AR18

CODE: 18IET212 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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 $x^3 - 2x - 5 = 0$, by using Iteration method. **6 M**

   b) Find the root of $2x - log_{10}x = 7$, that lies between 3.5 & 4 by using Regulai-Falsi method. **6 M**

(OR)

2. a) Find the root of $x = e^{-x}$, by using Newton-Raphson method. **6 M**

   b) Find the root of $sinx = \frac{1}{x}$ that lies between $x = 1$ & $x = 1.5$ (measured in radians) by using Bisection method. **6 M**

UNIT-II

3. a) Construct the difference table for the following data **6 M**

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
$f(x)$	0.003	0.067	0.148	0.248	0.370	0.518	0.697

and hence evaluate $f(1.2)$ using Newton's backward difference formula.

   b) Using Lagrange's formula, calculate $y(10)$ from the following table **6 M**

x	5	6	9	11
y	12	13	14	16

(OR)

4. a) The population of a town in the decimal census was given below. Estimate the population for the year 1985 by using Newton's Forward interpolation formula **6 M**

Year	1891	1901	1911	1921	1931
population	46	66	81	93	101

b) Use Gauss's Backward interpolation formula to find $f(32)$ given that $f(25) = 0.2707, f(30) = 0.3027, f(35) = 0.3386$ & $f(40) = 0.3794$. **6 M**

UNIT-III

5. A rod is rotating in a plane. The following table gives the angle θ(in radians) through which the rod has turned for various values of the time t (in seconds). **12 M**

t	0	0.2	0.4	0.6	0.8	1.0	1.2
θ	0	0.12	0.49	1.12	2.02	3.20	4.67

Calculate the angular velocity and the angular acceleration of the rod, when $t = 0.6$

(OR)

6. Compute the first two derivatives at $x = 3$ from the following table **12 M**

x	1	2	4	8	10
$f(x)$	0	1	5	21	27

UNIT-IV

7. Evaluate the following integral $\int_0^{\pi} t\, sint\, dt$ by using Trapezoidal rule and Simpson's 3/8 rule **12 M**

(OR)

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

UNIT-V

9. Find the approximate value of y for $x = 0.1$ & 0.2, if $\frac{dy}{dx} = x + y$ and $y = 1$ at $x = 0$ using Picard's method. Check your answer with exact solution. **12 M**

(OR)

10. Apply the Fourth order Runge-Kutta method, to find an approximate value of y when $x = 1.2$ in steps of 0.1, given that $\frac{dy}{dx} = x^2 + y^2, y(1) = 1.5$. **12 M**

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AR18

CODE: 18IET213 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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 gcd of 858 and 325	6M
	b)	Express 275 and 200 in the form of ax+by	6M
		(OR)	
2.	a)	Prove that n(n-1)(2n-1) is divisible by 6	6M
	b)	Prove that $9^n - 8^n - 1$ is divisible by 8	6M

UNIT-II

3.		Show that $10^n + 3.4^{n+2} + 5 \equiv 0\ (Mod\ 9)$	12M
		(OR)	
4.		Solve the congruence $259x \equiv 5\ \ (Mod\ 11)$	12M

UNIT-III

5.	a)	Define Euler-Fermate theorm . Hence, Show that $n^{12} - a^{12}$ is divisible by 13	6M
	b)	Define Wilson theorem. Hence, show that $(12! + 1)$ is divisible by 13.	6M
		(OR)	
6.		Use Chinees remainder theorem to solve	12M

$$x \equiv 3\ \ (Mod\ 5)$$
$$x \equiv 1\ \ (Mod\ 7)$$
$$x \equiv 6\ \ (Mod\ 8)$$

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 85 is quadratic residue of 223 or not	12M
		(OR)	
10.		Evaluate (2/7) and (2/19)	12M

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AR18

CODE: 18IET214 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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. List out the important characteristics of watershed.	5 M
	b)	Explain the integrated and multi-disciplinary approach for watershed management.	7 M
		(OR)	
2.	a)	Explain the influence of the following characteristics of watershed development (i) Size and Shape (ii) Hydrology (iii) Socio economic characteristics.	6 M
	b)	Define the basic data and inputs useful in implementing a watershed development.	6 M

UNIT-II

3.	a)	Find the types of soil erosion in a watershed and effects of erosion on land fertility	6 M
	b)	Classify the all soil erosion control measures in a watershed and discuss any two measures in detail	6 M
		(OR)	
4.	a)	Discuss in detail about erosion control methods with a neat sketch furrowing and bunding	6 M
	b)	Explain in detail how the following measures arrest the soil erosion in a watershed (i) Gully Control (ii) Trenching	6 M

UNIT-III

5.	a)	Explain the soil moisture conservation through artificial recharge techniques	6 M
	b)	Define water harvesting structures for ground water recharge	6 M
		(OR)	
6.	a)	Define in detail about catchment harvesting and soil moisture conservation	6 M
	b)	Explain the soil moisture conservation through Farm pond	6 M

UNIT-IV

7.	a)	Discuss in detail the land use and land capability classifications	6 M
	b)	Describe the management of Agriculture and Grass land in a watershed programme	6 M
		(OR)	
8.	a)	Explain the management of Forest land and wild lands 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

UNIT-V

9.	a)	Describe what is an eco system. Explain its significance in a watershed management	6 M
	b)	Discuss about the strip, mixed and inter cropping pattern	6 M
		(OR)	
10.	a)	Explain in detail social forestry and afforestation	6 M
	b)	Discuss how dry land agriculture and horticulture are managed in an ecosystem	6 M

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AR18

CODE: 18IET216 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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)	Explain various key features and scope of the MATLAB	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)	List out MATLAB command windows with their purpose.	CO1, K1	6M
	b)	List out relational operators available in MATLAB with one example.	CO1, K1	6M

UNIT-II

3.	a)	Determine the results for following commands? Given A = [3 1 0 4 5; 5 3 1 2 3 ;7 5 3 2 1; 0 3 5 7 1;] ; B = [1 3 6; 5 6 1;2 3 7; 1 0 3]; i) A(3,4)+B(1,3) ii) A(4,:) iii) B(:,2) iv)A(3,:) = [ ] v) A(2:3,2:3) vi) A' vii)size(B)	CO2, K2	7M
	b)	Create a function file to calculate the mean value of set of numbers.	CO2, K1	5M
		(OR)		
4.	a)	Explain defining and reshaping of vectors with suitable examples.	CO2,K2	6M
	b)	Explain the syntax function calling another function with suitable example.	CO2, K2	6M

UNIT-III

5.	a)	Write a script file to find roots of quadratic expression x^2+7x+12	CO3, K2	6M
	b)	Write a script file to find maximum number in a given set of 3 values.	CO3, K2	6M
		(OR)		
6.	a)	Write a short note on 'nested if' loop with an example.	CO3, K1	6M
	b)	Evaluate the factorial of a given number using while loops.	CO3, K2	6M

UNIT-IV

7.	a)	Develop code for plotting parabola $y=5x^2$ in the range of $-15 \leq x \leq 15$	CO4, K2	6M
	b)	Explain 'solve' and 'roots' commands in MATLAB with suitable examples.	CO4, K1	6M
		(OR)		
8.		Develop the code to find maxima and minima with a suitable example	CO4, K2	12M

UNIT-V

9.	a)	Explain the importance and applications of Simulink.	CO5, K1	6M
	b)	Develop the Simulink model for the equation $(dv/dt)= m – [(g/k)v^2]$	CO5, K2	6M
		(OR)		
10.		Develop a Simulink model for RLC series circuit with supply voltage V	CO5, K2	12M

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AR18

CODE: 18IET217 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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)	Find the packing factor of F C C, B C C space lattices	**[8 M]**
	b)	Define metallic bonding and its characteristics?	**[4 M]**
		(OR)	
2.	a)	Briefly explain about zero dimensional (point) defects?	**[6 M]**
	b)	Explain with neat sketch types bonding?	**[6 M]**

UNIT-II

3.	a)	Briefly explain about the deformation by twinning and slip mechanism?	**[8 M]**
	b)	Explain the Hume Rothery rules for maximum solid solubility	**[4 M]**
		(OR)	
4.	a)	Explain why fine grained materials have superior properties than coarse grained materials?	**[8M]**
	b)	What is the significance of the dislocations?	**[4 M]**

UNIT-III

5.	a)	What are the difference between hot working and cold working?	**[8M]**
	b)	Briefly explain about solidification mechanism?	**[4 M]**
		(OR)	
6.	a)	Briefly explain about planar and dendritic growth?	**[6 M]**
	b)	What are the advantages and disadvantage of hot working and cold working?	**[6 M]**

UNIT-IV

7.	a)	Draw the stress strain diagram for mild steel material and explain various curves in stress strain diagram?	**[8M]**
	b)	Explain about Brinell hardness test	**[4 M]**
		(OR)	
8.		Explain any six following terms	**[12M]**

A. Stress B. Strain C. Hardness D. Modules of elasticity E. Proof stress
F. Ductility G. malleability H .Toughness

UNIT-V

9.	a)	Briefly explain about the Charpy impact test?	**[8M]**
	b)	Factors Affecting Charpy Impact Energy	**[4 M]**
		(OR)	
10.	a)	Write a short note on Fatigue Testing.	**[6 M]**
	b)	What is meant by Creep? Explain different Creep mechanisms.	**[6 M]**

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AR18

CODE: 18IET219 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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?	K1-CO1[6M]
	b)	Draw and explain the DC ammeter circuit and derive the expression for shunt?	K2-CO1[6M]
		(OR)	
2.	a)	Discuss thermocouple type RF ammeter in detail?	K2-CO1[6M]
	b)	Draw and explain the working of series type ohmmeter?	K2-CO1[6M]

UNIT-II

3.	a)	Draw and explain the operation of standard AF sine and square wave generator?	K2-CO2[6M]
	b)	Explain the working of the wien's bridge method of harmonic distortion analyzer?	K2- CO2[6M]
		(OR)	
4.	a)	Draw and explain the operation of the basic wave analyzer?	K2- CO2[6M]
	b)	Draw and explain the operation of frequency selective wave analyzer?	K2- CO2[6M]

UNIT-III

5.	a)	Explain different features of CRT?	K1-CO3[6M]
	b)	Explain the measurement procedure of amplitude and time period?	K1-CO3[6M]
		(OR)	
6.	a)	Draw and explain the working of digital storage oscilloscope?	K2-CO3[6M]
	b)	With a block diagram explain the operation of a simple CRO?	K2-CO3[6M]

UNIT-IV

7.	a)	Draw and explain the Maxwell Bridge with neat diagram and derive the expression for unknown inductance?	K2-CO4[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?	K3-CO4[6M]
		(OR)	
8.	a)	Draw the circuit diagram of a wien's bridge, explain its working and derive the equation for frequency of oscillation?	K2-CO4[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?	K3-CO4[6M]

UNIT-V

9.	a)	What is an electrical transducer? Define active and passive transducers and give examples?	K1-CO5[6M]
	b)	Explain the principle, construction and working of LVDT?	K2-CO5[6M]
		(OR)	
10.	a)	Explain how the temperature is measured using Thermocouple?	K2-CO5[6M]
	b)	Explain the Principle, Construction and different forms of thermistor?	K2-CO5[6M]

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AR18

CODE: 18IET21A **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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 Architecture of Unix ?	6M
	b)	Write about features of Unix ?	6M
		(OR)	
2.	a)	Write about Unix file system?	6M
	b)	Explain about user level security in Unix ?	6M

UNIT-II

3.	a)	Explain the following commands with examples i)ls ii)cat iii)who	6M
	b)	Discuss the following commands with examples i)echo ii)passwd iii)pwd	6M
		(OR)	
4.	a)	Write short note on the following commands with examples i)rmdir ii)mkdir iii)wc	6M
	b)	Discuss the following commands with examples. i)date ii)cd iii)cp	6M

UNIT-III

5.	a)	Explain vi editor with examples?	6M
	b)	List and explain various file handling utilities?	6M
		(OR)	
6.	a)	Describe various text processing utilities?	6M
	b)	List and explain various disk processing utilities?	6M

UNIT-IV

7.	a)	Write about Redirection?	6M
	b)	Define a shell & Explain about shell variables?	6M
		(OR)	
8.	a)	Explain pipes with examples?	6M
	b)	Discuss about command line editing and command substitution.?	6M

UNIT-V

9.	a)	Explain shell responsibilities?	6M
	b)	List and explain different arithmetic operations in shell programming?	6M
		(OR)	
10.	a)	Write in detail about control structures in unix?	6M
	b)	Briefly discuss about environment variables?	6M

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AR18

CODE: 18IET21B **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, November-2020

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.	6M
	b)	. Define the evolutions of systems since 1960's and their management.	6M
		(OR)	
2.	a)	Explain the various IT systems components.	6M
	b)	Define Network? Explain Growth of Internet and its Application.	6M

UNIT-II

3.	a)	Explain Software Development life cycle and types of SDLC Models.	8M
	b)	Discuss about software economics.	4M
		(OR)	
4.		Explain the Waterfall model. List out the advantages and disadvantages of Waterfall model.	12M

UNIT-III

5.	a)	Describe the common tasks in IT system Management.	6M
	b)	Explain about System Context diagram in brief.	6M
		(OR)	
6.		State and Explain Service level management and Financial Management.	12M

UNIT-IV

7.		State and Explain Computer Security, Internet Security, Physical Security in detail.	12M
		(OR)	
8.		State Emerging Trends in IT E-Commerce and GSM.	12M

UNIT-V

9.	a)	Explain Storage Management Process and Activities	6M
	b)	Explain in detail about Disaster Recovery	6M
		(OR)	
10.	a)	Explain the traditional division of storage hierarchy	6M
	b)	Explain the mechanism of Back up Process	6M

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