CODE: 13EC3018

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2017

SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

PART-A
ANSWER ALL QUESTIONS   **[1 X 10 = 10 M]**

1. a). Define a continuous time signal?
   b) Evaluate the value of $f(t)=\int_{-\infty}^{\infty} e^{-at^2}\delta(t-5)dt$?
   c) What is Gibb's Phenomenon?
   d) What is Fourier Spectrum?
   e) Give any two differences between Fourier series and Fourier Transform?
   f) What is the Fourier Transform of unit step function?
   g) State Parsaval's Theorem?
   h) Find the Laplace Transform of x(t)=u(t-3)
   i) Define the Z-Transform?
   j) What is the ROC of a finite duration two sided sequence?

PART-B
Answer any one question from each unit   **[5 X 12 = 60 M]**
UNIT-I

2. a) Examine whether the following signals are periodic or not? If periodic determine
   the   Fundamental period.   i) $x(t) = \sin10\pi t + \cos20\pi t$ ii) $x(n) = \sin\frac{2\pi\pi}{3} + \cos\frac{2\pi\pi}{5}$

   8M

   b) Define LTI system? Explain the interconnection of discrete time LTI systems. 4M

(OR)

3. a) Determine the convolution sum of two sequences   6M

   $x(n) = \left\{ \underset{\uparrow}{3},2,1,2 \right\}$ $h(n) = \left\{ 1, \underset{\uparrow}{2},1,2 \right\}$

   b) Explain how the time-shifting, time scaling, signal addition operations performed
      on signals with one example .   6M

UNIT-II

4. The wave form shown in figure (a) is applied to the circuit shown in figure (b), determine the third harmonic frequency current using Fourier series.   12M
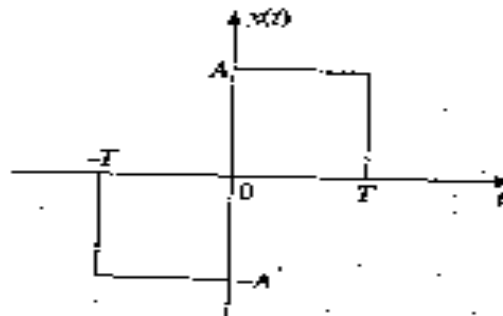

(a)   (b)
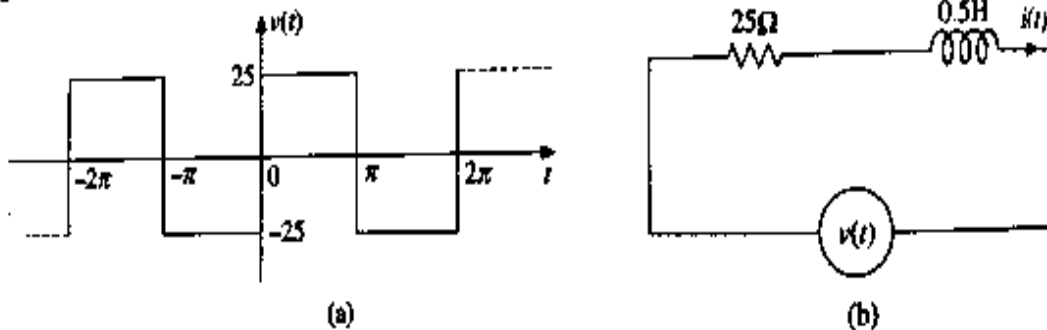
(OR)

5. a) For the CT periodic signal $x(t) = 2 + \cos 2t + \sin 4t$, determine the fundamental frequency and exponential Fourier series coefficients.   6M

   b) State and prove time shifting and time differentiation properties of Fourier series.   6M
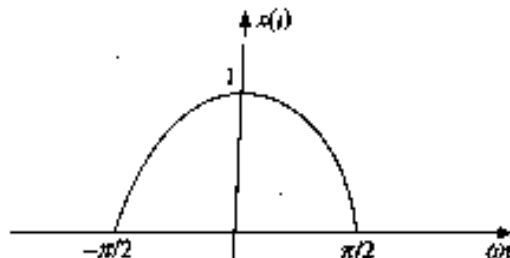
UNIT-III

6. a) Find the magnitude and phase spectrum of the signal shown in figure below   6M

   b) Using Fourier transform find the convolution of the signals   6M

   $$x_1(t) = e^{-2t} u(t) \qquad x_2(t) = e^{-3t} u(t)$$

(OR)

7. a) Find the Fourier transform of the co sinusoidal pulse shown in figure below   7M

b) State and prove the convolution property of Fourier transform   5M

UNIT-IV

8. a) Find the Laplace transform of following signals using properties of Laplace transform   6M

     i). $x(t) = te^{-t}u(t)$ ii) $x(t) = \dfrac{1 - e^{-t}}{t}$

     b) Find the convolution of the signals $x_1(t) = e^{-2t}u(t)$ and $x_2(t) = e^{-4t}u(t)$ using the property of Laplace transform.   6M

(OR)

9. a) Find the inverse Laplace transform of $X(s) = \dfrac{s+1}{s^3 + 4s^2 + 6s + 4}$ 6M

     b) Find the initial and final values of $X(s) = \dfrac{s+4}{s^2 + 3s + 5}$ 6M

UNIT-V

10.a) Prove that the sequences $x_1(n) = a^n u(n)$ and $x_2(n) = -a^n u(-n-1)$ have same X (z) but differ only in ROC. Also plot their ROC   8M

     b) State and prove time reversal property of Z-transform   4M

(OR)

11.a) Determine the Z-transform of following signal and sketch the ROC   6M

$$x(n) = \begin{cases} \left(\dfrac{1}{2}\right)^n, & for....n \geq 0 \\ \left(\dfrac{1}{4}\right)^{-n}, & for...n < 0 \end{cases}$$

     b) Find the inverse Z-transform of $X(z) = \dfrac{z^{-1}}{z^{-2} - 4z^{-1} + 3}, ...for, ROC : |z| > 1$ 6M

     using partial fraction method

AR13

CODE: 13CS3008   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2017

COMPUTER ORGANIZATION AND ARCHITECTURE
(Electronics and Communication Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Give the basic performance equation of a computer system.
   b) What are MAR and MDR?
   c) Perform the arithmetic operation $(15) + (-25)$ with binary numbers and negative number in signed-2's complement representation.
   d) What is a micro operation?
   e) What is a three state gate?
   f) What is an addressing mode?
   g) What is an interrupt?
   h) Differentiate between memory-mapped and Isolated I/O configurations.
   i) What is virtual memory?
   j) What is snoopy cache controller?

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-I

2. a. What is system software? What are its functions? Describe the role of various types of system software in a computer.   8 M
   b. Write notes on multiprocessor and multicomputer systems.   4 M

(OR)

3. a. Discuss in detail about the fixed point and floating point representation of data.   8 M
   b. Give a short sequence of machine instructions for the task "Add the contents of memory location A to those of location B, and place the answer in location C". Instructions   4 M

   Load R_i, LOC and
   Store R_i, LOC

   are the only instructions available to transfer data between the memory and the general purpose registers. Do not change the contents of either location A or B.

1 of 2

AR13

SET-2

UNIT-II

4.		Illustrate the steps of Booth's algorithm with a suitable example.	12 M

(OR)

5. a. Show the flowchart of the algorithm for adding and subtracting two binary numbers in signed-2's complement representation. Describe the steps of the flowchart.   6M

    b. Show the hardware to be used for the addition and subtraction of two decimal numbers represented in signed magnitude form. Indicate how an overflow is detected.   6 M

UNIT-III

6. a. Write notes on arithmetic logic shift unit.   6 M

    b. Discuss in detail about various types of shift micro operations.   6 M

(OR)

7. a. List and describe different registers for the basic computer.   8 M

    b. What is an instruction cycle? Explain in detail about the phases of an instruction cycle.   4 M

UNIT-IV

8. Explain in detail about asynchronous data transfer.   12 M

(OR)

9. a. What is priority interrupt? Explain.   6 M

    b. Describe various cache mapping techniques.   6 M

UNIT-V

10. a. Write a brief notes on RISC pipeline.   6 M

    b. Describe arbitration process.   6 M

(OR)

11. a. Write in detail about inter processor communication and synchronization.   6 M

    b. Explain the characteristics of multiprocessor systems.   6 M

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