K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Construction Planning and Management (CE)

Time: 3 Hours   Max. Marks: 70

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

### UNIT – I

1.   Discuss objectives of construction management and Explain Planning,   14M
      Scheduling and Controlling as a Function of Construction Management.

(OR)

2. (a) Write short note on scope of construction management.   7M
    (b) Define construction management and state objectives of construction   7M
         management.

UNIT – II

3.   The PERT network for a certain project is shown in Figure. Determine the expected time for   14M
      each path. Which path is critical?
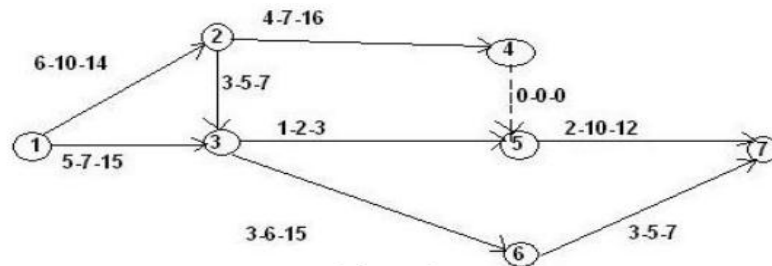
(OR)

4. (a) What is a Gantt bar chart? Explain with the help of a suitable example, the method of   7M
         preparing a bar chart.
    (b) Defined 'earliest event time' and 'latest occurrence event time'. How these can be   7M
         determined? Explain the tabular form for determining these.

UNIT – III

5. (a) Explain in detail the various equipment used for compaction, batching and mixing of   7M
         concrete.
    (b) Explain the methods of placing of concrete   7M

(OR)

6. (a) Describe the various applications of a bulldozer.   7M
    (b) List any four operations that can be performed by a bull dozer   7M

UNIT – IV

7. (a) Write the different principles of inspection   7M
    (b) Discuss about the Decision makers in quality control   7M

(OR)

8. (a) Discuss about the ethical audit procedures   7M
    (b) What are the various audit statement and reviews?   7M

UNIT-V

9.   Describe safety requirements for demolition works and mention the safety requirements for   14M
      scaffolding and form work.

(OR)

10. (a) Explain about leadership and human relations   7M
    (b) Explain the concept and importance of safety   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Advanced Foundation Engineering (CE)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) What are different types of sheet pile walls? Draw the sketches showing the pressure distribution. **7M**

   (b) Draw the pressure distribution diagrams for different cases of sheet pile walls and write the equations for determining the depth of embedment of sheet piles in sands and clays. **7M**

(OR)

2. (a) Describe the equivalent beam method for the analysis of an anchored sheet pile. **7M**

   (b) Write about the cantilever sheet piling in granular soils? **7M**

UNIT – II

3. (a) Draw different types of apparent pressure diagrams used in the design of braced cuts. What are the factors that affect the pressure distribution? **7M**

   (b) How the design of a cellar coffer dam on rock differ from that on a soil bed? **7M**

(OR)

4. (a) What is coffer dam? Explain the different types of coffer dams **7M**

   (b) A rectangular strutted excavation 2 m wide, is made in a plastic clay having unit weight 18 kN/m^3 and undrained cohesion 20 kN/m^2. If the depth of cut is 4.5 m, what is the factor of safety against base failure? Take bearing capacity factor N_c as 7.0. **7M**

UNIT – III

5. (a) Explain the design aspects of individual components of well foundation. **7M**

   (b) What are the measures to be taken for rectification of tilts and shifts of well foundations? **7M**

(OR)

6. Discuss the IRC method for the design of well foundation. **14M**

UNIT – IV

7. (a) Explain the method of foundation design and treatment of collapsible soil **7M**

   (b) Is Collapse potential, a major parameter to be considered when dealing with Collapsible soils? Justify your answer with proper reasoning. **7M**

(OR)

8. (a) List out the major precautions to be taken in design and execution of foundations in Expansive soils. **7M**

   (b) Explain the methods to evaluate the swell potential and swell pressure. **7M**

UNIT-V

9. (a) Explain the principle of soil-bitumen stabilization. What are the factors affecting the properties of soil-bitumen. **7M**

   (b) Explain any two methods suitable for stabilization of cohesive soils. **7M**

(OR)

10. (a) What are the functions and applications of geo-grid? **7M**

    (b) Discuss the Reinforced earth along with its application. **7M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Water Resources Engineering – II (CE)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) What is a spillway? What is the necessity of a spillway? What are the essential requirements of a spillway?   7M
    (b) Explain the classification of spillways according to different considerations.   7M

(OR)

2. (a) Explain the design principles of an Ogee spillway.   7M
    (b) Describe with neat sketches: (i) Roller gates and (ii) Tainter gates.   7M

UNIT – II

3. (a) What is a canal fall? Why is it necessary to provide a fall in a canal? What are the different types of falls?   7M
    (b) Explain the 'cistern element' in a fall. What are the various expressions for its dimensions?   7M

(OR)

4. (a) Explain the procedure for designing a Sarda type fall.   7M
    (b) Describe the procedure for designing a straight glacis fall.   7M

UNIT – III

5. (a) What is a distributary head regulator? What are the functions of a distributary head regulator?   7M
    (b) Describe the procedure for designing a head regulator for a distributary.   7M

(OR)

6. (a) What is an outlet? What are the requirements of a good outlet? What are the different types of outlets?   7M
    (b) Define sensitivity of an outlet. Find the relation between sensitivity and flexibility of an outlet.   7M

UNIT – IV

7. (a) What do you understand by a 'cross drainage work'? Differentiate between   (i)   7M
         aqueduct and syphon aqueduct
         (ii) super passage and canal syphon.
    (b) Discuss the various factors affecting the sustainability of aqueduct and syphon aqueduct.   7M

(OR)

8. (a) Explain the classification of Aqueducts. Indicate the circumstances under which each one is used.   7M
    (b) Explain the method of determining uplift pressure on the roof of a syphon aqueduct.   7M

UNIT-V

9. (a) What are the various purposes for which a multipurpose project is undertaken? Explain.   7M
    (b) Explain the process of Project formulation.   7M

(OR)

10. (a) Explain how an independent single purpose project may be evaluated.   7M
     (b) Explain the various 'strategies for future 'used in Water Resources planning.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Transportation Engineering – II (CE)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) What are the functions of sleepers in Railway track ? What are the requirements of good sleepers — 10M
   (b) What is Negative Super Elevation? What is sleeper density — 4M

(OR)

2. (a) With the help of a neat sketch, show the various components of a typical Railway track. — 7M
   (b) Explain the following terms (i) Track modulus, (ii) Coning of Wheels. Draw neat sketches, wherever necessary. — 7M

UNIT – II

3. (a) Write a note about - (i) Ruling gradient and (ii) Pusher gradient. — 7M
   (b) Explain, with neat sketches, the various considerations for providing extra clearances on Horizontal curves — 7M

(OR)

4. (a) What is conning of wheel and tilting of rails. Explain the behaviour of a conned wheel on curved track. — 7M
   (b) Explain the difference between cant deficiency and negative super elevation. — 7M

UNIT – III

5. (a) List out Aircraft characteristics to be considered in planning an airport planning and design — 6M
   (b) What is the effect of engine failure on runway length? — 8M

(OR)

6. (a) Explain in brief the difference between functional and structural evaluation of airfield pavements. — 7M
   (b) Explain in detail the various maintenance works that are performed on Flexible airfield pavements. — 7M

UNIT – IV

7. (a) Explain the different types of temporary breakwaters with neat sketches. — 7M
   (b) What are the requirements of good ports? Discuss the function of each component of harbour. — 7M

(OR)

8. (a) How are the harbours classified? What is the difference between a Port and a harbour? What are the requirements of a good port — 7M
   (b) What is the purpose of breakwaters? Explain different types of breakwater structures with suitable sketches. — 7M

UNIT-V

9. (a) What is Dredging? Classify the different types of dredging works — 7M
   (b) What are the factors to be considered for the selection of harbors on a sandy coast and Lower reach of a river — 7M

(OR)

10. (a) Differentiate between wharf, jetty and quay — 7M
    (b) List the navigational aids and explain their importance — 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Design and Detailing of Steel Structures (CE)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) Explain about the lower bound and upper bound theorems.   9M

    (b) Write the Shape factor for solid circular section, rectangular section and triangular section.   5M

(OR)

2.   A 16 mm thick plate is joined to a 14 mm plate by 180 mm long (effective) butt weld.   14M
     Determine the strength of joint if (i) a double V butt weld is used. (ii) a single V butt weld is
     used.

UNIT – II

3. (a) What is a lug angle? Illustrate with sketch. Why lug angles are used?   8M

    (b) Write short notes on tension member splices.   6M

(OR)

4.   Design a laced column with two channels back to back of length 8 m to carry an axial factored   14M
     load of 1200 kN. The column may be assumed to have restrained in position but not in
     direction at both ends, which are hinged.

UNIT – III

5.   Design a simply supported beam of 8 m effective span carrying a load of 48 kN/m. The depth   14M
     of the beam should not exceed 500 mm. The compression flange of the beam is laterally
     supported. Assume stiff end bearing is 100 mm.

(OR)

6.   An ISMB 450 section is used as a beam over a span of 5 m, with simply supported ends.   14M
     Determine the maximum factored uniformly distributed load that the beam can carry if the
     ends are restrained against torsion but compression flange is laterally unsupported.

UNIT – IV

7.   Draw neat sketches and explain the design principles of the following welded connections for   14M
     the transfer of shear only. (i) Double plate framed connection (ii) Double angle framed
     connection (iii) Unstiffened seat connection (iv) Stiffened seat connection.

(OR)

8.   An ISMB is connected to the flange of an ISHB 250 @ 537 N/m. Design a stiffened seated   14M
     connection.

UNIT-V

9.   A column section ISMB 450 @ 0.724 kN/m carries an axial load of 1200 kN. Design the slab   14M
     base if allowable bearing pressure on concrete is 4.5 MPa and allowable bending stress in
     bearing is 185 MPa.

(OR)

10. A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1800 KN.   14M
     Design a suitable bolted gusset base. The base rests on M20 grade of concrete pedestal. Use
     22 mm diameter bolts of grade 4.6 for making the connections.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Design and Detailing of Reinforced Concrete Structures-II (CE)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. Design a one-way continuous slab for a hall measuring 8 m x 16 m. The superimposed load   14M
    is 4kN/m^2. Assume width of beams as 250 mm and spaced at 4.0 m center to center. Use M
    20 concrete and Fe 415 steel. Bearing of beams is 200mm.

(OR)

2. Design a reinforced concrete slab for a room of clear dimensions 4mx5m. The slab is simply   14M
    supported on walls of width 300mm. The slab is carrying a live load of 4kN/m^2 and floor
    finish 1 kN/m^2. Use M 20 concrete and Fe 415 steel. The corners of slab are held down.

UNIT – II

3. Design a braced column 300mm x 300mm subjected to an Ultimate axial load of 2000kN and   14M
    ultimate moments of 70 kN.m and 50 kN.m with respect to major axis and minor axis.
    Assume the column is bent in double curvature in both directions. The unsupported length of
    column is 7 m. The column is restrained against sway. Use M20 concrete and Fe 415 steel.

(OR)

4. Determine the maximum factored load carrying capacity of a square column 400mm x   14M
    400mm reinforced with 12 bars of 16 mm diameter, uniformly spaced along all the four sides
    with an effective cover of 50mm. The column is braced against side sway and has
    unsupported length of 5.0m and effective length factor of 1 about the both axes. Assume M30
    mix and Fe415 Steel.

UNIT – III

5. Design an isolated square footing for a column 300mm x 300mm, transmitting an axial load   14M
    of 900 kN. The S.B.C. of the soil is 225 kN/m^2. Use M 20 concrete and Fe 415 grade steel.
    Show the detailing of reinforcement with a sketch.

(OR)

6. Design a combined footing for two columns 450 mm x 450 mm each, 4.5 m apart carrying a   14M
    load of 1400 kN. Available width restriction is 2.2 m. The safe bearing capacity of the soil is
    200 kN/m^2. Use M 25 concrete and Fe 415 grade steel.

UNIT – IV

7. Design a cantilever retaining wall to retain horizontal earthen embankment of height 4m   14M
    above the ground level. The earthen backfill is having a density of 16 kN/m^3 and an angle of
    internal friction as 25°. The safe bearing capacity of the soil is 160 kN/m^3. The coefficient of
    friction between soil and concrete is assumed to be 0.5. Use M20 concrete and Fe 415 steel.

(OR)

8. Design a T-shaped cantilever retaining wall to retain earth embankment 3.5m high above the   14M
    ground level. The embankment is surcharged at an angle of 15° to the horizontal. The unit
    weight of the earth is 18N/m^3 and its angle of repose is 26°. The safe bearing capacity of a
    soil may be taken as 150kN/m^2 at a depth of 1.2m below the ground. The coefficient of
    friction between concrete & soil may be taken as 0.60. Use M20 grade of concrete and Fe415
    Grade Steel.

UNIT-V

9. Design a circular water tank with fixed base, resting on the ground, for a capacity of 600 kl.   14M
    The depth of water tank is 5.5m and a free board of 200 mm is to be provided. Use M30
    concrete and Fe 415 steel. Bearing capacity of soil may be taken as 160 kN/m^2

(OR)

10. Design a rectangular water tank of size 3m x 5m x 4m, resting on the ground. Bearing   14M
    capacity of soil may be taken as 180 kN/m^2 . Use M25 concrete and Fe 415 steel.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Structural Analysis – II (CE)

Time: 3 Hours   **Max. Marks: 70**

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

UNIT – I

1. (a) Determine the static and kinematic indeterminacies of the two pin-jointed trusses shown in **fig.1a** and **1.b**   **7M**
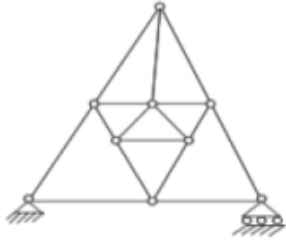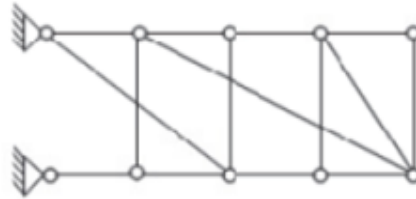
Fig.1a   **Fig.1b**

(OR)

2. (a) Determine the forces in all the members of a truss shown in **fig.2** by method of joints and tabulate the results.   **14M**
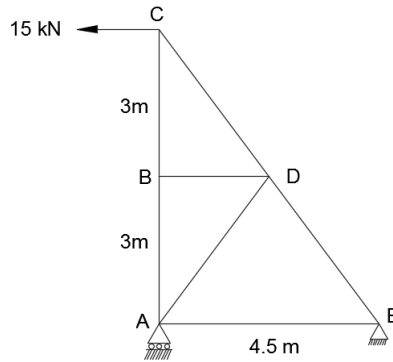
Fig.2

UNIT – II

3. (a) Show that the bending moment is zero at all sections of a parabolic arch when it is subjected to UDL over its entire span.   **7M**

    (b) Calculate support reactions, normal thrust and radial shear at point D for a three hinged parabolic arch as shown in **fig.3**   **7M**

Fig.3

(OR)

4. (a) A two hinged parabolic arch of span 25m, rise 6m is subjected to a udl of 15kN/m over the left half span and a point load of 25kN at 9.5m from the right support. Find the support reactions, BM, radial shear, and normal thrust at 4m from the left support. **14M**

UNIT – III

5. (a) A UDL of 15 kN/m covering a length of 3m crosses a girder of span 10m. Find the maximum shear force and bending moment at a section 4m from left support. **14M**

(OR)

6. (a) A rolling load of 50 kN moves from left to right on simply supported beam of 26 m span. Find the values of maximum positive and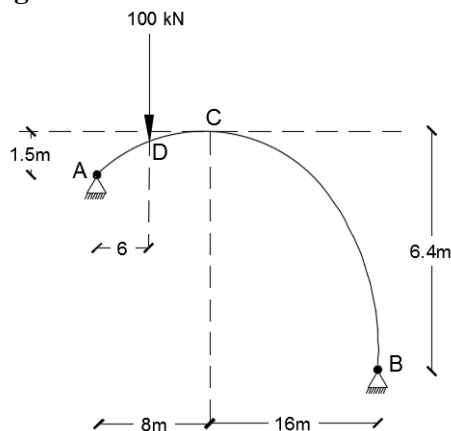 negative shear force and bending moment at a section 16m from the left end support. Also find out the absolute maximum bending moment on the span due to this rolling load. **14M**

UNIT – IV

7. (a) Define an influence line diagram. What are the uses of ILD? **7M**
    (b) Draw the influence line diagram for shear force at a section for a simply supported beam subjected to single point load. **7M**

(OR)

8. (a) A simply supported beam of span 8m is traversed by a UDL of 10m long with intensity 20 kN/m. Draw the influence line diagram for **14M**
    (i) Reaction at left support.
    (ii) SF at 3m from left support
    (iii)BM at 3m from left support
        Find the maximum values of above quantities.

UNIT-V

9. (a) Analyse the continuous by flexibility matrix method. Draw SFD and BMD.
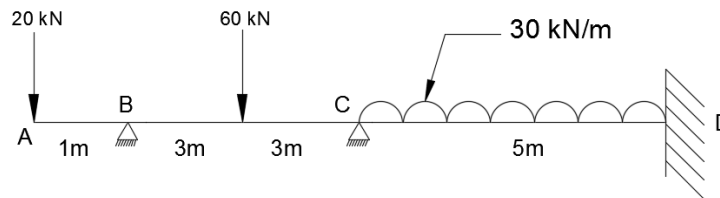

14M

Fig.4

(OR)

10. Analyse the continuous beam shown in **fig.5** by stiffness method. Draw bending moment diagram and shear force diagram.
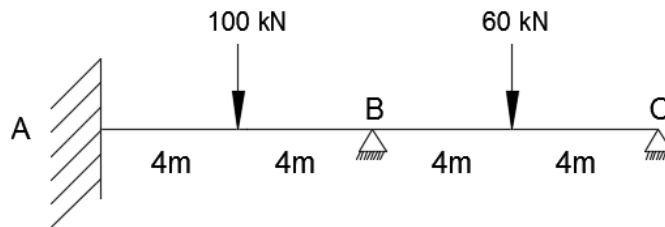

14M

Fig.5

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Power Quality (EEE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1.	(a)	Define power quality? Explain the reasons for increased concern in power quality.	7M
	(b)	Discuss the issues related to power quality	7M

(OR)

2.	(a)	Discuss the standards of power quality	7M
	(b)	Explain briefly about ITIC curve	7M

UNIT – II

3.	(a)	Explain about sources of sags and interruptions.	7M
	(b)	Explain the following terms related with power quality problem. (i) Impulsive transient (ii) Oscillatory transient	7M

(OR)

4.	(a)	Discuss briefly about outages due to variation in voltage	7M
	(b)	Discuss briefly about the conventional devices used for voltage regulation	7M

UNIT – III

5.	(a)	Distinguish the differences among the following (i)Voltage distortion and Current distortion (ii)Harmonics and Transients	7M
	(b)	Briefly explain about Harmonic sources from commercial loads	7M

(OR)

6.	(a)	Discuss impacts of harmonic distortion on various power system components.	7M
	(b)	Write the principle of controlling harmonics and list the devices used for it	7M

UNIT – IV

7.	(a)	Discuss briefly about the process of benchmarking power quality.	7M
	(b)	Explain how the monitoring location is chosen for monitoring power quality?	7M

(OR)

8.	(a)	Discuss about various instruments used for power quality measurements.	7M
	(b)	Discuss the process of assessing the power quality from measured data	7M

UNIT-V

9.	(a)	Explain briefly about the principle and operation of solid state current limiter.	7M
	(b)	Compare the performance of Solid State Breaker (SSB) and Solid State Transfer Switch (SSTS) used for improving the power quality.	7M

(OR)

10.		Discuss briefly how DVR and UPQC enhance power quality. Also explain why DVR and UPQC are called compensating devices?	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Electrical Distribution Systems (EEE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) Determine the relationship between the load factor and the loss factor for the three different cases when: (i) Load is steady. (ii) For very short lasting loads. (iii) Off-peak load is zero.   7M
   (b) Explain different types of loads with their characteristics   7M

(OR)

2. (a) Explain the constant power and constant current loads by deriving the necessary equations.   7M
   (b) The annual peak load of a primary feeder is 1000 kW at which the power loss i.e total copper loss is 40 kW/3φ. Assuming an annual loss factor of 0.12. Determine: (i) The average annual power loss. (ii) The total annual energy loss due to the copper losses of the feeder circuits.   7M

UNIT – II

3. (a) Discuss advantages and disadvantages of radial and loop type primary feeders.   7M
   (b) Explain the design aspects of secondary distribution systems.   7M

(OR)

4. (a) Discuss the design consideration of loop type primary feeders.   7M
   (b) Make a comparison between underground and overhead distribution systems.   7M

UNIT – III

5. With relevant diagrams, explain different bus bar arrangements in the sub stations.   14M

(OR)

6. (a) Draw layout of air insulated substation with the locations of all its equipment and explain.   7M
   (b) Enumerate various factors to be considered for ideal location of a substation.   7M

UNIT – IV

7. A 440 V, 50 cycles three phase line delivers 250 kW at 0.7 p.f (lag). It is desire to bring the line p.f to unity by installing shunt capacitors. Calculate the capacitance if they are: (i) Star connected. (ii) Delta connected.   14M

(OR)

8. Why do we need the voltage control and power factor correction in power systems? Explain.   14M

UNIT-V

9. (a) What criteria should be considered while integrating DA with SCADA?   7M
   (b) Discuss the different sub processes involved in data acquisition.   7M

(OR)

10. (a) Discuss about consumer information service ((CIS) and automatic meter reading (AMR) in detail.   7M
    (b) Discuss the role of geographical information system in distribution system automation.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Switch Gear & Protection (EEE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) What is a Peterson coil? What protective functions are performed by this device? — 7M
    (b) Differentiate between surge diverter and surge absorber. What are the characteristics of an ideal surge diverter? — 7M

(OR)

2. (a) Give reasons for the following:
    (i) The lightning arresters are installed as near as possible to the power transformer in a substation. (ii) A ground wire, if properly grounded using ground rods or counterpoise wires, acts as a protection against lightning strokes on transmission lines. — 7M
    (b) A surge of 100 kV travelling in a line of natural impedance 600 ohms arrives at a junction with two lines of impedances 800 ohms and 200 Ω respectively. Find the surge voltages and currents transmitted into each branch line. — 7M

UNIT – II

3. (a) Discuss the recovery rate theory and energy balance theory of arc interruption in a circuit breaker. — 7M
    (b) Write a short note on the following: (i) Merits of SF6 gas as an insulating and arc quenching medium (ii) Properties of SF6 gas. — 7M

(OR)

4. (a) Describe the construction, principle of operation and application of a vacuum breaker. — 7M
    (b) In a 220 kV system, the reactance and capacitance up to the location of circuit breaker is 8 Ω and 0.025 μ F, respectively. A resistance of 600 ohms is connected across the contacts of the circuit breaker. Determine the following: (a) Natural frequency of oscillation (b) Damped frequency of oscillation (c) Critical value of resistance which will give no transient oscillation (d) The value of resistance which will give damped frequency of oscillation, one-fourth of the natural frequency of oscillation. — 7M

UNIT – III

5. (a) Discuss the classification of protective relays based on their speed of operation. — 7M
    (b) What are the advantages and limitations of static relays? — 7M

(OR

6. (a) What are the various components of a protection system? Briefly describe their functions with the help of a schematic diagram. — 7M
    (b) What is an impedance relay? Explain its operating principle. Discuss how it is realized using the electromagnetic principle. — 7M

UNIT – IV

7. (a) Why is it necessary to provide protection to a generator in the event of the following types of faulty conditions? (i) Heavy unbalanced load (ii) Rotor earth-fault. — 7M
    (b) An 11 kV, 100 MVA alternator is provided with differential protection. The percentage of winding to be protected against phase to ground fault is 85%. The relay is set to operate when there is 20% out of balance current. Determine the value of the resistance to be placed in the neutral to ground connection. — 7M

(OR)

8. (a) What is Buchholz relay? For what types of faults is it employed? Discuss its working principle. — 7M
    (b) A three-phase, 11 kV/33 kV, Y-Δ connected power transformer is protected by differential protection. The CTs on the LV side have a current ratio of 400/5. What must be the ratio of CTs on the HV side? How the CTs on both the sides of the transformer are connected? — 7M

UNIT-V

9. (a) Give various schemes of protection for feeders and compare their performance. — 7M
    (b) Discuss a protective scheme for parallel feeders. — 7M

(OR)

10. (a) With a neat circuit diagram explain how a phase comparison carrier-current protection scheme operates. — 7M
    (b) Compare the merits and demerits of various pilot wire relaying schemes for protecting transmission lines. — 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: HVDC Transmission (EEE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) Compare AC & DC transmission systems based on economics of transmission & technical performance   **7M**
   (b) Explain typical layout of HVDC converter station.   **7M**

(OR)

2. (a) Explain in detail, the different types of HVDC links available with the help of neat sketches.   **7M**
   (b) For a fixed power of transmission explain how the economic choice of voltage level is selected in D.C. transmission system.   **7M**

UNIT – II

3. (a) Analyze the Graetz bridge circuit without overlap angle and draw the DC voltage waveforms.   **7M**
   (b) Explain the choice of converter configuration for any pulse number.   **7M**

(OR)

4. (a) Discuss the effect of source inductance on HVDC system.   **7M**
   (b) Explain the converter bridge characteristics as rectifier.   **7M**

UNIT – III

5. (a) Discuss in detail the principal of DC Link control.   **7M**
   (b) Explain about the converter control characteristics of HVDC system.   **7M**

(OR)

6. (a) With the help of a block diagram explain the hierarchical control structure for a D.C link.   **7M**
   (b) Explain briefly constant extinction angle control.   **7M**

UNIT – IV

7. (a) Explain the method of protection against over currents.   **7M**
   (b) Discuss the various faults exist in converter station?   **7M**

(OR)

8. (a) Explain briefly about surge arrester and their application?   **7M**
   (b) What are the uses of circuit breakers in HVDC systems?   **7M**

UNIT-V

9. (a) Discuss the various sources of reactive power for HVDC converters   **7M**
   (b) Why harmonics get generated in power systems? What are their harmful effects?   **7M**

(OR)

10. (a) What are the various types of AC filters that are employed in HVDC converter station? Discuss them in detail.   **7M**
    (b) Write short notes on RI noise   **7M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Advanced Control Systems (EEE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) What is the necessity of the compensation and explain briefly about various compensation   7M
         methods.
    (b) Briefly explain P,PI and PD controllers.   7M

                                           (OR)

2. (a) The Transfer Function of a plant is given by Gp(S) = K/ S(S+5)(S+10).Design a suitable   9M
         compensation to meet the following specifications: a) Kv =10, b). Phase margin = 45°.
    (b) Briefly explain the lead compensator with bode plot.   5M

UNIT – II

3. (a) Define the state, state variables and state vectors.   4M
    (b) Define controllability and explain the controllability tests for continuous systems.   5M
    c)   Obtain the state representation for the system described by the differential equation, $\ddot{Y}$ + 3   5M
         $\dot{Y}$ + 2 Y + U =0,Assume Zero initial conditions.

                                           (OR)

4. (a) Given the system n the state variables form X* =AX +BU,   7M

$$\text{Where} \quad A = \begin{bmatrix} 1 & -2 & 2 \\ -2 & 3 & 0 \\ 2 & 0 & 3 \end{bmatrix} ; B = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$$

         Transform the system to diagonal form.

    (b) The state equations of a system   are given below. Determine the system is completely   7M
         controllable and observable.
         X*= AX + BU and Y= CX

$$\text{Where } A = \begin{bmatrix} -5 & -1 \\ 3 & 1 \end{bmatrix} \text{ and } B^T = [2 \quad 5] ; \quad \text{and } C = [1 \quad 0]$$

UNIT – III

5. (a) Write the design steps for pole placements.   5M
    (b) Briefly explain Full order   and reduced order Observers.   5M
    c)   Write the properties of state transition matrix.   4M

                                           (OR)

6. (a) Explain the method of solution of state equations.   .   7M
    (b) Consider the system the described by,   7M
         X*= AX + BU and Y= CX

$$\text{Where } A = \begin{bmatrix} -5 & -1 \\ 3 & 1 \end{bmatrix} \text{ and } B^T = [2 \quad 5] ; \quad \text{and } C = [1 \quad 0]$$

         Find the state transition matrix(STM)of the system.

7. (a) Explain the construction of phase trajectories by phase plane method. 5M

   (b) Derive the describing function of dead-zone. and relay. 9M

   (OR)

8. A linear second order servo is described by the equation $e** + 2\xi Wn\ e* + Wn^2$ where $\zeta=0.15$, Wn=1,rad/sec, e(0) =15, and e*(0)=0 . Determine the singular point. Construct the phase trajectory, using the method of isoclines. 14M

UNIT-V

9. (a) State and Explain Lyapunovs Stability and instability theorms ? 7M

   (b) Consider a Non-linear sytem governed by the equation, 7M
   $X*_1 = - X_1 + 2X_1^2\ X_2$ and $X*_2 = - X_2$ .Determine the stability.

   (OR)

10. (a) By use of Krasovskii''s theorm, examine the stability of the equilibrium state X=0,of the following system, 7M
    $X*_1 =\ - X_1$
    $X*_2 = X_1 - X_2 - X_3^3$

    (b) Consider the second order system described by, $X*=AX$; where $A=\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$, 7M

    clearly the equilibrium state is origin.determine the stability of this state.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Management Science (EEE & ECE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. Define Management. Explain functions of Management   14M

(OR)

2. (a) Evaluate line and staff organization   7M

    (b) Write any six principles of Management, as given by Henry Fayol   7M

UNIT – II

3. (a) Illustrate strategy formulation and implantation.   7M

    (b) Write a short note on strategic deviation   7M

(OR)

4. (a) Explain characteristics of mission statement   7M

    (b) Discuss the various stages in the process of strategy formulation.   7M

UNIT – III

5. What is job evaluation? Explain types of job evaluation.   14M

(OR)

6. Describe various tools and techniques for inventory management?   14M

UNIT – IV

7. What do you understand by work measurement? Explain how do you determine standard   14M
    time.

(OR)

8. (a) Outline the work study with examples   7M

    (b) Explain the concept of statistical quality control   7M

UNIT-V

9. Write a short note on 1) PERT 2) CPM 3) Project crashing   14M

(OR)

10. (a) Illustrate Gantt chart   6M

    (b) What are the rules for drawing Networks   8M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Embedded Real Time Operating Systems (ECE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) Define ERTOS. What are the key characteristics of an RTOS?   7M

    (b) What are the various major application areas of Embedded systems?   7M

(OR)

2. (a) Explain Operational Quality attributes of Embedded system?   7M

    (b) Explain which type of skills required for Embedded Systems designer?   7M

UNIT – II

3. (a) What are the Fundamental Issues in Hardware Software Co-Design in Embedded Systems?   7M

    (b) Explain how Computational Models are useful in Embedded Design?   7M

(OR)

4. (a) Explain the role of Analog Electronic Components in embedded hardware   design?   7M

    (b) Explain Electronic Design Automation (EDA) Tools?   7M

UNIT – III

5. (a) Explain different type of IO devices with examples?   7M

    (b) Discuss in brief about Serial Bus Communication Protocols?   7M

(OR)

6. (a) Briefly explain about Parallel Bus Device Protocols?   7M

    (b) Explain Wireless and Mobile System Protocols?   7M

UNIT – IV

7. (a) Explain the overview of Threads and Processes?   7M

    (b) Explain Interrupt Routines in RTOS Environment and Handling of Interrupt Source Calls?   7M

(OR)

8. (a) Discuss in brief about Types of Operating Systems?   7M

    (b) Write a Short note on OS security issues and their solutions?   7M

UNIT-V

9. With a neat diagram explain Mobile Phone Software for Key Inputs?   14M

(OR)

10. Elaborately explain With neat diagram of an Embedded System for a Smart Card?   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Digital Image Processing (ECE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) Explain the fundamental steps involved in digital image processing   7M
   (b)   i) Explain how a digital image is formed   7M
        ii) Distinguish between digital image and binary image

(OR)

2. (a) Explain simple image model   7M
   (b) Explain in detail the following concepts   7M
        i) Uniform sampling and quantization
        ii) Non-uniform sampling and quantization

UNIT – II

3. (a) State any prove any three 2D DFT properties   7M
   (b) Obtain the Haar transform matrix for N=4   7M

(OR)

4. (a) Determine the kernel coefficients of 2D DCT transform for N=4   7M
   (b) Explain the properties of Slant transform.   7M

UNIT – III

5. (a) What is meant by Gradient and the Laplacian? Discuss their role in image enhancement.   7M
   (b) Explain how image smoothing is done in frequency domain by using the following filters.   7M
        i) Ideal low pass filter
        ii) Butterworth low pass filter
        iii) Gaussian low pass filter

(OR)

6. (a) Explain about following point processing operations in spatial domain   7M
        i) Image negative
        ii) Constrast stretching
        iii) Gray level slicing
        iv) Bitplane slicing
   (b) Explain briefly with block diagram about homomorphic filtering approach for image processing   7M

UNIT – IV

7. (a) What is meant by image restoration and explain its significance.   7M
   (b) Explain the detection of discontinuities in image segmentation   7M

(OR)

8. (a) Explain about inverse filtering in image restoration   7M
   (b) Explain the derivative operators used in image segmentation? Explain their significance   7M

UNIT-V

9. (a) Explain a general compression system model   7M
   (b) Obtain the Huffman code for the word "BALLAIAHBABU"   7M

(OR)

10. (a) Explain about lossless predictive coding   7M
    (b) Explain about image compression standards.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Optical Communications (ECE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) Distinguish the step index fibers & graded index fibers.   7M
   (b) Define numerical aperture. How to calculate numerical aperture of a given fiber? Explain.   7M

(OR)

2. (a) Draw the block diagram of optical fiber communication system and explain about each block   7M
   (b) Explain Advantages of Optical Fiber Communications   7M

UNIT – II

3. (a) Discuss different fiber material characteristics in detail   7M
   (b) Explain the following mechanisms in optical fiber   7M
       (i) absorption
       (ii) scattering

(OR)

4. (a) Explain bending losses with neat sketch in an optical fiber.   7M
   (b) Draw and explain the output patterns of source to fiber power launching.   7M

UNIT – III

5. (a) Explain about fiber splicing techniques in detail   7M
   (b) Write about Equilibrium numerical aperture   7M

(OR)

6. (a) Draw and explain the output patterns of source to fiber power launching.   7M
   (b) Write about fiber alignment& joint losses.   7M

UNIT – IV

7. (a) Explain PIN photo detector with neat sketch.   7M
   (b) Explain how temperature effects on Avalanche gain in PIN diode   7M

(OR)

8. (a) A pin photodiode on average generates one electron hole pair per three incident photons at a   7M
       wavelength of 0.8 μm. Assuming all the electrons are collected, calculate
       (i) The quantum efficiency of the device
       (ii) Its maximum possible band gap energy
       (iii)The mean output photocurrent when the received optical power is 10^{-7} W.
   (b) Derive laser diode rate equation.   7M

UNIT-V

9. (a) Explain about point-point links in optical system design   7M
   (b) A spot measurement of fiber attenuation is performed on a 1.5 km length of optical fiber at a 7M
       wavelength of 1.1 μm. The measured optical output power from the 1.5 km length of fiber is
       50.1 μW. When the fiber is cutback to 2m length, the measured optical power is 385.4 μW.
       Determine the attenuation per kilometer for the fiber at a wavelength of 1.1 μm.

(OR)

10. (a) What are the principles of the WDM technique? List various advantages.   7M
    (b) Write short note on attenuation measurement?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Electronic Measurements & Instrumentation (ECE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1.	(a)	Define Static and Dynamic characteristics.	4M
	(b)	Explain the working principle of AF Wave Analyzer with neat block diagram.	10M

(OR)

2.	(a)	Describe construction and principle of Chopper type Micro Voltmeter.	7M
	(b)	Explain the working principle of Harmonic Distortion Analyzer.	7M

UNIT – II

3.	(a)	Explain the working principle of Ramp Digital Voltmeter with a neat diagram.	7M
	(b)	Draw and explain the block diagram of Universal Counter.	7M

(OR)

4.	(a)	Explain the working principle of Digital Multimeter.	7M
	(b)	Explain the working principle of Staircase Digital Voltmeter.	7M

UNIT – III

5.	(a)	Define the terms Deflection sensitivity, Aluminizing.	4M
	(b)	Explain about storage oscilloscope with block diagram?	10M

(OR)

6.	(a)	Draw the block Diagram of a Dual Trace CRO and explain it?	7M
	(b)	Explain the measurement of frequency relationship of two waveforms using Lissajous figures.	7M

UNIT – IV

7.	(a)	Draw the Maxwell's Bridge Circuit and derives the expression for the unknown element at balance?	8M
	(b)	In Maxwell's capacitance bridge for calculating unknown inductance, the various values at balance are, R1 = 300 Ω, R2 = 700 Ω, R3 = 1500 Ω, C4 = 0.8 μF. Calculate R1, L1 and Q factor, if the frequency is 1100 Hz.	6M

(OR)

8.	(a)	Draw the Wien's Bridge Circuit and derives the expression for the unknown element at balance?	10M
	(b)	List out the advantages of bridge circuits.	4M

UNIT-V

9.	(a)	What is primary transducer and What is secondary transducer?	6M
	(b)	What parameters should be considered in selecting a transducer?	8M

(OR)

10.	(a)	Explain general Data Acquisition System (DAS) with a neat block diagram?	8M
	(b)	Define terms:	6M
		(i) Humidity (ii) Pressure (iii) Proximity	

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: VLSI Design (ECE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) List out the processing steps involved in the manufacturing of an IC.   7M
   (b) Explain the MOS transistor operation with the help of neat sketches in the enhancement mode.   7M

(OR)

2. (a) Describe in detail about integrated passive components.   6M
   (b) With neat sketches explain the ion lithography process.   8M

UNIT – II

3. (a) Derive the expression for the threshold voltage of MOSFET   7M
   (b) Deduce the expressions for drain-to-source current versus drain-to- source voltage relations.   7M

(OR)

4. (a) Define the following with necessary expressions. (i) gm (ii) gds (iii) Figure of Merit   7M
   (b) Explain CMOS inverter analysis.   7M

UNIT – III

5. (a) Explain step-by-step procedure for drawing stick diagram for single metal single polysilicon nMOS technology.   8M
   (b) Draw a stick diagram for two input CMOS NAND gate.   6M

(OR)

6. Describe the scaling of MOS circuits with limitations of scaling.   14M

UNIT – IV

7. (a) Discuss about area capacitances of MOS layers and give area capacitance calculations with suitable examples   8M
   (b) Define fan-in and fan-out. Explain their effects on propagation delay.   6M

(OR)

8. (a) Explain in detail about formal estimation of CMOS Inverter delay.   7M
   (b) Describe the nature of a parity generator and explain its structured design approach.   7M

UNIT-V

9. (a) Discuss about Complex Programming Logic Devices.   7M
   (b) Explain the architecture of Field Programmable Gate Arrays.   7M

(OR)

10. (a) How layout design can be done for improving testability? Explain   7M
    (b) Explain about chip level test techniques?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Rapid Prototyping (ME)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) What is Rapid Prototyping and explain about different steps involved in Rapid Prototyping technology?   7M
   (b) Distinguish between traditional prototyping and rapid prototyping.   7M

(OR)

2. (a) Describe the various stages in the development of rapid prototyping systems.   7M
   (b) List the limitations of Rapid Prototyping in product design and development.   7M

UNIT – II

3. (a) Describe the working principle of SLA process with a neat diagram.   7M
   (b) Write the applications Stereo Lithography process.   7M

(OR)

4. (a) Explain stereo lithography process with a neat sketch.   7M
   (b) What are the merits and demerits of Stereo Lithography process.   7M

UNIT – III

5. (a) Describe the process of fused deposition modeling.   7M
   (b) List the factors that affect the part quality in fused deposition modeling process.   7M

(OR)

6. (a) Explain in detail the Solid ground Curing process with a neat diagram.   7M
   (b) Write the applications and advantages of Solid ground curing.   7M

UNIT – IV

7. (a) Discuss the specifications of different LOM machines used.   7M
   (b) Write a short note on the following   7M
       i) Thermal jet printer ii) Genisys Xs printer

(OR)

8. (a) Compare LOM with SLS with suitable reasons.   7M
   (b) What are the merits and demerits of Laminated Object Manufacturing?   7M

UNIT-V

9. (a) Compare 'Direct' and 'Indirect' Rapid tooling with classic examples.   7M
   (b) Explain how Magics and Mimics softwares help to build a product in Rapid Prototyping process 7M

(OR)

10. (a) Discuss the process of making a rapid tooling for spray metal deposition.   7M
    (b) Explain about STL file problems in detail with examples.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Production and Operations Management (ME)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1.   Define Production? Explain various components of production system.   14M

(OR)

2. (a) Explain different types of production systems.   7M
   (b) Explain Just in time production system.   7M

UNIT – II

3. (a) Explain forecasting procedure   7M
   (b) A city Jail administrator has been using a 12-month moving average to forecast jail cell demand but wishes to convert to a simple exponential smoothing model. The current month's forecast is for 450 inmates.   7M
   (i) If the actual demand is 410, what should be the forecast demand for next month?
   (ii) If the actual demand for the next month is 520 , what should be the following month's forecast.

(OR)

4. (a) Explain briefly aggregate planning methods.   7M
   (b) Explain master production schedule.   7M

UNIT – III

5.   Explain factors affecting plant location.   14M

(OR)

6.   A proposal has been submitted to replace a group of assembly workers, each working individually, with an assembly line. The following table gives individual worker elements.   14M

Element	1	2	3	4	5	6	7	8
T_e (Min.)	1.0	0.5	0.8	0.3	1.2	0.2	0.5	1.5
Immediate Predecessors	--	--	1,2	2	3	3,4	4	5,6,7

The demand rate for this is 1600 units / week (assume 40 hours/week) and the current number of operators required to meet this demand is eight using the individual manual workers.
    (i) Draw the precedence diagram
    (ii) Assign workers to stations and compute Balance delay.

UNIT – IV

7. (a) Explain various costs of inventory.   7M
   (b) Perform ABC analysis for the following items   .   7M

Item	A	B	C	D	E	F	G	H	I	J
Annual Consumption	30,000	2800	300	1100	400	2200	1500	8000	3000	800
Unit Cost (Rs.)	0.01	1.50	0.10	0.05	0.05	1.00	0.05	0.05	0.30	0.10

(OR)

8.   Given the following information for a project.   14M
      i) Draw the Network
      ii)Find critical path.
      iii) Find Total float and Free float.

Operation	Predecessor	Days
A	-	20
B	A	14
C	B	10
D	B	5
E	B	15
F	C,D,E	6

UNIT-V

9.   (a) Explain factors affecting scheduling   4M
      (b) There are nine jobs, each of which must be processed on two machines A and B   in the order B   10M
           A. Processing times in hours are given in the table below :

Jobs									
	1	2	3	4	5	6	7	8	9
M/C A	4	7	6	11	8	10	9	7	6
M/C B	8	10	9	6	5	11	5	10	13

      Find Total elapsed time and idle time of the machines.

                                    (OR)

10.   (a) Explain inputs and outputs of MRP with diagram.   4M
      (b) The time required to process four jobs received in order (A,B,C,D) are shown in the following   10M
           table. Determine the processing sequence and average job lateness that would result from
           using the priority rules (a) FCFS (b) SPT and (c) EDD.

Job	Job time(days)	Due date(days)
A	8	6
B	11	18
C	4	24
D	12	14

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Instrumentation & Control Systems (ME)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) What are the various errors occur in the measuring instruments and explain the methods of elimination? — 7M
   (b) Draw the generalized scheme of typical measurement system and explain its components. — 7M

(OR)

2. (a) Define the terms linearity, reproducibility, repeatability and calibration. — 7M
   (b) State and explain dynamic characteristics of an instrument. — 7M

UNIT – II

3. (a) What are Transducers and how are they classified? Explain their importance in an instrumentation process. — 7M
   (b) Explain the working of Mcleod pressure gauge with a neat sketch — 7M

(OR)

4. (a) What are the different laws involved in thermocouples? Explain the working principle of thermocouple in measurement of temperature. — 7M
   (b) Explain the construction and characteristics of thermistor. — 7M

UNIT – III

5. What is relation between the rotational speed and the flashing rate of stroboscope directed onto a signal radial mark on the rotating wheel. — 14M

(OR)

6. (a) Describe the constructional details of Laser Doppler Anemometer — 7M
   (b) In what way cryogenic fuel level indicators works explain with neat sketch. — 7M

UNIT – IV

7. (a) What are the various types of Strain measurements? Derive an expression for gauge factor. — 6M
   (b) Explain the use of stain gauge for torque measurement. — 8M

(OR)

8. (a) Write a note on semiconductor strain gauge. — 7M
   (b) List the characteristics required for backing material of a bonded strain gauge. — 7M

UNIT-V

9. (a) Distinguish between open-loop and closed loop control system. — 7M
   (b) Sketch and explain the construction and working of a dew point meter. — 7M

(OR)

10. (a) With a neat sketch explain the position control system. — 7M
    (b) Explain the method of measuring force using a pneumatic load cell. — 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Finite Element Methods (ME)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. Explain the steps of FEM with the help of an example   14M

(OR)

2. (a) What is meant by discretization of a structure?   4M
    (b) Explain the process of discretization of a structure in finite element method in detail, with   10M
         suitable illustration.

UNIT – II

3. What is interpolation model? What are types of interpolation model? Explain briefly.   14M

(OR)

4. Using two finite elements, find the stress distribution in uniform tapering bar as shown in figure   14M
    $3cm^2$, $2cm^2$ at their ends, length 100mm, subjected to an axial load of 50N at smaller end and fixed
    at larger end. Take $E = 2 \times 10^5$ N/mm^2
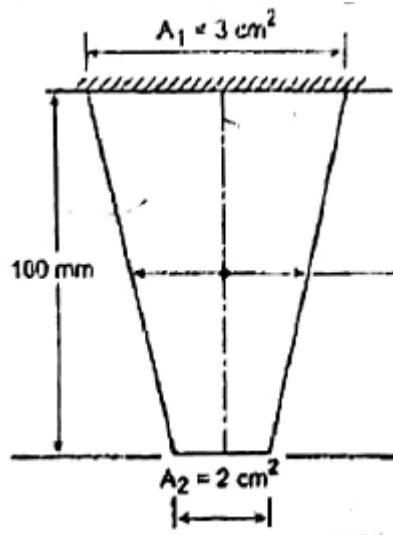
UNIT – III

5. Consider the three bar truss as shown in figure. It is given that $E = 2 \times 105$ MPa, Determine the   14M
    nodal displacement and stress in each member. Find the support reaction also
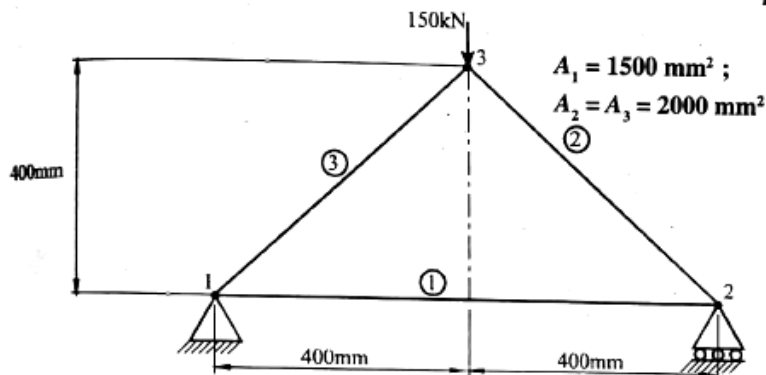
(OR)

6. Determine the maximum deflection in the uniform cross section of cantilever beam shown in figure 14M by assuming the beam as single element. Take $E = 7 \times 10^9$ N/m^2 and $I = 4 \times 10^{-4}$ m^4
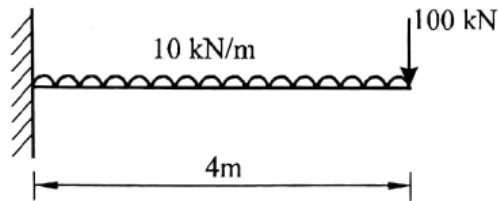

UNIT – IV

7. Derive the expression for strain displacement matrix for a constant strain triangular element. Also derive the stiffness matrix. 14M

(OR)

8. a) Explain about Isoparametric and Subparametric elements 4M
   b) Consider a quadrilateral element as shown in fig the local coordinates are $\xi = 0.5$, $\eta = 0.5$. 10M
      Evaluate Jacobian matrix and strain- Displacement matrix
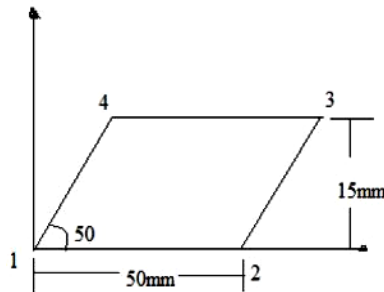
UNIT-V

9. Derive the one dimensional formulation of fin (Heat Transfer thin fins) 14M

(OR)

10. Determine the temperature distribution through the composite wall subjected to convection heat loss 14M on the right side surface with convective heat transfer coefficient as shown in figure. The ambient temperature is -5^0 C and Assume Area of wall to be 1 m^2.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Metrology (ME)

Time: 3 Hours   Max. Marks: 70

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

UNIT - I

1. Draw the conventional diagram of limits &fits and explain any five terms   14M
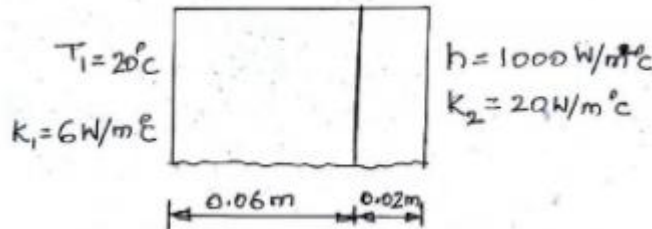
(OR)

2. (a) Briefly explain about Interchangeable assembly and Selective assembly   8M
    (b) A 50mm diameter shaft is made to rotate in the bush. The tolerances for both shaft and bush   6M
        are 0.05mm. Determine the dimension of the shaft and the bush to give a maximum clearance
        of 0.075mm with the hole basis system

UNIT – II

3. (a) Briefly explain about line standards and end standards   8M
    (b) An angle of 102^0 -8$^{'}$-42$^{"}$ is to be measured with the help of following standard 13 pieces set of   6M
        angle gauges and a square block. Sketch the combination

(OR)

4. (a) Explain Taylors principle of gauge design with a neat sketch   8M
    (b) How the gauges are classified? Briefly explain about any two types of gauges   6M

UNIT – III

5. (a) Explain optical profile projector with a neat sketch?   7M
    (b) List out the types of Interferometers and briefly explain about Michelson Interferometer   7M

(OR)

6. (a) Briefly explain about Tomlinson Surface meter with a neat sketch   7M
    (b) With a neat sketch explain the working principle of a Auto collimator   7M

UNIT – IV

7. (a) List out the various methods of measuring effective diameter? Briefly explain about Thread   7M
        micrometer with a neat sketch
    (b) With the help of a line diagram discuss screw thread terminology   7M

(OR)

8. (a) Describe how you would perform alignment tests on milling machine at any seven positions   14M
        with a line diagram

UNIT-V

9. (a) What are the various types of CMM. Write the advantages and possible sources of errors in   8M
        CMM
    (b) With a neat sketch explain the working principle of Parkinson gear Tester   6M

(OR)

10. (a) What is a comparator. Classify the various comparators and also list out uses of comparators   7M
    (b) Describe in brief the construction and working of a sigma comparator with a neat sketch   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: CAD/CAM (ME)

Time: 3 Hours   **Max. Marks: 70**

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

UNIT – I

1.	What do you understand by the CPU? Describe the functioning of a central processing unit with the aid of a block diagram.	14M

(OR)

2.	(a)	What are the input devices commonly used for general graphics applications?	7M
	(b)	List out the various types of storage devices used in computers?	7M

UNIT – II

3.	(a)	What does Clipping mean and give the details of polygon clipping with an example?	7M
	(b)	The two endpoints of a line segment have coordinates (1,1) and (2,4) if it is scaled 3 units its present size, write the transformation matrix and the coordinates of the new endpoints.	7M

(OR)

4.	What is meant by Transformation and Explain 3-D Transformations with suitable examples?	14M

UNIT – III

5.	What is a surface representation and Explain Bezier the surface with a neat sketch and state its advantages?	14M

(OR)

6.	(a)	Discuss wire frame modeling with neat sketch?	7M
	(b)	Explain CSG with suitable Example?	7M

UNIT – IV

7.	Why is Group Technology more important in the manufacturing scenario and what are the various methods available for forming groups in GT?	14M

(OR)

8.	(a)	Explain MICLASS coding system in GT.	7M
	(b)	Define FMS and Explain types Flexibilities in FMS?	7M

UNIT-V

9.	What is computer aided process planning and Explain Generative type of computer aided process planning with the help of block diagram?	14M

(OR)

10.	(a)	What is Barcode and how it works?	7M
	(b)	Discuss Inputs and outputs of MRP?	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Internet of Things (CSE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) Define IoT and explain the Physical design of IoT and its protocols with help of block diagram? **7M**

   (b) With an example, explain about the IoT service that uses Publish-Subscribe communication model? **7M**

(OR)

2. (a) List out the various Enabled IoT Technologies? Explain any two in detail? **8M**

   (b) What are the architectural constraints of REST communication model? Explain? **6M**

UNIT – II

3. Describe the IoT-levels for designing home automation IoT systems including **14M**

   a) Smart lighting.   b) Intrusion detection.

(OR)

4. Determine the various communication models that can be used for weather monitoring system. Which is appropriate for this model. Describe the pros and cons of it? **14M**

UNIT – III

5. (a) List and explain the differences between Machines in M2M and Things in IoT? **4M**

   (b) With a neat sketch, explain the architecture of Software Defined Networking (SDN)? **10M**

(OR)

6. With a neat diagram, demonstrate the case study on IoT System for weather Monitoring System using the IoT design methodology? **14M**

UNIT – IV

7. Explain the various Control Flow Statements in Python and write the difference between a Python module and Package? **14M**

(OR)

8. (a) Describe the differences between procedure-oriented programming and object-oriented programming? **7M**

   (b) With an example, explain a use case of Python Dictionary? **7M**

UNIT-V

9. (a) Describe the use of SPI and I2C interfaces on Raspberry Pi? **4M**

   (b) Explain in detail about Exemplary Device: Raspberry Pi? **10M**

(OR)

10. (a) Write a Python Script for simple LED blink using Raspberry Pi? **7M**

    (b) Define an IoT device and explain its building blocks with neat block diagram? **7M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Computer Graphics (CSE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1.	Differentiate Raster Scan systems and Random Scan systems	14M

(OR)

2.	List out various video display devices	14M

UNIT – II

3.	Explain Cohen – Sutherland line clipping algorithm	14M

(OR)

4.	Explain about scan converting circles?	14M

UNIT – III

5.	(a)	Write about 3D transformations	7M
	(b)	Explain the process of converting Window to view-port transformation	7M

(OR)

6.	Explain about Quadratic surfaces	14M

UNIT – IV

7.	Explain about Chromatic color	14M

(OR)

8.	Explain about Achromatic light	14M

UNIT-V

9.	(a)	What is Atmospheric attenuation	7M
	(b)	Explain basic rules of animation	7M

(OR)

10.	Explain Conventional and Computer–Assisted animation	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Software Testing (CSE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1.	(a)	What is the Purpose of Testing? Explain in Detail	7M
	(b)	Explain the Taxonomy of Bugs	7M

(OR)

2.	(a)	Explain the applications of path testing?	7M
	(b)	Explain the consequences of bugs in detail?	7M

UNIT – II

3.	(a)	Explain the path products and path expressions in detail?	7M
	(b)	How regular expressions are explained in flow anomaly detection?	7M

(OR)

4.	(a)	What are the strategies used in the dataflow testing?	7M
	(b)	What are the applications of dataflow testing?	7M

UNIT – III

5.	Explain in detail about the Decision Tables?	14M

(OR)

6.	Explain in detail about the Domains and Interface Testing's?	14M

UNIT – IV

7.	What are the Transaction flow testing Techniques? Explain.	14M

(OR)

8.	What are the Good and Bad State Graphs?	14M

UNIT-V

9.	Explain in detail about the Node reduction algorithm?	14M

(OR)

10.	Explain the power of a matrix in detail?	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Artificial Intelligence (CSE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) What are our underlying assumptions about intelligence?   7M
   (b) What kinds of techniques will be useful for solving AI problems   7M

(OR)

2. (a) At what level of detail, if at all are we trying to model human intelligence?   7M
   (b) How will we know when we have succeeded in building an intelligent program?   7M

UNIT – II

3. (a) What are the fundamental issues in knowledge representations?   7M
   (b) How to represent simple facts in logic?   7M

(OR)

4. (a) If a problem-solving search program were to be written to solve each of the following types   10M
       of problems, determine whether the search should proceed forward or backard:
       (i) Water jug problem
       (ii) Blocks world
   (b) What is a Conflict resolution?   4M

UNIT – III

5. (a) Compare and contrast the procedural and declarative knowledge?   7M
   (b) What is nonmonotonic reasoning? What is the logic for nonmonotonic reasoning?   7M

(OR)

6. (a) Describe JTMS labeling process. Write a formal description of that algorithm?   7M
   (b) Explain the bayes theorem?   7M

UNIT – IV

7. (a) Explain semantic nets?   7M
   (b) Define frames? How to use frames as Sets and Instances?   7M

(OR)

8. (a) Write an algorithm for inheritance and explain with an example?   7M
   (b) Give five examples of facts that are difficult to represent and manipulate in predicate logic   7M

UNIT-V

9. (a) How grammars and parsers works in Natural language processing   7M
   (b) Explain the semantic grammers   7M

(OR)

10. (a) Explain how you would use the corpus as a database for spell checking?   7M
    (b) Explain Minimax search procedure?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Cloud Computing (CSE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1. (a) List and explain the essential characteristics of cloud computing.   7M
    (b) Compare and contrast the grid computing with electric power grid   7M

(OR)

2. (a) Explain the cloud application, benefits and drawbacks.   7M
    (b) Describe the various applications of high performance and high throughput systems.   7M

UNIT – II

3. (a) With the help of neat diagram, explain the Cloud architecture.   7M
    (b) Elaborate the Anatomy of the Cloud.   7M

(OR)

4. (a) List and explain the features of cloud computing.   7M
    (b) Discuss the Managing the Cloud Infrastructure.   7M

UNIT – III

5. (a) List and explain the advantages and disadvantages of the private cloud.   7M
    (b) Illustrate the Popular SaaS Providers.   7M

(OR)

6. (a) Explain the characteristics of hybrid cloud.   7M
    (b) Discuss the Other Cloud Service Models.   7M

UNIT – IV

7. (a) Difference between the Cloud Haskell and Erlang.   7M
    (b) List out important features that SaaS developers should incorporate while developing SaaS   7M
         applications.

(OR)

8. (a) Which programming language is highly fault tolerant and for which type of application was it   7M
         originally designed? Explain in detail.
    (b) Briefly explain the requirements analysis for SaaS application.   7M

UNIT-V

9. (a) With the help of neat diagram, explain the IBM Smart Cloud.   7M
    (b) Write a short note on classification of data centers.   7M

(OR)

10. (a) Explain the Amazon Web Services in detail.   7M
    (b) List and explain the Networking Issues in Data Centers.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular & Supple. Examinations of February/March - 2021
SUB: Big Data Technologies (CSE)

Time: 3 Hours   Max. Marks: 70

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

UNIT – I

1.	(a)	Define Big Data. Explain 4 V's of Big data.	8M
	(b)	Discuss in detailed about history of Hadoop.	6M

(OR)

2.	(a)	Compared Hadoop with RDBMS.	6M
	(b)	Define Apache Hadoop. Describe the Hadoop Ecosystem.	8M

UNIT – II

3.	(a)	Explain the design of Hadoop.	7M
	(b)	Explain Replica placement in Hadoop.	7M

(OR)

4.	(a)	Explain why is a block in HDFS so large?	7M
	(b)	Discuss about Parallel copying with distcp with examples.	7M

UNIT – III

5.	(a)	Explain about analyzing data with Hadoop.	7M
	(b)	Explain data flow in Mapreduce task with single reduce and multiple reduce tasks.	7M

(OR)

6.	(a)	Write a unit test with for MapReduce program.	7M
	(b)	How to run distributed MapReduce job? Explain.	7M

UNIT – IV

7.	(a)	How Hadoop runs a MapReduce job using the classic framework.	8M
	(b)	Explain about task execution environment	6M

(OR)

8.	(a)	Explain shuffle and sort on mapper and reducer side.	10M
	(b)	Explain speculative execution.	4M

UNIT-V

9.	(a)	Explain about the Hive architecture.	7M
	(b)	What are the differences between HiveQL and SQL?	7M

(OR)

10.	(a)	List the data types in hive. Explain with examples.	7M
	(b)	Explain partitions and buckets in Hive.	7M