Independent University, Bangladesh

Mathematics (Part-II)

Time Allowed: 3 hours

Max Marks: 35

Note: Attempt five questions. Selecting Two Questions from Section-A and three question from section B. all Question Carry equal marks.

SECTION-A

Q.1. a) Transform the cartesian equation of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ to its polar form.

Q.2. Evaluate the integral $\int_{1.3}^{1.30} \sqrt{x}\, dx$ where h = 0.05 using

i. Trapezoidal rule ii. Simpson's rule and compare with exact value.

SECTION B

Q.3. a) Use the method of variation of parameters to solve $y^n + y = \frac{1}{1+sinx}$

b) Use the method of undetermined coefficient to solve $y^2 + y^3 = e^x sinx$

Q.4 Let P = $\begin{bmatrix} 12345 \\ 43351 \end{bmatrix}$ q = $\begin{bmatrix} 12345 \\ 43351 \end{bmatrix}$ and r = $\begin{bmatrix} 12345 \\ 43351 \end{bmatrix}$

Q.5 $\mu = \sqrt{\frac{1}{n-1}} \sum_{i=1}^{n} (x_i - x)$

Q.6 $\int_x^a \frac{1}{(x^2-a^2)} dx = \frac{1}{2a} . \log_2 \left|\frac{(x-a)}{(x+a)}\right| + \frac{1}{a} \tan^{-1} \log\left|x + \sqrt{x^2 - a^2}\right| + C$