SRM INSTITUTE OF SCIENCE AND TECHNOLOGY RAMAPURAM CAMPUS DEPARTMENT OF MATHEMATICS SURPRISE TEST – 4

* Required

Answer ALL Questions

Each question carries ONE mark.

1. *

The curvature of the straight line is	
(A) 1	(B) 2
(C) -1	(D) 0

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

2. *

The radius of curvature in polar coordinates is

(A) $\rho = \frac{\left(r^2 + r'^2\right)^{\frac{3}{2}}}{r^2 - rr' + 2r'^2}$ (B) $\rho = \frac{\left(r^2 - r'^2\right)^{\frac{3}{2}}}{r^2 - rr' + 2r'^2}$

(C) $\rho = \frac{\left(r^2 - r''^2\right)^{\frac{3}{2}}}{r^2 - rr' + 2r'^2}$ (D) $\rho = \frac{\left(r^2 + r'^2\right)^{\frac{3}{2}}}{r^2 - rr'' + 2r'^2}$

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

3. *

The envelope of the family of curves $A\,\alpha^2 + B\,\alpha + C = 0$ (α is parameter) is

(A) $B^2 + 4AC = 0$ (B) $B^2 - 4AC = 0$

(C) $B^2 + AC = 0$ (D) $B^2 - AC = 0$

- [ ] A
- [x] B

- C
- D

4. *

The equation of circle of curvature at any point (x, y) with center of curvature $(\bar{x}, \bar{y})$ and radius of curvature ρ is

(A) $(x+\bar{x})^2+(y+\bar{y})^2=\rho^2$ (B) $(x-\bar{x})^2+(y-\bar{y})^2=\rho^2$

(C) $(x-\bar{x})^2-(y+\bar{y})^2=\rho^2$ (D) $(x+\bar{x})^2+(y+\bar{y})^2=\rho^2$

- A
- B
- C
- D

5. *

The locus of centre of curvature is called

(A) Involute (B) Evolute

(C) Radius of curvature (D) Envelope

- A
- B
- C
- D

6. *

The curvature at any point of the circle is equal to___ of its radius.

(A) same (B) ellipse
(C) reciprocal (D) constant

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

7. *

The value of $\Gamma\left(\frac{1}{2}\right)$ is

(A) π (B) $\frac{\pi}{2}$
(C) $\sqrt{\pi}$ (D) $\frac{\sqrt{\pi}}{2}$

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

8. *

The value of $\int_0^\infty e^{-x} x^4 \, dx$ is

(A) 1 (B) 24

(C) 1/2 (D) $\frac{-8\sqrt{\pi}}{3}$

- A
- B
- C
- D

9. *

If n is a positive integer, then $\Gamma(n+1) =$

(A) $(n+1)!$ (B) $n!$

(C) $2n!$ (D) $(n-1)!$

- A
- B
- C
- D

10. *

The value of Beta function B (1/2, 1/2) =

(A) 1	(B) 4
(C) $\pi/2$	(D) π

- A
- B
- C
- D

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