9. (a) Explain the concept of shot noise.

(b) Find the Fourier Transform of signal given below :

$$x(t) = u(t) \cos \omega t.$$

Roll No..... **A**

Total No. of Questions : 9]

[Total No. of Printed Pages : 4

EC–206

SIGNALS AND SYSTEM (NEW)

(B.Tech., 4th Semester, 2055)

Time : 3 Hours Maximum Marks : 60

Note :– Section A is compulsory. Attempt any *Four* questions from Section B and any *Two* questions from Section C.

Section–A Marks : 2 Each

1. (a) Differentiate between deterministic and non-deterministic signals.

(b) Define Ergodic process.

(c) Differentiate between joint and conditional probabilities.

(d) What do you mean by digital no. ?

(e) What is FET noise ?

(f) Write short note on burst noise.

(g) Define noise figure.

(h) Find the Fourier Transform of sgn (t).

(i) Differentiate between stationary and non-stationary random process.

(j) Write short note on thermal noise.

Section–B Marks : 5 Each

2. Explain the working of matched filter.

3. Derive a relation for amplifier I/P noise in terms of noise figure.

4. Find continuous time Fourier Transform of signal $s(t) = e^{-A|t|}$ sgn (t).

5. A random variable has an exponential probability function $f(x) = ae^{-b|x|}$, where a and b are constants. Find the relationship between a and b.

6. Explain the experimental determination of noise figure.

Section–C Marks : 10 Each

7. Explain Convolution theorem.

8. (a) Explain the significance of noise temperature.

(b) The joint density function of two continuous random variables is :

$$f(x,y) = \begin{cases} Cxy & 0 < x < 2 \quad 1 < y < 3 \\ 0 & \text{otherwise} \end{cases}$$

Find :

(i) C

(ii) P $(x < 1, 4 > 2)$