

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>					
1.	a	Justify the need for non-traditional machining methods?	5M	CO1	L2
	b	List out various applications of the modern machining process	5M	CO1	L2
<b>(OR)</b>					
2.		Find out the volumetric material removal rate from the work piece due to hammering mechanism proposed by M.C.Shaw	10M	CO1	L2
<b><u>UNIT-II</u></b>					
3.	a	Describe the working principle of Water jet cutting	5M	CO2	L2
	b	Describe the working principle of the AWJM process	5M	CO2	L2
<b>(OR)</b>					
4.	a	List out essential variables of the abrasive flow machining process. Draw a sketch showing the effect of these variables on MRR	5M	CO2	L2
	b	List out essential variables of the abrasive jet machining process. Draw a sketch showing the effect of these variables on MRR	5M	CO2	L2
<b><u>UNIT-III</u></b>					
5.	a	Describe the working principle of Electrochemical machining.	5M	CO3	L2
	b	Describe the working principle of Electrochemical grinding.	5M	CO3	L2
<b>(OR)</b>					
6.	a	Describe the working principle of Chemical Machining	5M	CO3	L2
	b	Discuss the masking techniques for different production levels in CHM	5M	CO3	L2
<b><u>UNIT-IV</u></b>					
7.	a	Explain the working principles of Electric Discharge Machining (EDM)	5M	CO4	L2
	b	Describe the working principle of Electric Discharge Grinding (EDG)	5M	CO4	L2
<b>(OR)</b>					
8.	a	Explain the working principle of WEDM	5M	CO4	L2
	b	What are the limitations and applications of WEDM?	5M	CO4	L2
<b><u>UNIT-V</u></b>					
9.	a	Describe Electron Beam Machining (EBM) with a neat diagram	5M	CO5	L2
	b	Describe Laser Beam Machining (LBM) with a neat diagram	5M	CO5	L2
<b>(OR)</b>					
10.	a	Describe the working principle of Plasma Arc Machining (PAM):	5M	CO5	L2
	b	List the applications of plasma in machining	5M	CO5	L2
<b><u>UNIT-VI</u></b>					
11.	a	Describe right-angle drilling	5M	CO6	L2
	b	Explain the working principle of ESD	5M	CO6	L2
<b>(OR)</b>					
12.	a	Describe Shaped Tube Electrolytic Machining (STEM)	5M	CO6	L2
	b	Explain the effect of process parameters on MRR of STEM work samples	5M	CO6	L2

**AR20**

**CODE: 20ITE332**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**Cryptography and Network Security  
(Information Technology)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

		Marks	CO	Blooms Level
1.	Explain in detail Transposition Technique?	10M	CO1	L2
	(OR)			
2.	a) Explain about software vulnerabilities	5M	CO1	L2
	b) Write short notes on Security attacks	5M	CO1	L3

**UNIT-II**

3.	Enumerate in detail about the steps in BlowFish Algorithm and explain the process of each round with a neat diagram.	10M	CO2	L1
	(OR)			
4.	Explain Data Encryption standard (DES) in detail.	10M	CO2	L2

**UNIT-III**

5.	Explain Digital Signature Algorithm in detail	10M	CO3	L2
	(OR)			
6.	State the principles of public key cryptosystems and explain any one public key encryption in detail.	10M	CO3	L1

**UNIT-IV**

7.	Write a note on Kerberos and format of the X.509 certificate.	10M	CO4	L3
	(OR)			
8.	Define PGP? Write the services provided by PGP.	10M	CO4	L1

**UNIT-V**

9.	Elaborate the operations of secure socket layer	10M	CO5	L2
	(OR)			
10.	Explain the architecture of IP Security	10M	CO5	L2

**UNIT-VI**

11.	Explain about viruses in detail.	10M	CO6	L2
	(OR)			
12.	a) Describe the characteristics of firewalls	5M	CO6	L1
	b) Explain about different types of malicious programs.	5M	CO6	L2

**PRINCIPLES OF SIGNALS AND SYSTEMS**  
**(ELECTRICAL AND ELECTRONICS ENGINEERING)**

Time: 3 Hours

Max Marks: 60

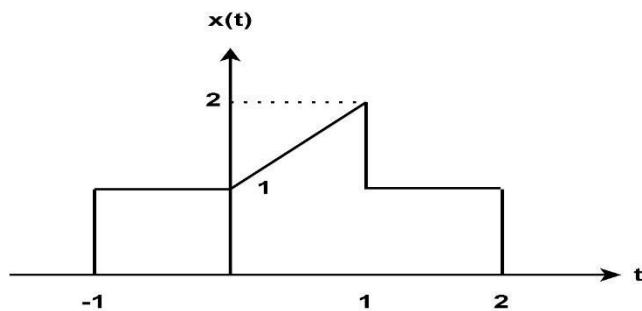
Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

- |  | Marks | CO | Blooms Level |
|--|-------|----|--------------|
| 1. Classify various systems and explain each of them.                | 10M   | 1  | L2           |
| (OR)   |       |    |              |
| 2. For the signal $X(t)$ shown in figure. find the following signals | 10M   | 1  | L3           |
| a) $x(t-3)$ and $x(t+3)$   |       |    |              |
| b) $x(2t+2)$ and $x(\frac{1}{2}t-2)$                                 |       |    |              |
| c) $x(\frac{5}{3}t)$ and $x(\frac{3}{5}t)$                           |       |    |              |
| d) $x(-t+2)$ and $x(-t-2)$   |       |    |              |
| e) Express given signal in terms of elementary signals               |       |    |              |

**UNIT-II**

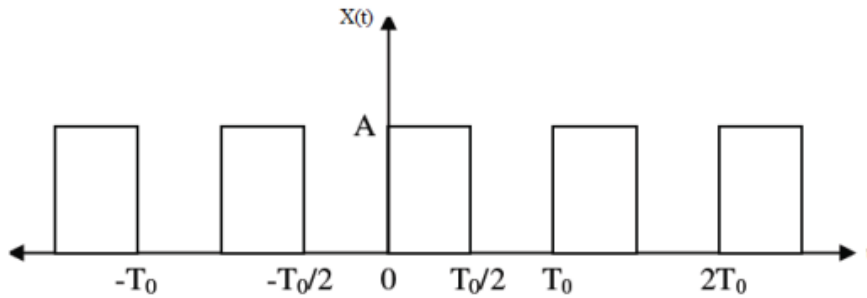
- |   |     |   |    |
|---|-----|---|----|
| 3. Determine convolution of following two sequences by 1) Graphical method 2) Matrix second method 3. Matrix first method | 10M | 2 | L3 |
| $x(n) = \{1, -1, 2, 3\}$  |     |   |    |
| $h(n) = \{1, -2, 3, -1\}$   |     |   |    |
|   |     | ↑ |    |

(OR)

- |   |     |   |    |
|---|-----|---|----|
| 4. Find the convolution of the following signals by graphical method. $x(t) = e^{-5t}u(t)$ & $h(t) = e^{-3t}u(t+3)$ . | 10M | 2 | L3 |
|---|-----|---|----|

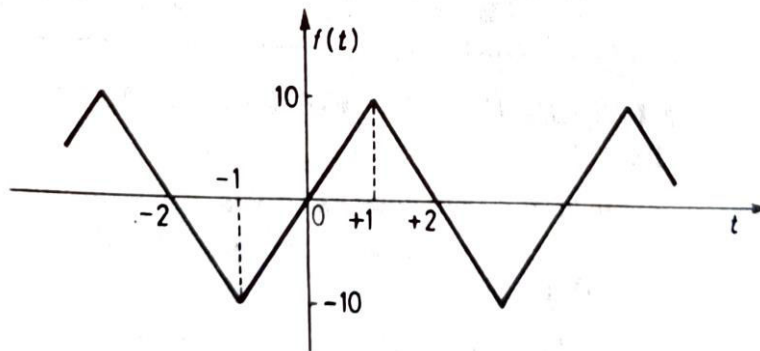
### UNIT-III

5. Consider the periodic square wave  $x(t)$  as shown in figure given below. 10M 3 L3  
Determine the complex exponential Fourier series of  $x(t)$ .



(OR)

6. Find the trigonometric Fourier series and exponential Fourier series for the waveform shown in figure below and draw their line spectrum 10M 3 L2



### UNIT-IV

7. 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 10M 4 L3

(OR)

8. State and prove linearity, time shifting and time scaling properties of Fourier Transform. 10M 4 L2

### UNIT-V

9. Obtain inverse Laplace transform of 10M 5 L2

$$F(s) = \frac{(2s+1)}{(s+1)((s^2+2s+2))}$$

(OR)

10. State and explain the Differentiation, Linearity and time shifting properties of Laplace transform. 10M 5 L2

### UNIT-VI

11. Explain the properties of ROC for Z Transforms. 10M 6 L2

(OR)

12. Find the inverse of Z transform of  $X(Z) = Z / (3Z^2 - 4Z + 1)$ . 10M 6 L2

**III B.Tech II Semester Supplementary Examinations, August, 2023  
EMBEDDED AND REAL TIME OPERATING SYSTEMS  
(ELECTRONICS AND COMMUNICATION ENGINEERING)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

	<b><u>UNIT-I</u></b>	Marks	CO	Blooms Level
1.	What is non-operational quality attribute? Explain the various non-operational quality attributes to be considered in any embedded system design.	10	1	K1
	<b>(OR)</b>			
2.	Explain any Embedded System used in home appliances with washing machine example.	10	1	K1
	<b><u>UNIT-II</u></b>			
3.	Demonstrate the design challenges of embedded systems and discuss briefly about Design technology.	10	2	K2
	<b>(OR)</b>			
4.	List out the differences between DSP processors and Micro controllers with an real time example.	10	2	K2
	<b><u>UNIT-III</u></b>			
5.	Explain about RS232 and RS422 and distinguish the difference in communication interface.	10	3	K1
	<b>(OR)</b>			
6. a)	List the broad specifications of Bluetooth standard.	5	3	K2
b)	Explain about infrared and IEEE 1394 firewire.	5	3	K2
	<b><u>UNIT-IV</u></b>			
7. a)	Draw and explain the architecture of kernel?	5	4	K3
b)	Explain about (i) Task (ii) Task states (iii) Task scheduler	5	4	K2
	<b>(OR)</b>			
8.	Explain about different scheduling algorithms with example.	10	4	K2
	<b><u>UNIT-V</u></b>			
9. a)	Explain about semaphore in RTOS.	5	5	K3
b)	Explain about memory management in RTOS	5	5	K2
	<b>(OR)</b>			
10.	Explain Priority inversion problem and priority Inheritance.	10	5	K2
	<b><u>UNIT-VI</u></b>			
11.	Define operating system and classify operating systems for embedded system with example.	10	6	K2
	<b>(OR)</b>			
12.	Explain about handheld operating system Windows CE ,Real-time operating system RT LINUX.	10	6	K3

**Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

			<b>Marks</b>	<b>CO</b>	<b>Blooms Level</b>
		<b><u>UNIT-I</u></b>			
1.	a	What is KDD? Explain about data mining as a step in the process of knowledge discovery	6M	1	L2
	b	How to classify data mining systems? Discuss	4M	1	L2
		<b>(OR)</b>			
2.	a	Explain in detail about Data mining functionalities?	5M	1	L2
	b	How is data similarity and dissimilarity measured ?	5M	1	L2
		<b><u>UNIT-II</u></b>			
3.		Explain about the Three-tier data warehouse architecture with a neat diagram?	10 M	2	L2
		<b>(OR)</b>			
4.	a	What are steps in designing the data warehouse? Explain	5M	2	L2
	b	Compare OLTP and OLAP	5M	2	L2
		<b><u>UNIT-III</u></b>			
5.	a	What is attribute relevance analysis?	5M	3	L2
	b	What is data analytical characterization?	5M	3	L2
		<b>(OR)</b>			
6.	a	Explain the process of mining class comparisons.	6M	3	L2
	b	How to discriminating between different classes ?	4M	3	L2
		<b><u>UNIT-IV</u></b>			
7.	a	Discuss about basic concepts of frequent itemset mining	6M	4	L2
	b	Write the Aprori Algorithm	4M	4	L2
		<b>(OR)</b>			
8.	a	What are the various Constraints in Constraint based Association rule mining? Explain.	6M	4	L2
	b	Write about basic concept in Association Rule mining	4M	4	L2
		<b><u>UNIT-V</u></b>			
9.	a	What is Bayesian belief network? Explain in detail.	5M	5	L2
	b	Write a note attribute selection measures.	5M	5	L2
		<b>(OR)</b>			
10.	a	What is prediction? Explain about Linear regression method	5M	5	L2
	b	Discuss about Accuracy and Error measures	5M	5	L2
		<b><u>UNIT-VI</u></b>			
11.	a	Define Clustering? Explain about Types of Data in Cluster Analysis?	6M	6	L2
	b	How to access the cluster quality?	4M	6	L2
		<b>(OR)</b>			
12.	a	What are outliers? Discuss the methods adopted for outlier detection	6M	6	L2
	b	Explain about Density based clustering methods	4M	6	L2

# AR18

**CODE: 18EEE321**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B.Tech II Semester Supplementary Examinations, August, 2023**

## **PRINCIPLES OF SIGNALS AND SYSTEMS**

**(Electrical and Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

### **UNIT-I**

1. a) Define the following with waveforms 6M

- i. unit function
- ii. ramp function
- iii. impulse function
- iv. Parabolic function

b) Determine the following signals is energy signal or power signal 6M

- i.  $x(t) = A \sin(\omega t + \theta)$
- ii.  $x(n) = (1/2)^n u(n)$

**(OR)**

2. a) Check whether the following signal  $x(t)$  is energy signal or power signal 6M

$$X(t) = \left( e^{j(2t + (\frac{\pi}{4}))} \right)$$

b) Check whether the following system is linear or not 6M

$$y(n) = 2x(n) + 1/x(n - 1)$$

### **UNIT-II**

3. a) Check whether the following systems stable or not 6M

(i)  $h(t) = e^{2t} u(t)$

b) (ii)  $h(t) = (2 + e^{-3t})u(t)$  6M

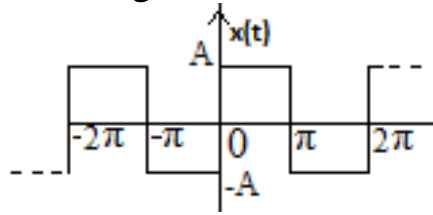
**(OR)**

4. a) Prove that the convolution of any sequence with the unit sample sequence results in the same sequence? 6M

b) Define LTI systems? what are the properties of LTI system? 6M

### UNIT-III

5. a) Any two properties of Fourier transform. 6M  
b) Find the exponential Fourier series expansion for the waveform shown in the figure 6M



(OR)

6. a) Define trigonometric fourier series and evaluate the fourier coefficients of the trigonometric fourier series 6M  
b) Find the Fourier transform of  $te^{-at}u(t)$  6M

### UNIT-IV

7. a) State and prove any two properties of Laplace transform? 6M  
b) Find the inverse Laplace transform of  $X(s) = \frac{1}{s^2+3s+2}$ ; ROC:  $-2 < \text{Re}(s) < -1$ ? 6M

(OR)

8. a) Derive relation between Laplace transform & Fourier transform? 6M  
b) Find the Laplace transform of the signal  $x(t)=A \sin \omega_0 t u(t)$ ? 6M

### UNIT-V

9. a) Determine the z-transform of following sequence  $x(n)=\{1,2,3,4,5,0,7\}$  6M  
b) Find the inverse z-transform of  $X(z)= 1/(1-az^{-1})$  with ROC  $|z|<|a|$ ? 6M

(OR)

10. a) Prove that the sequences  $x_1(n)=a^n u(n)$  and  $x_2(n)= -a^n u(-n-1)$  have the same  $X(z)$  and differ only in ROC's. Plot their ROC's? 6M  
b) Define ROC & List the properties of ROC for Z-transforms? 6M



# AR16

**CODE: 16CS3020**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**Data Warehousing and Data Mining  
(Common to CSE & IT Branches)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## **UNIT-I**

1. a) Describe the steps in Data pre processing in detail. 9M  
b) Explain the measures of dissimilarity. 5 M  
(OR)
2. a) Define KDD. Discuss the motivating challenges of Data Mining. 7 M  
b) Explain different types of attributes with examples. 7 M

## **UNIT-II**

3. a) Describe multi dimensional model in data warehouse. 7 M  
b) Compare and contrast OLTP and OLAP Systems 7 M  
(OR)
4. a) Explain the Data warehouse architecture with neat sketch. 9 M  
b) Explain the attribute oriented induction for class comparisons. 5 M

## **UNIT-III**

5. a) Find the frequent item sets for the following data using Apriori algorithm with minimum support count = 2 and minimum confidence = 60% 9 M

TID	Items
T100	I1,I2,I5
T200	I2,I4
T300	I2,I3
T400	I1,I2,I4
T500	I1,I3
T600	I2,I3
T700	I1,I3
T800	I1,I2,I3,I5
T900	I1,I2,I3

- b) Explain about generating Association Rules from Frequent Item sets. 5 M

**(OR)**

6. a) Find all frequent item sets for the following data using FP-growth algorithm with minimum support=60% and minimum confidence =80% 10M

TID	Items bought
T100	{M,O,N,K,E,Y }
T200	{D,O,N,K,E,Y}
T300	{M,A,K,E}
T400	{M,U,C,K,Y}
T500	{C,O,O,K,I,E}

- b) Write short note on Closed Item sets 4 M

#### **UNIT-IV**

7. a) Explain the Bayes classification with an example. 7 M  
b) Describe the metrics for evaluating classifier. 7 M  
(OR)  
8. a) Explain the basic algorithm for inducing a decision tree from training tuples. 7 M  
b) Describe the Rule based classification with an example. 7 M

#### **UNIT-V**

9. a) Describe the Bisecting K-means algorithm with an example 9 M  
b) Discuss the Strengths and weaknesses of DBSCAN algorithm 5 M  
(OR)  
10. a) Describe the Basic Agglomerative Hierarchical Clustering Algorithm with an example. 9 M  
b) Write short note on different types of clusters 5 M

# AR13

**CODE: 13EC3021**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B.Tech II Sem Supplementary Examinations, August, 2023**

**VLSI DESIGN**

**(ELECTRONICS & COMMUNICATION ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 70**

## **PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) Define Moore's law.
- b) Advantages of CMOS technology compared to BJT.
- c) Write down the equations for  $I_{ds}$  of an n-channel enhancement MOSFET operating in Non-saturated region
- d) Define stick diagram
- e) Give the different scaling models
- f) Mentioning different forms of pull up
- g) Define Fan-in
- h) Write about pass transistor
- i) Define switch logic
- j) Define controllability

## **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

### **UNIT-I**

2. a) Explain the MOS transistor operation with the help of neat sketches in the Enhancement mode. [6 M]
  - b) What are the steps involved in the NMOS fabrication? Explain with neat sketches. [6 M]
- (OR)**
3. a) Explain Twin tub-CMOS Fabrication Process. [8 M]
  - b) Compare CMOS and bipolar technologies [4 M]

## **UNIT-II**

4. a) Derive the relationship between drain to source current  $I_{ds}$  versus drain to source voltage  $V_{ds}$  in a non-saturated and a saturated region. [6 M]  
b) Draw CMOS Inverter circuit and explain different region of operation.. [6 M]

**(OR)**

5. a) Determine pull-up to pull-down ratio of an NMOS inverter when driven through one or more pass transistors. [6 M]  
b) What is threshold voltage of a MOS device and explain its significance. [6 M]

## **UNIT-III**

6. a) What is a stick diagram? Draw the stick diagram and layout for a CMOS inverter. [6 M]  
b) Write about the scaling limitations. [6 M]

**(OR)**

7. a) Draw a stick diagram and layout for two input CMOS NAND gate indicating all the regions and layers [6 M]  
b) What are the  $\lambda$ -based design rules? Give them for each layer. [6 M]

## **UNIT-IV**

8. a) What is meant by sheet resistance( $R_s$ )? Explain the concept of  $R_s$  applied to MOS transistors. [6 M]  
b) Explain how to Calculate of Delay unit  $\tau$  [6 M]

**(OR)**

9. a) How switch logic can be implemented using Pass Transistors? Explain. [6 M]  
b) Explain about design of ALU subsystems. [6 M]

## **UNIT-V**

10. a) Explain about design verification tools [6 M]  
b) Briefly explain need for CMOS testing [6 M]

**(OR)**

11. a) Explain about Design-capture tools [6 M]  
b) Explain about design strategies in CMOS Testing [6 M]