K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Advanced Soil Mechanics (GTE)

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) Explain in detail, how to determine the coefficient of consolidation by square root of time fitting method. — 6M CO1 L2

   (b) A clay layer 4 m thick is subjected to a pressure of 55 kN/m². If the layer has a double drainage and undergoes 50 % consolidation in one year, determine the coefficient of consolidation. Take T_v = 0.196. If the coefficient of permeability is 0.020 m/yr, determine the settlement in one year. — 6M CO1 L5

(OR)

2. (a) State the assumptions and their validity of the Terzaghi's consolidation theory. — 6M CO1 L3

   (b) The time to reach 60% consolidation is 30 sec for a sample of 1 cm thick, tested in the laboratory under condition of double drainage. How many years will the corresponding layer in nature require to reach the same degree of saturation if it is 10 m thick and drained on one side only? — 6M CO1 L4

UNIT – II

3. (a) Explain the Mohr-coulomb failure criterion. — 6M CO2 L2

   (b) Two identical soil specimens were tested in a tri-axial apparatus. First specimen failed at a deviator stress of 770 kN/m² when the cell pressure was 200 kN/m². Second specimen failed at a deviator stress of 1370 kN/m² under a cell pressure of 400 kN/m². Determine the value of c and Ø analytically. If the same soil is tested in a direct shear apparatus with a normal stress of 600 kN/m². Estimate the shear stress at failure. — 6M CO2 L3

(OR)

4. (a) What is the effect of pore pressure in strength of soils? — 6M CO2 L2

   (b) The following results were obtained from undrained shear box tests on samples of silty clay: — 6M CO2 L5

Normal pressure (kN/m²)	60	100	135
Shear stress (kN/m²)	30	36	41

Determine the cohesion and angle of shearing resistance.

UNIT – III

5. Describe the Lambe's stress path. — 12M CO3 L2

(OR)

6. Discuss the different practical situations of the stress path. — 12M CO3 L6

UNIT – IV

7. Define critical void ratio. Explain the shear behavior of a soil whose void ratio is lesser than the critical void ratio. — 12M CO4 L2

(OR)

8. (a) Explain the critical state parameters. — 6M CO4 L1

   (b) Describe the different dilation models. — 6M CO4 L4

UNIT-V

9. Write a short note on: (i) Elastic wall   (ii) Yield curve — 12M CO5 L2

(OR)

10. Discuss the flow rules of non-associated to elastic and plastic deformations. — 12M CO5 L3

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Advanced Foundation Engineering (GTE)

Time: 3 Hours   Max. Marks: 60

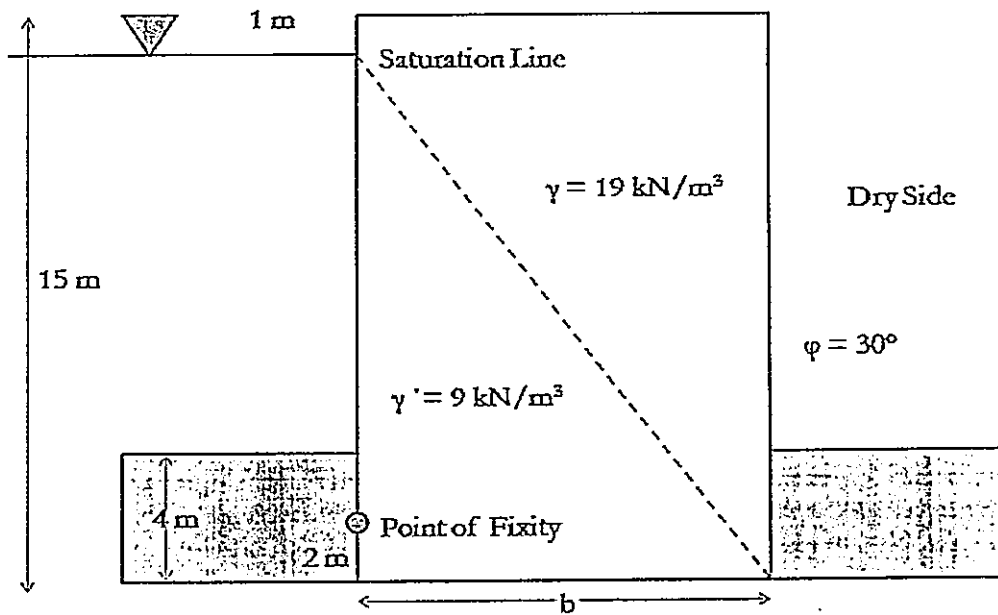### Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	(a)	What do you mean by Site investigation? What are the objectives of Site Investigation?	6M	CO1	L1
	(b)	Discuss various types of Penetration tests used in sub soil investigation?	6M	CO1	L2
		(OR)			
2.	(a)	Describe various methods of Sub soil Exploration and explain open excavation method of sub soil exploration	6M	CO1	L2
	(b)	With the help of neat sketch explain Wash boring method of drilling bore hole	6M	CO1	L2
		UNIT – II			
3.	(a)	What are the Requirements for Satisfactory Performance of Foundations	6M	CO2	L2
	(b)	A column carries a load of 1000KN.The soil is dry sand weighing 19kN/m3 and having an angle of internal friction of 400.A minimum factor of safety of 2.5 is required and Terzaghi's bearing capacity factors are Nγ=42,Nq=21.Find the size of a square footing, if placed at the ground surface.	6M	CO2	L3
		(OR)			
4.	(a)	What are different types of raft foundations? Write a note on allowable settlement of structures on individual footings and Raft foundations	6M	CO2	L1
	(b)	Discuss the procedure for the design of a raft foundation	6M	CO2	L3
		UNIT – III			
5.	(a)	What are the various methods of Estimating Load Transfer of Piles? Explain how can you estimate load carrying capacity of a pile by using Pile load test	6M	CO3	L3
	(b)	A square group of 9 piles was driven into soft clay extending to a large depth. The dieter and length of piles were 30cm and 9m respectively. If the unconfined compressive strength of clay is 9 t/m^2 and pile spacing is 90cm c/c. What is the capacity of group? Assume a factor of safety of 2.50 and adhesion factor of 0.75.	6M	CO3	L3
		(OR)			
6.	(a)	What is 'negative skin friction' on pile and why does it cause concern Suggest means of controlling it.	6M	CO3	L2
	(b)	A 500 m diameter concrete pile is to be driven in a clay soil. The design capacity of the pile is 500 KN. The soil has unconfined compressive strength of 115 KN/m^2 and γ=18.1KN/m^3.Assume adhesion factor α=0.75.Find the length of the pile for the above design capacity.	6M	CO3	L3
		UNIT – IV			
7.	(a)	Discuss the situations where a well foundation is more suitable than the other types of foundations	6M	CO4	L2
	(b)	A well foundation has the following particulars: Outer diameter=5.0m, Inner diameter=3.0m, Depth below the scour Level=12.0m, Moment=5000 kN-m, Horizontal force acting at 8m above the scour level=600Kn, Factor of Safety=2.0, Assuming that the well tilts about a certain point above the base compute the allowable ,total equivalent resisting force due to earth pressure. Take γsat=20kN/m^3 φ=30^0.	6M	CO4	L3
		(OR)			

8. (a) Discuss various methods of for the design of well foundations. What are their relative merits   6M   CO4   L2

(b) A cylindrical well of external diameter 6 m and internal diameter 4 m is sunk to   6M   CO4   L3 a depth 16 m below the maximum scour level in a sand deposit. The well is subjected to a horizontal force of 1000 kN acting at a height of 8 m above the scour level. Determine the total allowable equivalent resisting force due to earth pressure, assuming that (a) the well rotates about a point above the base, and (b) the well rotates about the base. Assume $\gamma' = 10$ kN/m^3, $\varphi = 30°$, and factor of safety against passive resistance = 2. Use Terzaghi's Approach.

UNIT-V

9   Design a circular cellular coffer dam of total height 15 m resting on rock as   12M   CO5   L4 shown in Figure 02. Take allowable interlock tension of 1500 kN/m, $\varphi = 30°$, $\delta = 25°$, K = 0.60, f = 0.30 and γsat = 10 kN/m^3.

(OR)

10. (a) Compare diaphragm cellular coffer dam and circular cellular coffer dam   6M   CO5   L4

(b) What are causes of failure of a Coffer Dam   6M   CO5   L2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular Examinations of March/April – 2023
SUB: Ground Improvement Techniques (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.	What is preloading? Discuss the principle and installation of preloading and wick drains to accelerate the consolidation in soft clay.	12M	CO 1,3	L1
	(OR)			
2.	Explain how deep layer of cohesionless soil is densified by the vibroflotation? Discuss the benefits and limitations of this Vibroflotation method.	12M	CO 2,3	L1
	UNIT – II			
3.	When do you prefer chemical treatment of ground? Discuss how you improve cohesive soil with the industrial by product fly ash?	12M	CO 2,3	L2
	(OR)			
4.	What are the characteristics of grout materials? Explain jet grouting method with its advantages and limitations.	12M	CO2	L2
	UNIT – III			
5.	Why soils experience freezing and thawing? Discuss the associated effects due to thawing and freezing.	12M	CO 1,3	L3
	(OR)			
6.	Explain how you modify the ground which is subjected to freezing and thawing? Discuss the drawbacks of thermal modification of ground.	12M	CO 2,3	L3
	UNIT – IV			
7.	What is the role of reinforcement in ground modification? Discuss how you improve desired properties of a soil with the the inclusion of geotextiles to the soil.	12M	CO 2,3	L4
	(OR)			
8.	What is soil nailing? Discuss how you install soil nailing? Also write the various advantages and drawbacks of the soil nailing process.	12M	CO4	L4
	UNIT-V			
9.	Compute the pullout capacity of the following reinforcing elements buried in a horizontal position at a depth of 8 m in sand having $\gamma = 18$ kN/m^3 , c = 0 and $\phi = 30°$. For soil metal take $\tan \delta = 0.7 \tan\phi$ whereas for soil grout and soil Geotextile take $\tan \delta = \tan\phi$, (i) a steel strip of width 100 mm, (ii) a driven soil nail in a hole of diameter 150 mm, and unit width of a Geotextile sheet of length 5 m.	12M	CO 4	L5
	(OR)			
10.	Elaborate on analysis and design of shallow foundations constructed on reinforced earth beds.	12M	CO 3	L5

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Pavement Analysis and Design (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.		How would you show your understanding of Performance of Airport Pavements?	12M	CO1	L3
		(OR)			
2.		What are the factors affecting the Pavement design? Explain in detail?	12M	CO1	L5
		UNIT – II			
3.	(a)	Would you explain about Burmister's two layer system with the help of diagram?	6M	CO2	L5
	(b)	Would you discuss the vertical stress distribution under the pavement?	6M	CO2	L5
		(OR)			
4.	(a)	Sketch the structure of a flexible pavement. The analysis of sub-grade soil of a proposed highway gives the following data: Passing No.200 in ASTM 15 microns sieve is 60% Liquid limit 45% and plastic limit 25% Daily traffic intensity 1000 heavy vehicles per day. List the design procedure for a suitable flexible pavement.	6M	CO2	L5
	(b)	Would explain the concept of Equivalent single wheel load of multiple wheels with the help of diagram.	6M	CO2	L5
		UNIT – III			
5.	(a)	What are the different types of stresses that are to be considered in flexible pavement design?	6M	CO3	L4
	(b)	Can you list out the advantages and limitations of Empirical and mechanistic empirical design methods for flexible pavement design?	6M	CO3	L4
		(OR)			
6.	(a)	Would you explain the brief concepts of layered system in flexible pavements?	6M	CO3	L5
	(b)	Can you identify the design factors considered in Flexible Pavement deisgn as per IRC Guidelines?	6M	CO3	L5
		UNIT – IV			
7.		Discuss Westergaard's concept of temperature stresses in concrete pavements. Find the spacing between contraction joints for a 3.75 m slab width having a thickness of 25 cm for Reinforces cement concrete slab. Take allowable tensile stress values in concrete and steel are 0.80 and 1400 kg/cm2, coefficient of friction is 1.50.	12M	CO4	L4
		(OR)			
8.	(a)	Can you explain the warping & frictional stresses in rigid pavements?	6M	CO4	L4
	(b)	Can you list the various considerations in rigid pavement analysis?	6M	CO4	L4
		UNIT-V			
9.		Estimate the thickness of cement concrete pavement using the method suggested by IRC (old method) and take the following data: modulus of elasticity of concrete = 3×105 kg/cm2 , modulus of rupture of concrete =45 kg/cm2 , Poisson's ratio of concrete =0.15, modulus of sub-grade reaction =6.5 kg/cm3 , design wheel load = 5100 kg and radius of contact area = 16cm	12M	CO5	L5
		(OR)			
10.	(a)	Can you explain the design of cement concrete pavement for runways?	6M	CO5	L4
	(b)	Would you explain the design of continuously reinforced concrete pavements?	6M	CO5	L4

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Advanced Power System Protection (PS)

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)	Discuss the purpose of back up protection.	6M	CO1	L3
	(b)	Mention the merits and demerits of static relays in power system protection	6M	CO1	L3
		(OR)			
2.	(a)	What are the advantages and disadvantages of static relays?	6M	CO1	L4
	(b)	Explain how an Instrument Transformers can be used for the protection purpose.	6M	CO1	L4
		UNIT – II			
3.	(a)	Illustrate least squares method for curve fitting in detail with necessary diagrams and derivations.	6M	CO2	L5
	(b)	Explain the concept of Finite Difference Techniques	6M	CO2	L4
		(OR)			
4.	(a)	Explain in detail of Walsh Function Analysis.	6M	CO2	L4
	(b)	Explain in detail of backward interpolation formulas.	6M	CO2	L4
		UNIT – III			
5.	(a)	Write short notes on Surge Protection and Analog Filtering	6M	CO3	L3
	(b)	Explain in details of Digital Relay as a Unit Consisting of Hardware and Software.	6M	CO3	L4
		(OR)			
6.	(a)	What is Signal Aliasing Error and Multiplexers	6M	CO3	L3
	(b)	Write short notes on the Sample and Hold Circuits	6M	CO3	L3
		UNIT – IV			
7.	(a)	Discuss Fractional Cycle Window algorithm.	6M	CO4	L3
	(b)	Explain the First Derivative (Mann and Morrison) algorithm	6M	CO4	L4
		(OR)			
8.	(a)	Explain Walsh Function Based Algorithm	6M	CO4	L4
	(b)	Discuss Differential Equation Based Algorithms	6M	CO4	L3
		UNIT-V			
9.	(a)	Discuss in detail about recent advances in digital protection of power systems	6M	CO5	L5
	(b)	Classify the types of differential protection?	6M	CO5	L3
		(OR)			
10.		Explain Digital Differential Protection of Transformers using harmonic filtering algorithms-based restraint conditions.	12M	CO5	L4

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Power System Dynamics – I (PS)

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.	Write and Explain the mathematical modelling Equations of Synchronous machine	12M	CO1	L2
			CO1	
	(OR)			
2.	Explain the performance of a synchronous machine under steady state conditions by applying per unit quantities.	12M	CO1	L2
	UNIT – II			
3.	Discuss about Steady state equivalent circuit with relevant equations?	12M	CO2	L1
	(OR)			
4.	Formulate the state space model for synchronous machine.	12M	CO2	L1
	UNIT – III			
5.	Explain about the parameters Sub transient and Transient inductances I the model of a Synchronous motor?	12M	CO3	L3
	(OR)			
6.	Obtain the simplified model of a synchronous machine with necessary equations.	12M	CO3	L3
	UNIT – IV			
7.	.Explain about different Excitation systems and its effects on Synchronous machine performance?	12M	CO4	L3
	(OR)			
8.	Obtain the state space model of rotating rectifier system.	12M	CO4	L1
	UNIT-V			
9.	Explain about Steady state equivalent circuits of the mathematical model of an Induction motor?	12M	CO5	L1
	(OR)			
10.	Discuss about the modelling of a Prime mover?	12M	CO5	L2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Energy Conversion 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)	Name the renewable energy sources and explain them in brief	6M	CO1	L2
	(b)	What is the status of non-conventional energy sources in India, and what are their future prospect?	6M	CO1	L3
		(OR)			
2		Discuss the impact of various conventional sources of energy on the environment and suggest remedial measures.	12M	CO1	L4
		UNIT – II			
3.	(a)	Explain the construction and working of a solar cell.	6M	CO2	L4
	(b)	What are the main advantages of flat plate solar collector? Explain in detail.	6M	CO2	L3
		(OR)			
4.	(a)	How the solar radiation data is collected and what way it is helpful in solar energy conversion.	6M	CO2	L2
	(b)	What is solar power? Discuss the various environmental impact of solar power system on environment?	6M	CO2	L3
		UNIT – III			
5.		Classify Wind Energy conversion systems and list out their advantages and disadvantages.	12M	CO3	L2
		(OR)			
6.	(a)	Discuss in detail the operation and control of a wind turbines which are used in wind energy system?	6M	CO3	L2
	(b)	Explain how the variations of wind velocity and its directions are taken care in Wind energy systems?	6M	CO3	L2
		UNIT – IV			
7.	(a)	What are the advantages and disadvantages of Geo-thermal energy?	6M	CO4	L3
	(b)	What are the limitations of harnessing Geo-thermal energy?	6M	CO4	L3
		(OR)			
8.		What is geothermal energy? How can geothermal energy are utilized for electric power Generation?	6M	CO4	L3
		UNIT-V			
9.	(a)	What is the principle of tidal power generation?	6M	CO5	L3
	(b)	Explain the various components of tidal power plants with neat sketch.	6M	CO5	L4
		(OR)			
10.	(a)	What are the main hurdles in the way of common use of fuel cell?	6M	CO5	L2
	(b)	Describe the classification of the fuel cells.	6M	CO5	L4

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Electrical Distribution 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.	Describe various load forecasting Techniques in Power systems.	12M	CO1	L2
	(OR)			
2.	Explain about Distributed energy supply system & technological forecasting.	12M	CO1	L2
	UNIT – II			
3.	Explain with suitable block diagram Distribution automation and its control function.	12M	CO2	L2
	(OR)			
4.	Discuss about the communication requirements for distribution automation.	12M	CO2	L3
	UNIT – III			
5.	With a neat block diagram, explain the components and its function of SCADA.	12M	CO3	L2
	(OR)			
6.	Explain the various DA integration mechanisms.	12M	CO3	L2
	UNIT – IV			
7.	Discuss various communication methods used for Automated Meter Reading System?	12M	CO4	L2
	(OR)			
8.	Explain optimal switching device placement in radial distribution system.	12M	CO4	L5
	UNIT-V			
9.	Discuss about implementation of genetic algorithm for distributed automation?	12M	CO4	L3
	(OR)			
10. (a)	What is the need of demand side management.	6M	CO4	L1
(b)	What are the benefits of Demand Side Management.	6M	CO4	L3

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Advanced Thermodynamics and Fluid Mechanics (RE)

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

		M	CO	BL
1.	(a) Establish the inequality of Clausius.	6M	CO1	L6
	(b) Air flows through an adiabatic compressor at 2 kg/sec. The inlet conditions are 1 bar and 313 K and the exit conditions are 7 bar and 56^0K. Compute the net rate of availability transfer and the irreversibility. Temperature of surroundings= 298 K.	6M	CO1	L5

(OR)

		M	CO	BL
2.	(a) Using Clausius-Clapeyron's equation, estimate the enthalpy of vaporization. The following data is given: At 2000C: v_g=0.1274 m^3/kg; v_f=0.001157 m3/kg; (dp/dT)=32 kPa/K.	6M	CO1	L5
	(b) Explain Maxwell relations.	6M	CO1	L2

UNIT – II

		M	CO	BL
3.	Explain conditions for equilibrium and types of equilibrium.	12M	CO2	L2

(OR)

		M	CO	BL
4.	What do you understand by first -law analysis of reacting systems? Explain in detail.	12M	CO2	L2

UNIT – III

		M	CO	BL
5.	Water is flowing through 200 mm dia pipe with a coefficient of friction as 0.06. The shear stress at a point 45 mm from the pipe wall is 0.02 N/cm^2. Calculate the shear stress at the pipe wall.	12M	CO3	L5

(OR)

		M	CO	BL
6.	State and explain velocity potential function and stream function?	12M	CO3	L2

UNIT – IV

		M	CO	BL
7.	Derive the Poiseuille's formula express the disharged streamlined volume flow through a smooth-walled circular pipe.	12M	CO4	L4

(OR)

		M	CO	BL
8.	Write in detail about hydro dynamically smooth and rough boundaries?	12M	CO4	L1

UNIT-V

		M	CO	BL
9.	Derive the expression for Bernoulli's equation for compressible flow undergoing Adiabatic Process.	12M	CO5	L4

(OR)

		M	CO	BL
10.	Explain the fluid flow through variable area passage nozzles and diffusers.	12M	CO5	L2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Introduction to Renewable Energy Systems (RE)

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.		Discuss renewable and non-renewable forms of energy. And write their merits and demerits	12M	CO1	L1
		(OR)			
2.	(a)	Explain about Direct and Indirect radiation.	5M	CO1	L1
	(b)	What are the various types of solar radiation measurement instruments? explain	7M	CO1	L1
		UNIT – II			
3.	(a)	Classify solar thermal power plant and discuss about low temperature solar power plant with neat sketch.	6M	CO2	L2
	(b)	Explain solar kilns with neat sketch	6M	CO2	L2
		(OR)			
4.	(a)	Compile the meteorological data of wind speeds in India and classify the sites into fair, good and excellent wind energy potential sites.	6M	CO2	L2
	(b)	What is grid interfacing and how can the grid connection be made?	6M	CO2	L2
		UNIT – III			
5.	(a)	Discuss the process of production of ethanol from biomass	6M	CO3	L2
	(b)	What do you mean by biogas? Write a note on producer gas and liquid fuel.	6M	CO3	L1
		(OR)			
6.	(a)	Classify the resources of geothermal energy. Briefly explain each of them	6M	CO3	L2
	(b)	Explain about utilization of geothermal energy	6M	CO3	L2
		UNIT – IV			
7.	(a)	List out major components used in hydroelectric power generation. And explain with neat sketch.	8M	CO4	L2
	(b)	Distinguish between reaction and impulse turbine	4M	CO4	L2
		(OR)			
8.	(a)	Discuss closed rankine cycle of OTEC system with schematic diagram.	8M	CO4	L1
	(b)	Calculate the efficiency of closed rankine cycle of OTEC system.	4M	CO4	L2
		UNIT-V			
9.	(a)	How do you find energy output of a fuel cell?	8M	CO5	L2
	(b)	Write advantages of fuel cell power plant	4M	CO5	L1
		(OR)			
10.	(a)	Explain how hydrogen is a more versatile fuel? And write applications of hydrogen energy system.	6M	CO5	L2
	(b)	Discuss various methods of hydrogen storage?	6M	CO5	L2

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

M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023

SUB: Wind Energy Technologies (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.	(a)	Is wind energy a better alternative source of energy for Indian demand? Explain in detail how wind energy is produced.	6M	CO1	BL1
	(b)	Explain in detail about the performance and efficiency of different types of wind mills.	6M	CO1	BL2
		(OR)			
2.	(a)	Discuss briefly about a) Performance of wind mills b) Wind power generation in India.	6M	CO1	BL2
	(b)	Compare the performance of horizontal and vertical axis wind mills.	6M	CO1	BL2
		UNIT – II			
3.	(a)	Have there been successful lawsuits related to the health impacts of wind farms?	6M	CO2	BL3
	(b)	How do wind farms impact wildlife?	6M	CO2	BL1
		(OR)			
4.	(a)	What are the economic benefits from wind farm construction?	6M	CO2	BL1
	(b)	What is the expected lifespan of a wind turbine, and how is it decommissioned?	6M	CO2	BL1
		UNIT – III			
5.		Explain the Grid Tied Inverter, Power Management, Grid Monitoring Unit with neat sketch ?	12M	CO3	BL2
		(OR)			
6.	(a)	Derive the expression for Circumferential and Axial Thrust Force.	12M	CO3	BL2
		UNIT – IV			
7.	(a)	Is wind energy a better alternative source of energy for Indian demand? Explain in detail how wind energy is produced.	6M	CO4	BL2
	(b)	How wind energy conversion systems are classified? Discuss in brief. What are its advantages and disadvantages?	6M	CO4	BL2
		(OR)			
8.		Explain the condition for maximum power generation in wind conversion system.	12M	CO4	BL2
		UNIT-V			
9.	(a)	What is the origin of wind and what are the various factors which govern wind energy and direction?	6M	CO5	BL1
	(b)	Describe the savonious type of rotor in wind mill.	6M	CO5	BL2
		(OR)			
10.	(a)	Explain and mention the Wind Turbine Monitoring with Error codes and its data base ?	12M	CO5	BL2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Energy Storage 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.	Why is energy storage important? Energy storage system roadmap for India 2019-32.	12M	CO1	L2

(OR)

2.	Briefly explain different types of energy storage systems.	12M	CO1	L2

UNIT – II

3.	What are the different methods of thermal energy storage and write down the thermal energy storage applications	12M	CO2	L2

(OR)

4.	Explain the following mechanical energy storage systems. a) Flywheel storage b) Compressed air storage.	12M	CO2	L3

UNIT – III

5.	What are the three types of electrochemical energy systems? Describe in detail.	12M	CO3	L2

(OR)

6.	What is electrochemical energy storage system? What is electrochemical energy storage system? Are electrochemical batteries sustainable?	12M	CO3	L2

UNIT – IV

7.	How is hydrogen used as a fuel resource? What are the 4 basic methods of producing hydrogen?	12M	CO4	L3

(OR)

8.	What is the principle of direct energy conversion system in fuel cells?	12M	CO4	L2

UNIT-V

9.	Explain about Fuel cell, its principle of operation and advantages of it?	12M	CO5	L3

(OR)

10.	What is green house heating system? Explain the different types of heating systems used in a greenhouse?	12M	CO5	L2

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

M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023

SUB: RTL Simulation and Synthesis with PLDs (ES&VLSI)

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)	Explain briefly about continuous and implicit continuous assignment operation with suitable examples.			6M	CO1	L2
	(b)	Describe about function and tasks in Verilog HDL.			6M	CO1	L2
		(OR)					
2.	(a)	Explain the concept of gate delays in Verilog with example.			6M	CO1	L2
	(b)	Discuss the control and repetition statements in HDL.			6M	CO1	L2
		UNIT – II					
3.		Implement the sequence detector using FSM.			12M	CO2	L5
		(OR)					
4.	(a)	Design of 4-bit BCD Adder.			6M	CO2	L5
	(b)	Draw a Mealy state machine having single input X and single output Z, the output is asserted after each four bit input sequence if it consists of one of the binary string "0110" or "1010". The machine returns to the reset state after each four bit sequence.			6M	CO2	L4
		UNIT – III					
5.		Illustrate the design flow of ASIC with a neat diagram.			12M	CO3	L2
		(OR)					
6.		Write a brief note on the following i) Floor planning ii) Placement iii) Routing			12M	CO3	L2
		UNIT – IV					
7.	(a)	Discuss the design strategies for multi-clock domain designs.			6M	CO4	L2
	(b)	Give the steps to remove setup and hold time violations.			6M	CO4	L3
		(OR)					
8.		Explain about Meta-stability and Clock issues.			12M	CO4	L2
		UNIT-V					
9.	(a)	Write a short note on CPLD. How are they different from FPGA?			6M	CO5	L2
	(b)	Distinguish between ROM, PLA and PAL.			6M	CO5	L4
		(OR)					
10.	(a)	With a neat block diagram, explain PLA.			6M	CO5	L2
	(b)	Draw the general structure of an FPGA and explain how a logic circuit can be realized on FPGA taking a suitable example.			6M	CO5	L2

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

M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023

SUB: Microcontrollers and Programmable Digital Signal Processors (ES& VLSI)

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)	Explain ARM Cortex-M3 Processor Applications.	6M	CO1	L2
	(b)	State and explain different operating modes of ARM Cortex-M3 processor.	6M	CO1	L2
		(OR)			
2.	(a)	Explain Pipeline mechanism in Cortex-M3 Processor.	6M	CO1	L2
	(b)	Explain about Exceptions and Interrupts in Cortex-M3 Processor.	6M	CO1	L2
		UNIT – II			
3.	(a)	Explain with neat diagram the nested vector interrupt controller and its operation with entry and exit.	6M	CO2	L2
	(b)	Discuss Various faults can be caused by exception handling.	6M	CO2	L6
		(OR)			
4.	(a)	Explain the various Fault Exceptions occur in Cortex M3 Processor.	6M	CO2	L2
	(b)	Discuss the various blocks of ARM Cortex-M3 based controller.	6M	CO2	L6
		UNIT – III			
5.	(a)	Briefly describe SYSTICK Timer and its usages.	6M	CO3	L5
	(b)	Describe the Features of WDT in LPC 17XX Microcontroller.	6M	CO3	
		(OR)			
6.	(a)	Describe the Features and benefits of LPC 17XX Microcontroller.	6M	CO3	L3
	(b)	Describe the Features and Functionalities of LPC 17XX general purpose parallel I/O (GPIO).	6M	CO3	L3
		UNIT – IV			
7.	(a)	Explain the MAC unit of Programmable DSP Processors.	6M	CO4	L2
	(b)	Briefly describe the Multi-port memory of Programmable DSP Processors.	6M	CO4	L3
		(OR)			
8.	(a)	Describe the Harvard architecture of Programmable DSP Processors.	6M	CO4	L3
	(b)	Explain the architectural differences between DSP processors and Microprocessors.	6M	CO4	L2
		UNIT-V			
9.	(a)	List the on-chip peripherals of DSP TMS320C6000 processor.	6M	CO5	L1
	(b)	Describe the advantages and disadvantages of VLIW architecture.	6M	CO5	L6
		(OR)			
10.	(a)	Explain what is meant by instruction pipelining. How pipelining increases the throughput efficiency.	6M	CO5	L2
	(b)	Explain the logical operations Code Composer Studio for application development of digital signal processing.	6M	CO5	L2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Design for Testability (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)	Define Simulation and describe different types of Simulation.	6M	CO1	L1
	(b)	Explain various methods of detecting hazards in vlsi chips?	6M	CO1	L2
		(OR)			
2.	(a)	Discuss what are the types of tests VLSI chips are subjected to?	6M	CO1	L6
	(b)	Explain, with a block diagram, simulation for design verification.	6M	CO1	L2
		UNIT – II			
3.	(a)	How the effect of a fault is represented by means of a model? Explain multiple stuck-at fault model with example.	6M	CO2	L2
	(b)	Illustrate the single stuck-at faults of combinational circuits with example?	6M	CO2	L2
		(OR)			
4.	(a)	Discuss about Digital and analog VLSI testing.	6M	CO2	L6
	(b)	Describe various levels of Fault models.	6M	CO2	L1
		UNIT – III			
5.	(a)	How the path sensitization method is used to generate a test pattern for combinational circuits?	6M	CO3	L1
	(b)	Draw a modulo-3 circuit diagram illustrating scan design and test generation and also explain its working.	6M	CO3	L2
		(OR)			
6.	(a)	Explain concept of ATG in combinational circuit using fan out free circuit.	6M	CO3	L2
	(b)	Explain vector simulation, vector compaction and compression in detail.	6M	CO3	L2
		UNIT – IV			
7.	(a)	Explain the test procedure for syndrome-testable circuit with suitable block diagram.	6M	CO4	L2
	(b)	Explain the Boundary Scan standards.	6M	CO4	L2
		(OR)			
8.	(a)	What are the properties of a testable circuit?	6M	CO4	L1
	(b)	How the control logic can be used to increase the observability and controllability?	6M	CO4	L6
		UNIT-V			
9.	(a)	Explain why BIST is the preferred form of DFT?	6M	CO5	L2
	(b)	Draw the block diagram for a BIST implementation using BILBO and explain the test procedure.	6M	CO5	L2
		(OR)			
10.		Explain the tradeoff between ATEs and BIST.	12M	CO5	L5

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: CPLD, FPGA Architectures and 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 about PROM.	6M	CO1	L2
	(b)	Explain about Sequential Programmable Logic Devices (SPLDs).	6M	CO1	L2
		(OR)			
2.		Explain design flow using FPGA by using flowchart.	12M	CO1	L2
		UNIT – II			
3.	(a)	Discuss Actel FPGAs clearly.	6M	CO3	L2
	(b)	Explain about AMD FPGAs.	6M	CO3	L2
		(OR)			
4.	(a)	Explain about XILINX SPARTAN II.	8M	CO3	L2
	(b)	Write the features of XILINX SPARTAN II.	4M	CO3	L1
		UNIT – III			
5.		Explain Cypres flash 370 device technology, lattice PLSI's architectures in CPLDs.	12M	CO2	L2
		(OR)			
6.		Explain the max 7000 series CPLD's clearly.	12M	CO2	L2
		UNIT – IV			
7.	(a)	Explain Min cut-Based placement.	6M	CO4	L2
	(b)	Write about computing signal delay in RC tree networks.	6M	CO4	L1
		(OR)			
8.		Explain about iterative improvement placement clearly.	12M	CO4	L2
		UNIT-V			
9.		Analyze the testing concepts, failure mechanisms and faults, fault coverage.	12M	CO5	L4
		(OR)			
10.	(a)	List ATPG methods.	2M	CO5	L1
	(b)	Explain the ATPG methods clearly.	10M	CO5	L2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular / Supple. Examinations of March – 2023
SUB: Machine Learning (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

			M	CO	BL
1.	(a)	Explain with examples why machine learning is important.	6M	CO1	L2
	(b)	How can you choose the Training Experience, Target function, and Function approximation algorithm in designing a learning system?	6M	CO1	L1

(OR)

			M	CO	BL
2.	(a)	Identify the three features for a well-posed learning problem.	6M	CO1	L3
	(b)	Compare Supervised and Unsupervised Learning.	6M	CO1	L2

UNIT – II

			M	CO	BL
3.	(a)	Discuss the use of decision tree for classification purpose with an example.	6M	CO2	L4
	(b)	Write a note on Occam's razor and minimum description principal.	6M	CO2	L1

(OR)

			M	CO	BL
4.	(a)	Discuss Inductive Bias in Decision tree learning.	6M	CO2	L4
	(b)	Construct Decision trees to represent the Boolean Functions: i) A && ~ B ii) A V [B && C] iii) A XOR B	6M	CO2	L3

UNIT – III

			M	CO	BL
5.	(a)	Draw the perceptron network with the notation. Derive an equation of gradient descent rule to minimize the error.	6M	CO3	L4
	(b)	Differentiate between Gradient Descent and Stochastic Gradient Descent.	6M	CO3	L2

(OR)

			M	CO	BL
6.	(a)	Write an algorithm for back propagation algorithm which uses stochastic gradient descent method.	6M	CO3	L1
	(b)	Explain the appropriate problems for neural network learning.	6M	CO3	L2

UNIT – IV

			M	CO	BL
7.	(a)	What is the relationship between Bayes theorem and the problem of concept learning?	6M	CO4	L1
	(b)	Explain the EM Algorithm in detail.	6M	CO4	L2

(OR)

			M	CO	BL
8.	(a)	Explain the Gradient search to maximize likelihood in a neural net.	6M	CO4	L2
	(b)	Explain Maximum Likelihood Hypothesis for predicting probabilities.	6M	CO4	L4

UNIT-V

			M	CO	BL
9.	(a)	Explain with suitable example K-Nearest Neighbor Algorithm.	6M	CO5	L2
	(b)	Explain radial basis function.	6M	CO5	L4

(OR)

			M	CO	BL
10.	(a)	What is instance-based learning? Explain key features and disadvantages of these methods.	6M	CO5	L1
	(b)	Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can be corrected.	6M	CO5	L4

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March– 2023
SUB: Artificial Intelligence (AI & DS)

Time: 3 Hours

Max. Marks: = 60

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

12*5=60

			Marks	CO	BL
		UNIT - I			
1.		What is an agent? Explain different types of agents in artificial intelligence.	12M	CO1	L1
		(OR)			
2.		What is rationality? Explain four approaches to AI in detail.	12M	CO1	L1
		UNIT – II			
3.	(a)	Explain generic algorithm for simple problem-solving agent?	6M	CO2	L2
	(b)	What is heuristic search? Explain any one of heuristic search strategy with suitable example.	6M	CO2	L2
		(OR)			
4.	(a)	Explain the problem formulation of 8-Puzzle problem.	6M	CO2	L2
	(b)	What is blind search? Explain any one of blind search strategy with suitable example.	6M	CO2	L2
		UNIT – III			
5.		Explain in detail about issues in knowledge representation.	12M	CO3	L2
		(OR)			
6.		Explain resolution algorithm for predicate logic with suitable example.	12M	CO3	L2
		UNIT – IV			
7.		Explain the following	12M	CO4	L3

   i) Learning by parameter adjustment
   ii) Learning with macro-operators
   iii) Learning by Chunking

(OR)

			Marks	CO	BL
8.	(a)	How decision tree concept is useful in learning? Explain	6M	CO4	L3
	(b)	Discuss in detail about Explanation based learning.	6M	CO4	L3
		UNIT-V			
9.		Discuss the following.	12M	CO5	L4

   i) Expert system shells
   ii) MOLE

(OR)

			Marks	CO	BL
10.		Explain the following algorithms	12M	CO5	L4

   i) Page rank algorithm
   ii) HITS algorithm

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Big Data Analytics (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.	Describe big data explain about analytic processes and Tools of big data?	12 M	CO1	L2
	(OR)			
2.	Illustrate Intelligent data analysis with an example	12M	CO1	L3
	UNIT – II			
3.	Explain about the Cloud with Big Data and software as services BI	12M	CO2	L2
	(OR)			
4.	Discuss about Rights and Responsibility of Data privacy and ethics in Big Data.	12M	CO2	L2
	UNIT – III			
5.	Discuss in detail about File-Based Data Structures with suitable examples.	12M	CO3	L2
	(OR)			
6.	What is map reduce illustrate java map reduce with an example	12M	CO3	L2
	UNIT – IV			
7.	List major differences pig with other databases and explain them.	12M	CO4	L2
	(OR)			
8. (a)	Discuss about expressions in pig with an example	6M	CO4	L2
(b)	Illustrate with an example Schema relationship in pig.	6M	CO4	L3
	UNIT-V			
9. (a)	List and explain about Hive Services	6M	CO5	L4
(b)	Explain with an example about Partitions and Buckets in managing table of Hive.	6M	CO5	L2
	(OR)			
10.	Explain various steps involved in Building an online query applications	12M	CO5	L2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular End Examinations of March/April– 2023
SUB: Data Visualization Techniques (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)	Why Do Data Semantics and Types are required for Data Visualization? Explain	6M	CO1	L1
	(b)	Explain the visualization pipeline.	6M	CO1	L3
		(OR)			
2.		Give a brief note on the Value of Visualization.	12M	CO1	L2
		UNIT – II			
3.		Explain plot () function is used to draw points (markers) in a R Programming.	12M	CO2	L3
		(OR)			
4.	(a)	Describe the Optimal visualization types.	6M	CO2	L3
	(b)	Explain the Calculated fields.	6M	CO2	L2
		UNIT – III			
5.	(a)	Explain Channel Effectiveness with a suitable example.	6M	CO3	L3
	(b)	Illustrate Relative vs. Absolute Judgments.	6M	CO3	L4
		(OR)			
6.		List and explain the Validation Approaches.	12M	CO3	L3
		UNIT – IV			
7.		Discuss in detail about ggplot library in R – layers	12M	CO4	L1
		(OR)			
8.		Explain the terms geoms, stats, positioning, and annotations.	12M	CO4	L4
		UNIT-V			
9.	(a)	Illustrate Textual data, Temporal data.	6M	CO5	L3
	(b)	What are the four key elements of dashboard reporting? Explain	6M	CO5	L1
		(OR)			
10.		List and explain the Dashboard design principles.	12M	CO5	L3

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. I Semester (R22PG) Regular Examinations of March/April – 2023
SUB: Research Methodology & IPR (GTE, PS, ES&VLSI,RE, 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)	Explain the sources of research problem.	6M	CO1	L2
	(b)	What are the characteristics of good research problem.	6M	CO1	L2
		(OR)			
2.		What are the different types of data collection and explain the different sources of data collection.	12M	CO1	L1
		UNIT – II			
3.		What are the different approaches for effective literature approaches.	12M	CO2	L4
		(OR)			
4.	(a)	Explain how to write a good report.	6M	CO2	L2
	(b)	What are the formats of research proposals.	6M	CO2	L2
		UNIT – III			
5.	(a)	Explain the importance of research proposal and how to write research proposal.	6M	CO3	L2
	(b)	Write the need and importance of Trade and Copyright in research.	6M	CO3	L2
		(OR)			
6.	(a)	Explain the procedure for grant of patents.	6M	CO3	L1
	(b)	Write a short note on international scenario on intellectual property.	6M	CO3	L1
		UNIT – IV			
7.		Define patent. Explain the various steps in filing the patent.	12M	CO4	L4
		(OR)			
8.		Explain about licensing and transfer of technology in detail	12M	CO4	L2
		UNIT-V			
9.	(a)	Write a IPR of biological systems.	6M	CO5	L2
	(b)	What are the importance of IPR and write its advantages.	6M	CO5	L1
		(OR)			
10.		With examples, explain about computer software patents	12M	CO5	L3