(b) $\frac{3}{2}$	(c) $\frac{5}{2}$	(d) $\frac{7}{2}$

19) For any value of  $n \in \mathbb{Z}$ ,  $\int_0^{\pi} e cos^{2x} cos^3 [(2n+1)x]$  is

(a)  $\frac{\pi}{2}$  (b)  $\pi$ 20) The value of  $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} sin^2 x cos x dx$  is

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

(d) 2

(c) 0

(d)  $\frac{2}{3}$