# SRM INSTITUTE OF SCIENCE AND TECHNOLOGY RAMAPURAM CAMPUS DEPARTMENT OF MATHEMATICS CONTINUOUS ASSESSMENT TEST – 1

* Required

Answer ALL Questions

Each question carries ONE mark.

1. *

$$\int_0^2 \int_0^1 y \, dx \, dy =$$

(A) 4 (B) 2
(C) 0 (D) 1

- A
- B
- C
- D

2. *

$$\int_0^{\pi} \int_0^{a \sin\theta} r \, dr \, d\theta =$$

(A) $\pi a^2$

(B) $\frac{\pi}{4} a^2$

(C) $\frac{\pi}{4} a^3$

(D) $\frac{\pi}{6} a^2$

- A
- B
- C
- D

3. *

$$\int_0^1 \int_0^2 \int_0^3 dx \, dy \, dz =$$

(A) 3

(B) 4

(C) 2

(D) 6

- A
- B
- C

- (●) D

4. *

$$\int_0^1 \int_1^2 (x^2 + y^2)\, dx\, dy \;=$$

(A) 0 (B) 9

(C) $\frac{8}{3}$ (D) $-\frac{8}{3}$

- ( ) A
- ( ) B
- (●) C
- ( ) D

5. *

$$\int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} d\theta\, d\varphi =$$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi^2}{4}$ (D) $\frac{\pi^2}{8}$

- ( ) A
- ( ) B

- (●) C
- ( ) D

6. *

$$\int_0^1 \int_0^x \int_0^y dz\, dy\, dx \quad =$$

(A) 1/4 (B) 1/6

(C) 1/2 (D) 1

- ( ) A
- (●) B
- ( ) C
- ( ) D

7. *

Area of a region $R$ in Cartesian co-ordinates system is

(A) $\iint_R dr\, d\theta$ (B) $\iint_R dy\, dx$

(C) $\iint_R x\, dx\, dy$ (D) $\iint_R x^2\, dx\, dy$

- ( ) A
- (●) B
- ( ) C

D

8. *

$$\int_1^2 \int_2^5 x\,y\,dx\,dy \;=$$

(A) 1 (B) $-1$

(C) $\frac{63}{4}$ (D) $\frac{53}{4}$

A

B

C

D

9. *

The region of integration of the integral $\int_{-b}^{b} \int_{-a}^{a} f(x,y)\,dx\,dy$ where $b > a$ is

(A) square (B) rectangle

(C) triangle (D) circle

A

B

C

D

10. *

$$\int_0^1 \int_0^1 e^{x+y}\, dx\, dy \;=$$

(A) $(e-1)^2$ (B) $(e^2-1)^2$

(C) 1 (D) 0

A

B

C

D

11. *

$$\int_2^3 \int_1^2 \frac{dx\, dy}{x\, y} \;=$$

(A) $\log 2 + \log 3$ (B) $\log 3$

(C) $\log 2$ (D) $\log 2 \log\left(\frac{3}{2}\right)$

A

B

C

D

12. *

$$\int_0^{\frac{\pi}{2}} \int_{\frac{\pi}{2}}^{\pi} \cos x \; dx \, dy =$$

(A) 2 (B) 1

(C) $\frac{\pi}{2}$ (D) $-\frac{\pi}{2}$

A

B

C

D

13. *

$$\int_0^1 \int_0^1 \frac{1}{1 + x^2} \, dy \, dx =$$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi^2}{4}$ (D) 1

A

B

C

D

14. *

The region of integration bounded by the lines $x = 0, y = 0, x + y = 2$ in the positive quadrant is

(A) square (B) rectangle

(C) triangle (D) circle

A

B

C

D

15. *

The new limits after changing the order of integration in

$$I = \int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{a\,x}} dy\,dx \text{ is}$$

(A) $I = \int_0^{4a} \int_{\frac{y^2}{4a}}^{2\sqrt{a\,y}} dx\,dy$

(B) $I = \int_0^{a} \int_{y^2}^{\sqrt{a\,y}} dx\,dy$

(C) $I = \int_0^{a} \int_{y^2}^{2\sqrt{a\,y}} dx\,dy$

(D) $I = \int_0^{a} \int_{\frac{y^2}{4a}}^{\sqrt{a\,y}} dx\,dy$

- (●) A
- ( ) B
- ( ) C
- ( ) D

16. *

$$\int_0^2 \int_0^2 dx\,dy \;=$$

(A) 4 (B) 2

(C) 0 (D) 1

- (●) A
- ( ) B
- ( ) C
- ( ) D

17. *

$$\int_0^{\infty} \int_0^1 e^{-y}\,dx\,dy \;=$$

(A) 4 (B) 2

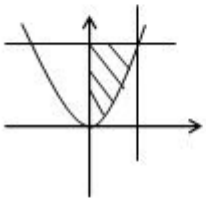
(C) 0 (D) 1

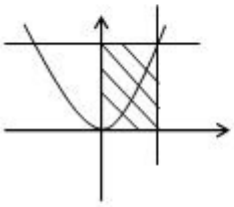
- ( ) A
- ( ) B
- ( ) C

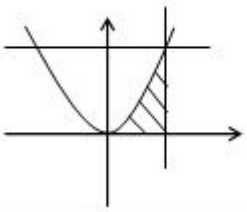
- [x] D

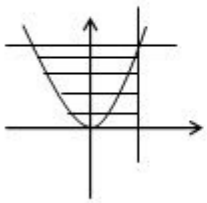
18. *

Identify the region of integration for $I = \int_0^4 \int_{\sqrt{y}}^2 dx\,dy$ .

(A) 

(B) 

(C) 

(D) 

- [ ] A
- [ ] B
- [x] C
- [ ] D

19. *

$$\int_0^{\pi}\int_0^{a} r\,dr\,d\theta =$$

(A) $\frac{\pi a^2}{2}$ (B) $\frac{\pi a^2}{4}$

(C) $\frac{\pi a^2}{3}$ (D) $\frac{\pi^2 a^2}{2}$

- (●) A
- ( ) B
- ( ) C
- ( ) D

20. *

Area of the region $R$ in polar coordinates is

(A) $\iint_R dr\,d\theta$ (B) $\iint_R r^2\,dr\,d\theta$

(C) $\iint_R r\,dr\,d\theta$ (D) $\iint_R (r+1)\,dr\,d\theta$

- ( ) A
- ( ) B

- (●) C
- ( ) D

21. *

Change the order of integration in $I = \int_0^a \int_y^a e^{-y} \, dx \, dy.$

(A) $I = \int_0^a \int_x^a e^{-y} \, dy \, dx$ (B) $I = \int_0^a \int_0^x e^{-y} \, dy \, dx$

(C) $I = \int_0^a \int_x^a e^{-y} \, dx \, dy$ (D) $I = \int_0^a \int_x^{x^2} e^{-y} \, dy \, dx$

- ( ) A
- (●) B
- ( ) C
- ( ) D

22. *

$\int_0^2 \int_0^2 \int_0^2 dz \, dy \, dx =$

(A) 6 (B) 8
(C) 12 (D) 24

- (●) A
- ( ) B
- ( ) C
- ( ) D

23. *

Volume of a region $R$ in Cartesian coordinates is given by

(A) $\iiint_R dx\,dy\,dz$

(B) $2\iint_R dx\,dy$

(C) $\iint_R dy\,dx$

(D) $\iint_R dx\,dy$

- (●) A
- ( ) B
- ( ) C
- ( ) D

24. *

$\int_0^1 \int_0^x dy\,dx =$

(A) 1

(B) $-1$

(C) $\frac{1}{2}$

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

- ( ) A
- ( ) B
- (●) C

D

25. *

The common region of integration of the integral $I = \iint_R e^y \, dx \, dy$ where $R$ denotes the region bounded by the straight lines by $x = 1$, $y = 0$ and $y = x$ is

(A) square (B) rectangle

(C) triangle (D) circle

A

B

C

D

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