J 1278

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Third Semester

MA 231 — MATHEMATICS — III

(Common to all branches except Biomedical Engineering, Civil Engineering and Computer Based Constructions, Fashion Technology, Industrial Bio-Technology, Textile Chemistry)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Form partial differential equation by eliminating the arbitrary function from $z = f(xy)$.

2. Write down the complete solution of $z = px + qy + c\sqrt{1 + p^2 + q^2}$.

3. Find a_n in expanding e^{-x} as Fourier series in $(-\pi, \pi)$.

4. State Parseval's Identity of Fourier series.

5. A tightly stretched string of length 2 L is fastened at both ends. The mid point of the string is displaced to a distance 'b' and released from rest in this position. Write the Initial Conditions.

6. In one dimensional heat equation $u_t = \alpha^2 u_{xx}$. What does α^2 stands for?

7. State initial and final value theorems.

8. Define convolution and convolution theorem of Laplace transforms.

9. If $F\{f(x)\} = \bar{f}(s)$ then give the value of $F\{f(ax)\}$.

10. Find Fourier transform of $f(x)$ $= 1 \quad |x| \le 1$
$= 0 \quad |x| > 1.$