Seat No. : 3053

AC-107

April-2019

B.Sc., Sem.-IV

CC-205 : Electronics

Time : 2:30 Hours] **[Max. Marks : 70**

Instructions : (1) Symbols indicate their usual meanings.
(2) Numbers to the right indicate marks.

1. (A) (1) Find the Laplace transform of the derivative and second derivative of a function f(t). 7

(2) Discuss the response of a RL circuit to an exponential voltage using Laplace transformation. 7

OR

(1) Find the solution of the following integro-differential equation, using Laplace transformation.

$$\frac{d^2i}{dt^2} + 4\frac{di}{dt} + 8i = 8u(t)$$

given that $i(0+) = 3$ and $\frac{di(0+)}{dt} = -4$.

(2) Discuss the response of a parallel RLC circuit to a exponential driving voltage using Laplace transformation.

(B) Answer in short any **four**. 4

(1) What is the Laplace transform of e^{at} ?

(2) What is the domain of F(s) ?

(3) What is the equation for finding inverse Laplace transform ?

(4) What is a transform pair ?

(5) What is the Laplace transform of f(t) = t ?

(6) For a linear combination of functions, how will you find the Laplace transform ?

2. (A) (1) What is "Fourier series" ? Explain how the Fourier coefficients a_o, a_n and b_n can be evaluated. 7

(2) Explain waveform symmetries as related to Fourier coefficients. 7

OR

(1) Obtain the exponential form of Fourier series.

(2) Discuss exponential function e^{-at} and impulse function with respect to Fourier transform. 4

(B) Answer in short any **four**.

(1) What is an aperiodic signal ?

(2) How will you find Fourier transform of a function ?

(3) What is duty cycle ?

(4) What type of amplitude spectrum do we obtain for an aperiodic signal ?

(5) What is an ideal transmission system ?

(6) What are the limits of integration in direct and inverse Fourier transform ?

3. (A) (1) Write a note on clocked R.S flip flops. 7

(2) Draw a diagram of a J-K master slave flip flop and describe its operation. 7

OR

(1) Explain about serial in-serial out shift registers.

(2) Write a note on parallel in parallel out register.

(B) Answer in short any **three**. 3

(1) What does it mean to say that a flip-flop is transparent ?

(2) What is positive edge-triggering ?

(3) How long will it take to shift an 8-bit number into a 54164 shift register if the clock is set at 10 MHz ?

(4) What is meant by parallel shifting ?

(5) What is a ring counter ?

4. (A) (1) Draw and explain the 8085 bus structure. 7

(2) Explain memory map and memory address range of 8085 microprocessor system. 7

OR

(1) Classify the memory of a 8085 μp.

(2) Write notes on encoder and decoder.

(B) Answer in short any **three** : 3

(1) What is a flag ?

(2) Why is the program counter a 16-bit register ?

(3) If the memory chip size is 1024 × 4 bits, how many chips are required to make up 16-k byte memory ?

(4) What is the function of the accumulator ?

(5) What is a tri-state device ?