AR18

CODE: 18IET212 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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 root of $x log_{10} x = 1.2$ by using Bisection method. **6 M**

   b) Find the reciprocal of 18 using Newton Raphson method. **6 M**

(OR)

2. a) Find the positive root of $e^x sinx = 1$, by using Regulai-Falsi method. **6 M**

   b) Find the root of $3x = cosx + 1$, by using Iteration method. **6 M**

UNIT-II

3. a) Applying Newton's Forward interpolation formula, compute the value of $\sqrt{5.5}$, given that $\sqrt{5} - 2.236, \sqrt{6} - 2.449, \sqrt{7} - 2.646, \sqrt{8} - 2.828$, correct up to three decimal places. **6 M**

   b) Using Lagrange's formula, calculate $f(3)$ from the following table **6 M**

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

(OR)

4. a) Find by Gauss's Backward interpolating formula the value of y at $x = 1936$, using the following table **6 M**

x	1901	1911	1921	1931	1941	1951
y	12	15	20	27	39	52

   b) A curve passing through the points $(0,18), (1,10), (3,-18) \& (6,90)$. Find value of the curve at $x = 2$. **6 M**

UNIT-III

5. Find the first and second derivatives of the function tabulated below at the points $x = 3$ **12 M**

x	1.5	2	2.5	3	3.5	4
y	3.375	7.0	13.625	24.0	38.875	59.0

(OR)

6. Using the table find the first two derivatives at $x = 0 \ \& \ x = 4$ **12 M**

x	0	2	3	4	7	9
$f(x)$	4	26	58	112	466	922

UNIT-IV

7. Evaluate the following integral $\int_0^6 \frac{dx}{1+x^2}$, by using Trapezoidal rule and Simpson's 1/3 rule **12 M**

(OR)

8. Evaluate $\int_0^1 \int_0^1 e^{(x+y)}\, dxdy$ by using Simpson's 1/3 rule and taking $h = 0.5 \ \& \ k = 0.5$ **12 M**

UNIT-V

9. Use Taylor's method to obtain the approximate values of $y(1.1) \& \ y(1.3)$, for the differential equation $\frac{dy}{dx} = xy^{\frac{1}{3}}, y(1) = 1.$ Compare the numerical solution obtained with exact solution **12 M**

(OR)

10. Apply the Fourth order Runge-Kutta method, to find an approximate value of y when $x = 0.1 \ \& \ 0.2$ in steps of 0.1, given that $\frac{dy}{dx} = xy + y^2, y(0) = 1.$ **12 M**

***

AR18

CODE: 18IET213 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

INTRODUCTION TO NUMBER THEORY

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)	Obtain gdd of 275 and 200	6M
	b)	Express 858 and 325 in the form of ax+by	6M
		(OR)	
2.	a)	Obtain sumof divisors of 360	6M
	b)	Show that the product of two numbers of the form 6n+1 is also 6n+1	6M

UNIT-II

3.		Show that $8^n - 3^n$ is divisible by 5	12M
		(OR)	
4.		Solve the congruence $13x \equiv 10 \ (Mod\ 28)$	12M

UNIT-III

5.	a)	Define Euler-Fermate theorm . Hence, Show that $n^{18} - a^{18}$ is divisible by 133 if n and a are co-prime to 133.	6M
	b)	Define Wilson theorem. Hence, show that $2(p-3)! + 1$ is divisible by a prime p.	6M
		(OR)	
6.		Use Chinees remainder theorem to solve	12M

$$x \equiv 1 \ (Mod\ 5)$$
$$x \equiv 1 \ (Mod\ 7)$$
$$x \equiv 3 \ (Mod\ 11)$$

UNIT-IV

7.		Define Mobius function μ. Determine $\mu(17), \mu(20)$	12M
		(OR)	
8.		Define Euler Totient Function Φ. Determine $\Phi(180)$	12M

UNIT-V

9.		Determine whether 888 is quadratic residue of 1999 or not	12M
		(OR)	
10.		Evaluate (-1/3) , (-1/11) and (2/19)	12M

***

AR18

CODE: 18IET214 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

WATER SHED 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 watershed development and its objectives. Explain Integrated approach for watershed management.	6 M
	b)	Explain the influence of the following characteristics of watershed development (i) Physiography (ii) climate (iii) Drainage	6 M
		(OR)	
2.	a)	Explain the need for watershed development in India	4 M
	b)	Explain the influence of the following characteristics of watershed development (i) Slope (ii) Geology & Soils (iii) Vegetation (iv) Hydrogeology	8 M

UNIT-II

3.	a)	Explain the factors influencing the erosion of soil in a watershed management	6 M
	b)	explain in detail how the following measures arrest the soil erosion in a watershed (i) Ploughing (ii) Trenching	6 M
		(OR)	
4.	a)	Discuss in details of Brushwood dam and rock fill dam	6 M
	b)	Explain the estimation of soil loss due to erosion and write the universal soil loss equation?	6 M

UNIT-III

5.	a)	Explain in detail the water harvesting structures	6 M
	b)	Explain the soil moisture conservation through check dam	6 M
		(OR)	
6.	a)	Define soil conservation measures for wastelands	6 M
	b)	Explain the soil moisture conservation through Percolation tank	6 M

UNIT-IV

7.	a)	Explain the management of Forest land and Grass land in a watershed management	6 M
	b)	Describe the reasons for formation of saline and alkaline soils and explain the steps for reclaim to normal state	6 M
		(OR)	
8.	a)	Describe the management of Agriculture and Wild land in a watershed programme	6 M
	b)	Discuss in detail the land use and land capability classifications	6 M

UNIT-V

9.	a)	Discuss about the strip, mixed and inter cropping pattern	6 M
	b)	Explain how the sustainable agriculture and bio - mass management managed in an ecosystem	6 M
		(OR)	
10.	a)	Explain the role of eco system in a watershed management	6 M
	b)	Discuss how dry land agriculture and horticulture are managed in an ecosystem	6 M

***

AR18

CODE: 18IET216 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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)	List out data types available in the MATLAB with one example.	CO1, K1	6M
	b)	List different types of arithmetic operators available in MATLAB and explain them with suitable example.	CO1, K1	6M
		(OR)		
2.	a)	Explain various key features and scope of the MATLAB	CO1, K1	6M
	b)	List out relational operators available in MATLAB with one example.	CO1, K1	6M

UNIT-II

3.	a)	Explain the syntax for the 'function calling another function' with a suitable example.	CO2, K2	6M
	b)	Evaluate results for the following commands? Given A = [8 6 1 2 5; 5 0 -1 2 3 ;4 2 1 8 7; 5 6 7 8 9;] ; B = [1 3 6; 5 6 1;2 3 7; 1 0 3]; i) A(4,3)+B(2,3) ii) A(3,:) iii) B(:,1) iv)B(3,:) = [ ] v) A(2:3,2:3) vi)size(B)	CO2, K2	6M
		(OR)		
4.	a)	Develop a user defined function to find mean value of set of numbers.	CO2, K2	6M
	b)	Evaluate results for the following commands? Given A=[-1 -2 3 4 5; 8 7 6 5 1; 2 1 0 3 4; 5 -8 -7 3], C=[3 4 5; 0 1 2; -3 -1 9; 3 -3 5]; i) A(2,3)+C(3,2) ii)length(A) iii)A[2,:] iv)C[:,3] iv)A[3,:]=[] v)size(C) vi)A'	CO2, K2	6M

UNIT-III

5.		Explain the 'loops' available in MATLAB with suitable examples.	CO3,K1	12M
		(OR)		
6.	a)	Develop the script file to evaluate the factorial of a given number using 'for' loop.	CO3, K2	6M
	b)	Develop the script file to calculate the minimum number for a given set numbers using 'while' loop.	CO3,K2	6M

UNIT-IV

7.	a)	Explain the commands for integration and differentiation in MATLAB with suitable examples.	CO4,K1	6M
	b)	Develop code for plotting '10sin(ωt)' in the range of $0<\omega t<2\pi$	CO4,K2	6M
		(OR)		
8.		Develop the code to find maxima and minima with a suitable example	CO4, K2	12M

UNIT-V

9.	a)	Develop the Simulink model for RLC series circuit with supply voltage 'V'.	CO5,K2	12M
		(OR)		
10.	a)	List the advantages of Simulink.	CO5,K1	5M
	b)	Develop Simulink model for the equation $dv/dt = m - (g/k)\, v^2$	CO5, K2	7M

***

AR18

CODE: 18IET217 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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)	Briefly explain about surface defects?	[6 M]
	b)	Explain different types of bonding	[6 M]
		(OR)	
2.	a)	What are types of point imperfections and explain in details with neat sketch?	[6 M]
	b)	What is the significance of the dislocations	[6 M]

UNIT-II

3.	a)	Explain why fine grained materials have superior properties than coarse grained materials?	[8 M]
	b)	Explain classification of solid solutions	[4 M]
		(OR)	
4.	a)	Discuss the differences between Slip and Twinning	[6 M]
	b)	What is grain refinement?	[6 M]

UNIT-III

5.	a)	Explain the Hume Rothery rules for maximum solid solubility	[6 M]
	b)	Explain Mechanism of crystallization	[6 M]
		(OR)	
6.	a)	Explain solidification of alloy using binary cooling curves	[8 M]
	b)	What are the advantages and disadvantage of hot working and cold working?	[4 M]

UNIT-IV

7.		Draw stress strain curve for ductile and brittle material and explain stress strain curve for mild steel?	[12M]
		(OR)	
8.	a)	Define hardness and briefly explain types of hardness tests.	[6 M]
	b)	Explain Toughness and Resilience	[6 M]

UNIT-V

9.	a)	Why impact test is necessary and explain charpy test	[6 M]
	b)	Factors to improve fatigue resistance	[6 M]
		(OR)	
10.	a)	What is meant by Creep? Explain different Creep mechanisms.	[6 M]
	b)	Write a Short note on Fracture and Fatigue Testing.	[6 M]

***

AR18

CODE: 18IET219 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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 and define different dynamic characteristics?	K1-CO1 [6M]
	b)	Draw and explain the DC voltmeter circuit and derive the expression for multiplier?	K2-CO1[6M]
		(OR)	
2.	a)	Explain different types of static errors?	K1-CO1[6M]
	b)	Explain how unknown resistance can be measured using shunt type ohmmeter?	K2-CO1[6M]

UNIT-II

3.	a)	Draw the block diagram and explain the principle of operation of standard signal generator?	K2-CO2[6M]
	b)	Draw the block diagram and explain the principle of operation of function Generator?	K2-CO2[6M]
		(OR)	
4.	a)	Draw and explain the operation of the RF heterodyne wave analyzer?	K2-CO2[6M]
	b)	Explain the working of resonance bridge harmonic distortion analyzer?	K2-CO2[6M]

UNIT-III

5.	a)	With the aid of block diagram explain the operation of a simple CRO?	K2-CO3[6M]
	b)	Draw and explain the operation of Dual beam CRO?	K2-CO3[6M]
		(OR)	
6.	a)	Explain different features of CRT?	K1-CO3[6M]
	b)	Draw and explain the operation of Dual trace oscilloscope?	K2-CO3[6M]

UNIT-IV

7.	a)	Draw the circuit diagram of Wheatstone bridge and derive condition for balance?	K2-CO4[6M]
	b)	In a Wheatstone bridge utilizing R_1 ,R_2 and R_3 are 10kΩ, 15kΩ and 40kΩ respectively, find the unknown resistance value R_X ?	K3-CO4[6M]
		(OR)	
8.	a)	Draw the circuit diagram of Schering's bridge and derive conditions of balance?	K2-CO4[6M]
	b)	Draw the circuit diagram of Anderson's bridge and derive condition for balance?	K2-CO4[6M]

UNIT-V

9.	a)	List and define the important parameters of electrical transducers?	K1-CO5[6M]
	b)	Give the application of how sensistor is used in a circuit for temperature compensation?	K2-CO5[6M]
		(OR)	
10.	a)	Draw and explain the Digital Data acquisition system?	K2-CO5[6M]
	b)	What is a electrical transducer? Define active and passive transducers and give examples?	K1-CO5[6M]

AR18

CODE: 18IET21A **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February, 2021

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)	Explain structure of Unix operating system.	6M
	b)	Write short note on Unix file system.	6M
		(OR)	
2.	a)	Write about system administration.	6M
	b)	Explain the features of Unix.	6M

UNIT-II

3.	a)	Discuss the following commands with examples. i) rmdir ii)mv iii)wc	6M
	b)	Explain the following commands with examples. i) cp ii) mkdir iii) pwd	6M
		(OR)	
4.	a)	Explain the following commands with examples. i) uname ii) cd iii) rm	6M
	b)	Discuss the following commands with examples. i) echo ii) more iii) date	6M

UNIT-III

5.	a)	Explain security by file permissions	6M
	b)	Describe the following command with examples. i) tail ii) head iii) sort	6M
		(OR)	
6.	a)	Explain the following commands with examples. i) grep ii) passwd iii) join	6M
	b)	Describe the following commands with examples. i) cmp ii) ps iii) du.	6M

UNIT-IV

7.	a)	Explain about standard streams in unix.	6M
	b)	Discuss about redirections.	6M
		(OR)	
8.	a)	Explain about command execution with example.	6M
	b)	Define shell &write a short note on foreground and back ground process.	6M

UNIT-V

9.	a)	Define control structures with examples.	6M
	b)	Write a shell script to perform arithmetic operations..	6M
		(OR)	
10.	a)	Explain shell meta characters.	6M
	b)	Write a shell script to reverse the given number.	6M

***