AR18

CODE: 18IET219 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

INTRODUCTION TO ELECTRONIC MEASUREMENTS

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)	List out static characteristics? Define any four of them?	[6M]
	b)	Draw and explain the DC ammeter circuit and derive the expression for shunt?	[6M]
		(OR)	
2.	a)	Discuss thermocouple type RF ammeter in detail?	[6M]
	b)	Draw and explain the working of series type ohmmeter?	[6M]

UNIT-II

3.	a)	Draw and explain the operation of standard AF sine and square wave generator?	[6M]
	b)	Explain the working of the wien's bridge method of harmonic distortion analyzer?	[6M]
		(OR)	
4.	a)	Draw and explain the operation of the basic wave analyzer?	[6M]
	b)	Draw and explain the operation of frequency selective wave analyzer?	[6M]

UNIT-III

5.	a)	Explain different features of CRT?	[6M]
	b)	Explain the measurement procedure of amplitude and time period?	[6M]
		(OR)	
6.	a)	Draw and explain the working of digital storage oscilloscope?	[6M]
	b)	With a block diagram explain the operation of a simple CRO?	[6M]

UNIT-IV

7.	a)	Draw and explain the Maxwell Bridge with neat diagram and derive the expression for unknown inductance?	[6M]
	b)	A Maxwell bridge is used to measure inductive impedance. Utilizing the bridge constants at balance are C1=0.01 μF, R1=470k Ω, R2=5.1k Ω and R3=100k Ω, find the series equivalent of the unknown impedance?	[6M]
		(OR)	
8.	a)	Draw the circuit diagram of a wien's bridge, explain its working and derive the equation for frequency of oscillation?	[6M]
	b)	In a wien's bridge Utilizing R_1, R_3 and C_1, C_3 are 3.1k, 12.4k and 5.2 μF,20.3pF respectively, find the frequency of oscillation?	[6M]

UNIT-V

9.	a)	What is an electrical transducer? Define active and passive transducers and give examples?	[6M]
	b)	Explain the principle, construction and working of LVDT?	[6M]
		(OR)	
10.	a)	Explain how the temperature is measured using Thermocouple?	[6M]
	b)	Explain the Principle, Construction and different forms of thermistor?	[6M]

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CODE: 18IET217 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

FUNDAMENTALS OF MATERIAL SCIENCE

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)	Classify materials and define Atomic Packing Factor.	5M
	b)	Calculate Atomic Packing Factor for FCC and BCC crystal structures.	7M
		(OR)	
2.	a)	What are bonds in solids? Define crystal structure.	4M
	b)	Briefly explain all Bravais lattice crystal structures.	8M

UNIT-II

3.	a)	What are defects in crystals?	2M
	b)	Explain point defects and line defects with neat sketch.	10M
		(OR)	
4.	a)	What are the deformation in crystals	2M
	b)	Briefly explain plastic deformation by slip.	10M

UNIT-III

5.	a)	Define recrystallization temperature.	2M
	b)	What are the difference between hot working and cold working?	10M
		(OR)	
6.	a)	Briefly explain Planar growth with neat sketch.	6M
	b)	Describe Dendrite growth.	6M

UNIT-IV

7.	a)	Define Hardness and Ductility.	4M
	b)	Explain about Rockwell hardness test and Brinell hardness test with neat sketch.	8M
		(OR)	
8.	a)	Draw stress - strain curve of a mild steel work piece and explain various zone in stress strain curve.	10M
	b)	Define Stress and Strain.	2M

UNIT-V

9.	a)	Briefly explain about the Charpy impact test with neat sketch.	8M
	b)	Define Impact strength and Creep strength.	4M
		(OR)	
10.	a)	Define fatigue strength.	2M
	b)	Briefly explain about the creep curve and creep test procedure?	10M

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CODE: 18IET216 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

INTRODUCTION TO MATHEMATICAL SIMULATION AND MODELING

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) What is MATLAB? Write its history and applications. 6 M
   b) Name the commands used for athematic operations with scalars. 6 M

(OR)

2. a) Discuss the typical uses of MATLAB. 6 M
   b) Name the commands used for relational operations and explain with examples. 6 M

UNIT-II

3. a) What is the list of matrix operations are performed in MATLAB? Explain each matrix operation with example. 6 M
   b) Express the results for following commands? 6 M

A = [2 4 5 6; 3 1 4 7; 1 2 6 8] ; B = [2 1; 4 2; 3 5; 1 6];

i) A(2,3)+B(3,2) ii) A(2,4) iii) B(:,1)

iv) A(2,:) = [ ] v) B' vi) B(:, 2)

(OR)

4. a) How to create the multi-dimensional arrays and strings in MATLAB and explain them briefly. 6 M
   b) List the common statistics functions available in MATLAB. 6 M

UNIT-III

5. a) Explain the operation of **"while"** loop with one simple example 6 M
   b) Write the differences between "for loop" and "while loop". 6 M

(OR)

6. a) Explain the operation of "for" loop with one simple example 6 M
   b) List out various conditional statements available and write the MATLAB syntax for each. 6 M

UNIT-IV

7. a) Write a short note on creating plots and subplots briefly. 6 M
   b) Explain the procedure for solving following equation using MATLAB. 6 M

i) $\sin(x) = e^x - 5;$

ii) $\begin{cases} 5x - 3y + 2z = 10 \\ -3x + 8y + 4z = 20 \\ 2x + 4y - 9z = 9 \end{cases}$

(OR)

8. a) How to plot the multiple data sets in one graph? Explain briefly by taking any example. 6 M
   b) Explain the procedure for solving the systems of four equations given below using MATLAB. 6 M

$$2w + x + 3y + 5z = 19$$
$$3w - x + 5y + 7z = 22$$
$$5w - 3x + 12y + 18z = -56$$
$$7w + 8x - 15y + 21z = 72$$

UNIT-V

9. a) Write a short note on basic tools that are available with Simulink. 6 M
   b) How to create the Simulink model in MATLAB? Explain briefly by taking any example. 6 M

(OR)

10. a) What is Simulink? Write down the importance of Simulink 6 M
    b) Convert the following mathematical model into Simulink model 6 M

$$x(t) = 2x(t) + u(t)$$

AR18

CODE: 18IET21B **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

IT SYSTEMS MANAGEMENT

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 IT Infrastructure. Explain IT infrastructure Management Activities.	7M
	b)	Explain Complexity of today's Computing Environment.	7M
		(OR)	
2.	a)	Define the evolutions of systems since 1960's and their management.	7M
	b)	Define Network? Explain Growth of Internet and its Application.	7M

UNIT-II

3.	a)	Explain Software Development life cycle and types of SDLC Models.	7M
	b)	Discuss about software economics.	7M
		(OR)	
4.	a)	Explain the Waterfall model. List out the advantages and disadvantages of Waterfall model.	7M
	b)	Explain Conventional Software Management Performance.	7M

UNIT-III

5.	a)	Define Model? Explain about Use Case Diagram in modelling.	7M
	b)	Describe the common tasks in IT system Management.	7M
		(OR)	
6.	a)	Explain about System Context diagram in brief.	7M
	b)	Explain about Strategy-Tactics-Operations (STO) approach in detail.	7M

UNIT-IV

7.	a)	Define Access control System in detail.	7M
	b)	Explain Emerging Trends in IT E-Commerce and GSM.	7M
		(OR)	
8.	a)	Explain Computer Security, Internet Security.	7M
	b)	What are Identity Management and Intrusion Detection?	7M

UNIT-V

9.	a)	Explain in detail about Disaster Recovery.	7M
	b)	Explain the traditional division of storage hierarchy.	7M
		(OR)	
10.	a)	Explain the mechanism of Back up Process.	7M
	b)	Explain Storage Management Process and Activities.	7M

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AR16

CODE: 16OE2029 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, August, 2023
Computational Number Theory

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 Obtain gcd of 858 and 325 **7M**

   b Express 858 and 325 in the form of m.858 + n.325 **7M**

(OR)

2. Prove that $9^n - 8^n - 1$ is divisible by 8 **14M**

UNIT-II

3. Show that $10^n + 3.4^{n+2} + 5 \equiv 0\ (Mod\ 9)$ **14M**

(OR)

4. Solve the congruence $13x \equiv 10\ \ (Mod\ 28)$ **14M**

UNIT-III

5. Define Euler-Fermate theorm . Hence, Show that $n^{16} - a^{16}$ is divisible by 85 if n and a are co-prime to 85. **14M**

(OR)

6 Define Wilson theorem. Hence, show that $(6! + 1)$ is divisible by 7. **14M**

UNIT-IV

7. Define Mobius function μ. Determine $\mu(11), \mu(15)$ **14M**

(OR)

8. Define Euler Totient Function Φ. Determine $\Phi(180)$ **14M**

UNIT-V

9. Evaluate (2/3) and (2/19) **14M**

(OR)

10. Determine whether 85 is quadratic residue of 223 or not **14M**

AR16

CODE: 16OE2021 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, August,2023

TRANSFORM THEORY

Time: 3 Hours **MaxMarks: 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) Find $Z(n)$ using $Z(n)$Show that $Z(na^n) = \frac{az}{(z-a)^2}$ **7M**
   b) Find the value of $Z(coshat\ sin\ bt)$ **7M**

(OR)

2. a) If $Z(u_n) = \frac{z}{z-1} + \frac{z}{z^2+1}$, find the Z-transform of u_{n+2} **10 M**
   b) Find the Z-transform of $u_n = \frac{a^n e^{-a}}{n!}$ **4 M**

UNIT-II

3. a) Find $Z^{-1}[\frac{z^2+z}{(z-1)^2}]$ **7M**
   b) Using Convolution Theorem, evaluate $Z^{-1}[(\frac{z}{z-a})^2]$ **7M**

(OR)

4. a) Find $Z^{-1}[\frac{z^2-3}{(z+2)(z^2+1)}]$ **7M**
   b) Using Convolution Theorem, evaluate $Z^{-1}[\frac{z^2}{(z-4)(z-5)}]$ **7M**

UNIT-III

5. Using Fourier integral show that $e^{-x}cosx = \frac{2}{\pi}\int_0^\infty \frac{\lambda^2+2}{\lambda^2+4} cos\lambda x\ d\lambda$. **14M**

(OR)

6. Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax}-e^{-bx}}{x}\ sinsxdx = tan^{-1}\left(\frac{s}{a}\right) - tan^{-1}\left(\frac{s}{b}\right)$ **14M**

UNIT-IV

7. Find the Fourier transform of $f(x)$ defined by $f(x) = \begin{cases} 1-x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$ and hence evaluate and $\int_0^\infty \frac{xcosx-sinx}{x^3} cos\frac{x}{2} dx$ **14M**

(OR)

8. Find the inverse Fourier sine transform of $f(x)$of $F_s(p) = \frac{e^{-ap}}{p}$ and hence deduce ${F_s}^{-1}(\frac{1}{p})$. **14M**

UNIT-V

9. Solve the difference equation, using Z-transform $y(n+2) - 4y(n+1) + 3y(n) = 0$, given $y(0) = 2, y(1) = 4$ **14M**

(OR)

10. Solve $y(n+2) - y(n) = 2^n$where $y(0) = 0, y(1) = 1$. **14M**