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

B.Tech. VII Sem (R15) Supple Examinations of October 2020
SUB: CONSTRUCTION PLANNING & 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. (a) Explain about Resource Analysis and Resource Allocation   (7M)
    (b) Write about the new techniques in construction management   (7M)

(OR)

2. (a) Write the objectives and Functions of Construction Management   (7M)
    (b) Explain about Significance of Construction Management   (7M)

UNIT – II

3. (a)   What is a milestone chart? How does it differ from a bar chart? How can a mile   (7M)
         stone chart be developed into a network?
    (b) What do you understand by 'earliest start time' and 'latest start time of an activity'?   (7M)
         How are these determined?

(OR)

4. The network of a certain project is shown in Figure.1 with the estimated durations of   (14M)
    various
    activities. Determine the following: i) Earliest event time and latest event time
    ii) Earliest and latest start and finish times of each activity.
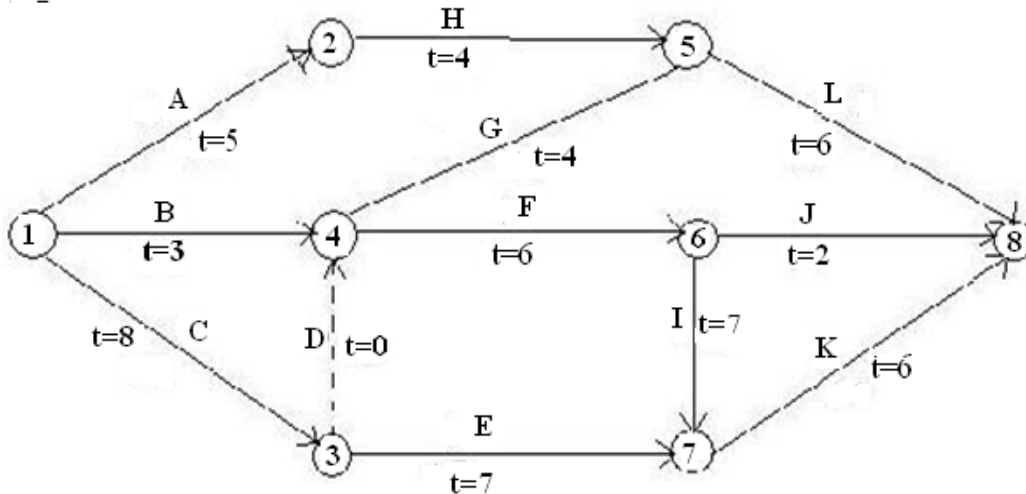   iii) Total and free floats for each activity. iv) Critical path for the network

Figure 1

UNIT – III

5. (a) Write short notes on: tractors, motors and graders.   (7M)
    (b) Write short notes on (i) Screening equipment (ii) Crushers (iii) Handling equipment   (7M)

(OR)

6. (a) What are the factors influencing selection of equipment   (7M)
    (b) Explain about Earth movers and equipment used for erection of structures   (7M)

UNIT – IV

7. (a) Explain about Ethical Audit (7M)
   (b) Write about the Stages of Inspection (7M)

(OR)

8. (a) Write on Quality Control Principles (7M)
   (b) Write on Variety of Interest in quality control (7M)

UNIT-V

9. (a) Discuss importance of safety in construction sites (7M)
   (b) State and describe various causes of accidents at the construction site (7M)

(OR)

10. (a) Discuss in detail the common risks possible at the fabrication stage. (7M)
    (b) What do you understand by Quality Control in Construction industry? How it (7M)

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

B.Tech. VII Sem (R15) Supple Examinations of October 2020

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) Briefly describe about design of anchored bulkhead by free earth method? (7M)
   (b) Write about the cantilever sheet piling in Cohesive soils (7M)

(OR)

2. (a) An anchored bulk head 5 m high retains sand on both sides. The anchor rods are 1m below the top and depth of embedment is 2 m. Determine the factor of safety against failure. Angle of internal friction of sand is 30º and the sand is submerged throughout with a unit weight of 10 kN /m³. Comment if the depth of embedment which render the design adequate (7M)
   (b) Write a short note on Rowe's Moment Reduction Curves? (7M)

UNIT – II

3. (a) Sketch a typical section of a braced cut and show the various components. (7M)
   (b) Draw different types of apparent pressure diagrams used in the design of braced cuts. What are the factors that affect the pressure distribution? (7M)

(OR)

4. (a) Explain how stability of coffer dam on rock is analyzed (7M)
   (b) List out different types of coffer dams. Also, Mention their advantages and disadvantages (7M)

UNIT – III

5. (a) Sketch the different shapes of well foundation and also explain their advantages. (7M)
   (b) Explain the design criteria for the stability of the wells. (7M)

(OR)

6. (a) What are the components of well foundations and their uses? (7M)
   (b) What are the measures to be taken for rectification of tilts and shifts of well foundations? (7M)

UNIT – IV

7. (a) Explain any two methods used for treatment of collapsible soils. (7M)
   (b) What are the methods adopted such that a structure is not affected by swelling of the soil? (7M)

(OR)

8. (a) Define swelling pressure. What is the effect of swelling on buildings? (7M)
   (b) Explain the design consideration for the design of foundation in Expansive soils. (7M)

UNIT-V

9. (a) Is soil stabilization required for all the type of soils? Justify your answer with proper reasoning. (7M)
   (b) Explain the step wise procedure followed in Thermal and Electrical stabilization of problematic soils? (7M)

(OR)

10. (a) Differentiate between woven and non-woven geotextiles? Also, Explain the functions and advantages of Geotextiles. (7M)
    (b) Explain the various components of reinforced earth with a neat sketch. (7M)

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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) How are spillways classified? Describe the different types of spillways. (7M)
   (b) Compute the discharge over an ogee weir with Coefficient of discharge equal to 2.4 at (7M) ahead of 2 m. the length of the spillway is 100 m. The weir crest is 8 m. above the bottom of the approach channel having the same width as that of the spillway.

(OR)

2. (a) Describe the following type of spillway gates with near sketches. (i)Flash boards (ii) Stop logs (7M) and needles and (iii) Radial gates.
   (b) What are 'Jump height curve' and 'Tail water rating curve'? What are the conditions that (7M) govern the relationship between the two?

UNIT – II

3. (a) What is a fall in a canal? Why is it necessary to provide a fall in a canal? What are the (7M) various considerations according to which its location is decided?
   (b) What is a cistern element in a fall? Describe briefly the various types of cistern elements. (7M)

(OR)

4. Design a Sarda type fall for the following data : (14M)

   (i)Full supply discharge: $\frac{u/s}{d/s} = 45$ m^3/s(ii)Full supply level $: \frac{u/s}{d/s} = \frac{118.30\ m}{116.80\ m}$

   (iii)Full supply depth: $\frac{u/s}{d/s} = \frac{1.8m}{1.8\ m}$ (iv)Bed width: $\frac{u/s}{d/s} = \frac{28\ m}{28m}$

   (v)Bed level: $\frac{u/s}{d/s} = \frac{116.50\ m}{115.00\ m}$ (vi)Drop: 1.5m

   Design the floor on the basis of Bligh's theory taking Coefficient of creep = 8.

UNIT – III

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

(OR)

6. (a) Define a canal outlet. Explain different types of outlets. (7M)
   (b) Define sensitivity of an outlet. Find the relation between sensitivity and flexibility of an (7M) outlet.

UNIT – IV

7. Describe with neat sketches the various types of cross drainage works. (14M)

(OR)

8. (a) Discuss the various factors affecting the suitability of aqueduct and syphon aqueduct. (7M)
   (b) Explain the method of fixing the waterway of drain in an aqueduct. (7M)

UNIT-V

9. (a) What is water resources planning? What are the purposes served by water resources (7M) development projects?
   (b) Explain the classification of water resources development projects. (7M)

(OR)

10. (a) What are the functional requirements in multipurpose projects? Explain. (7M)
    (b) Explain the process of project formulation. (7M)

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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) Describe the functions and requirements of ballast in a railway track
    (b)   What is creep? Discuss the theories propounded to explain probable causes of creep.

(OR)

2. (a) What are the functions and requirements of sleepers in a railway track?
    (b) Explain the functions and requirements of fish plates and bolts in a railway track

UNIT – II

3. (a) What is the necessity of geometric design of a railway track? Enumerate the significant features of design of a railway track.
    (b) Describe the factors that influence the selection of site for a railway station.

(OR)

4. (a) How the railway stations are classified?
    (b) Discuss about the drainage in tunnels.

UNIT – III

5. (a) Explain various factors affecting the selection of a suitable site for an airport.
    (b) Discuss about taxiway lighting.

(OR)

6. (a) What is runway orientation? Explain.
    (b) Discuss about taxiway lighting.

UNIT – IV

7. (a) What are docks? Differentiate between dry dock and wet dock.
    (b) Discuss about size of harbours.

(OR)

8. (a) Differentiate between natural harbours and artificial harbours.
    (b) Briefly discuss about shape of docks and basins.

UNIT-V

9. (a) Explain briefly different types of dredgers.
    (b) Explain about protection of timber piles.

(OR)

10. (a) Explain the necessity of dredging.
     (b) Explain about bucket and cutter dredgers.

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

B.Tech. VII Semester (R15) Supple Examinations of October 2020
SUB: DESIGN & 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) What are the assumptions made in the plastic analysis   7M

   (b) Two plates of 16mm and 14mm thick are to be joined by a groove weld .The joint is   7M
   subjected to a factored tensile force of 430kN.Due to some reasons the effective length
   of weld that could be provided was 175mm only check the safety of joint if single v-
   groove weld and double v-groove weld is provided.

(OR)

2.   An ISLC 300 @ 324.7 N/m (Fe-410 grade steel) is to carry a factored tensile force of   14M
   900 kN. The channel section to be welded at the site to a gusset plate of 12 mm thick.
   Design a fillet weld if the overlap of the channel is limited to 350 mm

UNIT – II

3.   A tie member of a truss consists of double angle sections, each of ISA 80x80x8 mm welded   14M
   on the opposite side of a 12 mm thick gusset plate as shown in the figure. Design a fillet
   weld for making the connection in the workshop? Given the factored tensile force in the
   member is 300 kN.

(OR)

4.   Design the built-up column 9m long to carry a factored axial compressive load of 1100 kN.   14M
   The column is restrained in position but not in direction at both the ends. Design the column
   with connecting system as battens with welded connections. Use two channel sections back-
   to-back. Use steel of grade Fe-410.

UNIT – III

5.   Design a laterally supported beam section for supporting roof of a big hall for the   14M
   following data Fe410 steel, clear span=6.5m
   C/C spacing of beams =3m, Imposed load on the beam =10kN/m2
   Dead load=4kN/m2.Restriction on beam depth=375mm.

(OR)

6.   A simply supported steel joist of 4m effective span is laterally supported throughout   14M
   the length it carries a total UDL of 40kN including self-weight. Design an appropriate
   section using steel of grade Fe410.

UNIT – IV

7.   Design a stiffened seat connection for an ISMB350@514N/m transmitting an end reaction of   14M
   320kN (due to factored loads) to a column section ISHB300@576.8N/m. The steel is of grade
   Fe410

(OR)

8. A bracket plate is welded to the flange of a column section ISHB300@618N/m as shown in the figure. Calculate the size of a weld required to support a factored load of 110kN. Assume shop welding is done   14M
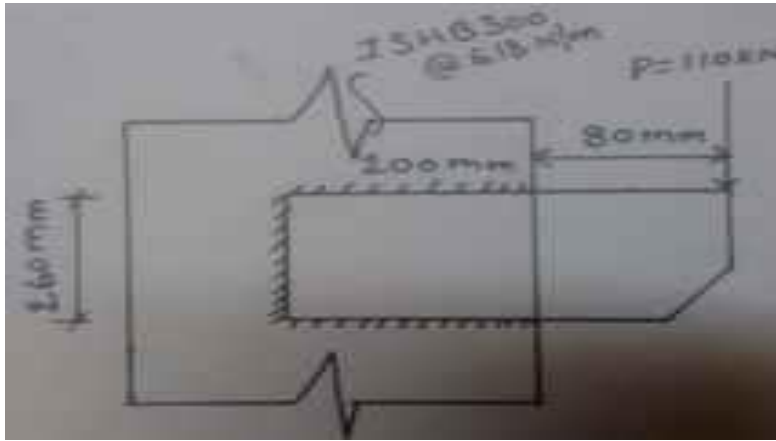
UNIT-V

9. A column consisting of ISHB350@661.2N/m carries a axial factored compressive load of 1700kN.Design a suitable gusset base. The base plate rest on M15 grade concrete pedestal   14M

(OR)

10. Design the base plate for an ISHB300@618N/m column to carry a factored load of 1000kN.Assume Fe410 grade steel and M25 grade concrete   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of October 2020
SUB: Design & 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 is $3kN/m^2$ and finishing load is $1 kN/m^2$. Assume width of beams as 230 mm. Use M 20 concrete and Fe 415 steel.   14M

(OR)

2. A T-beam slab floor of an office comprises of a slab of 150mm thick spanning between ribs spaced at 3 m c/c. the effective span of the beam is 8m. The service live load on the floor is 4 kN/sq.m. Using M20 grade concrete and Fe 415 HYSD bars,   design one of the intermediate T-beam and sketch the details of reinforcement.   14M

UNIT – II

3. Determine the reinforcement required for a column with the given data and which is restrained against sway. Size of the column=500mmx400mm, effective lengths l_{ex}=7.0m, l_{ey}=6.0 m and unsupported length of the column =7.0m. Use M30 concrete and Fe 415 steel. It is subjected to a factored load of 1600 kN. Factored moment is 40 kNm at top, 25kNm at bottom, in the direction of larger dimension. Factored moment is 30 kNm at top, 20kNm at bottom, in the direction of shorter dimension. The column is bend in double curvature with reinforcement equally distributed on all the four sides.   14M

(OR)

4. Determine the maximum factored load carrying capacity of a square column 500mmX500mm reinforced with 12 bars of 25mm 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 6.5m and effective length factor of 1 about the both axes. Assume M25 mix and Fe415 Steel.   14M

UNIT – III

5. Design an isolated square footing for a column 300mm x 300mm, transmitting an axial load of 600 kN. The S.B.C. of the soil is $180 kN/m^2$. Use M 20 concrete and Fe 415 grade steel. Show the detailing of reinforcement with a sketch.   14M

(OR)

6. Design a combined footing for two columns 500 mm x 500 mm each, 5 m apart carrying a load of 1600 kN. Available width restriction is 2.4 m. The safe bearing capacity of the soil is 200 kN/m^2. Use M 25 concrete and Fe 415 grade steel.   14M

UNIT – IV

7. Design a T-shaped cantilever retaining wall to retain earth embankment 3.2m high above the ground level. The unit weight of earth is 19 kN/m^3 and its angle of repose is 30º, the embankment is horizontal at its top. The safe bearing capacity of a soil may be taken as $150kN/m^2$ and the coefficient of friction between soil and concrete as 0.45. Use M20 grade of concrete and Fe415 Grade Steel.   14M

(OR)

8. Design a cantilever retaining wall for retaining an earthfill of 4.5 m height above the ground. The safe bearing capacity of the soil is $130 kN/m^2$.The earthen backfill is having a density of 18 kN/m^3 and an angle of internal friction as 30º. The coefficient of friction between soil and concrete is assumed to be 0.45. Use M20 concrete and   Fe 415 steel.   14M

UNIT-V

9. Design a circular water tank with fixed base, resting on the ground, for a capacity of 500 kl. The depth of water tank is 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 $150 kN/m^2$ 14M

(OR)

10. Design a rectangular water tank of size 6m x 5m x 4m, resting on the ground. Bearing capacity of soil may be taken as $150 kN/m^2$. Use M25 concrete and Fe 415 steel.   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of OCTOBER 2020
SUB: STRUCTURAL ANALYSIS – II (CE)

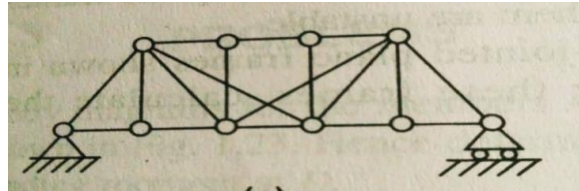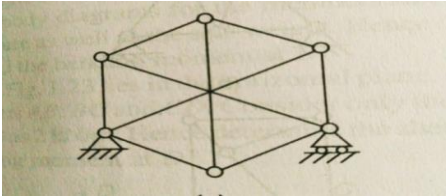Time : 3 Hours   Max. Marks: 70

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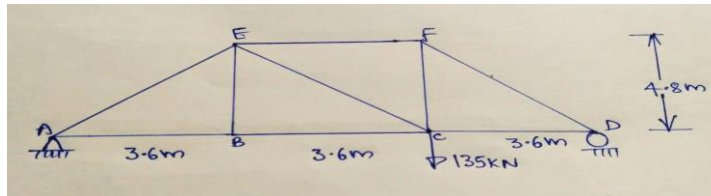**All questions carry Equal Marks.**

UNIT - I

1. Determine the static and kinematic indeterminacies of the 2 pin jointed trusses as shown in fig 1a & 1b   14M

(OR)

2. A pin jointed framed structure is loaded as shown in fig below. Calculate the forces in all members. Take $E=200x10^6 KN/m^2$. $E=200x10^6 KN/m^2$, $AE=FD=250mm^2$, $EC=EF=1875mm^2$, $AB=BC=CD=EB=FC=1250$ mm^2 14M

UNIT – II

3. A symmetrical three hinged circular arch has a span of 16m and a rise to the central hinge of 4m. It carries a vertical load of 16KN at 4m from the left end. Find the vertical reaction at the supports, the magnitude of the horizontal thrust at the springing, bending moment at 6m from the left hand hinge, the maximum positive and negative bending moment.   14M

(OR)

4. A two hinged parabolic arch of span 30m, rise 2.5m is subjected to an uniformly distributed load of 30KN/m over the left half span and a point load of 135KN at center of arch / crown. Find the support reactions, BM, radial shear and normal thrust.   14M

UNIT – III

5. A uniformly distributed load of intensity 40KN/m of length 10m rolls along length of beam of span 100m. Determine maximum negative SF, maximum positive SF and max BM at section 20m from the left support   14M

(OR)

6. Two point loads 50KN and 70KN spaced 4m apart with 70KN load passing over a simply supported beam of span 16m from left to right. Determine the maximum B.M and SF at a section 4m from left support. Also determine absolute maximum BM and SF.   14M

UNIT – IV

7. An uniformly distributed load of intensity 40KN/m longer than span over a girder of 30m span using Influence line diagram calculate SF and BM. Determine maximum SF and BM at a section 12m from left hand support. Also determine the absolute maximum SF and absolute max BM   14M

(OR)

8. A pratt truss of 40m span has 8 panels of 5m each, the height of the truss is 5m. Draw influence line for bottom pratt member and diagonal of the 3rd panel from left. Calculate maximum forces in these (CN,ON,CD) members for uniformly distributed load of 100KN/m run longer than span.   14M
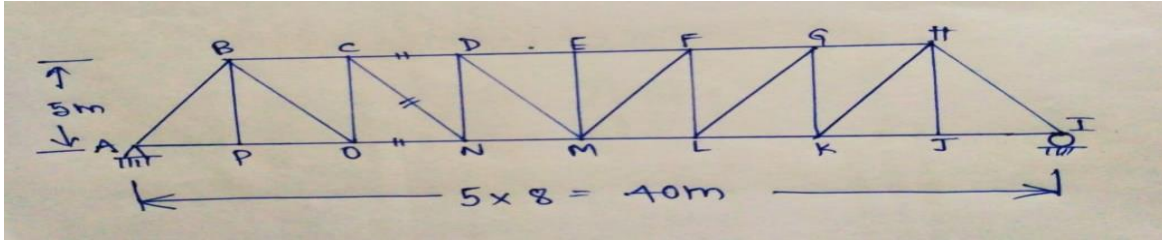
UNIT-V

9. Analyze the continuous beam shown in fig by using flexibility method. Also draw BMD & SFD. Assume EI is constant   14M
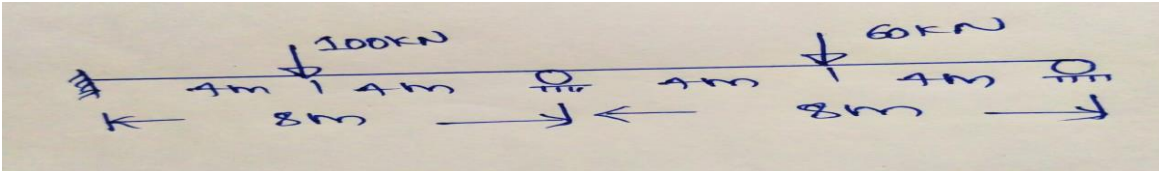
(OR)

10. Analyze the continuous beam shown in fig using stiffness method for condition   14M
    a.) That all supports are rigid
    b.) Support B sinks by 10mm
Take E=200x10^{6}KN/m^2, I=100x10^{-6} m^4. Also draw BMD & SFD
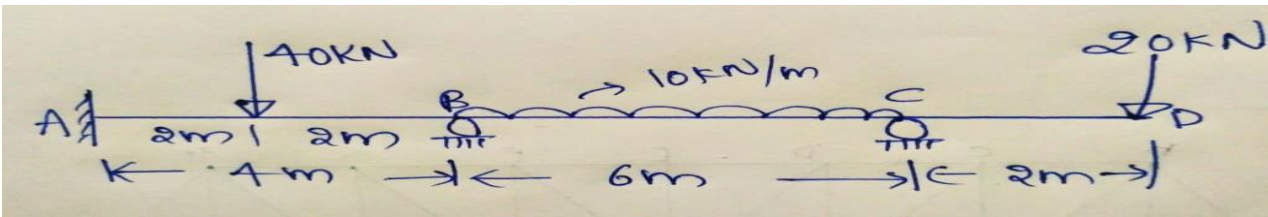
K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
SUB: POWER QUALITY (EEE)

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) What are the major power quality issues? Explain in detail   7M
   (b) Explain the evaluation procedure of power quality   7M

(OR)

2. Discuss about the computer Business Equipment Manufactures Associations   14M
   (CBEMA).Explain about the events described in the curve.

UNIT – II

3. (a) Illustrate the phenomena of impulsive and oscillatory transients   7M
   (b) Discuss how sag and swell affect the power quality   7M

(OR)

4. (a) Discuss briefly about the transient over voltages due to lightning.   7M
   (b) What are the different voltage sag mitigation techniques ?Explain in detail.   7M

UNIT – III

5. (a) What are the general causes of harmonics in power systems   7M
   (b) List the various effects on equipments due to harmonics. Explain briefly.   7M

(OR)

6. Explain for the following: 14M
   (i) Harmonic sources from commercial loads.
   (ii) Harmonic sources from industrial loads.
   (iii) Harmonic sources from residential loads.

UNIT – IV

7. (a) Discuss the need and importance of power quality bench marking   7M
   (b) What are the important objectives of power quality monitoring   7M

(OR)

8. Discuss briefly about   14M
   (i) Harmonic Analyzer
   (ii) Disturbance Analyzer
   (iii) Flicker meter

UNIT-V

9. Explain the following
   (i)Solid State breaker   14M
   (ii)Solid State Transfer Switch

(OR)

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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) What is meant by load modeling and give their characteristics?   6M

   (b) Prove that approximate formula for loss factor $F_{LS}=0.7F_{LD}^2+0.3F_{LD}$,   8M

   where F_{LD} = load factor.

(OR)

2. (a) With block diagram, explain a typical distribution system planning process.   7M

   (b) Explain the characteristics of residential, industrial and commercial loads.   7M

UNIT – II

3. (a) Make a comparison between underground and overhead distribution systems.   7M

   (b) Explain different types of primary feeders and give their merits and demerits.   7M

(OR)

4. (a) Give the various loading and voltage level factors that influence the design and   7M
       operation of primary feeders.

   (b) Explain the design aspects of secondary distribution systems.   7M

UNIT – III

5. (a) Draw layout of air insulated substation with the locations of all its equipment and   7M
       explain.

   (b) Enumerate various factors to be considered for ideal location of a substation.   7M

(OR)

6. (a) How do you analyze a substation service area with 'n' primary feeders?   7M

   (b) Discuss the features, advantages and disadvantages of main and transfer bus bar   7M
       arrangement and one and half breaker system arrangement.

UNIT – IV

7. (a) Discuss the need of power factor improvement in distribution system.   7M

   (b) Explain the role of shunt and series capacitors in power factor correction. Compare   7M
       their performance in power factor correction.

(OR)

8. (a) Derive the expression for voltage drop and power loss in 3-phase primary lines.   7M

   (b) Derive the equation for load power factor for which the voltage drop is maximum.   7M

UNIT-V

9. (a) What are the requirements for DA communication? State different communication   7M
       systems used in DA.

   (b) Explain the advantages of introducing distribution automation.   7M

(OR)

10. (a) What are the components of SCADA in distribution automation.   7M

    (b) Discuss about consumer information service and automatic meter reading.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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) Explain the importance of ground wire   7M
    (b) Explain the various causes of over voltage in power system   7M

(OR)

2. (a) Explain the working principle of lighting arrestor   7M
    (b) List the merits of resistance grounded system   7M

UNIT – II

3. (a) A 50Hz, 11kV, 3 phase alternator with earthed neutral has a reactance of 5 ohms per phase and   7M
        is connected to a bus bar through a circuit breaker. The distributed capacitance up to circuit
        breaker between phase and neutral is 0.01micro farad. Then find the peak re-striking voltage
        across the contacts of the circuit breaker, frequency of oscillations and the average rate of rise
        of re-striking voltage up to first peak?
    (b) Illustrate the current chopping? Explain how can the effect of current chopping be minimized?   7M

(OR)

4. (a) What are the ratings and specifications of a circuit breaker?   7M
    (b) Compare the performance and characteristics of different types of CB. List out their merits and   7M
        demerits

UNIT – III

5. (a) Explain the general working of a relay and derive the fundamental torque equation   7M
    (b) Discuss the construction details and principle of operation of induction type directional over   7M
        current relay

(OR)

6. (a) Describe the principle of percentage biased differential relay with necessary diagrams. Also   7M
        discuss its applications
    (b) Define static relay? What are the merits and demerits of static relays over electromagnetic relays 7M
        also mention its applications?

UNIT – IV

7. (a) With the help of neat sketches explain the protections of a star –delta power transformer, against the earth 7M
        fault condition
    (b) An 11 KV,100MVA generator is grounded through a resistance of 6 ohms. The C.T.s have a ratio   7M
        1000/5.The relay is set to operate when there is an out of balance current of 1 A. What percentage of the
        generator winding will be protected by the percentage differential scheme of protection?

(OR)

8. (a) Discuss biased differential protection for transformers.   7M
    (b) What is Buchholz relay? Discuss its working principle.   7M

UNIT-V

9. Explain over-current protection of feeders. How is the protection system graded with respect to the time of operation 14M
    of relays for a radial feeder?

(OR)

10. (a) Discuss the considerations which determine the need for a busbar protection   7M
    (b) Discuss the operation of differential protection of bus bars with diagram?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of October 2020
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) Discus the limitations of HVDC Transmission.   7M
   (b) Draw the schematic diagram of a typical HVDC converter station and explain the role of terminal equipment in the operation of HVDC link.   7M

(OR)

2. (a) Explain the power handling capabilities of HVDC lines.   6M
   (b) Detail the types of HVDC links used in HVDC transmission system. Bring out the significance of Back-to-Back connection.   8M

UNIT – II

3. (a) Explain the choice of converter configuration for any pulse number.   4M
   (b) Derive the expression for DC voltage of a six pulse bridge converter, considering gate control and source reactance.   10M

(OR)

4. (a) How does overlap angle effects the performance of a converter circuit? Explain.   7M
   (b) Obtain the equivalent circuit for rectifier operation of a Graetz circuit.   7M

UNIT – III

5. (a) What are various methods of converter controls? Explain with neat diagrams the working principle of CEA control.   8M
   (b) Explain the HVDC system control hierarchy with neat sketches.   6M

(OR)

6. (a) Give detailed explanation about starting and stopping of a DC link.   7M
   (b) List the various types of firing schemes in HVDC converter control. Explain with neat diagram and working principle of current and extinction angle control.   7M

UNIT – IV

7. (a) Elucidate the following   8M
     (i) Commutation failure in HVDC Systems and appropriate remedies
     (ii) over voltages due to disturbance on the DC Side of the converter and appropriate remedies
   (b) Comment on Electromechanical circuit breakers and Solid state circuit breakers.   6M

(OR)

8. (a) Explicate the protection against over voltages in a converter station.   8M
   (b) Explain the operation of a typical DC circuit breaker.   6M

UNIT-V

9. (a) Discuss reactive power requirements at steady state. List the various source of reactive power in HVDC system.   7M
   (b) List the various types of AC filters that can be used for harmonic reduction in HVDC system.   7M

(OR)

10. (a) Clearly explain why harmonics are produced in HVDC converter. Obtain the expression for RMS value of fundamental component of the current.   7M
    (b) What are the various types of AC and DC filters that can be used for harmonic reduction?   7M

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

B.Tech. VII Semester (R15) Supple Examinations of October 2020
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 methods   7M
   (b) The transfer function of a plant is given by   7M
       $G_P(S) = K/ S(S+5) (S+10)$
       Design a suitable compensator to meet the following specifications
           (i) $K_v = 10$
           (ii) Phase Margin $=45^0$

(OR)

2. (a) Briefly explain P and PI controllers.   7M
   (b) The forward transfer function of a unity feedback system is given by   7M
       $G_P(S)= K/ S(S+3)(S+6)$
       It is desired that the dominant poles of the closed – loop system transfer function have a   damping ratio of 0.5 and the magnitude of the real part of the pole be not less than 1. Also K_v must be at least 10. Design a suitable compensator

UNIT – II

3. (a) i) Define the state, state variables and state vector.   7M
       ii) Obtain the state representation for the system described by the differential equation
           $Y^{**}+ 3 Y^* +2y + U=0$. Assume zero initial conditions.

   (b) i) Derive the state model of a field controlled dc servo motor.   7M
       (ii) Obtain the state model of the system whose transfer function is given by
           $Y(s)/U(s) = 10 / S^3 + 4 S^2 +2S +1$

(OR)

4. (a) Given the system in the state variable X= AX+BU   7M

   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 controllable and observable. $X^{*}= AX+BU$ and $Y=CX$ 7M

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

UNIT – III

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

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

Find the state transition matrix of the system.

(OR)

6. (a) Explain briefly about the full order and reduced order state observers. 7M
   (b) Determine the time response of the following system represented as; 7M
   $X^* = AX+BU$ and $Y=CX$

   Where $A = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$; $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ and $C = [0 \quad 1]$; where U(t) is unit step input and initial

   condition $X(0) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$

UNIT – IV

7. (a) Explain the construction of phase trajectories by phase plane method. 7M
   (b) Derive the describing functions of relay and saturation non- linearity. 7M

(OR)

8. (a) Explain the different characteristics of a Non – linear systems? 7M
   (b) Explain the procedure for determining the stability of nonlinear system using describing 7M
   function analysis

UNIT-V

9. (a) State and explain the two theorems of Liapunov? 7M
   (b) Consider the second order system described by 7M
   $X^* = AX$, where $A = \begin{bmatrix} 0 & 1 \\ -1 & -1 \end{bmatrix}$
   Clearly, the equilibrium state is origin. Determine the stability of this state.

(OR)

10. (a) Explain the stability in the sense of liapunov stability of linear system. 7M
    (b) Explain the krasovskii's method. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of October 2020
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. Explain the evaluation of management thought?   14M
(OR)
2. What is theme of social responsibility? Discuss the different factors for increased   14M
social consciousness among businessmen?

UNIT – II
3. What is SWOT analysis and prepare SWOT analysis of any industry known to you.   14M
(OR)
4. Discuss different types of industrial plant layouts in detail.   14M

UNIT – III
5. Distinguish the human resource management and personnel management.   14M
(OR)
6. What is meant by inventory management? Examine different methods used to   14M
effective inventory control?

UNIT – IV
7. "Method study is to eliminate the unnecessary operations and to achieve the best   14M
method of performing the operation"-Elucidate.
(OR)
8. What is a statistical quality control and control chart?   14M

UNIT-V
9. A project schedule has the following characteristics as shown in Table   14M

Activity	Name	Time	Activity	Name	Time (days)
1-2	A	4	5-6	G	4
1-3	B	1	5-7	H	8
2-4	C	1	6-8	I	1
3-4	D	1	7-8	J	2
3-5	E	6	8-10	K	5
4-9	F	5	9-10	L	7

(i) Compute TE and TL for each activity.
(ii)   Find the critical path.
(OR)
10. (a) Differentiate the PERT and CPM   7M
     (b) Project crashing   7M

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

B.Tech. VII Sem (R15) Supple Examinations of October 2020

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)	What are the characteristics of Embedded Systems?	7M
	(b)	Discuss in detail about the Embedded Firewall.	7M

(OR)

2.	(a)	Explain communication interface briefly.	7M
	(b)	What are the various application areas of Embedded systems?	7M

UNIT – II

3.	(a)	Explain the Fundamental Issues in Hardware Software Co-Design.	7M
	(b)	Explain the VLSI and Integrated Circuit Design	7M

(OR)

4.	(a)	Explain the role of digital and analog electronic components in embedded hardware design.	7M
	(b)	Explain about Electronic design automation tools.	7M

UNIT – III

5.	(a)	Explain about Wireless and Mobile system protocols	7M
	(b)	Explain about Sophisticated Interfacing Features in Device Ports.	7M

(OR)

6.	(a)	Describe about Parallel Bus Device Protocols	7M
	(b)	Explain parallel communication network using ISA and PCI	7M

UNIT – IV

7.	Explain Basic functions of real time kernel.	14M

(OR)

8.	(a)	Discuss about OS Security Issues.	7M
	(b)	Explain in detail about Task Synchronization.	7M

UNIT-V

9.	With a neat diagram explain smart card hardware.	14M

(OR)

10.	With neat diagram explain embedded system in Automobile industry	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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)	Discuss about image sampling and quantization.	7M
	(b)	Distinguish between the following tools used in digital image processing	
		i) Array and Matrix operations	7M
		ii) Linear and Non-linear operations	

(OR)

2.	(a)	Explain about components of an image processing system.	7M
	(b)	Distinguish between digital image and binary image.	7M

UNIT – II

3.	(a)	Obtain Hadamard transform matrix for N=4.	7M
	(b)	Determine the kernel coefficients of 2D DCT transform for N=4.	7M

(OR)

4.	(a)	Explain the following two properties of 2D-DFT:	
		i) Convolution	7M
		ii) Correlation	
	(b)	Explain about Haar Transform and its properties	7M

UNIT – III

5.	Explain how image smoothing is done in frequency domain.	14M

(OR)

6.	(a)	Explain briefly with block diagram about homomorphic filtering approach for image processing.	7M
	(b)	Explain about different color models used in color image processing	7M

UNIT – IV

7.	(a)	With the help of block diagram explain about degradation model.	7M
	(b)	Explain different edge detection techniques?	7M

(OR)

8.	(a)	Briefly explain the approach of inverse filtering method used for image restoration.	7M
	(b)	Discuss about region based Image segmentation.	7M

UNIT-V

9.	(a)	Explain the various redundancies to achieve image compression.	7M
	(b)	Obtain the Huffman code for the word "COMMITTEE".	7M

(OR)

10.	(a)	Discuss about image compression standards.	7M
	(b)	Determine arithmetic coding to encode the word "DAD", when source emits four symbols {A,B,C,D} with the probabilities 0.4, 0.2, 0.1 and 0.3 respectively.	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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) Describe with the aid of simple ray diagrams: 10M
   (i) the multimode step index fiber;
   (ii) the single-mode step index fiber.
   Compare the advantages and disadvantages of these two types of fiber for use as an
   optical channel.

   (b) Define Acceptance angle and Numerical Aperture.   4M

(OR)

2. (a) List and explain the merits and special features offered by optical fiber communications over more   7M
   conventional electrical communications.

   (b) A graded index fiber with a core axis refractive index of 1.5 has a characteristic index profile (α)   7M
   of 1.90, a relative refractive index difference of 1.3% and a core diameter of 40 μm. Estimate the
   number of guided modes propagating in the fiber when the transmitted light has a wavelength of
   1.55 μm, and determine the cutoff value of the normalized frequency for single-mode transmission
   in the fiber.

UNIT – II

3. (a) When the mean optical power launched into an 8 km length of fiber is 120 μW, the   8M
   mean optical power at the fiber output is 3 μW.
   Determine:
   (i) the overall signal attenuation or loss in decibels through the fiber assuming there
       are no connectors or splices;
   (ii) the signal attenuation per kilometer for the fiber.
   (iii) the overall signal attenuation for a 10 km optical link using the same fiber with
        splices at 1 km intervals, each giving an attenuation of 1 dB;
   (iv) the numerical input/output power ratio in (iii).

   (b) What is a Material absorption? Explain Intrinsic absorption and Extrinsic absorption.   6M

(OR)

4. (a) A 6 km optical link consists of multimode step index fiber with a core refractive   9M
   index of 1.5 and a relative refractive index difference of 1%. Estimate:
   (i) the delay difference between the slowest and fastest modes at the fiber output;
   (ii) the rms pulse broadening due to intermodal dispersion on the link;
   (iii) the maximum bit rate that may be obtained without substantial errors on the
        link assuming only intermodal dispersion;
   (iv) the bandwidth–length product corresponding to (iii).

   (b) Two polarization-maintaining fibers operating at a wavelength of 1.3 μm have beat   5M
   lengths of 0.7 mm and 80 m. Determine the fiber birefringence in each case and
   comment on the results.

UNIT – III

5. (a) Describe the general splicing methods and then single-mode splicing. 8M

(b) A Single-mode fiber has a normalized frequency V=2.40, a core refractive index n_1=1.47, a cladding refractive index n_2=1.465, and a core diameter 2a=9 µm. Find the insertion losses of a fiber joint having a lateral offset of 1 µm. 6M

(OR)

6. (a) Explore fiber-to-fiber coupling loss. Also, explain how to prepare the proper fiber end faces. 7M

(b) How to calculate the maximum optical power coupled into a fiber? Explain. 7M

UNIT – IV

7. (a) Describe the structure and basic operating characteristics of hetero-junction-structured semiconductor LEDs. 8M

(b) Briefly outline the advantages and drawbacks of the LED in comparison with the injection laser for use as a source in optical fiber communications. 6M

(OR)

8. (a) Explain the detection process in the Avalanche photo diode and compare this device with the P-I-N photodiode. 7M

(b) Outline the reasons for the adoption of the materials and devices used for photo detection in optical fiber communications. Discuss in detail the P-I-N photodiode with regard to performance and compatibility requirements in photo detectors. 7M

UNIT-V

9. (a) Give an overview of the fundamental operational characteristics of the various stages of an optical receiver. 8M

(b) Give an account of Fiber optic link rise time budget and its uses. 6M

(OR)

10. (a) Discuss system considerations in point -to-point optical link. 7M

(b) Discuss with the aid of suitable diagram the measurement of dispersion in optical fibers. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
SUB: ELECTRONIC MEASUREMENTS AND 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) List the basic performance Static characteristics of a system? and Explain.   6M
   (b) Discuss the different types of static errors in a system?   8M

(OR)

2. (a) Explain the working of the harmonic distortion analyzer?   7M
   (b) Draw the block Schematic of a Basic Spectrum Analyzer and explain its working?   7M

UNIT – II

3. (a) Define digital voltmeter.   2M
   (b) Explain the working principle of successive approximation type digital voltmeter with a neat diagram.   12M

(OR)

4. (a) List the applications of Digital tachometer.   2M
   (b) Discuss the following   12M
       (i) Digital Multimeter   (ii) Digital Phase Meter   (iii) Universal Counter.

UNIT – III

5. (a) Discuss the Delay lines in CROs.   6M
   (b) What is CRO? Explain the vertical deflection systems with a neat sketch.   8M

(OR)

6. (a) Draw the block Diagram of a Dual Trace CRO and explain its working principle?   9M
   (b) Explain in detail about various types of attenuators?   5M

UNIT – IV

7. (a) Draw the Maxwell's Bridge Circuit and derives the expression for the unknown element at balance?   7M
   (b) Describe the operation of the Wheatstone bridge with a neat sketch.   7M

(OR)

8. (a) The four arms of a bridge supplied from a sinusoidal source are configured as follows: 6M
       Arm AB: A resistance of 100 Ω in parallel with a capacitance of 0.5 µF
       Arm BC: A 200 Ω non inductive resistance
       Arm CD: A 800 Ω non inductive resistance
       Arm DA: A resistance Rx in series with a 1 µF capacitance
       Determine the value of Rx and the frequency at which the bridge will balance.
       Supply is given between terminals A and C and the detector is connected between nodes B and D.
   (b) Draw the circuit of a basic Q-meter diagram and explain its principal of operation using a vector diagram?   8M

UNIT-V

9. (a) Compare RTD with Thermistor.   7M
   (b) What is temperature coefficient of resistor? Explain in detail?   7M

(OR)

10. (a) Define data acquisition? Mention the essential features of a data acquisition system   6M
    (b) What is the difference between photoemmissive, photoconductive and photovoltaic transducers?   8M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of October 2020
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. List and explain fabrication steps involved in IC Technology?   14M

(OR)

2. (a) Explain indetail about Probe testing?   7M
   (b) Discuss the differences and similarities between Diffusion and Ion implantation?   7M

UNIT – II

3. (a) Draw the circuit diagram of Bi-CMos Inverter and explain its operation?   7M
   (b) Derive the expression for Figure of Merit of a MOS transistor   7M

(OR)

4. Derive the equation for Pull up to Pull Down ratio for an N Mos inverter driven through one or more Pass transistors?   14M

UNIT – III

5. (a) Discuss 2μ CMOS Design rules for MOS technology?   7M
   (b) What are the Limitations of Scaling MOS device   7M

(OR)

6. Draw the tick and Layout diagram of a two input CMOS NAND gate   14M

UNIT – IV

7. (a) Write short notes on Wiring Capacitance and Area Capacitance   7M
   (b) Explain the concept of drining large capacitive loads in MOS circuits?   7M

(OR)

8. With the help of neat diagram explain the significance of Carry Look Ahead Adder in Sub system design   14M

UNIT-V

9. Explain about PLA'S, FPGA'S and CPLD'S design   14M

(OR)

10. (a) What is the need for testing a Mos device and explain various test principles?   7M
    (b) briefly explain about Layout Design for improved Testability   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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. Define Rapid Prototyping and discuss the need for rapid prototyping in the modern industry scenario?   14M

(OR)

2. Classify the rapid prototyping system and describe the various challenges to implement the rapid prototyping system?   14M

UNIT – II

3. Define Stereolithography system? Explain the principle and operation of the same?   14M

(OR)

4. Describe the merits, demerits and application of the Stereolithography system?   14M

UNIT – III

5. Define Fusion Decomposition Modeling and explain the principle and operation of the same with suitable sketch?   14M

(OR)

6. Describe the merits, demerits and application of the Solid Ground Curing?   14M

UNIT – IV

7. Explain the principle and operation of laminated object manufacturing?   14M

(OR)

8. Sketch and explain the operation of thermal jet printer?   14M

UNIT-V

9. Describe the principle and operation of selective laser sintering?   14M

(OR)

10. Differentiate the laminated metal tooling and direct metal laser sintering tooling? 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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. Discuss about models of production system　　　　　　　　　　　　　　14M

(OR)

2. (a) Give the brief explanation about the concept of kanban system　　　6M

　 (b) State the difference between Products and services　　　　　　　　8M

UNIT – II

3. Explain the various forecasting techniques.　　　　　　　　　　　　　14M

(OR)

4. Describe aggregate planning with suitable diagrams and explain pure strategies of aggregate planning.　　14M

UNIT – III

5. What are the Factors affecting Facility Layout and explain the concept of Break-Even Analysis　　14M

(OR)

6. Differentiate between 'Product Layout' and 'Process Layout' with neat block diagrams.　　14M

UNIT – IV

7. 　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　14M

Activity	A	B	C	D	E	F	G
predecessors	__	__	A	A,B	D	C,E	E
Expected time	7	9	12	8	9	6	5

　i) Construct project network
　ii) Perform forward and backward passes

(OR)

8. What is inventory cost and explain the concept of inventory control system　　14M

UNIT-V

9. Solve the following sequencing problem using Johnson's algorithm method and find out:- i) Total runtime ii) ideal time　　14M

Jobs	Machine1(Time in hrs)	Machine2 (Time in hrs)
A	4	2
B	3	9
C	5	1
D	7	3
E	8	5

(OR)

10. What are the objectives of scheduling? Explain briefly about job shop scheduling.　　14M

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

B.Tech. VII Sem (R15) Supple Examinations of October 2020
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) Explain the basic principle of measurement. 7M
   (b) Explain briefly the application of measuring systems / instruments? 7M

(OR)

2. (a) What are the different types of errors in the measurement? Explain briefly? 7M
   (b) Describe the working principle of an electrical resistance thermometer? 7M

UNIT – II

3. (a) Explain the use of thermal conductivity gauges of pressure measurement. 7M
   (b) Explain the various principle of temperature measurement. 7M

(OR)

4. (a) Describe the working principle of pirani gauge with neat sketch? 7M
   (b) Explain the operating principle of an LVDT with a diagram? 7M

UNIT – III

5. (a) Considering rotameter as an example give the functional description of various elements 7M
   (b) Explain the working principle of a vibrometer with a neat sketch? 7M

(OR)

6. (a) Describe the working principle of stroboscope with a neat sketch? 7M
   (b) Explain the working principle of electrical tachometer. 7M

UNIT – IV

7. (a) What is strain gauge rosette? Explain its importance. 7M
   (b) What is gauge factor? Explain the working of electrical strain gauges? 7M

(OR)

8. (a) What is temperature compensation in strain gauge? How is it achieved? 7M
   (b) Explain how strain gauges can be used for measurement of bending stress? 7M

UNIT-V

9. (a) Explain the working of sling psychometer? 7M
   (b) Discuss the importance of control system. 7M

(OR)

10. (a) Describe the working principles of a dew point meter with a neat sketch? 7M
    (b) Describe how the torque and power are measure of by using a prony brake dynamometer? 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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. (a) Derive the strain displacement relation for a two dimensional element?   7M
   (b) Explore the stress strain relation for 2D and 3D elastic problems   7M

(OR)

2. Explain natural coordinate system? Derive expression for relation between natural &   14M
    Cartesian coordinate systems?

UNIT – II

3. A tapered bar of Aluminium is having length of 520 cm. The area of cross section at   14M
    the fixed end is 82 cm^2 and the free end is 20 cm^2 with the variation of the sectional
    area is linear. The bar is subjected to an axial load of 10 kN at 240 mm from the fixed
    end. Calculate the maximum displacement and stress developed in the bar?

(OR)

4. Determine the nodal displacements, stresses and reactions of the bar shown in figure   14M
    below. Take $E_1 = E_2 = 80 \times 10^3$ N/mm^2, $L_1 = 90$ mm, $L_2 = 80$ mm, $A_1 = 800$ mm^2, $A_2 = 350$ mm^2, P = 25KN.
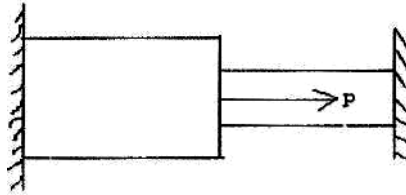
UNIT – III

5. A beam is fixed at one end and supported by a roller at the other end, has a 20 kN   14M
    concentrated load applied at the centre of the span of 10 m. Calculate the deflection and
    slope and also construct shear force and bending moment diagrams. Take I = 2500 cm^4
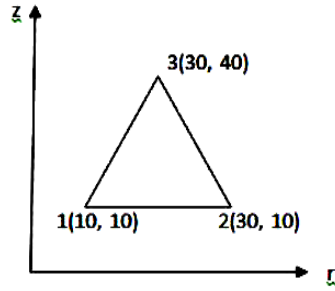   and $E = 20 \times 106$ N/cm^2.

(OR)

6. Find the nodal displacements and element stresses in a plane truss shown in the figure   14M
    below.
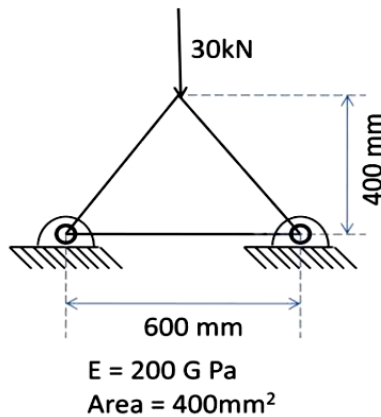
UNIT – IV

7. Calculate the stiffness matrix for the element shown in figure. Co-ordinates are given in mm. Assume plane stress conditions. Take E=2.1X10^5 N/mm^2, v = 0.25, t=10 mm. **14M**

(OR)

8. (a) Define Iso-parametric, Super Parametric and Sub-Parametric elements? **4M**

   (b) Consider a quadrilateral element as shown in figure. The local coordinates are ξ =0.5, η = 0.5. Evaluate the Jacobian matrix and strain- Displacement matrix. **10M**
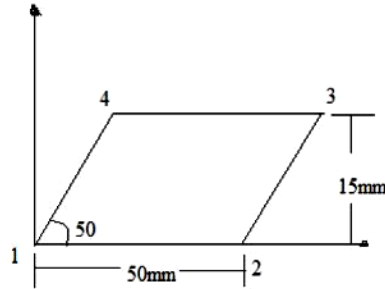
UNIT-V

9. Consider a brick wall of thickness 0.3 m, k=0.7 W/m K. The inner surface is at 280 ^{0}C and the outer surface is exposed to cold air at –150 ^{0}C. The heat transfer coefficient associated with the outside surface is 40W/m^{2}K. Determine the steady state temperature distribution within the wall and also the heat flux through the wall. Use two elements and obtain the solution. **14M**

(OR)

10. Derive the conductivity matrix for two dimensional triangular element subjected to convection on one face of the element. **14M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of October 2020
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. (a) Differentiate between Tolerance and allowance — 7M

   (b) Define
   a)Limit   b)Fit   c)Tolerance   d)Allowance   e)Deviation   with one example each — 7M

(OR)

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

   (b) Explain about the interchangeability and selective assembly — 6M

UNIT – II

3. (a) Explain Taylor's principle of gauge — 6M

   (b) Explain the working principle of Dial Indicator with a neat sketch — 8M

(OR)

4. (a) Explain the phenomenon of ringing and the grades of slip gauge — 7M
   (b) Explain anyone method for measuring the angle of the given work piece with a neat sketch. — 7M

UNIT – III

5. (a) Describe the construction of an optical projector — 7M
   (b) Describe the principle, working f an Autocollimator — 7M

(OR)

6. (a) Differentiate between surface roughness and surface waviness — 7M
   (b) Explain the numerical assessment of surface waviness by CLA Method — 7M

UNIT – IV

7. (a) Describe the pitch measurement of internal screw threads by various methods — 7M
   (b) Explain in detail with suitable sketches about various alignment tests performed on a lathe. — 7M

(OR)

8. Explain how can you measure the effective diameter of the screw thread by two wire method — 14M

UNIT-V

9. (a) Describe Parkinson gear tester and state its limitations — 8M
   (b) Define CMM and write the applications of CMM — 6M

(OR)

10. (a) Explain the basic principle of comparator its uses — 7M
    (b) Explain Johansson mikrokator — 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Semester (R15) Supple Examinations of October 2020
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. (a) Explain the role of Computers in the Manufacturing scenario?　　7M
   (b) Discuss various input devices with suitable diagrams.　　7M

(OR)

2. What are the various display devices that are used for displaying graphics information? Explain CRT with the help of neat sketch?　　14M

UNIT – II

3. (a) Explain about the DDA line algorithm?　　7M

   (b) Explain the importance of clipping. Give the details of method used for line clipping?　　7M

(OR)

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

UNIT – III

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

(OR)

6. (a) Explain the concept of the three basic Boolean operations used in solid modelling.　　7M
   (b) Explain the B- Representation with an example?　　7M

UNIT – IV

7. Explain about the Opitz coding system generally used in group technology?　　14M

(OR)

8. (a) Explain the benefits of group technology layout compare to process type layouts?　　7M

   (b) What is an FMS? Explain in detail the basic components of FMS?　　7M

UNIT-V

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

(OR)

10. (a) What is Material Requirement Planning and explain its Benefits?　　7M
    (b) Define Computer-Aided Process Planning? What are the benefits of using CAPP?　　7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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. Explain about the Physical design of IoT   14M

(OR)

2. Discuss about the various levels of IoT Systems?   14M

UNIT – II

3. (a) List out the various application areas of IoT? Explain about the surveillance   8M
   system using IoT.
   (b) How IoT is used in Retail system?   6M

(OR)

4. Discuss in detail about Home automation system in IoT?   14M

UNIT – III

5. (a) With neat diagram and example discuss about M2M?   7M
   (b) Explain about the Software Defined Networking?   7M

(OR)

6. Illustrate about the various steps involved in IoT System Design Methodology? 14M

UNIT – IV

7. (a) Define Module? Explain about examples of modules in Python?   7M
   (b) Explain about the control flow statements in Python?   7M

(OR)

8. (a) Clarify about Date / Time Operations in Python?   7M
   (b) Describe about Classes in Python?   7M

UNIT-V

9. Write about Raspberry Pi board and Raspberry Pi interfaces with diagrams?   14M

(OR)

10. What is an IoT device? Explain basic building blocks of an IoT device?   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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. (a) Describe the Importance of Computer Graphics in the area of CAD and Visualization? 　7M
   (b) Explain in detail about Graphical User Interfaces? 　7M

(OR)

2. (a) Elaborate the Raster Scan Systems and Random Scan Systems? 　7M
   (b) Explain about the Graphics Monitors and workstations? 　7M

UNIT – II

3. (a) Write about Scan Converting Ellipses? 　10M
   (b) What Are the uses of Thick Primitives? 　4M

(OR)

4. (a) Explain about Cohen-Sutherland Line Clipping Algorithm? 　10M
   (b) What is Clipping Lines? 　4M

UNIT – III

5. (a) Explain two dimensional Translation and Scaling with example 　7M
   (b) Explain in detail about window to viewport coordinate transformation 　7M

(OR)

6. (a) Write about Parametric bicubic surfaces? 　4M
   (b) Describe the Importance of Polygon Meshes? 　10M

UNIT – IV

7. (a) What is Projections and explain about Regularized Boolean set Operations? 　7M
   (b) What is a Sweep representation? Explain about Spatial –Partitioning Representations? 　7M

(OR)

8. (a) Write about Achromatic light? 　4M
   (b) Explain in detail about the properties of light and draw chromaticity diagram? 　10M

UNIT-V

9. (a) Explain in detail about Basic Illumination Models? 　10M
   (b) Explain about Constant Shading? 　4M

(OR)

10. (a) Elaborate the steps for Design of Animation Sequences ? 　7M
    (b) Differentiate between the Conventional and Computer–Assisted animation? 　7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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)	Distinguish between Testing & debugging?	7M
	(b)	Discuss about consequences and taxonomy of bugs.	7M

(OR)

2.	(a)	Explain about different kinds of loops.	7M
	(b)	Discuss about path sensitizing.	7M

UNIT – II

3.	(a)	Explain the following terms with examples.	9M
		i)Path product ii) Path expression iii) Path sum	
	(b)	Explain flow anomaly detection in regular expressions.	5M

(OR)

4.	(a)	Write short notes on data flow testing strategies.	8M
	(b)	Explain about data flow anomaly state graph	6M

UNIT – III

5.	(a)	Explain about Domain Closure and Domain Dimensionality.	7M
	(b)	Explain about Nice domains.	7M

(OR)

6.	(a)	What is a decision table? How it is useful in testing?	7M
	(b)	Write Boolean Algebra rules. Illustrate the rules with path expressions.	7M

UNIT – IV

7.	Write short notes on	14M
	(i) Transition bugs	
	(ii) Dead states	
	(iii) State bugs	
	(iv) Encoding bugs	

(OR)

8.	What is a transaction? Explain about transaction flow testing techniques.	14M

UNIT-V

9.	(a)	Explain about basic principles of the matrix of a graph with example	6M
	(b)	Discuss about partitioning algorithm for Graph Matrix with an example.	8M

(OR)

10.	Write a Node Reduction algorithm in terms of Matrix operations.	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem (R15) Supple Examinations of October 2020
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.		What are the different types of Control Strategies in Artificial Intelligence, Explain any one Method	14M

(OR)

2.	(a)	Explain in Detail about Generate and Test Strategy approach in Problem solving	7M
	(b)	Discuss about Constraint Satisfaction Algorithm	7M

UNIT – II

3.	(a)	Explain in detail about Representation and Mappings in AI with neat Diagram	7M
	(b)	What are different Issues in Knowledge Representation?	7M

(OR)

4.	(a)	Discuss about Procedural versus Declarative Knowledge with an Example	7M
	(b)	Explain in detail about Forward versus Backward Reasoning	7M

UNIT – III

5.	(a)	Explain in detail about Nomonotonic Reasoning	7M
	(b)	Explain any one implementation technique	7M

(OR)

6.	(a)	Define and explain Bayes' theorem in detail	7M
	(b)	Explain in detail about Fuzzy Logic	7M

UNIT – IV

7.	(a)	Define Frames and explain with an example	7M
	(b)	Explain about Conceptual Dependency	7M

(OR)

8.	(a)	What are the different types of declarative structures	7M
	(b)	Explain about Logic and Slot – and – Filler Structures	7M

UNIT-V

9.		Explain in detail about Minimax Search Procedure algorithm	14M

(OR)

10.	(a)	Define Natural Language Processing and explain in detail about the Boundaries	7M
	(b)	Explain in detail about Knowledge acquisition in Expert System	7M

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

B.Tech. VII Semester (R15) Supple Examinations of October 2020
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)	Discuss in detail about parallel and distributed computing.	7M
	(b)	Explain various service models in cloud with example.	7M

(OR)

2.	(a)	Write briefly about Quantum Computing along with its applications.	7M
	(b)	Illustrate and elaborate on five essential characteristics of Cloud computing	7M

UNIT – II

3.	(a)	Demonstrate with neat sketch the working procedure involved in Cloud anatomy	7M
	(b)	Compare public and private cloud access networking.	7M

(OR)

4.	(a)	Explain the steps involved in managing cloud infra structure	7M
	(b)	Discuss various layers involved in cloud architecture	7M

UNIT – III

5.	(a)	Define Virtualization. Explain the concept of resource virtualization in IaaS	7M
	(b)	Enumerate pros and cons of SaaS	7M

(OR)

6.	(a)	Briefly write about XaaS and other cloud service models	7M
	(b)	Compare and contrast on-premise and out sourced community cloud	7M

UNIT – IV

7.	(a)	Demonstrate the process of application development in Azure	7M
	(b)	Elaborate on IBM Cloud API	7M

(OR)

8.	(a)	Explain the process if cloud application development using Google App Engine	7M
	(b)	Discuss challenges involved in software development for cloud.	7M

UNIT-V

9.	(a)	Define Datacenter. Explain role of data centers in Cloud computing	7M
	(b)	Explain how Rackspace support the implementation of web services in cloud	7M

(OR)

10.	(a)	Explain in detail about the architecture of classical data centers	7M
	(b)	Write briefly about IBM blue mix	7M

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

B.Tech. VII Semester (R15) Supple Examinations of October 2020
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)	Explain big data storage and analysis.	7M
	(b)	What is Big Data? And what are the big data sources.	7M

(OR)

2.	(a)	Why Hadoop is big data technology? Explain how it supports big data.	7M
	(b)	Compare Hadoop with Relational data base.	7M

UNIT – II

3.	(a)	Write java code to create directory in HDFS and delete directory or file from HDFS.	8M
	(b)	Explain how to copy large amount of data to and from Hadoop file system in parallel using distcp.	6M

(OR)

4.	(a)	Explain anatomy of file write to HDFS with neat sketch.	6M
	(b)	Discuss about coherence model in brief.	8M

UNIT – III

5.	(a)	Explain managing configuration when developing Hadoop application.	7M
	(b)	Describe Map and Reduce phases of Map Reduce with example.	7M

(OR)

6.	(a)	Write a unit test for mapper with example.	7M
	(b)	Explain running MapReduce application on cluster.	7M

UNIT – IV

7.	(a)	Explain Shuffle and sort on Map and Reducer side with example.	10M
	(b)	Explain map side tuning properties.	4M

(OR)

8.	(a)	The relationship of the Streaming and Pipes executable to the tasktracker and its child	7M
	(b)	Explain map side join and reduce side join.	7M

UNIT-V

9.	(a)	Explain Hive architecture with neat diagram.	7M
	(b)	Explain creation of table, load data into table, and retrieve data from table with example.	7M

(OR)

10.	(a)	What is HBase? Explain storage mechanism of HBase with an example.	7M
	(b)	Compare HBase with Relational Data Base Management System.	7M