Section A: MCQs (20 questions, single-correct)

1. If $S = \{z \in \mathbb{C} : |z-2+3i| = 5\}$, then the locus of z in the Argand plane is
   A) Circle, center (2,−3), radius 5
   B) Circle, center (2,3), radius 5
   C) Line x+3y=5
   D) Parabola with focus (2,3)

2. The domain of f(x)=ln(2−√(x−1)) is
   A) (−∞,1]
   B) [1,(−∞,2]
   C) (1,2]

3. If a,b,c are in AP and a+b+c=15, b−a=3, then c equals
   A) 3 B) 6 C) 9 D) 12

4. Let A= [,]. Then for any $n \in \mathbb{N}$, det(A^n) equals

5. The value of lim_{x→0} (sin(3x)−3x)/(x^3) is
   A) −9/2 B) 0 C) −9 D) −27/2

6. If y=x^x for x>0, then dy/dx at x=1 equals
   A) 1 B) e C) 1+ln 1 D) 1+ln 1/e

7. Tangent to the curve y=ln(x+√(x^2+1)) at x=0 has slope
   A) 0 B) 1 C) −1 D) 1/2

8. ∫ (x e^{x}) dx equals
   A) x e^{x} + C
   B) (x−1)e^{x} + C
   C) (x+1)e^{x} + C
   D) e^{x} + C

9. Area bounded by y=|x| and y=2 is