Mid-West University

Examinations Management Office

End Semester Exam-2081

B.Ed. Level /V Semester

Sub: Analytical Solid Geometry (MATH452)

Roll No. .....

Group 'A' **10×1=10**

Tick (✓) the Best Answer.

1. The equation of the plane in normal form is...
   a) $ax + by + cz = 0$ b) $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$
   c) $lx + my + nz = p$ d) $ax + by + cz = 1$

2. The perpendicular distance of the point $(1, 2, 3)$ from the plane $x + y + z - 3 = 0$ is ...
   a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$
   c) $\sqrt{5}$ d) $\sqrt{7}$

3. The straight line is perpendicular to the given plane if...
   a) $\theta = 180^o$ b) $\theta = 90^o$
   c) $\theta = 0^o$ d) $\theta = \infty^o$

4. The equation of straight line passing through the points $A(x_1, y_1, z_1)$ *and* $B(x_2, y_2, z_2)$ is.
   a) $\frac{x-x_1}{l} = \frac{y-y_1}{m} = \frac{z-z_1}{n} = 0$ b) $\frac{x-x_1}{l} = \frac{y-y_1}{m} = \frac{z-z_1}{n}$
   c) $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1} = \frac{z-z_1}{z_2-z_1}$ d) $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1} = \frac{z-z_1}{z_2-z_1} = 0$

5. The plane section of a sphere through its centre is known as a...
   a) great circle b) small circle
   c) point circle d) imaginary circle

6. If $u^2 + v^2 + w^2 - d = 0$, then the sphere becomes a...
   a) real sphere b) imaginary sphere
   c) line sphere d) point sphere

7. Any straight line lying on the surface of the cone is called the...
   a) guiding curve b) generator
   c) axis d) tangent

8. The locus of the tangent lines to a given surface which are parallel to a given line is called an...
   a) telescopeic cylinder b) tierod cylinder
   c) enveloping cylinder d) welded cylinder

9. All the surfaces have a centre and three principal planes are known as...
   a) central conicoids b) elliptic paraboloid
   c) hyperbolic paraboloid d) none of the above

10. **The slope of a line $ax + by + c = 0$ is...**
    a) $\frac{a}{b}$ b) $-\frac{a}{b}$
    c) $\frac{c}{b}$ d) $-\frac{a}{b}$

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End Semester Exam-2081

Level: B.Ed. / V Semester FM: 60

Time: 3 hrs PM: 30

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Candidates are requested to give their answers in their own words as far as practicable.

Attempt All the Questions.

Group 'B' **6 × 5 = 30**

1. Find the equation of the plane through the points $P(1,1,1)$, $Q(3,-1,2)$ and $R(3,\ -1,\ 2)$.

2. Prove that the points $(1,-1,\ 3)$ and $(3,\ 3,\ 3)$ are equidistant from the plane $5x+2y-7z+19=0$ and lie on opposite sides of the plane.

3. Deduce the equation of a straight line through a given point and in a given direction (line in symmetrical form).

   Or

   Find the angle between the line $\frac{x-x_1}{l}=\frac{y-y_1}{m}=\frac{z-z_1}{n}$ and the plane $ax+by+cz+d=0$.

4. Show that the shortest distance between the lines $\frac{x}{4}=\frac{y+1}{3}=\frac{z-2}{2}$; $5x-2y-3z+6=0=x-3y+2z-3$ is $\frac{34}{13\sqrt{6}}$.

5. Find the equation of a sphere when the ends of the diameter $A(x_1,y_1,z_1)$ and $B(x_2,y_2,z_2)$ are given.

6. Show that the plane $2x-2y+z+12=0$ touches the sphere $x^2+y^2+z^2-2x-4y+2z-3=0$ and find the point of contact.

   Or

   Find the equation of a cone whose vertex at (α,β,γ) and base $y^2=4ax,\ z=0$.

Group 'C' **2 × 10=20**

7. Show that the lines $x+2y-5z+9=0=3x-y+2z-5$ and $2x+3y-z-3=0=4x-5y+z+3$ are coplanar. Find the equation of the plane in which they lie.

8. Define enveloping cone. Also, find the equation of the enveloping cone with vertex at (α,β,γ) whose generators touch the sphere $x^2+y^2+z^2=a^2$.

   Or

   Explain the central conicoid. Also, deduce the equation of tangent plane at the point (α,β,γ) to the central conicoid $ax^2+by^2+c=1$

THE END