AR13

CODE: 13EC3018 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Regular & Supplementary Examinations, October-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) Distinguish between Deterministic and random Signals.
   b) What are the Conditions for a System to be LTI System?
   c) Obtain Fourier Series Coefficients for $x(n) = sinw_0n$
   d) Define Fourier transform pair.
   e) State Convolution property of Fourier Transform.
   f) When is a System said to be memory less? Give Example.
   g) What is the Laplace transform of the function X(t)=u(t) - u(t-2)
   h) What are the Properties of ROC.
   i) Define one sided Z transform and two sided Z transform.
   j) What is ROC in Z transforms?

PART-B

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

UNIT-I

2. a Test Whether the signal $x(n) = (½)^n u(n)$ energy or power signal 6M

   b Find the even and odd components of the following signals 6M
   (i) $x(t)=(\sin^2 t)(\cos 2t)+ 3\sin 3t$
   (ii) $x(t)=\cos^2 4t +(\sin 5t)(\cos 2t)$

(OR)

3. a Find the convolution of the two signals 9M
   i) $x(n) = 3^n u(-n)$; $h(n) = (1/3)^n u(n-2)$
   ii) $x(n) = (1/3)^{-n} u(-n-1)$; $h(n) = u(n-1)$
   iii) $x(n) = u(n) - u(n-5)$; $h(n) = 2[u(n) - u(n-3)]$

   b Find the impulse response of the system. Determine whether the following system are time invariant or not 3M
   (i) $y(t) = t\ x(t)$ (ii) $y(n) = (2n)$

UNIT-II

4. a Differentiate clearly between the even, odd and half wave symmetry waveforms with respect to their Fourier co-efficients (use appropriate waveform) in their Fourier series representation. 6M

	b	State and Prove Convolution property and parseval's relation of Fourier series	6M

(OR)

5.	a	Write the Derichlet's conditions to obtain Fourier series representation of any signal. Find the trigonometric fourier series for full wave rectified sine wave.	8M
	b	Explain any three properties of Fourier Series.	4M

UNIT-III

6.	a	Determine the Fourier Transform for double exponential pulse whose function is given by $y(t) = e^{-2\|t\|}$ Also draw its magnitude and phase spectra	8M
	b	State and prove time convolution and time differentiation properties of Fourier Transform.	4M

(OR)

7.	a	Find the Fourier transform of a gate pulse of unit height, unit width and centered at t=0.	7M
	b	State and prove the Time-shifting property of Fourier transform.	5M

UNIT-IV

8.	a	Define Laplace Transform and explain the properties of Laplace Transform.	6M
	b	Find the inverse Laplace transform of $X(s)=\frac{5s+13}{s(s^2+4s+13)}$ Re(s)>0.	6M

(OR)

9.	a	Find the Laplace Transform of the following i) $t\,e^{-at}\,u(t)$ ii) $\cos\omega_0 t\,u(t)$	6M
	b	Find out the inverse Laplace Transform of $X(s)=\frac{s-2}{s(s+1)^3}$	6M

UNIT-V

10.	a	State and prove the following properties of Z transform i) Time shifting ii) Convolution	6M
	b	Find the Z-transform and ROC of the discrete signal $x[n]= [3(2^n) - 4(3^n)]u[n]$.	6M

(OR)

11.	a	Find the inverse z-transform of $x(z) = (z^2+z) / (z-1)(z-3)$, ROC: $z > 3$. Using (i) Residue method and (ii) Partial fraction method.	8M
	b	State and prove initial and final value theorems of z-transform.	4M

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AR13 SET-1

CODE: 13CS3008

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Regular & Supplementary Examinations, October-2017

COMPUTER ORGANIZATION AND ARCHITECTURE
(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 X 10 = 10M]**

1. a) What is Sign Magnitude representation?
   b) Write the basic functional units of a computer.
   c) What is a micro operation?
   d) Give two examples for implicit addressing mode.
   e) List the memories in the increasing order of speed.
   f) What are the advantages of virtual memory?
   g) Write the different types of interrupts.
   h) What is the need for parallel processing?
   i) What is instruction pipeline?
   j) What is cache coherence?

PART-B

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

UNIT-I

2. Explain basic operational concepts of a computer with neat diagram [12M]

(OR)

3. (a) Explain Floating point representation [6M]
   (b) Discuss the concept of compliments used to represent signed numbers. [6M]

UNIT-II

4. (a) Discuss decimal arithmetic operations [6M]
   (b) Explain division algorithm with example. [6M]

(OR)

5 (a) Explain Booth Multiplication algorithm with example. [6 M]
   (b) Derive and explain an algorithm for adding and subtracting 2 floating point binary numbers [6 M]

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SET-1

CODE: 13CS3008

UNIT-III

6	(a)	Explain about Instruction Formats	[6 M]
	(b)	Explain the Memory reference instructions? Give examples?	[6M]
		(OR)	
7	(a)	Briefly explain the arithmetic logic shift unit	[6M]
	(b)	List and explain the shift micro operations	[6M]

UNIT-IV

8	(a)	Explain about associative memory	[6 M]
	(b)	Explain internal organization of memory chips.	[6 M]
		(OR)	
9	(a)	What are handshaking signals? Explain the handshake control of data transfer during input and output operation	[6 M]
	(b)	Explain the functions of typical input-output interface.	[6 M]

UNIT-V

10	(a)	What is pipe lining? Explain parallelism in uni-processor system	[6 M]
	(b)	Explain how to resolve branch conflicts in Instruction pipeline	[6 M]
		(OR)	
11	(a)	What is multiprocessor system? Explain the advantages of multi processors over uni-processors	[6M]
	(b)	Explain the interconnection structures for multiprocessor systems	[6M]

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