AR18

CODE: 18IET212 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

NUMERICAL METHODS

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) Find the positive root of the equation $x^3 - 5x + 1 = 0$. Using Bisection method correct upto 3 decimal places. **6M**

   b) Evaluate $\sqrt{28}$ to four decimal places by using Newton-Raphson method. **6M**

(OR)

2. a) Find the positive root of $x^4 - x - 10 = 0$, by using Regulai-Falsi method. **6M**

   b) Evaluate $\frac{1}{\sqrt{12}}$ by fixed point iteration method. **6M**

UNIT-II

3. Find $f(0.5)$ and $f(5.8)$ by using Newton's forward and backward difference formula from the table **12M**

x	0	1	2	3	4	5	6
$f(x)$	0	1	16	81	256	625	1296

(OR)

4. Using Lagrange's formula, evaluate the polynomial and calculate $f(3)$ from the following table **12M**

x	0	1	2	4	5	6
$f(x)$	1	14	15	5	6	19

UNIT-III

5. Find the first and second derivatives of the function tabulated below at the points $x = 0 \& x = 6$ **12M**

x	0	1	2	3	4	5	6
y	6.9897	7.4036	7.7815	8.1291	8.4510	8.7506	9.0309

(OR)

6. Compute the first two derivatives at $x = 10 \& x = 29$ from the following table **12M**

x	3	5	11	27	34
$f(x)$	-13	23	899	17315	35606

UNIT-IV

7. Evaluate the following integral $\int_0^1 \sqrt{1+x^4}\,dx$, by using Trapezoidal rule and Simpson's 1/3 rule **12M**

(OR)

8. Evaluate $\int_1^2 \int_2^3 e^{-(x+y)}\,dxdy$ by using Trapezoidal rule here take $h = 0.5 \& k = 0.5$. **12M**

UNIT-V

9. Using Taylor's series method, solve the equation $\frac{dy}{dx} = x - y^2$ for $x = 0.2, 0.4 \& 0.6$, given that $y(0) = 1$. **12M**

(OR)

10. Find $y(0.1)$ and $y(0.2)$ using Runge-Kutta method of Fourth order given that $\frac{dy}{dx} = x^2 - y$ and $y(0) = 1$. **12M**

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AR18

CODE: 18IET216 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

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)	Name the commands used for athematic operations with scalars.	6 M
	b)	What are the applications and typical uses of MATLAB?	6 M
		(OR)	
2.	a)	What are the windows available in MATLAB? and explain them briefly.	6 M
	b)	Write down the history and applications of MATLAB	6 M

UNIT-II

3.	a)	Write a short note on defining and reshaping of vectors with examples.	6 M
	b)	Express the results for following commands? A = [7 4 8 6; 6 4 7 1; 3 2 6 8] ; B = [5 6; 3 7; 4 8; 2 9]; i) A(3,3)+B(2,2) ii) A(:,3) iii) B(:,2) iv) A(3,:) = [ ] v) A' vi) B(3,:)	6 M
		(OR)	
4.	a)	How to generate the matrices and range of values? Give one example for each and explain them briefly.	6 M
	b)	How to create the multi-dimensional arrays and strings in MATLAB and explain them briefly.	6 M

UNIT-III

5.	a)	Explain the "Else statement" with flowchart and MATLAB program.	6 M
	b)	Explain the operation of "while" loop with one simple example	6 M
		(OR)	
6.	a)	Write the differences between "for loop" and "while loop".	6 M
	b)	Explain the "Elseif statement" with flowchart and MATLAB program.	6 M

UNIT-IV

7.	a)	Write a short note on the "creation of multiple data sets in one graph"	6 M
	b)	Write the MATLAB script file for finding the roots of equation "$y = 5x^4 + 3x^3 - 9x^2 + 10x - 25$".	6 M
		(OR)	

8. a) Explain the procedure for finding roots of quadratic equation. 6 M

$$y = ax^2 + bx + c$$

b) Explain the procedure for solving the systems of three equations given below using MATLAB. 6 M

$$x + 3y + 5z == 19$$
$$-x + 5y + 7z == 22$$
$$-3x + 12y + 18z == -56$$

UNIT-V

9. a) Create the Simulink model of Gain Amplifier and draw its waveforms. 6 M

b) How to convert the mathematical model into Simulink model? Explain briefly by taking any example. 6 M

(OR)

10. a) Convert the following mathematical model into Simulink model 6 M

$$\dot{x}(t) = 2x(t) + u(t)$$

b) What is Simulink? Discuss its importance. 6 M

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AR18

CODE: 18IET217 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

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)	List out bonds in solids.	4M
	b)	Write down various points in perfections in crystal structures	8M
		(OR)	
2.	a)	What are the mechanical properties of materials?	3M
	b)	Calculate atomic packing factor for any two Crystal structures.	9M

UNIT-II

3.	a)	What are the deformations in crystals?	2M
	b)	Briefly explain plastic deformation by Twinning	10M
		(OR)	
4.	a)	What are crystal imperfections?	2M
	b)	Briefly explain all crystal imperfections with neat sketch.	10M

UNIT-III

5.	a)	Explain about Hot working and Cold working operations.	10M
	b)	What are processing steps in solidification mechanism.	2M
		(OR)	
6.	a)	What is recrystallization temperature.	2M
	b)	Briefly explain solidification mechanisms.	10M

UNIT-IV

7.	a)	Briefly explain about tensile test procedure with neat sketch.	10M
	b)	Define hardness.	2M
		(OR)	
8.	a)	Draw stress strain curve for mild steel.	4M
	b)	Briefly explain hardness test procedure with neat sketch.	8M

UNIT-V

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

AR18

CODE: 18IET21B **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

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)	Briefly explain the development of internet.	6M
	b)	Define IT. How is it affecting the common life in current scenario?	6M
		(OR)	
2.	a)	Define IT infrastructure? Explore the various components under IT infrastructure?	6M
	b)	Discuss the advantages and challenges of IT infrastructure management?	6M

UNIT-II

3.	a)	Summarize the phases of 'Software Development Life Cycle (SDLC)'.	6M
	b)	Discuss 'Classic Life Cycle Model' with Pros and Cons.	6M
		(OR)	
4.	a)	Illustrate on Conventional Software Management	6M
	b)	Analyse the Evolution of Software Economics from software cost estimation models.	6M

UNIT-III

5.	a)	Discuss following organizational development approaches: i. People-Process-Technology Approach ii. Strategy-Tactics-Operations Approach	6M
	b)	Write short notes on IT management system context diagram	6M
		(OR)	
6.	a)	What is service level agreement? How does it help service level management process?	6M
	b)	Discuss capacity management and availability management with advantages.	6M

UNIT-IV

7.	a)	What is antivirus tool? Explore the applications of antivirus tools.	6M
	b)	Discuss the relation between OSI and TCP/IP layer architecture.	6M
		(OR)	
8.	a)	Discuss the two basic components of the cryptography.	6M
	b)	Discuss the emerging trends in IT: E-commerce, GSM	6M

UNIT-V

9.	a)	Define storage management? Explore the process activities of storage management.	6M
	b)	Define backup. Explore the process activities of backup storage and restore polices.	6M
		(OR)	
10.	a)	Define disaster recovery. Classify the different disasters?	6M
	b)	Define space management. Explain the uses of hierarchical storage management.	6M

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AR18

CODE: :18IET219 **SET 2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

INTRODUCTION TO ELECTRONIC MEASUREMENTS

(Interdisciplinary Elective – I)

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 and Explain all Static characteristics.	6M
	b)	Distinguish between Static and Dynamic Characteristics of an instrument.	6M
		(OR)	
2.	a)	Discuss thermocouple type RF ammeter in detail.	6M
	b)	With neat sketch explain the operation of Series type ohmmeter and also explain how it is calibrated.	6M

UNIT-II

3.	a)	What is a Standard signal generator? Explain with a neat block diagram.	6M
	b)	What are the different functions in the front panel of an AF sine wave generator and explain clearly.	6M
		(OR)	
4.	a)	Explain the working of Frequency Selective wave analyzer.	6M
	b)	Explain with the help of block diagram the working of harmonic distortion analyzer	6M

UNIT-III

5.		With a block diagram explain the operation of a Digital storage Oscilloscope	12M
		(OR)	
6.	a)	Distinguish between Dual Trace and Dual Beam Oscilloscopes	6M
	b)	Draw the block diagram of Dual Trace CRO and explain it.	6M

UNIT-IV

7.		Draw the circuit diagram of a wien bridge , explain its working and derive the equation for frequency.	12M
		(OR)	
8.	a)	Draw the circuit diagram of Maxwell's bridge and derive conditions of balance.	6M
	b)	With neat sketch explain how unknown resistance is measured by means of wheatstone bridge	6M

UNIT-V

9.	a)	What is Transducer? Write the classification of transducers.	6M
	b)	What are the different types of inductance transducers? explain their basic principle of operation.	6M
		(OR)	
10.	a)	Explain about digital data acquisition systems	6M
	b)	Write notes on sensistors	6M

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AR18

CODE: 18IET21A **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

UNIX UTILITIES

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)	Draw and Explain the architecture of UNIX Operating System	6m
	b)	Brief the Features of UNIX	6m
		(OR)	
2.	a)	Explain about kernel data structures	6m
	b)	Explain about System administration.	6m

UNIT-II

3.	a)	Explain the following commands with examples i)cat ii)wc iii)cp	6m
	b)	Explain the following commands with examples i)mv ii)man iii)ls	6m
		(OR)	
4.	a)	Discuss the following commands with examples i)echo ii)who iii)pwd	6m
	b)	Explain the following commands with examples i) mkdir ii)rmdir iii)date	6m

UNIT-III

5.	a)	Explain the file utilities commands with examples	6m
	b)	Explain text processing utilities commands	6m
		(OR)	
6.	a)	Explain the UNIX Backup Utilities and disk utilities commands	6m
	b)	List and explain various networking commands ?	6m

UNIT-IV

7.	a)	Define a shell & Explain about shell variables?	6m
	b)	Explain the following i) Redirection ii)pipes	6m
		(OR)	
8.	a)	Explain the following i) Tee Command ii)Job Control	6m
	b)	Explain about standard streams in UNIX	6m

UNIT-V

9.	a)	Explain conditional statements or decision making statements with one example	6m
	b)	Explain Repetition statements with one example	6m
		(OR)	
10.	a)	Write a shell script to print factorial value of given integer	6m
	b)	Write a shell script to find out whether a given number is prime number or not.	6m

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AR16

CODE: 16OE2021 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

TRANSFORM 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) Find the values of $Z(n)$ and $Z(\frac{1}{n+1})$. 7 M

   b) If $Z(n^2) = \frac{(z^2+z)}{(z-1)^3}$, find $Z(n^3)$. 7 M

(OR)

2. If $f(z) = \frac{5z^2+3z+12}{(z-1)^4}$, find the values $f(2)$ and $f(3)$. 14 M

UNIT-II

3. Evaluate $Z^{-1}[\frac{z}{(z+3)^2(z-2)}]$. 14 M

(OR)

4. a) Using Convolution Theorem, show that $\frac{1}{n!} * \frac{1}{n!} = \frac{2^n}{n!}$. 7 M

   b) Evaluate $Z^{-1}[\frac{z}{z^2+11z+24}]$. 7 M

UNIT-III

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

(OR)

6. Find the Fourier sine and cosine transforms of $f(x) = 2e^{-5x} + 5e^{-2x}$. 14 M

UNIT-IV

7. Find the inverse Fourier Cosine Transform $f(x)$ of 14 M

$$F_c\{p\} = \begin{cases} \frac{1}{2a}\left(a - \frac{p}{2}\right), & when\ p < 2a \\ 0, & when\ p \geq 2a \end{cases}$$

(OR)

8. Evaluate the following by using Parseval's identity $\int_0^\infty \frac{dx}{(x^2+a^2)(y^2+b^2)}\ (a > 0, b > 0)$. 14 M

UNIT-V

9. Solve the difference equation, using Z-transform 14 M
   $u_{n+2} - 3u_{n+1} + 2u_n = 0$, given that $u_0 = 0, u_1 = 1$.

(OR)

10. Solve the difference equation, using Z-transform 14 M
    $u_{n+2} - 5u_{n+1} - 6u_n = 5^n$, given that $u_0 = u_1 = 0$.

AR16

CODE: 16OE2024 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

PRINCIPLES OF MECHANICAL MEASUREMENTS

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.		Define accuracy, precision, sensitivity, repeatability, tolerance, range, span and resolution?	14M
		(OR)	
2.		Explain the Basic Functional description of measuring Instruments	14M

UNIT-II

3.	a)	With a neat sketch explain working principle and operation of rota meter and list out any 4 merits and demerits?	7M
	b)	Briefly explain working principle and operation of magneto flow meter with a neat sketch?	7M
		(OR)	
4.	a)	Briefly explain working principle and operation of hot-wire anemometer with a neat sketch?	7M
	b)	Explain the working principle and operation of ultrasonic flow meter with neat sketch	7M

UNIT-III

5.		Explain working principle of bimetallic thermometer with a neat figure? And list out their advantages and disadvantages?	14M
		(OR)	
6.		Explain working principle of liquid gas thermometer with a neat figure? And list out their advantages and limitations?	14M

UNIT-IV

7.		Describe the working principle and operation of capacitive displacement transducer	14M
		(OR)	
8.		With suitable sketches explain working principle and operation of resistance transducers. State their advantages, disadvantage and application?	14M

UNIT-V

9.		With a neat sketch explain working principle and operation of stroboscope and list merits, demerits and applications?	14M
		(OR)	
10.	a)	Explain working of hydraulic load cell with diagram?	7M
	b)	Write short notes on optical torsion meter with neat sketch?	7M

AR16

CODE: 16OE2029 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI (AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, January-2022

COMPUTATIONAL NUMBER THEORY

(Open Elective)

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 275 and 200 **7M**
   b Express 275 and 200 in the form of m.275 + n.200 **7M**

(OR)

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

UNIT-II

3. Show that $4^{2n+1} + 3^{n+2} \equiv 0\ (Mod\ 13)$ **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**