Q.P. Code: 1851301

SET - 1

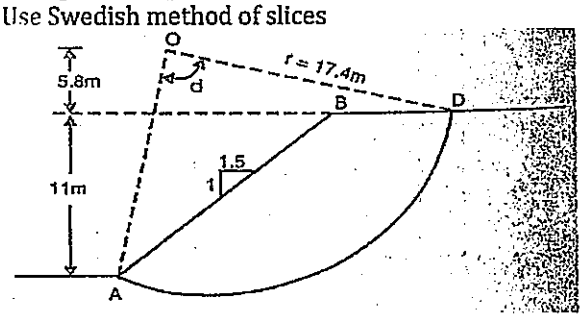
K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

M. Tech. III Semester (R18PG) Regular/Supplementary Examinations of March– 2023

SUB: Stability Analysis of Slopes (GTE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			Marks	CO	Bl.
		UNIT - I			
1.	(a)	Explain about Failure Modes of slopes.	12M	CO1	L2
		(OR)			
2.	(a)	Explain the Mechanics of Slope Failure	12M	CO1	L2
		UNIT – II			
3.	(a)	Explain the Infinite and Finite Slopes with Water Pressures	6M	CO2	L2
	(b)	Discuss the Concept of Factor of Safety	6M	CO2	L6
		(OR)			
4.		Determine the factor of safety of slope against the sliding for the slip surface shown in below figure. The properties of soil are c = 20 kN/m², φ = 36° and γ = 20 kN/m³. Use Swedish method of slices 	12M	CO2	L4
		UNIT – III			
5.	(a)	Derive the two-dimensional flow of Laplace equation and it's solution	6M	CO3	L3
	(b)	Discuss the determination of phreatic line, flow nets in homogeneous	6M	CO3	L2
		(OR)			
6.	(a)	Discuss the Seepage Control in Earth Dams	6M	CO3	L2
	(b)	Write short notes on: Critical hydraulic gradient and Piping	6M	CO3	L1
		UNIT – IV			
7.	(a)	Explain the Stabilization of Slopes by Drainage Methods	6M	CO4	L1
	(b)	Discuss briefly about Shotcreting.	6M	CO4	L2
		(OR)			
8.	(a)	Explain the Stabilization and Strengthening of Slopes by rock anchoring,	6M	CO4	L1
	(b)	Discuss about maintenance of slopes.	6M	CO4	L3
		UNIT-V			
9.	(a)	Discuss the Aims, Regional perspective Case studies of urban slope stability	6M	CO5	L2
	(b)	Discuss about slope stability analyses of Site 64 in the suburb of Scarborough.	6M	CO5	L3
		(OR)			
10.	(a)	Explain about Observational approach and monitoring.	6M	CO5	L1
	(b)	Discuss about slope stability analyses of Site 77 in the suburb of Scarborough.	6M	CO5	L2

Q.P. Code: 1852303

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

M. Tech. III Semester (R18PG) Regular/Supplementary Examinations of March - 2023

SUB: Dynamics of Linear Systems (PS)

Time: 3 hours Max. Marks: 60

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			Marks	CO	BL
		UNIT - I			
1.	(a)	The transfer function of a closed loop system is $\frac{x(s)}{u(s)} = \frac{K(s-\alpha 1)(s-\alpha 2)}{(s-\lambda 1)(s-\lambda 2)(s-\lambda 3)}$ where $\lambda_1 \neq \lambda_2 \neq \lambda_3$. Obtain a state space model for the system?	6M	CO1	L3
	(b)	Reduce the given state model into its canonical form by diagonalizing matrix A $\dot{x}(t) = \begin{bmatrix} 0 & 1 & -1 \\ -6 & -11 & 6 \\ -6 & -11 & 5 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$ And $y(t) = [1 \quad 0 \quad 0]\, x(t)$	6M	CO1	L5
		(OR)			
2	(a)	Obtain transfer function of a system if State Model is given.	6M	CO1	L3
	(b)	Determine the transfer matrix for the system $\begin{bmatrix} \dot{x}1 \\ \dot{x}2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & 0 \end{bmatrix} \begin{bmatrix} x1 \\ x2 \end{bmatrix} + \begin{bmatrix} 4 & 6 \\ -5 & 0 \end{bmatrix} \begin{bmatrix} u1 \\ u2 \end{bmatrix} ; \begin{bmatrix} y1 \\ y2 \end{bmatrix} = \begin{bmatrix} 1 & -1 \\ 8 & 1 \end{bmatrix} \begin{bmatrix} x1 \\ x2 \end{bmatrix}$	6M	CO1	L5
		UNIT – II			
3.	(a)	Obtain the Laplace transform approach to the solution of non-homogeneous state equations?	6M	CO2	L3
	(b)	Obtain the state transition matrix for the following system: $\begin{bmatrix} \dot{x}1 \\ \dot{x}2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x1 \\ x2 \end{bmatrix}$	6M	CO2	L3
		(OR)			
4.	(a)	obtain the time response of the following system with initial condition x(0)=0 for a unit step function occurring at t=0. $\begin{bmatrix} \dot{x}1 \\ \dot{x}2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x1 \\ x2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$	6M	CO2	L3
	(b)	List the properties of State Transition Matrix.	6M	CO2	L1
		UNIT – III			
5.		A system represented by following state model is controllable but not observable. Show that non-observability is due to a pole-zero cancellation in $C[sI-A]^{-1}B$ $\dot{x} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix} x + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u$ and $y = [1 \quad 1 \quad 0]\, x$	12M	CO3	L1
		(OR)			
6.	(a)	Explain Principle of duality? what are its necessary and sufficient conditions?	6M	CO3	L1

	(b)	Obtain the controllable phase variable state variable model of transfer function $\frac{y(s)}{u(s)} = \frac{b_0 s^3 + b_1 s^2 + b_2 s^1 + b_3}{s^3 + a_1 s^2 + a s^1 + a_3}$	6M	CO3	L3

UNIT – IV

7.	(a)	Explain the necessary and sufficient condition for pole placement?	6M	CO4	L5
	(b)	Consider the system $\dot{x} = Ax + Bu$ and $y = Cx$ Where A=$\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$ B=$\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$ C=[1 0 0] Design a minimum order state observer. The desired Eigen values of the observer matrix are 2+j 3.464 and -2-j3.464.	6M	CO4	L6

(OR)

8.		A plant is given by $\dot{x} = Ax + Bu$ where A=$\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -6 \end{bmatrix}$ B=$\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$. Determine the state feedback gain matrix K with closed loop poles as $s = -2 + j4, s = -2 - j4$ and $s = -10$.	12M	CO4	L5

UNIT-V

9.	(a)	Explain Liapunov stability analysis of linear time invariant system?	6M	CO5	L5
	(b)	Using Liapunov function, check the stability of the following second order linear time in-variant system? $\begin{bmatrix} \dot{x}1 \\ \dot{x}2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -1 & -1 \end{bmatrix} \begin{bmatrix} x1 \\ x2 \end{bmatrix}$	6M	CO5	L3

(OR)

10.	(a)	Determine stability of the system described by the following matrix $A = \begin{bmatrix} -1 & -2 \\ 1 & -4 \end{bmatrix}$	6M	CO5	L5
	(b)	Write short notes on (i) Positive definiteness and positive indefiniteness of scalar function (ii) Negative definiteness and Negative indefiniteness of scalar function (iii) Indefiniteness of scalar function	6M	CO5	L1

Q.P. Code: 18[illegible]301

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

M. Tech. III Semester (R18PG) Regular/Supplementary Examinations of March– 2023

SUB: Fuels and Combustion Technology (RE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			Marks	CO	BL
		UNIT - I			
1.		Explain the properties and rating of fuels?	12M	CO1	L3
		(OR)			
2.		Explain Orsat apparatus with neat sketch?	12M	CO1	L3
		UNIT – II			
3.		Explain the Coal preparation process?	12M	CO2	L3
		(OR)			
4.		Explain the different types of coal and their properties?	12M	CO2	L3
		UNIT – III			
5.		Why is Oil so Important in Today's World?	12M	CO3	L3
		(OR)			
6.		Explain the different processing of petroleum?	12M	CO3	L3
		UNIT – IV			
7.		What are the classification of gases fuels briefly explain it?	12M	CO4	L4
		(OR)			
8.	(a)	Explain the concept of adiabatic flame temperature?	6M	CO4	
	(b)	What are the combustion appliances for solid, liquid and gaseous fuels briefly explain it?	6M	CO4	L4
		UNIT-V			
9.	(a)	What are the methods of strategies for emission reduction?	6M	CO5	L4
	(b)	What are the recent protocols of emission?	6M	CO5	L4
		(OR)			
10.		What are the emissions from fuel combustion system briefly explain it?	12M	CO5	L4

Q.P. Code: 1884301

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

M. Tech. III Semester (R18PG) Regular/Supplementary Examinations of March– 2023

SUB: IOT & ITS Applications (ES & VLSI)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			Marks	CO	BL
		UNIT - I			
1.	(a)	Explain and Draw One M2M IOT Standardized Architecture	6	CO1	L2
	(b)	What is the importance of sensors and Actuators in IoT	6	CO1	L1
		(OR)			
2.	(a)	Write in detail about the Evolution of Internet of Things	6	CO1	L3
	(b)	Explain Simplified IOT Architectures	6	CO1	L2
		UNIT – II			
3.	(a)	Draw and explain the MAC frame format of IEEE 802.15.4	6	CO2	L1
	(b)	Explain Network Layer Protocols in IOT.	6	CO2	L2
		(OR)			
4.	(a)	Distinguish Constrained Nodes and Constrained Networks	6	CO2	L4
	(b)	Explain the Application Layer Protocols: CoAP and MQTT	6	CO2	L2
		UNIT – III			
5.	(a)	What is the Influence of Microcontrollers in IOT	6	CO3	L1
	(b)	Explain in detail the Raspberry Pi interfaces.	6	CO3	L4
		(OR)			
6.	(a)	Discuss about System on Chips	6	CO3	L2
	(b)	Discuss in detail the use of embedded computing in the design of IoT Systems.	6	CO3	L2
		UNIT – IV			
7.	(a)	Explain about Edge Streaming Analytics and Network Analytics.	6	CO4	L2
	(b)	Write the use of Python Web Application Framework – Django.	6	CO4	L4
		(OR)			
8.	(a)	Discuss Briefly Hadoop Eco-System.	6	CO4	L2
	(b)	Discuss in detail about Xively cloud for IT and Illustrate Xively dashboard device details.	6	CO4	L2
		UNIT-V			
9.	(a)	Explain use of Big Data and Visualization in IOT.	6	CO5	L2
	(b)	Give two examples of IoT applications related to Home appliances and buildings	6	CO5	L5
		(OR)			
10.	(a)	Analyze the IOT applications in Industry 4.0 Concepts.	6	CO5	L4
	(b)	Formulate an Industrial application of IoT system and brief on the various use cases of smart and connected cities.	6	CO5	L6

Q.P. Code: 1898303

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

M. Tech. III Semester (R18PG) Regular/Supplementary Examinations of March- 2023

SUB: Scalable Systems for Data Science (AI&DS)

Time: 3 Hours

Max. Marks: 60

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			Marks	CO	BL
		UNIT - I			
1.	(a)	List and explain the Characteristics of Distributed Systems.	6M	CO1	L4
	(b)	Discuss in detail about User requirements and design issues in Distributed systems	6M	CO1	L3
		(OR)			
2.	(a)	Explain the VMTP and FLIP.	6M	CO1	L2
	(b)	Describe the evolution of Distributed Systems.	6M	CO1	L3
		UNIT – II			
3.		Explain in detail about Google File system	12M	CO2	L3
		(OR)			
4.		Draw and explain the Sun Network File System.	12M	CO2	L4
		UNIT – III			
5.	(a)	Discuss in detail about CORBA.	6M	CO3	L3
	(b)	What is a RMI? Explain	6M	CO3	L1
		(OR)			
6.	(a)	Define web services. Discuss the Web Services.	6M	CO3	L1
	(b)	Illustrate the Remote procedure call.	6M	CO3	L2
		UNIT – IV			
7.		Explain Functional programming model of MapReduce.	12M	CO4	L3
		(OR)			
8.	(a)	Describe the File permissions in HDFS.	6M	CO4	L4
	(b)	Explain the YARN.	6M	CO4	L2
		UNIT-V			
9.	(a)	Discuss in detail about Parallel data access.	6M	CO5	L3
	(b)	Explain Evolutionary Algorithm based Techniques to Handle Big Data..	6M	CO5	L2
		(OR)			
10.		Describe the Next Level Combat with Big Data.	12M	CO5	L3

Q.P. Code: 1871308

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. III Sem. (R18PG) Regular Examinations of March, 2023
SUB: COMPOSITE MATERIALS (GTE, RE, ES&VLSI & AI&DS)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			M	CO	BL
		UNIT - I			
1.	(a)	What are the primary functions of a reinforcement in composite materials	6M	CO1	L1
	(b)	Explain in detail how the distribution and density of reinforcement influence the properties of the composite materials	6M	CO1	L2
		(OR)			
2.		Describe in detail the effect of reinforcement on overall composite performance.	12M	CO1	L1
		UNIT – II			
3.		Explain layup method, curing , properties and applications of glass fibres	12M	CO2	L2
		(OR)			
4.	(a)	Describe the manufacturing process of Boron-fibres, with a neat schematic diagram	6M	CO2	L2
	(b)	Discuss in detail about particulate reinforcements	6M	CO2	L2
		UNIT – III			
5.	(a)	Explain properties and applications of carbon-carbon composites	6M	CO3	L3
	(b)	Write a detail note on Liquid metal infiltration of manufacturing of ceramic matrix composites	6M	CO3	L2
		(OR)			
6.		What is carbon-carbon composites and how they are produced? Why they are recommended for high temperature applications?	12M	CO3	L2
		UNIT – IV			
7.		Discuss any three curing methods involved in manufacturing of polymer matrix composites	12M	CO4	L3
		(OR)			
8.		Write notes on (i) filament winding and (ii) pultrusion.	12M	CO4	L1
		UNIT-V			
9.		What is hygrothermal failure and describe various failure criteria.	12M	CO5	L2
		(OR)			
10.	(a)	Discuss on stress concentrations in composite materials	6M	CO5	L3
	(b)	Discuss on strength design using caplet plots	6M	CO5	L3

Q.P. Code: 1871307

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

M. Tech. III Semester (R18PG) Regular/Supplementary Examinations of March– 2023

SUB: Cost Management of Engineering Projects (PS)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

		Marks	CO	BL
	UNIT - I			
1.	Differentiate between Relevant cost and Differential cost	12M	CO1	L2
	(OR)			
2.	Illustrate the Creation of a Database for operational control	12M	CO1	L4
	UNIT – II			
3.	Classify the various stages of project execution	12M	CO2	L4
	(OR)			
4.	Discuss about the Project commissioning	12M	CO2	L2
	UNIT – III			
5.	Explain about Break even analysis	12M	CO3	L2
	(OR)			
6.	Summarize the various pricing strategies	12M	CO3	L5
	UNIT – IV			
7.	What is Just-in-Time approach? Give an example.	12M	CO4	L1
	(OR)			
8.	Differentiate between Balanced Score Card and Value chain Analysis	12M	CO4	L2
	UNIT-V			
9.	Discuss about Linear programming.	12M	CO5	L2
	(OR)			
10.	What is the difference between PERT and CPM? Explain	12M	CO5	L1