SURENDRANATH COLLEGE

INTERNAL ASSESSMENT
SEMESTER-1, 2018-19
SUBJECT- MTMA
CC-1

Time-30 MINS **Full Marks-10**

CU Reg. No.-	SECTION-	ROLL NO.-

MARKS OBTAINED	Signature of Examiner- With date
MARKS CONVERTED TO 10	Approved by HOD- With date

Question Booklet

Q No.	*Answer all the Questions. Put (∨) mark in the box for correct answer.*	*Marks*
1.	The angle through which the axes must be turned so that the equation ax + by+ +c = 0 ($a \neq 0$) may reduce to the form Ax + B = 0 is a) $\theta = \tan^{-1}(\frac{b}{a})$ ☐ b) $\theta = \tan^{-1}(\frac{a}{b})$ ☐ c) $\theta = \tan^{-1}(\frac{2b}{a})$ ☐ d) none of these ☐	
2.	The nature of the conic, $9x^2 + 24xy + 16y^2 + 126x + 82y - 59 = 0$ is a) an ellipse ☐ b) a pair of parallel lines ☐ c) a parabola ☐ d) none of these ☐	

3. If a line makes angles α,β,γ with the co-ordinate axes, then the value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$ is

(a) 1 ☐

(b) 2 ☐

(c) 3 ☐

(d) -1 ☐

4. The value of m for which the straight line $\frac{x-11}{3} = \frac{y-2}{m} = \frac{z+3}{-2}$ is parallel to the plane x-3y+ 6z +7 =0 is

(a) 3 ☐

(b) -3 ☐

(c) 3/2 ☐

(d) -3/2 ☐

5. The length of the curve $x=a(\theta+\sin\theta)$, $y=a(1-\cos\theta)$ is

a) 4a ☐

b) 2a ☐

c) 8a ☐

d) 6a ☐

If p is the perpendicular from the pole to the tangent to a polar curve $r=1/u=f(\theta)$, then

6.

i) $\frac{1}{p^2} = u^2 + (\frac{du}{d\theta})^2$ ☐

ii) $\frac{1}{p^2} = r^2 + (\frac{dr}{d\theta})^2$ ☐

iii) $\frac{1}{p^2} = \frac{1}{u} + (\frac{du}{d\theta})^2$ ☐

iv) $p^2 = u^2 + r^2$ ☐

7.

For the pedal curve p=f(r) , the radius of curvature at any locus point is measured using formula

i) $r\frac{dr}{dp}$ ☐ ii) $1/r\frac{dp}{dr}$ ☐

iii) $r\frac{dp}{dr}$ ☐ iv) dp/dr ☐

8.

Which one categorically defines the point of inflection of a continuous curve :

i) Jointly $y_2=0$ and $yy_2 < 0$ at P(x,y) ☐

ii) Jointly $y_2=0$ and $yy_2 > 0$ at P(x,y) ☐

iii) Jointly $yy_2=0$ and y_2 changes sign at (x-h,x+h) ☐

iv) None of the above. ☐

The solution of the vector $\vec{x}$ from the vector equations $\vec{x} \times \vec{\beta} = \vec{r}$ and $\vec{x} \cdot \vec{\alpha} = 3$, where, $\vec{\alpha} = \vec{i} + 2\vec{j} + \vec{k}$, $\vec{\beta} = 2\vec{i} - \vec{j} + \vec{k}$ and $\vec{r} = -4\vec{j} - 4\vec{k}$ is given by

i) $2\vec{i} - \vec{j} - \vec{k}$ ☐

ii) $2\vec{i} + \vec{j} - \vec{k}$ ☐

iii) $2\vec{i} + \vec{j} + \vec{k}$ ☐

9.	iv) $2\vec{i} - \vec{j} + \vec{k}$ ☐ The torque about the point B(3,-1,3) of a force $\vec{P}$ (4,2,1) passing through the point A(5,2,4) is i) $\vec{i} + 2\vec{j} + 8\vec{k}$ ☐ ii) $\vec{i} - 2\vec{j} + 8\vec{k}$ ☐ iii) $\vec{i} + 2\vec{j} - 8\vec{k}$ ☐ iv) $-\vec{i} + 2\vec{j} - 8\vec{k}$ ☐	
10.		

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