Q.P. Code: 2212201

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: EXPERIMENTAL GEOMECHANICS (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) | How would you differ the depth of exploration and lateral extent of exploration? | 6M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | What is Reconnainace? What information is obtained in Reconnainace? What is its use? | 6M | CO1 | L2 |
| | (b) | Explain about the execution of soil exploration programme? | 6M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | (a) | Describe open excavation methods of soil exploration. What are their advantages and disadvantages? | 6M | CO2 | L3 |
| | (b) | With the help of neat sketch explain Wash boring method of drilling bore hole | 6M | CO2 | L2 |
| | | (OR) | | | |
| 4. | (a) | Describe various methods of drilling holes for subsurface exploration? | 6M | CO2 | L2 |
| | (b) | Write the advantages and disadvantages of Augur boring | 6M | CO2 | L2 |
| | | UNIT – III | | | |
| 5. | (a) | What do you understand about disturbed and undisturbed samples? How would you obtain undisturbed sample? | 6M | CO3 | L4 |
| | (b) | The sampling tube 18cm internal diameter is 1mm thick. It is fitted with cutting edge. The inside diameter of cutting edge is 17.8cm and thickness of cutting edge is 2.4cm.Compute inside and outside clearance and Area Ratio | 6M | CO3 | L3 |
| | | (OR) | | | |
| 6. | (a) | Mention various types of soil samplers for obtaining soil samples? With the help of neat sketch explain Split spoon sampler | 6M | CO3 | L2 |
| | (b) | Explain the method of sampling from boreholes? | 6M | CO3 | L2 |
| | | UNIT – IV | | | |
| 7. | (a) | Discuss standard penetration test? Explain various corrections applied in SPT test | 6M | CO4 | L2 |
| | (b) | How would you conduct an in-situ vane shear test? What is its use? | 6M | CO4 | L3 |
| | | (OR) | | | |
| 8. | (a) | Explain about in situ pressure meter test | 6M | CO4 | L2 |
| | (b) | Explain in detail about field permeability test | 6M | CO4 | L2 |
| | | UNIT-V | | | |
| 9. | (a) | Describe in brief various geophysical methods? Discuss their limitations and uses | 6M | CO5 | L2 |
| | (b) | Write a note on Sub soil investigation report | 6M | CO5 | L3 |
| | | (OR) | | | |
| 10. | (a) | Explain Cross Hole Tests (CHT), Down hole Tests (DHT) | 6M | CO5 | L2 |
| | (b) | Explain about Ground Penetrating Radar (GPR) | 6M | CO5 | L2 |

Q.P. Code: 2212202 | SET - 1

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

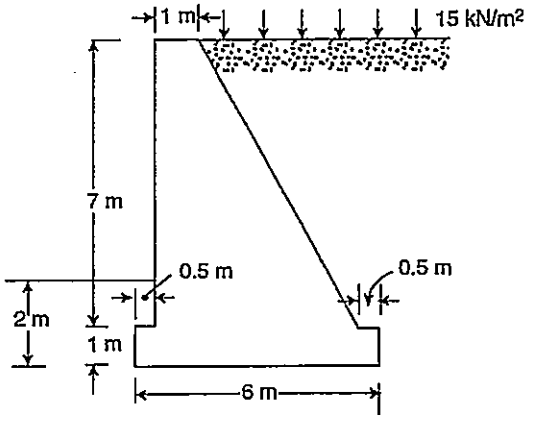
M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: EARTH RETAINING STRUCTURES (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 about the Rankine's earth pressure theory? | 6M | CO1 | L1 |
| | (b) | Determine the Rankine Passive force per unit length of the wall had two layers H1=2m and H2=3m. The water tale is at level of H2 take unit weight of water is 10kN/$m^3$ | 6M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | Differentiate critically between Rankine and Coulomb theories of earth pressure. | 6M | CO1 | L2 |
| | (b) | A retaining wall with a smooth vertical back retains a purely cohesive fill. Height of wall is 12 m. Unit weight of fill is 20 kN/$m^3$ . Cohesion is 1 N/cm 2. What is the total active Rankine thrust on the wall? At what depth is the intensity of pressure zero and where does the resultant thrust act? | 6M | CO1 | L3 |
| | | UNIT – II | | | |
| 3. | (a) | Discuss about the design considerations for a mechanically stabilized earth wall. | 6M | CO2 | L2 |
| | (b) | Discuss the stabilized retaining and reinforced earth retaining walls | 6M | CO2 | L2 |
| | | (OR) | | | |
| 4. | | Check the stability of the concrete retaining wall shown in Figure. The backfill material is a mixture of sand and gravel with the following properties: $\gamma$ = 19.6 kN/$m^3$ and $\varphi$ = 33°. The tangent of the coefficient of friction between the concrete and the soil is 0.48. The unit weight of concrete is 2.5 kN/m. The retaining wall is placed on a very dense gravelly bed with an allowable soil pressure of 380 kN/$m^2$. | 12M | CO2 | L4 |



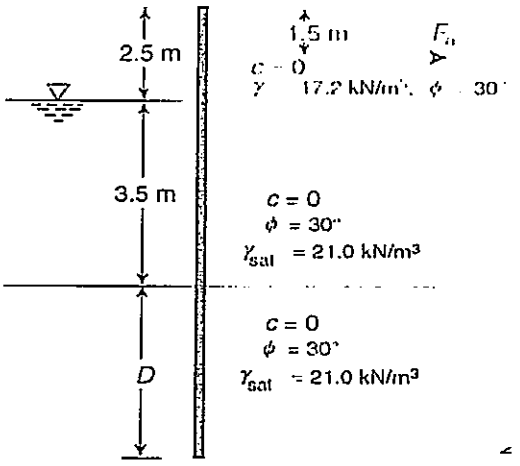

| | | | | | |
|---|---|---|---|---|---|
| | | UNIT – III | | | |
| 5. | | Discuss about the sheet piling in cohesive soils with granular backfill with a neat diagram. | 12M | CO3 | L3 |
| | | (OR) | | | |
| 6. | | A cantilever sheet pile retains soil at a height of 6m Find the depth to which the pile should be driven assuming two thirds of the theoretical passive resistance is developed on the embedded length g=19kN/$m^3$ and =30 use approximate method | 12M | CO3 | L3 |

UNIT IV

| | | | | | |
|---|---|---|---|---|---|
| 7. | (a) | Explain about the classification of bulkheads. | 6M | CO4 | L3 |
| | (b) | Discuss the free earth support of cantilever sheet pile for clay soils | 6M | CO4 | L4 |

(OR)

| | | | | | |
|---|---|---|---|---|---|
| 8. | | The cross-section of an anchored sheet pile is shown in Figure. Determine the design depth of penetration. Use the fixed earth support method. | 12M | CO4 | L4 |




UNIT-V

| | | | | | |
|---|---|---|---|---|---|
| 9. | (a) | Explain the design of various components of bracings | 6M | CO5 | L3 |
| | (b) | Discuss the types of sheeting bracing system | 6M | CO5 | L3 |

(OR)

| | | | | | |
|---|---|---|---|---|---|
| 10. | | A long 5 m wide and 8 m high vertical channel has to be constructed in a deep cohesive soil with $c = 36$ kN/m$^2$ and $\gamma = 18$ kN/m$^3$. Before protecting the sides using sheet piles, it is intended to check the safety of the bottom of the channel against heave. Consider the excavation to be completed rapidly and find the factor of safety against heave. What will be the change in the factor of safety if a hard material is present at 2.5 m from the bottom of the channel? | 12M | CO5 | L4 |

Q.P. Code: 2212204

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: FOUNDATIONS ON EXPANSIVE SOILS (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 about Microscale Aspects of Expansive Soil Behavior | 6M | CO1 | L3 |
| | (b) | Explain Identification of Expansive Soil | 6M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | Explain about the natural soil deposits. | 6M | CO1 | L2 |
| | (b) | Explain the field conditions that favor swelling of expansive Soil | 6M | CO1 | L3 |
| | | UNIT – II | | | |
| 3. | | Explain how Expansive Soil is treated by using Moisture control method. | 12M | CO2 | L2 |
| | | (OR) | | | |
| 4. | | Explain the following methods along with merits and demerits<br>i) Soil Replacement technique ii) Pre wetting | 12M | CO2 | L3 |
| | | UNIT – III | | | |
| 5. | | Explain in detail about spread footing foundation in expansive soil | 12M | CO3 | L3 |
| | | (OR) | | | |
| 6. | | A site with a soil profile given in Table. A single story house will be constructed with a 0.4m shallow strip footing foundation founded at a depth of 1.00 m. The house will have a structural floor with a crawl space below. The dead load on the footing will be 2.85kN/m .Compute the weighted risk factor, free field heave, predicted footing heave. | | | |

| Depth (m) | 0 – 2.5 | 2.5 – 12 |
|---|---|---|
| Soil Type | Silty Clay | Sandy Claystone |
| Water Content (%) | 22 | 13 |
| Dry Density (kN/m$^3$) | 16.3 | 18.1 |
| CS % Swell, $\varepsilon_{cs}$ @ 47.9 kN/m$^2$ (%) | 0.4 | 2.0 |
| CV Swelling Pressure, $\sigma^n_{cv}$ (kN/m$^2$) | 78.6 | 117.1 |

12M CO3 L3

| | | | | | |
|---|---|---|---|---|---|
| | | UNIT – IV | | | |
| 7. | | What is deep foundation techniques adopted in Expansive Soil? Explain Patented Pier Technology in Expansive Soil. | 12M | CO4 | L2 |
| | | (OR) | | | |
| 8. | | What are the remedial measures for deep foundations, explain in detail | 12M | CO4 | L3 |
| | | UNIT-V | | | |
| 9. | | A basement wall is to be constructed in an area with expansive clay soil. The angle of internal friction, $\phi$, of the clay soil is equal to 22°. The backfill will be compacted to a dry density, $\gamma$d, of 16 kN/m$^3$ at a water content of 22 %. The CV swelling pressure for this soil was measured in the laboratory to be 48 kN/m$^2$. The basement will have a structural floor. The height of the backfill behind the wall will be 3.00 m. Determine the lateral earth pressure acting on the wall with non-expansive soil backfill, and considering the expansion potential of the backfill. | 12M | CO5 | L2 |
| | | (OR) | | | |
| 10. | | Discuss the methods to reduce lateral swelling pressure of Expansive Soil | 12M | CO5 | L2 |

Q.P. Code: 2212207 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. II Semester (R22PG) Regular Examinations of August – 2023
*SUB: DESIGN WITH GEOSYNTHETICS (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 the and necessity of geosynthetics in ground improvement | 6M | CO1 | L1 |
| | (b) | In placing a geotextile beneath railroad ballast, the materials can serve in four different functions simultaneously. Describe and illustrate these functions. | 6M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | What two commonly used polymers in the manufacture of geosynthetics materials are in the polyolefin family. | 6M | CO1 | L1 |
| | (b) | Explain the properties of geosynthetic Clay Liners | 6M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | (a) | Discuss the Functions of geotextiles, Explain with neat sketch | 6M | CO2 | L2 |
| | (b) | Explain the geotextiles testing of a) Index test b) performance test | 6M | CO2 | L2 |
| | | (OR) | | | |
| 4. | | Design a 6.00 m high wrap-around type of geotextile wall that is to carry a storage area of equivalent dead load of 10 kPa. The wall is to be backfilled with a granular soil (SP) having properties of $\gamma$ = 18 kN/m$^3$, $\phi$ = 36°, and c = 0 kN/m$^2$ . A woven slit-film geotextile with wrap (machine) direction ultimate wide-width tensile strength of 50 kN/m and friction angle with granular soil of $\delta$ = 24° is intended to be used in its construction. The orientation of the geotextile is perpendicular to the wall face and the edges are to be overlapped or sewn to handle the weft (cross machine) direction. A factor of safety of 1.4 is to be used along with site specific reduction factors. | 12M | CO2 | L4 |
| | | UNIT – III | | | |
| 5. | (a) | In using geogrids for reinforcement of paved roads, a possible mechanism involving increased bearing capacity is often mentioned. On a conceptual basis, how does this work? | 6M | CO3 | L2 |
| | (b) | Discus the function of geogrids as soil reinforcement | 6M | CO3 | L2 |
| | | (OR) | | | |
| 6. | | What is the effect of high temperature on the following mechanical properties of geogrids? (i) modulus, (ii) tensile strength, (iii) elongation at failure, and (iv) creep behavior | 12M | CO3 | L2 |
| | | UNIT – IV | | | |
| 7. | | Discuss the design of geonets concepts for drainage with neat sketch | 12M | CO4 | L3 |
| | | (OR) | | | |
| 8. | (a) | When using geonets for drainage functions, what keeps the adjacent soil from getting in their apertures and blocking flow | 6M | CO4 | L2 |
| | (b) | List the basic difference between geonets and geogrids | 6M | CO4 | L1 |
| | | UNIT-V | | | |
| 9. | (a) | What is the difference between thermoplastic and thermoset geomembrane? | 6M | CO5 | L1 |
| | (b) | Discus the advantages and disadvantages of the composite geomembrane clay liner? | 6M | CO5 | L2 |
| | | (OR) | | | |
| 10. | (a) | Discuss the properties required for survivability of geomembrane | 6M | CO5 | L2 |
| | (b) | Describe the chemical interaction process by which organic solvents decrease the hydraulic conductivity of clay soils | 6M | CO5 | L1 |

Q.P. Code: 2252201

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: Power System and State Estimation (PS)*

Time: 3 Hours Max. Marks: 60

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

| Q.No. | | Stem of the Question | M | L | CO |
|---|---|---|---|---|---|
| | | UNIT-I | | | |
| 1. | | Illustrate step by step formation of Bus admittance matrix by Direct inspection method. | 12 | L2 | CO1 |
| | | (OR) | | | |
| 2. | a | Write an algorithm for formation of Bus Impedance matrix with addition of a link. | 6 | L2 | CO 1 |
| | b | Write Π model Representation of nominal tap transformer. | 6 | L2 | CO 1 |
| | | UNIT-II | | | |
| 3. | | Define power system security. List the various factors influencing power system security with brief explanation. | 12 | L2 | CO 2 |
| | | (OR) | | | |
| 4. | | Explain DC power flow methods in detail. | 12 | L2 | CO 3 |
| | | UNIT-III | | | |
| 5. | a | Explain contingency analysis by detection of network problems. | 6 | L1 | CO 3 |
| | b | Explain contingency analysis selection procedure in detail. | 6 | L1 | CO 3 |
| | | (OR) | | | |
| 6. | | Explain briefly about linear sensitivity factors in detail. | 12 | L2 | CO 3 |
| | | UNIT-IV | | | |
| 7. | | What is SCADA? Explain the role of SCADA in state estimation of power system networks and list its advantages and disadvantages? | 12 | L2 | CO 4 |
| | | (OR) | | | |
| 8. | | a) List the Various methods of state estimation. Give their Properties and limits. | 6 | L5 | CO 2 |
| | | b) Write the applications of power system state estimation. | 6 | L5 | CO 2 |
| | | UNIT-V | | | |
| 9. | | a) Explain electricity sector structure model in detail. | 6 | L3 | CO 4 |
| | | b) Write short notes on Available Transfer Capacity (ATC). | 6 | L3 | CO 4 |
| | | (OR) | | | |
| 10. | | Explain various congestion management methods. Explain in detail about system security deregulations. | 12 | L2 | CO 3 |

Q.P. Code: 2252202 | SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: POWER SYSTEM DYNAMICS - II (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. | Explain the structure of a power system with neat sketch, showing its basic elements | 12M | CO1 | L1 |
| | (OR) | | | |
| 2. | Describe small signal stability. Also show the nature of small disturbance response. | 12M | CO1 | L3 |
| | UNIT – II | | | |
| 3. | Explain the direct method of stability assessment stability enhancing techniques | 12M | CO2 | L2 |
| | (OR) | | | |
| 4. | Write short notes on mitigation using power system stabilizer | 12M | CO2 | L2 |
| | UNIT – III | | | |
| 5. | Write short notes on mitigation using power system stabilizer | 12M | CO3 | L3 |
| | (OR) | | | |
| 6. | Explain in detail about asynchronous operation. | 12M | CO3 | L3 |
| | UNIT – IV | | | |
| 7. | Explain about dynamic analysis of voltage stability. | 12M | CO4 | L4 |
| | (OR) | | | |
| 8. | What is voltage stability? What are the factors affecting voltage instability and collapse | 12M | CO4 | L4 |
| | UNIT-V | | | |
| 9. | Explain about (a) Frequency stability (b) Automation Generation control | 12M | CO5 | L5 |
| | (OR) | | | |
| 10. | Describe about sub synchronous resonance in series compensated system | 12M | CO5 | L5 |

Q.P. Code: 2252204

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: ENERGY AUDITING AND MANAGEMENT (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. | | Explain the methodology for detailed Energy Audit Process. | 12M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | List and enumerate the Goals of Energy Audit and where they can be applied. | 6M | CO1 | L2 |
| | (b) | Explain in detail about Sankey diagram, Pie charts and Load Profiles used in Energy flow representation. | 6M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | (a) | Discuss the features of energy efficient motors. | 5M | CO2 | L2 |
| | (b) | Which is the best location for capacitor banks for power factor improvement from energy conservation point of view? | 7M | CO2 | L4 |
| | | (OR) | | | |
| 4. | (a) | Explain why efficiency of Energy efficient motor is more than conventional motor? | 7M | CO2 | L2 |
| | (b) | How do you size a transformer for a load? | 5M | CO2 | L2 |
| | | UNIT – III | | | |
| 5. | (a) | Discuss the qualities of an energy efficient lighting | 6M | CO3 | L1 |
| | (b) | Explain Energy conservation in Lighting Schemes | 6M | CO3 | L1 |
| | | (OR) | | | |
| 6. | | Write Short Notes on a) Electronic ballast b) Power quality issues | 12M | CO3 | L1 |
| | | UNIT – IV | | | |
| 7. | (a) | What are the different types of co generation? | 6M | CO4 | L1 |
| | (b) | Write short notes on Electric loads of Air conditioning &Refrigeration | 6M | CO4 | L1 |
| | | (OR) | | | |
| 8. | (a) | Explain the Optimal operation of cogeneration plants | 6M | CO4 | L1 |
| | (b) | Explain the types of Cool storage. | 6M | CO4 | L1 |
| | | UNIT-V | | | |
| 9. | (a) | Write short notes on a) Electrolytic Process b) Compressors | 8M | CO5 | L1 |
| | (b) | Explain the Energy conservation measures in heating | 4M | CO5 | L1 |
| | | (OR) | | | |
| 10. | (a) | What is Energy Management System (EMS) for Computers? Explain | 6M | CO5 | L1 |
| | (b) | Is solar water heater better than electric geyser? Explain | 6M | CO5 | L2 |

Q.P. Code: 2252207 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. II Semester (R22PG) Regular Examinations of August – 2023
*SUB: ELECTRICAL POWER QUALITY (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. | Define Power Quality. Briefly explain the various reasons for increased concern on power quality issues. | 12M | CO2 | L2 |
| | (OR) | | | |
| 2. | Define interruption. Discuss the causes of short and long interruptions. Suggest remedies to overcome the interruptions. | 12M | CO2 | L2 |
| | UNIT – II | | | |
| 3. | Discuss the effect of power system harmonics on power system equipment and loads. | 12M | CO4 | L3 |
| | (OR) | | | |
| 4. | Explain about the controlling of harmonics using passive and active filters. How active filters overcome the drawbacks of passive filters in controlling of harmonics. | 12M | CO2 | L2 |
| | UNIT – III | | | |
| 5. | Discuss how the capacitors are used for voltage regulation in power systems in shunt and series configuration. | 12M | CO4 | L3 |
| | (OR) | | | |
| 6. | Explain power quality problems created by drives and its impact on drive. | 12M | CO2 | L2 |
| | UNIT – IV | | | |
| 7. | Explain Control Methods for Single Phase APFC & Three Phase APFC and Control Techniques | 12M | CO2 | L2 |
| | (OR) | | | |
| 8. | (a) Discuss the importance of Power factor improvement | 6M | CO4 | L3 |
| | (b) Explain Passive Filtering with suitable example | 6M | CO2 | L2 |
| | UNIT-V | | | |
| 9. | Discuss how the Dynamic Voltage Restorers are useful in reducing voltage sag and flicker problems | 12M | CO4 | L2 |
| 10. | List and explain grounding requirements and reasons for grounding. | 12M | CO2 | L1 |

Q.P. Code: 2299201

SET - 1

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

**M. Tech. II Semester (R22PG) Regular Examinations of August – 2023**

***SUB: ENERGY AUDIT AND MANAGEMENT (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. | Explain the trends and pattern of Energy Consumption in India. | 12M | CO1 | L1 |
| | **(OR)** | | | |
| 2. | A hall 30 m long and 15 m wide with a ceiling height of 5 m is to be provided with a general illumination of 120 lumens/$m^2$. Taking a coefficient of utilization of 0.5 and depreciation factor of 1.42, determine the number of fluorescent tubes required, their spacing, mounting height and total wattage. Taking luminous efficiency of fluorescent tube as 40 lumens/watt for 80 w tube. | 12M | CO1 | L4 |
| | **UNIT – II** | | | |
| 3. | Explain in detail about Energy conservation in lighting. | 12M | CO2 | L2 |
| | **(OR)** | | | |
| 4. | Explain the methodology and steps of detailed energy audit with special reference to a power plant. | 12M | CO2 | L2 |
| | **UNIT – III** | | | |
| 5. | What are the various Peak Demand Control methodologies? Explain in detail | 12M | CO3 | L1 |
| | **(OR)** | | | |
| 6. | Explain on Energy efficient motors and factors affecting the motor efficiency. | 12M | CO3 | L2 |
| | **UNIT – IV** | | | |
| 7. | Explain 'Simple Payback Period' method of financial analysis with its advantages and limitations. | 12M | CO4 | L3 |
| | **(OR)** | | | |
| 8. | What is Cogeneration and explain about its types | 12M | CO4 | L1 |
| | **UNIT-V** | | | |
| 9. | Write a short note on Implementation plan for top Management. | 12M | CO5 | L1 |
| | **(OR)** | | | |
| 10. | Explain about the Energy conservation measures of<br>-Electrolytic Process<br>-Computer Controls<br>- software-EMS. | 12M | CO5 | L3 |

Q.P. Code: 2299202 | SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

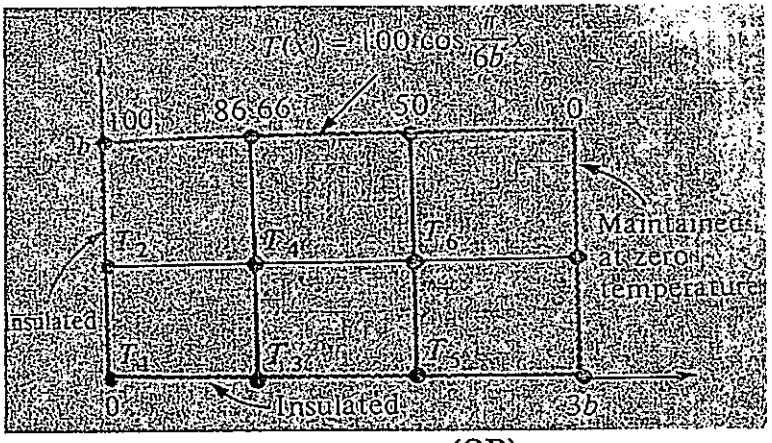
*SUB: COMPUTATIONAL FLUID DYNAMICS (RE)*

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. | What are the advantages and limitations of computational approach compared to experimental approach, as far as fluid dynamics is concerned | 12M | CO1 | L1 |
| | **(OR)** | | | |
| 2. | Classify partial differential equations and explain forward, backward and central difference formulation. | 12M | CO1 | L2 |
| | **UNIT – II** | | | |
| 3. | a) Explain crank Nicholson implicit scheme.<br>b) Discuss consistency and convergence of the above scheme | 12M | CO2 | L2<br>L6 |
| | **(OR)** | | | |
| 4. | Derive the continuity, Navier- stokes and energy equation in Cartesian coordinate system? | 12M | CO2 | L3 |
| | **UNIT – III** | | | |
| 5. | Consider steady state heat conduction in a rectangular region 0<=x<=3b, 0<= y<= 2b, subjected to the boundary conditions as shown in fig. Calculate the temperatures $T_m$ ,m=1 to 6 , at six nodes shown in this fig, and compare the finite difference solution with the exact results. | 12M | CO3 | L3 |




| | | | | |
|---|---|---|---|---|
| | **(OR)** | | | |
| 6. | Explain the process of pressure –velocity decoupling that occurs in the process of solving incompressible flows numerically. | 12M | CO3 | L5 |
| | **UNIT – IV** | | | |
| 7. | Write the SIMPLER algorithm.. | 12M | CO4 | L2 |
| | **(OR)** | | | |
| 8. | Write Euler equation of inviscid and incompressible flows? | 12M | CO4 | L2 |
| | **UNIT-V** | | | |
| 9. | Define the following terms<br>i. Stability<br>ii. Consistency<br>iii. Round off error<br>iv. Convergence<br>v. Discretization error | 12M | CO5 | L1 |
| | **(OR)** | | | |
| 10. | Explain briefly about Reynolds -Averaged Navier -Stokes (RANS) Equations | 12M | CO5 | L2 |

Q.P. Code: 2299204 | SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: ENERGY CONSERVATION BY WASTE HEAT RECOVERY (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. | (a) | Classify the waste heat sources and explain any two with neat sketch | 6M | CO1 | L2 |
| | (b) | Discuss the high grade and low grade heat losses | 6M | CO1 | L6 |
| | | (OR) | | | |
| 2. | | Define energy conservation and energy efficiency. How do an Industry, nation and globe work would benefit from energy efficiency program. | 12M | CO1 | L1 |
| | | **UNIT – II** | | | |
| 3. | (a) | Define total energy approaches with suitable example. | 6M | CO2 | L1 |
| | (b) | How do you classify the Cogeneration system? Explain any one system. | 6M | CO2 | L1, L2 |
| | | (OR) | | | |
| 4. | (a) | Explain Gas-to-Gas and Gas-to-liquid heat recovery system with neat sketch | 7M | CO2 | L2 |
| | (b) | How to perform energy analysis for industrial application | 5M | CO2 | L1 |
| | | **UNIT – III** | | | |
| 5. | | Explain Fluidized bed heat recovery systems with suitable application. | 12M | CO3 | L2 |
| | | (OR) | | | |
| 6. | (a) | Explain the operating principle of a waste heat recovery boiler with examples. | 8M | CO3 | L2 |
| | (b) | Explain the operating principle of a run around coil exchanger | 4M | CO3 | L2 |
| | | **UNIT – IV** | | | |
| 7. | (a) | A new small cogeneration plant installation is expected to reduce a company's annual energy bill by Rs.4, 86,000. If the capital cost of the new boiler installation is Rs.22, 20,000 and the annual maintenance and operating costs are Rs. 42,000, calculate the expected payback period for the project? | 7M | CO4 | L1, L2 |
| | (b) | Define thermo-economic viability? | 5M | CO4 | L1 |
| | | (OR) | | | |
| 8. | | In a heat exchanger, steam is used to heat 3000 litres/hr of furnace oil from 30°C to 100°C. The specific heat of furnace oil is 0.22 k Cal/ kg/C and the density of furnace oil is 0.95. How much steam per hour is needed if steam at 4 kg/cm² with latent heat of 510 kcal/kg is used? If steam cost is Rs.4/kg and electrical energy cost is Rs.8/kWh, which type of heating would be more economical in this particular case? (assume no losses in electrical and steam heating process) | 12M | CO4 | L2, L1 |
| | | **UNIT-V** | | | |
| 9. | | Define energy storage? Explain the classification energy storage systems and give brief discussion any one. | 12M | CO5 | L1 |
| | | (OR) | | | |
| 10. | (a) | Discuss Thermal and Electrical storage systems. | 6M | CO5 | L6 |
| | (b) | Write a technical note on battery energy storage system. | 6M | CO5 | L2 |

Q.P. Code: 2299207 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. II Semester (R22PG) Regular Examinations of August - 2023
*SUB: SOLAR ENERGY TECHNOLOGY (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. | (a) | What will be future planning of solar power in India? | 6M | CO1 | L1 |
| | (b) | Explain parabolic through concentrator solar system. | 6M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | Classify the solar plants based on temperature. Discuss any one with neat sketch. | 6M | CO1 | L2 |
| | (b) | Write about the flat plate collector and parabolic collector. | 6M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | (a) | Explains the solar heat and cooling system with diagrams? | 6M | CO2 | L2 |
| | (b) | Explain the solar cooker. | 6M | CO2 | L2 |
| | | (OR) | | | |
| 4. | (a) | What is a solar pond explain with a neat diagram and its application? | 6M | CO2 | L2 |
| | (b) | What is term of solar desalination? | 6M | CO2 | L1 |
| | | UNIT – III | | | |
| 5. | | What are semiconductors how are they classified? What are the properties of semiconductors? | 12M | CO3 | L1 |
| | | (OR) | | | |
| 6. | (a) | Explain the variation of efficiency with band-gap and temperature efficiency measurements | 6M | CO3 | L2 |
| | (b) | Explain the p-n junction solar system | 6M | CO3 | L2 |
| | | UNIT – IV | | | |
| 7. | (a) | Explain the solar cells? | 6M | CO4 | L2 |
| | (b) | Explain the design procedure of PV solar system. | 6M | CO4 | L2 |
| | | (OR) | | | |
| 8. | (a) | Explain the solar array system. | 6M | CO4 | L2 |
| | (b) | Explain the solar energy grid connected system. | 6M | CO4 | L2 |
| | | UNIT-V | | | |
| 9. | (a) | What is the thermal comfort explain briefly. | 6M | CO5 | L2 |
| | (b) | Briefly explain the radiative cooling system. | 6M | CO5 | L2 |
| | | (OR) | | | |
| 10. | (a) | Explain the concept of passive cooling system and evaporative cooling system. | 6M | CO5 | L2 |
| | (b) | What are the bioclimatic classifications? | 6M | CO5 | L1 |

Q.P. Code: 2284201

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: Analog and Digital CMOS VLSI Design (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) | Write short notes on fixed cost. Assume a wafer size of 12 inch, a die size of 2.5 $cm^2$, 1 defects/$cm^2$ and $\alpha = 3$. Determine the die yield of this CMOS process run. | 6M | CO1 | L4 |
| | (b) | Derive the expression for Switching threshold of a CMOS Inverter. | 6M | CO1 | L3 |
| | | (OR) | | | |
| 2. | (a) | Explain the basic MOS structure with a neat diagram. | 6M | CO1 | L2 |
| | (b) | Derive the expression for gain in Noise margins. | 6M | CO1 | L3 |
| | | UNIT – II | | | |
| 3. | (a) | What is ESD? Explain ESD protection circuit with a neat diagram. | 6M | CO2 | L1 |
| | (b) | Explain in Physical Design Flow (i) Floor planning (ii) Routing. | 6M | CO2 | L2 |
| | | (OR) | | | |
| 4. | (a) | Explain the pass transistor implementation of an AND gate. | 6M | CO2 | L2 |
| | (b) | Explain the concept of Ratioed Logic with neat diagram. | 6M | CO2 | L2 |
| | | UNIT – III | | | |
| 5. | (a) | Explain the working of $C^2$MOS based dual-edge triggered register. | 6M | CO3 | L2 |
| | (b) | Distinguish between Latch vs Registered Based pipelines. | 6M | CO3 | L4 |
| | | (OR) | | | |
| 6. | (a) | Implement a positive latch based on Multiplexer and Explain. | 6M | CO3 | L2 |
| | (b) | What is Oxide Break down and substrate current- Induced Body effect? Explain. | 6M | CO3 | L2 |
| | | UNIT – IV | | | |
| 7. | (a) | Consider the circuit shown in the Figure 1. Determine $R_X$ if $\lambda = 0$. | 6M | CO4 | L5 |

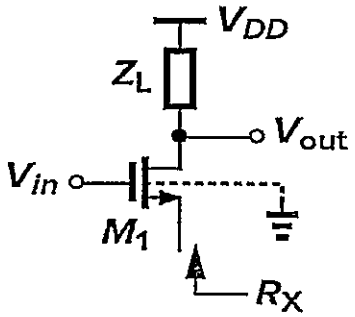



Figure 1 Impedance seen at the source with $\lambda = 0$

| | | | | | |
|---|---|---|---|---|---|
| | (b) | Draw the circuit of Gilbert cell and explain why the gilbert cell can operate as an analog voltage Multiplier. | 6M | CO4 | L2 |
| | | (OR) | | | |
| 8. | (a) | Compare the maximum output voltage swings provided by a CS stage and a Differential pair. | 6M | CO4 | L5 |

(b) Calculate the voltage gain of a common gate stage with a current source load for the circuit shown in the Figure 2. 6M CO4 L3

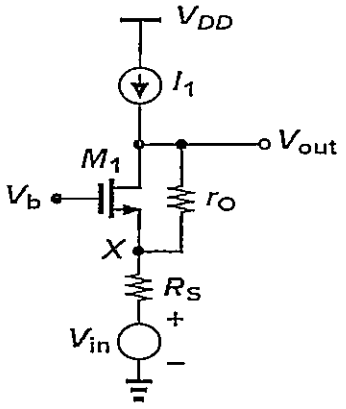



Figure 2

UNIT-V

9. (a) In Figure 3, Find the drain current of $M_4$ if all of the transistors are in saturation? 6M CO5 L1

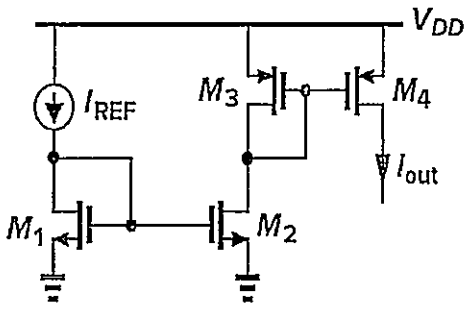



Figure 3

(b) Explain the basic concept of Common-mode feedback with neat diagram. 6M CO5 L2

(OR)

10. (a) State and prove Miller's theorem. 6M CO5 L5

(b) In the circuit of Figure 4, assume that the Op-Amp is a single-pole voltage Amplifier. If $V_{in}$ is a small step, calculate the time required for the output voltage to reach within 1% of its final value. What unity-gain bandwidth must the Op-Amp provide if $1 + R_1/R_2 \approx 10$ and the settling time is to be less than 5 $ns$? For simplicity, assume that the Low-frequency gain is much greater than unity. 6M CO5 L3

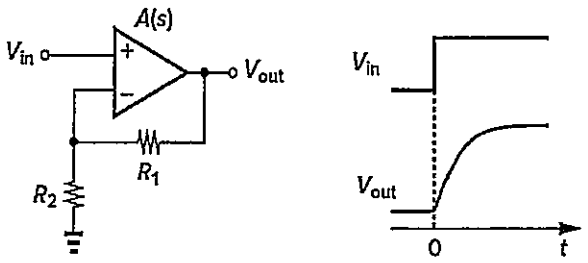



Figure 4

Q.P. Code: 2284202

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. II Semester (R22PG) Regular Examinations of August – 2023
*SUB: Embedded and Real Time Operating Systems (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) | List and explain some of the common relevant design metrics. | 6M | CO1 | L1 |
| | (b) | Discuss in detail libraries/IP and test/verification approaches to improve the design process for increased productivity. | 6M | CO1 | L3 |
| | | (OR) | | | |
| 2. | (a) | Discuss the following w.r.t IC technologies:<br>i. Full-custom/VLSI<br>ii. Semi-custom ASIC (gate array and standard cell)<br>iii. PLD | 9M | CO1 | L3 |
| | (b) | List some of the applications of Embedded systems. | 3M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | (a) | Illustrate the idea of pipelining with an example. | 6M | CO2 | L2 |
| | (b) | List and explain several addressing modes of general purpose processor. | 6M | CO2 | L2 |
| | | (OR) | | | |
| 4. | (a) | Discuss the two memory architectures: Harvard and Princeton. | 4M | CO2 | L2 |
| | (b) | Write a program to add numbers from 1 to 10 in C language as well as in assembly language. | 8M | CO2 | L3 |
| | | UNIT – III | | | |
| 5. | (a) | Explore the difference between a computational model and a language. | 5M | CO3 | L2 |
| | (b) | With an example explain communication among processors using shared memory. | 7M | CO3 | L2 |
| | | (OR) | | | |
| 6. | (a) | Develop a C language program for capturing the elevator's Unit Control state machine in a sequential programming language. | 6M | CO3 | L3 |
| | (b) | Develop a program to implement consumer-producer problem using conditional variables. | 6M | CO3 | L3 |
| | | UNIT – IV | | | |
| 7. | (a) | What is synthesis? Discuss in detail logical synthesis, RT synthesis and behavioral synthesis. | 9M | CO4 | L2 |
| | (b) | Briefly introduce design technology. | 3M | CO4 | L2 |
| | | (OR) | | | |
| 8. | (a) | Discuss in detail the concept of IP crores reuse. | 6M | CO4 | L2 |
| | (b) | Briefly discuss the verification of hardware/software co-simulation. | 6M | CO4 | L2 |
| | | UNIT-V | | | |
| 9. | (a) | What is a semaphore? Discuss in detail binary semaphore and counting semaphores. | 6M | CO5 | L2 |
| | (b) | List and explain different states of a task. | 6M | CO5 | L2 |
| | | (OR) | | | |
| 10. | (a) | With the help of a diagram, explain the relation between tasks, ISRs and a message mailbox. | 6M | CO5 | L2 |
| | (b) | What is an interrupt? What is an ISR? How to handle Interrupts? | 6M | CO5 | L2 |

Q.P. Code: 2284204 | SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: Advanced Computer Architecture (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) | How do you compare the terms cost and price. Explain in detail about Amdahl's law. | 6M | CO1 | L5 |
| | (b) | Assume a disk subsystem with the following components and MTTF:<br>■ 10 disks, each rated at 1,000,000-hour MTTF<br>■ 1 ATA controller, 500,000-hour MTTF<br>■ 1 power supply, 200,000-hour MTTF<br>■ 1 fan, 200,000-hour MTTF<br>■ 1 ATA cable, 1,000,000-hour MTTF<br>Using the simplifying assumptions that the lifetimes are exponentially distributed and that failures are independent, compute the MTTF of the system as a whole. | 6M | CO1 | L3 |
| | | **(OR)** | | | |
| 2. | (a) | Show that the ratio of the geometric means is equal to the geometric mean of the performance ratios, and that the reference computer of SPECRatio matters not. | 6M | CO1 | L2 |
| | (b) | Explain the addressing modes for signal processing operations in the instruction set with examples | 6M | CO1 | L2 |
| | | **UNIT – II** | | | |
| 3. | (a) | Compute the number of bits are in the (0,2) branch predictor with 4K entries? How many entries are in a (2,2) predictor with the same number of bits? | 6M | CO2 | L3 |
| | (b) | Explain about hardware-based speculation using Tomasulo's algorithm. | 6M | CO2 | L2 |
| | | **(OR)** | | | |
| 4. | (a) | Distinguish between hardware and software solutions | 6M | CO2 | L4 |
| | (b) | Illustrate conditional or predicated instructions? Explain with examples. | 6M | CO2 | L2 |
| | | **UNIT – III** | | | |
| 5. | (a) | Classify different techniques used for reducing cache miss penalty. | 6M | CO3 | L2 |
| | (b) | How is a block found if it is memory | 6M | CO3 | L2 |
| | | **(OR)** | | | |
| 6. | (a) | Identify Which block should be replaced on a virtual miss | 6M | CO3 | L3 |
| | (b) | Briefly discuss about a virtual memory. | 6M | CO3 | L2 |
| | | **UNIT – IV** | | | |
| 7. | (a) | Discuss about the performance of symmetric shared memory | 6M | CO4 | L2 |
| | (b) | What are the basic schemes for enforcing coherence, explain them in detail. | 6M | CO4 | L2 |
| | | **(OR)** | | | |
| 8. | (a) | What is multiprocessor cache coherence. Explain in detail. | 6M | CO4 | L2 |
| | (b) | What are the basic schemes for enforcing coherence, explain them in detail. | 6M | CO4 | L2 |
| | | **UNIT-V** | | | |
| 9. | (a) | Discuss about the following terms<br>(i) Fault (ii) Failure (iii) Error | 6M | CO5 | L2 |
| | (b) | Explain about 6 types of RAID in brief. | 6M | CO5 | L2 |
| | | **(OR)** | | | |
| 10. | (a) | Discuss about the throughput versus response time for an I/O system | 6M | CO5 | L2 |
| | (b) | Write about the practical issues to be considered for commercial interconnection networks. | 6M | CO5 | L2 |

Q.P CODE: 2284208 SET I

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

M. Tech. II Sem. (R22PG) Regular Examinations of August - 2023

SUB: Network Security and Cryptography (ES & VLSI)

Time: 3 Hours Max. Marks: 60

Answer any five Questions choosing one question from each unit.

All questions carry Equal Marks.

| | | Questions | Marks | CO | BL |
|---|---|---|---|---|---|
| | | UNIT - I | | | |
| 1. | | Explain in detail about (i) Chinese Remainder Theorem (ii) Euclidean Algorithm | 12M | CO2 | L2 |
| | | (OR) | | | |
| 2. | | Elucidate various classical Encryption Techniques? | 12M | CO1 | L3 |
| | | UNIT – II | | | |
| 3. | (a) | Explain the Operation of DES Algorithm? | 6M | CO1 | L2 |
| | (b) | Explain the Operation of AES Algorithm? | 6M | CO1 | L2 |
| | | (OR) | | | |
| 4. | | Write in detail about (i) Block Cipher principles (ii) Triple DES | 12M | CO1 | L1 |
| | | UNIT – III | | | |
| 5. | (a) | Compare Diffie -Hellman Key exchange, Elliptic Curve Cryptography | 6M | CO1 | L5 |
| | (b) | Explain about Elliptical Curve Cryptography? | 6M | CO1 | L3 |
| | | (OR) | | | |
| 6. | (a) | Illustrate HASH functions and how they are helpful in Message Authentications? | 6M | CO3 | L4 |
| | (b) | Explain in detail about Message digest algorithms? | 6M | CO3 | L2 |
| | | UNIT – IV | | | |
| 7. | | Explain in detail the architecture of IP Security and Secure Electronic Transaction? | 12M | CO1 | L2 |
| | | (OR) | | | |
| 8. | | Illustrate (i) Secure Socket Layer (ii) Transport Layer Security | 12M | CO2 | L4 |
| | | UNIT-V | | | |
| 9. | | Explain in detail about different types of viruses and Firewall Design Principles? | 12M | CO2 | L3 |
| | | (OR) | | | |
| 10. | | List the three classes of intruders and Explain the intrusion techniques to protect from the intruders | 12M | CO1 | L2 |

Q.P. Code: 2298201

SET - 1

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

M. Tech. II Semester (AI & DS-R22 PG) Regular Examinations of August– 2023

*SUB: 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) | What Is Data Science? Explain the history of the Data Science. | 6M | CO1 | L1 |
| | (b) | Discuss the Exploratory Data Analysis. | 6M | CO1 | L3 |
| | | (OR) | | | |
| 2. | | What is EDA? Explain EDA in data science with suitable examples. | 12M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | | Discuss the Web APIs and Other Tools in detail. | 12M | CO2 | L3 |
| | | (OR) | | | |
| 4. | (a) | Explain linear regression in detail. | 6M | CO2 | L3 |
| | (b) | Discuss the K-NN algorithm in detail. | 6M | CO2 | L2 |
| | | UNIT – III | | | |
| 5. | (a) | Explain the Data Visualization History. | 6M | CO3 | L3 |
| | (b) | Describe the Data Visualization at Square. | 6M | CO3 | L4 |
| | | (OR) | | | |
| 6. | | How data science detects bad behavior efficiently? Explain with an example | 12M | CO3 | L3 |
| | | UNIT – IV | | | |
| 7. | | Why use R for analytics? What are the common R Libraries for data science? Explain. | 12M | CO4 | L1 |
| | | (OR) | | | |
| 8. | | Explain the R programming structures. | 12M | CO4 | L4 |
| | | UNIT-V | | | |
| 9. | (a) | Discuss the Social Network Analysis at Morning Analytics. | 6M | CO5 | L3 |
| | (b) | Write shot notes on Data Journalism. | 6M | CO5 | L1 |
| | | (OR) | | | |
| 10. | | Explain the need of centrality measures in social networks? | 12M | CO5 | L3 |

Q.P. Code: 2298202

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: DEEP 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** | | | |
| 1. | (a) | Define Machine Learning. Briefly discuss the types of Machine Learning. | 6M | CO1 | L1 |
| | (b) | What is the purpose of Optimization Techniques? How optimization techniques help in ANN'S. Discuss. | 6M | CO1 | L2 |
| | | **(OR)** | | | |
| 2. | (a) | Define Artificial Neural Networks. Discuss the types of ANN's. | 6M | CO1 | L3 |
| | (b) | Discuss the classification problem with the help of a data set. | 6M | CO1 | L2 |
| | | **UNIT – II** | | | |
| 3. | (a) | What is the purpose of Convolution layer and Pooling layer in CNN? Discuss. | 6M | CO2 | L2 |
| | (b) | What are the advantages and disadvantages of Leaky ReLU and Randomized ReLU? Discuss. | 6M | CO2 | L2 |
| | | **(OR)** | | | |
| 4. | | What are the various applications of CNN? Explain them. | 12M | CO2 | L3 |
| | | **UNIT – III** | | | |
| 5. | (a) | How RNN is different from CNN? Discuss. | 6M | CO3 | L4 |
| | (b) | Write short notes on : i) Bidirectional and Stateful RNNs ii) Deep Recurrent Neural Network | 6M | CO3 | L2 |
| | | **(OR)** | | | |
| 6. | (a) | Discuss the challenges encountered with vanishing gradients in RNN. | 6M | CO3 | L3 |
| | (b) | Explain RNN Topology. | 6M | CO3 | L2 |
| | | **UNIT – IV** | | | |
| 7. | (a) | List the types of Autoencoders? Explain any two. | 6M | CO4 | L4 |
| | (b) | How Regularized Autoencoder is different from other types of Autoencoders? Discuss. | 6M | CO4 | L3 |
| | | **(OR)** | | | |
| 8. | | Write short notes of Deep Autoencoder and Denoising Autoencoder and list the advantages and disadvantages of Deep Autoencoder amd Denoising Autoencoder. | 12M | CO4 | L4 |
| | | **UNIT-V** | | | |
| 9. | (a) | How Boltzmann machine is related to hopefield networks? Discuss. | 6M | CO5 | L2 |
| | (b) | What is the purpose of Gibbs Sampler in RBM Architecture? Discuss. | 6M | CO5 | L4 |
| | | **(OR)** | | | |
| 10. | | Discuss the features of the following frameworks: (i) TensorFlow (ii) PyTorch | 12 M | CO5 | L4 |

Q.P. Code: 2298204

SET - 1

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

M. Tech. II Semester (R22PG) Regular Examinations of August – 2023

*SUB: EXPLORATORY DATA ANALYSIS USING R (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 is data, information, and knowledge? Discuss the role of data analysis. | 6M | CO1 | L1 |
| | (b) | Construct histograms and QQ plots from the brain weight data of mammals. | 6M | CO1 | L2 |
| | | **(OR)** | | | |
| 2. | (a) | Explain a Representative R session. | 6M | CO1 | L2 |
| | (b) | Why R? Explain some R packages that support analysis methods from many branches of statistics. | 6M | CO1 | L1, L2 |
| | | **UNIT – II** | | | |
| 3. | (a) | Discuss a few of the more common base graphics functions. | 6M | CO2 | L2 |
| | (b) | Explain the optional parameters for the base graphics. | 6M | CO2 | L2 |
| | | **(OR)** | | | |
| 4. | (a) | Illustrate the plot function in sample R and model the boxplot summary using plot function. | 6M | CO2 | L3 |
| | (b) | Explain the color options in R with examples. | 6M | CO2 | L2 |
| | | **UNIT – III** | | | |
| 5. | (a) | What are the four key concepts in exploring data? Explain the general strategies of EDA. | 6M | CO3 | L1, L2 |
| | (b) | Write about the limitations of the simple summary statistics | 6M | CO3 | L1 |
| | | **(OR)** | | | |
| 6. | | Discuss various Anomalies in numerical data with examples | 12M | CO3 | L2 |
| | | **UNIT – IV** | | | |
| 7. | (a) | Why manual data entry is bad but sometimes expedient. Give reasons. | 6M | CO4 | L1 |
| | (b) | How CSV files work? Explain the read and write CSV operations in R with examples. | 6M | CO4 | L1, L2 |
| | | **(OR)** | | | |
| 8. | (a) | How to save and retrieve R objects? Explain with functions | 6M | CO4 | L1, L2 |
| | (b) | Explain merging data from different sources. | 6M | CO4 | L2 |
| | | **UNIT-V** | | | |
| 9. | (a) | Explain (i) Describing lines in the plane (ii) Fitting lines to points in the plane. | 6M | CO5 | L2 |
| | (b) | Discuss the problem of collinearity with an example. | 6M | CO5 | L2 |
| | | **(OR)** | | | |
| 10. | (a) | What is linear regression? Explain multiple predictors in linear regression with examples. | 6M | CO5 | L1, L2 |
| | (b) | Explain the most important linear regression tools available in R. | 6M | CO5 | L2 |

Q.P. Code: 2298206 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
M. Tech. II Semester (R22PG) Regular Examinations of August – 2023
*SUB: TEXT MINING & TIME SERIES DATA (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. | | Discuss about the basic techniques in Natural Language Processing | 12M | CO1 | L2 |
| | | (OR) | | | |
| 2. | (a) | Illustrate the procedure used to representing the documentation in text mining. | 6M | CO1 | L3 |
| | (b) | Explain about KNN text categorization algorithm in detail. | 6M | CO1 | L2 |
| | | UNIT – II | | | |
| 3. | | Explain in detail about various applications of Topic Modeling. | 12M | CO2 | L2 |
| | | (OR) | | | |
| 4. | (a) | Explain about Extraction- based summarization methods in detail. | 6M | CO2 | L2 |
| | (b) | Define semantic analysis and explain how sentiment polarity predication has been done in text mining. | 6M | CO2 | L1 |
| | | UNIT – III | | | |
| 5. | (a) | Analyze the necessity to have time series data and discuss about time series statistical models. | 6M | CO3 | L4 |
| | (b) | Briefly explain about measure of Correlation in time series. | 6M | CO3 | L3 |
| | | (OR) | | | |
| 6. | | Discuss about Time series Regression & Exploratory Data Analysis in detail. | 12M | CO3 | L4 |
| | | UNIT – IV | | | |
| 7. | (a) | Explain the working functionalities of Autoregressive moving average models. | 6M | CO4 | L2 |
| | (b) | Demonstrate how Integrated models for nonstationary data is evaluated using ARIMA. | 6M | CO4 | L3 |
| | | (OR) | | | |
| 8. | (a) | Discuss about Autocorrelation and partial autocorrelation models in detail. | 6M | CO4 | L4 |
| | (b) | Explain the procedure to Building ARIMA models. | 6M | CO4 | L2 |
| | | UNIT-V | | | |
| 9. | | Give the working procedure and functionalities of Periodogram and Discrete Fourier transform. | 12M | CO5 | L1 |
| | | (OR) | | | |
| 10. | | Discuss about Lagged Regression models in detail. | 12M | CO5 | L3 |