K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Remote Sensing & GIS *(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 briefly about the process of Remote Sensing with neat supporting diagram?   8M
    (b) Give note on advantages of remote sensing and applications of remote sensing?   6M
(OR)
2. (a) Explain about EMR Spectrum?   8M
    (b) Describe atmospheric windows with neat sketch?   6M

UNIT – II

3. (a) What are the different types of platforms and orbits?   8M
    (b) Define the Spectral, Radiometric and Spatial Resolutions   6M
(OR)
4. Explain the satellite and sensor characteristics of Resourcesat-1 and Cartosat-1?   14M

UNIT – III

5. Explain different methods of supervised classification?   14M
(OR)
6. Explain the term "Visual Image Interpretation"? Give notes on various elements   14M
    of Visual Interpretation?

UNIT – IV

7. (a) Describe Geographic Information System? Explain briefly key components of   8M
         GIS?
    (b) Explain briefly about data base management system of GIS?   6M
(OR)
8. Explain following terms
    (a) Cartography   4M
    (b) Georeference   4M
    (c) Map scale   3M
    (d) Map projection   3M

UNIT-V

9. Explain the applications of Remote Sensing in watershed management?   14M
(OR)
10. Explain the applications of Remote Sensing in environmental monitoring?   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Transportation Engineering - I (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 the role of reconnaissance survey in finalizing highway alignment.   7M
   (b) Explain the functional classification of highways   7M

(OR)

2. What are the guidelines given by third road development plan for finalizing different types of highways. and explain briefly about star and grid pattern of road network   14M

UNIT – II

3. (a) Design the length of a horizontal transition curve for a two lane National highway having a radius of 300 m and for a design speed of 100 kmph for a rolling terrain. The average length of rigid base of vehicle is considered as 6 m. Take coefficient of lateral friction 0.38.   10M
   (b) Calculate the extra width required for a two lane highway having a horizontal curve of radius 200m,if the design speed is 80 Kmph.   4M

(OR)

4. (a) write a short note on different types of sight distances   7M
   (b) Derive an expression for extra widening on highway curves   7M

UNIT – III

5. (a) Explain spot speed, running sped, space mean speed, time mean speed and average speed. How is spot speed studies carried out?   7M
   (b) Explain various types of road markings.   7M

(OR)

6. (a) Discuss the relation between parameters of Traffic-Volume, Speed and Density.   7M
   (b) Discuss the guidelines of IRC method of Signals.   7M

UNIT – IV

7. Explain the advantages and disadvantages of grade separated intersection. What are the factors to be considered for providing camber.   14M

(OR)

8. (a) What are the different corrections to be applied in estimating rotary capacity?   10M
   (b) What should be the criteria for selecting width of weaving section in rotary design as per IRC?   4M

UNIT-V

9. (a) What are the various types of flexible pavement failures? Explain briefly   7M
   (b) What are requirements of filler and sealer materials for using them in the construction of cc pavements?   7M

(OR)

10. Discuss about the critical combination of stresses to be considered in the design of rigid pavements. Explain the functionality of dowel bars in rigid pavements   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Water Resources Engineering - I (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 the term 'Irrigation'. What is the necessity of Irrigation?   7M
   (b) Explain the terms 'duty' and 'delta'. Explain the factors affecting duty of water.   7M

(OR)

2. (a) A water course commands an irrigated area of 800hactates. The intensity of irrigation of rice in this area is 50%. The transplantation of rice crop takes 15 days and total depth of water required by the crop is 60 cm on the field during the transplantation period, given that the rain falling on the field during this period is 15 cm. Find the duty of irrigation water for the crop on the field during transplantation, at the head of the distributary, assuming losses of water to be 20% in the water course. Also calculate the discharge required in the water course.   7M
   (b) Describe the vertical distribution soil moisture with a neat sketch.   7M

UNIT – II

3. (a) What is a canal? How are canals classified?   7M
   (b) Explain the procedure of designing a channel using Kennedy's theory.   7M

(OR)

4. (a) Design a channel section for the following data, using Lacey's theory.
       Discharge (Q) = 30 m^3/s.   Silt factor (f) = 1.00,   side slope = ½ : 1
       Find also the longitudinal slope.   7M
   (b) What is canal lining? What are the requirements of a good lining material?
       What are the various types of linings used for canal?   7M

UNIT – III

5. (a) Explain with a neat sketch, the various component parts, along with their functions, of a diversion head work.   7M
   (b) What are the various causes of failures of hydraulic structures on permeable foundations? What are the remedies? Explain.   7M

(OR)

6. (a) Discuss the Bligh's creep theory used for design of impervious floor.   7M
   (b) Explain the following terms related to Khosla's theory:
       (i) Corrections to be applied   and   (ii) Exit gradient.   7M

UNIT – IV

7. (a) Explain the classification of dams.   7M
   (b) What are the factors on which the selection of the site of a reservoir depends?   7M

(OR)

8. (a) Explain the various zones of storage of a reservoir with a neat sketch.   7M
   (b) Explain the method of calculating reservoir capacity for a specified yield, from the mass inflow curve.   7M

UNIT-V

9. (a) What do you understand by gravity dam? Explain the various forces that act on a gravity dam.   7M

   (b) Distinguish clearly between a low gravity dam and high gravity dam. Derive the expression used for such a distinction.   7M

(OR)

10. (a) What are the various causes of failure of earth dams? Explain.   7M

    (b) Discuss the various measures for control seepage in earth dams.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Design & Detailing of Reinforced Concrete Structures-I (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 the role of partial safety factors in limit state design. Give partial safety factors for materials strength for concrete and steel. **7M**

   (b) Differentiate between Working Stress Method and Limit State Method. **7M**

(OR)

2. (a) Distinguish between balanced, under-reinforced and over reinforced sections. **7M**

   (b) Draw the stress strain curve for concrete and state the assumptions in the limit state method. **7M**

UNIT – II

3. Design a rectangular beam 230 mm x 600 mm (overall) over an effective span of 5 m. The superimposed load on the beam is 50kN/m. Effective cover to reinforcement is taken as 50 mm. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. **14M**

(OR)

4. Determine the area of steel required for a T-beam with the following dimensions: **14M**
   Depth of slab – 100 mm

   Breadth of flange – 750 mm

   Breadth of web – 250 mm

   Total depth – 600 mm

   The beam is subjected to an ultimate bending moment of 500 kNm. Use M20 concrete and Fe 415 steel.

UNIT – III

5. (a) Briefly explain the reasons for the development of diagonal tension cracks in R.C.C. beams. **6M**

   (b) A 250 mm wide and 600 mm deep R.C.C. beam is reinforced with 2 legged 10mm diameter inclined stirrups at 250 mm c/c with $\alpha=60°$. Longitudinal steel consists of 4 bars of 20 mm with a cover of 40 mm. M 25 grade concrete and Fe 415 steel are used, determine the strength of the section in shear. **8M**

(OR)

6. A R.C.C. beam has cross section 300 mm x 600 mm and is subjected to the following design moments & forces: **14M**
   Bending Moment=115 kN-m, Shear Force= 95 kN and Torsional Moment=45 kN-m. Determine the equivalent bending moment and shear force for which section is to be designed and design the section.

UNIT – IV

7. (a) Explain the differences between one way slab and two-way slab. **4M**

   (b) Design a simply supported slab for a room of size 3 m x 9 m. All surrounding walls are of 230mm wide. Assume a live load of 3 kN/m^2 and floor finishes as 1 kN/m^2. Use M 20 concrete and Fe 415 steel. **10M**

(OR)

8. Design a dog-legged stair for a building in which vertical distance between the floors is 3.3m. The stair room measures 2.3m by 5.5m. The live load on stairs may be taken as 2200 N/m^2. Use M 20 concrete mix and Fe 415 grade steel. **14M**

UNIT-V

9.   Design a circular column of diameter 400 mm with helical reinforcement subjected to a working load of 1200 kN. Use M25 concrete and Fe 415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends, but not restrained against rotation. Sketch the reinforcement details.   14M

(OR)

10. (a)   Explain the need and usage of interaction curves in design of columns carrying moments in addition to axial loads.   7M

    (b)   Discuss in brief 'Short term' and 'Long term' deflections of R.C.C. beams.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Structural Analysis - I (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 shear force and bending moment values and draw SFD and BMD for the fixed beam shown below.   14M

Fig.1
(OR)

2. For a rigidly fixed beam AB of span 5m carrying a UDL of 10 kN/m over the entire span. Locate the contraflexure and draw BMD and SFD.   14M
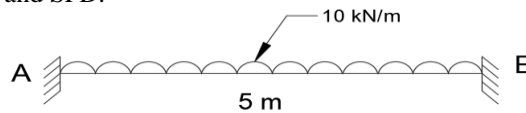

Fig.2

UNIT – II

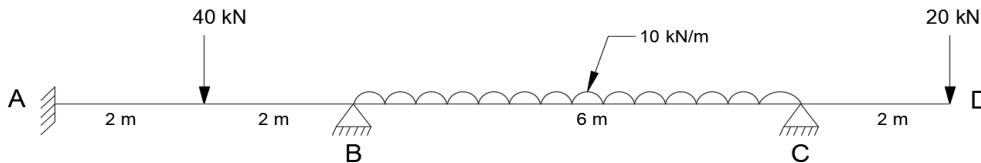3. Analyse the continuous beam as shown in fig.3 by slope deflection method. Draw SFD.   14M

Fig.3
(OR)

4. Analyse the frame as shown in **fig.4** by slope deflection method. Draw BMD.   14M

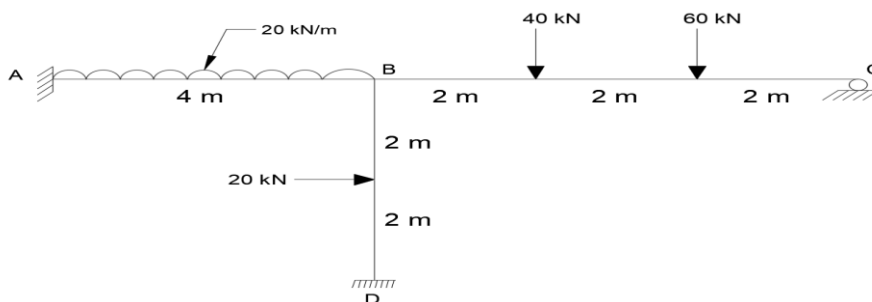**Fig.4**

UNIT – III

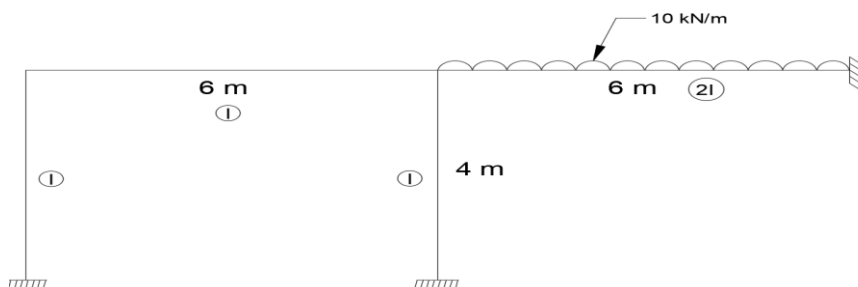5. Analyse the frame shown in **fig.5** by moment distribution method.   14M

Fig.5
(OR)

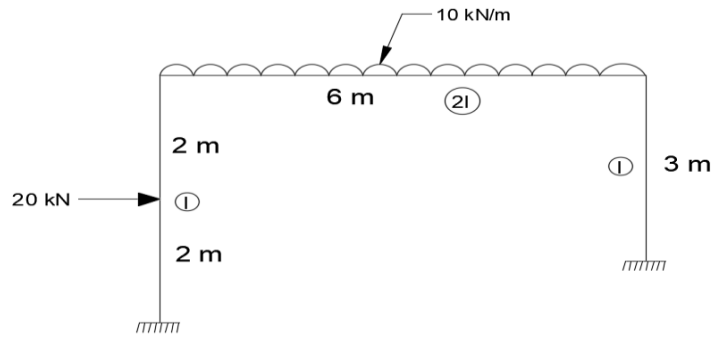6. Analyse the frame as shown in **fig.6** by moment distribution method. 14M

10 kN/m

6 m (2I)

2 m

20 kN → (I) 3 m

2 m (I)

2 m

Fig.6

UNIT – IV

7. Analyse the continuous beam as shown in **fig.7** by Kani's method. Draw SFD. 14M

8 kN

2 kN/m

6 kN

A B C D

2 m 4 m 5 m 2 m 3 m
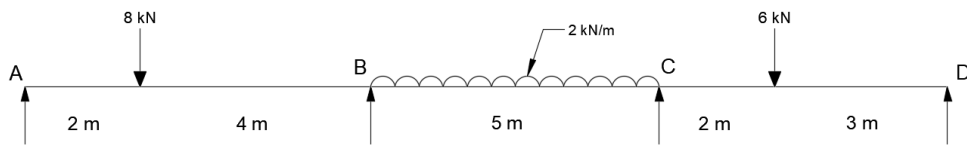
Fig.7

(OR)

8. Analyse the frame shown in **fig.8** by kani's method. Draw BMD. 14M

30 kN/m

(2I)

4 m (I) (I)

30 kN 30 kN

2 m 2 m 2 m

(2I)

4 m (I) (I)
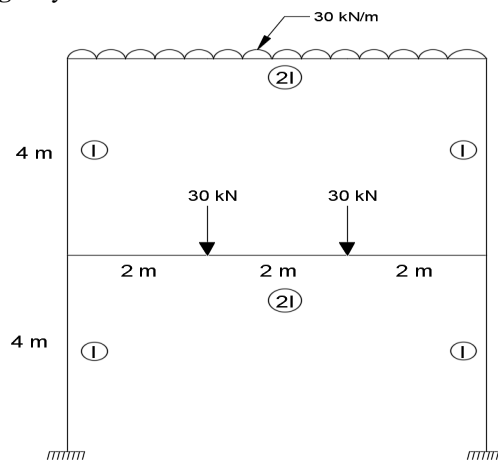
Fig.8

UNIT-V

9. Find the vertical and horizontal reactions for the pin jointed truss shown in **fig.9**

30 kN

B

4.5 m

A C

6.0 m 6.0 m

14M
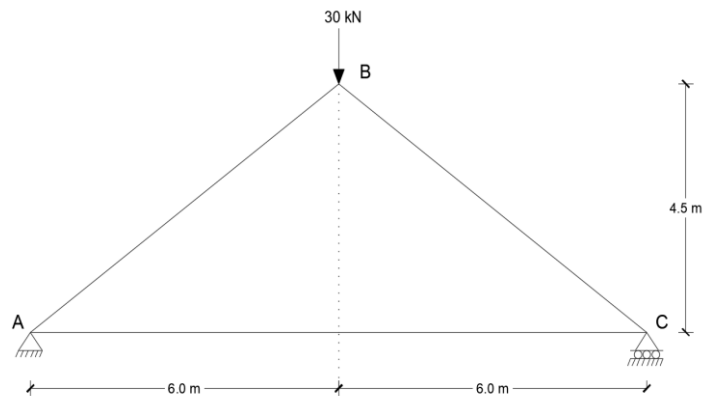
(OR)

10. Derive an expression for strain energy due to bending. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Managerial Economics and Financial Analysis (CE, ME & 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. 'The two major concepts of Managerial Economics are Decision making and forward planning'. Discuss   14M

(OR)

2. Every one desires for a luxury car. Does this mean that the demand for luxury car is large? Clarify   14M

UNIT – II

3. What are Iso costs and Iso quants? Do they intersect each other? Explain with an illustration.   14M

(OR)

4. Sales are Rs.1,10,000 producing a profit of Rs. 40,000 in period-1. Sales are Rs.1,15,000 producing a profit of Rs. 12,000 in period-2.Determine the BEP and fixed cost.   14M

UNIT – III

5. Explain how the price is determined under conditions of perfect competition. Illustrate this with the help of diagram   14M

(OR)

6. What are the objectives and policies of making pricing methods?   14M

UNIT – IV

7. Explain the need for public enterprises in India. Do you think public enterprise as a whole have fulfilled that need?   14M

(OR)

8. Give ranks to the projects P and Q in order of profitability according to   14M

a) Payback period

b) Net Present Value at 10% cost of capital

Project	Initial outflow (Rs)	Annual cash inflow (Rs)	Life (Years)
P	50,000	10,000	5
Q	10,000	5,000	6

UNIT-V

9. Journalise the following transactions in the books of Senthil 2019 April

       1 Started business with cash Rs 4,000

       4.Purchased goods from Prasad for Rs 3,271

       9.Sold goods to Hari krishna Rs 1,293

       10.Cash Cases Rs 372

       12. Sold goods to Babulal for Rs 631   14M

       14.Paid to Prasad on Account Rs 1,500

       16.Paid salaries Rs 500

       30. Rent Paid Rs 400

(OR)

10. From the following Trial Balance extracted from the books of Hari&Co Ltd Prepare Final Accounts.

Debit Balances	Rs	Credit Balances	Rs
Salaries	2,000	Bills Payable	5,000
Bills Receivable	5,000	Discount received	700
Wages	1,500	Capital	20,000
Carriage Inwards	200	Sales	10,000
Bad Debts	500		
Miscellaneous expenses	1,000		
Purchase of Raw materials	12,000		
Furniture	1,500		
Insurance premium	6,000		
Depreciation	1,000		
Closing stock	5,000		
	35,700		**35,700**

14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: HYDRAULIC MACHINERY (CE - Readmitted)

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 geometric, kinematic and dynamic similarities.   7M
   (b) Obtain an expression for the force exerted by a jet of water on an inclined fixed plate   7M
       in the direction of the jet.

(OR)

2. (a) Explain the terms: distorted models and undistorted models. What is the use of distorted   7M
       models?
   (b) A jet of water of diameter 7.5 cm strikes a curved plate at its centre with a velocity of   7M
       20 m/s. The curved plate is moving with a velocity of 8 m/s in the direction of the jet.
       The jet is deflected through an angle of 165^0. Assuming the plate to be smooth find:
       (i)   Force exerted on the plate in the direction of the jet,
       (ii)   Power of the jet and   (iii) Efficiency of the jet.

UNIT – II

3. (a) How are hydraulic turbines classified? Explain.   7M
   (b) Show the efficiency of a free jet striking normally on a series of flat plates mounted on   7M
       the periphery of a wheel can never exceed 50%.

(OR)

4. (a) Briefly explain about elements involved in Hydroelectric power plants.   7M
   (b) Obtain an expression for the work done per second by water on the runner of a Pelton   7M
       wheel. Also derive the expression for the hydraulic efficiency.

UNIT – III

5. (a) What is a draft-tube? Why is it used in a reaction turbine? Describe with sketches two   7M
       different types of draft-tubes.
   (b) Explain the factors influencing the selection of a particular turbine for a hydropower   7M
       project.

(OR)

6. (a) Define the specific speed of a turbine. Derive an expression for the specific speed.   7M
       What is the significance of the specific speed?
   (b) Explain the performance characteristic curves of a turbine.   7M

UNIT – IV

7. (a) What is the difference between single-stage and multistage pumps? Describe multistage   7M
       pump with (i) impellers in parallel and (ii) impellers in series.
   (b) Explain the working principles of a centrifugal pump with sketches.   7M

(OR)

8. (a) Draw and discuss the main and operating characteristic curves of a centrifugal pump.   7M
   (b) Define specific speed of a centrifugal pump. Derive an expression for the same.   7M

UNIT-V

9. (a) What is a reciprocating pump? Describe the principle and working of a single acting   7M
       reciprocating pump with a neat sketch.
   (b) What is a hydraulic intensifier? Explain its principle and working.   7M

(OR)

10. (a) Differentiate between a single acting reciprocating pump and double acting   7M
        reciprocating pump.
    (b) Draw a neat sketch and explain the principle and working of a hydraulic press.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Soft Computing Techniques (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 artificial intelligence? What is an AI technique?	4M
	(b)	Explain the three most important AI techniques.	10M

(OR)

2.	What is the symbolic reasoning system and explain the different reasoning methods?	14M

UNIT – II

3.	(a)	What is an Artificial Neural Network? Draw its architecture.	4M
	(b)	Compare Artificial Neural Network and Biological Neural Network. Give the various characteristics of ANN?	10M

(OR)

4.	Explain in detail the architecture of McCulloch-Pitt's neuron model and also realize the 2 input AND & OR gate?	14M

UNIT – III

5.	Discuss about the application of ANN in Induction Motor Speed control technique.	14M

(OR)

6.	(a)	List various applications of ANN in Electrical Power Systems.	4M
	(b)	Write about ANN approach to Load Forecasting problem.	10M

UNIT – IV

7.	(a)	What is the difference between classical sets and fuzzy sets?	7M
	(b)	Explain various operations of Fuzzy sets with suitable examples.	7M

(OR)

8.	(a)	What is membership function? What are the various membership functions that used in fuzzy logic?	7M
	(b)	Let X={a,b,c,d},Y={1,2,3,4} & A={(a,0) (b,0.8) (c,0.6) (d,1)}, B={(1,0.2),(2,1),(3,0.8),(4,0)}, C= {(1, 0.2),(2,0.4),(3,1),(4,0.8)}. Determine the implication relations(i) if X is A THEN Y is B (ii) if X is A THEN Y is B,ELSE Y is C.	7M

UNIT-V

9.	Explain elaborately about fuzzy logic application in speed control of Induction Motor.	14M

(OR)

10.	What is Automatic Voltage Regulator? Explain the fuzzy logic implementation in Automatic voltage regulator?	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Power System Operation and Control (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) Derive general transmission line loss formula and state the assumptions made for calculating B- coefficients.   8M

   (b) In a thermal power station, incremental costs are given by the following equations: 6M

   dc_1/dp_1 = Rs. $(0.15P_1 + 12)$;

   dc_2/dp_2 = Rs. $(0.05P_2 + 14)$.

   dc_3/dp_3 = Rs. $(0.21P_3 + 13)$;

   Where P_1, P_2 and P_3 are the loads in MW. Determine the economical load allocation between the three units, when the total load on the station is 300 MW

(OR)

2. (a) Explain various factors to be considered in allocating generation to different power stations for optimum operation.   6M

   (b) A system consists of two generating plants with fuel costs of: 8M

   $C_1 = 0.03P_1^2 + 15P_1 + 1.0$

   $C_2 = 0.04P_2^2 + 21P_2 + 1.4$

   The system operates on economic dispatch with 120MW of power generation by each plant. The incremental transmission loss of plant '2' is 0.15. Find the penalty factor of plant '1'.

UNIT – II

3. (a) Explain the need of an optimal unit commitment problem.   7M

   (b) Explain different constraints considered in solving a unit commitment problem.   7M

(OR)

4. (a) A power system network with a thermal power plant is operating by four generating units. Determine the most economical unit to be committed to a load demand of 8 MW. Also, prepare the UC table for the load changes in steps of 1 MW starting from the minimum to the maximum load. The minimum and maximum generating capacities and cost-curve parameters of the units listed in a tabular form are given in Table given below.   14M

   Capacities and cost-curve parameters of the units

Unit number	Capacity (MW)		Cost-curve parameters		
	Min.	Max.	A	b	d
1	1.0	14.0	0.74	22.9	0
2	1.0	14.0	1.56	25.9	0
3	1.0	14.0	1.97	29.0	0
4	1.0	14.0	1.36	31.2	0

UNIT – III

5. (a) Obtain the condition for economic generation of steam and hydro plants for short term scheduling. State any assumptions that are considered.   8M

(b) Two generators rated 300 MW and 400 MW respectively are operating in parallel. The droop characteristics of their governors are 4% and 6% respectively from no load to full load. The speed changers of the governors are set so that a load of 400 MW is shared among the generators at 50 Hz in the ratio of their ratings. What are the no load frequencies of the generators? **6M**

(OR)

6. (a) Derive the transfer function of speed governor and represent its block diagram. **14M**

UNIT – IV

7. (a) With a neat block diagram, explain the single area load frequency control system with different modules. **14M**

(OR)

8. (a) Show that the steady change in frequency in load frequency control of an isolated power can be reduced to zero, if the change in controlling force applied to the speed changer is equal to the change in load demand. **14M**

UNIT-V

9. (a) The two area system has the following data: **14M**
Capacity of area 1, P_{r1} = 1000 MW,
Capacity of area 2, P_{r2} = 2000 MW,
Nominal load of area 1, P_{D1}= 500 MW
Nominal load of area2, P_{D2}= 1500 MW
Speed regulation of area 1= 4%
Speed regulation of area 2= 3%
Find the new steady state frequency and change in the line for a load change of area 2 by 125 MW. For both the areas each percent change in frequency causes 1 percent change in load. Find also the amount of additional frequency drop if the interconnection is lost due to certain reasons.

(OR)

10. (a) What are the basic requirements needed for control strategy in LFC system **5M**
(b) Obtain the mathematical modeling of tie-line power in an inter connected system and draw its block diagram **9M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Power Systems-III (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 idea behind performing power flow analysis of any given power system?   7M
    (b) For the two bus system with the data given below $Y_{11}=Y_{22}=1.6\angle -80^0$ p.u. and $Y_{21} = Y_{12} = 1.9\angle 100^0$ p.u. Determine the p.u. voltage at bus 2 by the GS-method after 2-iterations. Given $P_2 = 0.5$, $Q_2 = 0.3$ and $V_1 = 1.1\angle 0^0$.   7M

(OR)

2. (a) What is acceleration factor? What is its role in GS-method for power flow studies?   7M
    (b) Write the algorithm for GS-method considering without PV Buses.   7M

UNIT – II

3. (a) Derive the jacobian matrix for NR method.   7M
    (b) Write the algorithm for NR method considering without PV Buses.   7M

(OR)

4. The following is the system data for a load flow solution: The load flow data for the sample power system are given below. The voltage magnitude at bus 2 is to be maintained at 1.04 p.u. The maximum and minimum reactive power limits of the generator at bus 2 are 0.35 and 0.0 p.u. respectively. Determine the set of load flow equations at the end of first iteration by using Newton-Raphson method.   14M

Impedance for sample system:

Bus code	Impedance	Line charging admittance
1–2	$0.08 + j0.24$	0.0
1–3	$0.02 + j0.06$	0.0
2–3	$0.06 + j0.18$	0.0

| Bus code	Assumed voltages	Generation MW	MVAR	Load MW	MVAR
1	$1.06 + j0.0$	0	0	0	0
2	$1.0 + j0.0$	0.2	0.0	0.0	0.0
3	$1.0 + j0.0$	0	0	0.6	0.25

UNIT – III

5. A synchronous generator of reactance 1.20 pu is connected to an infinite bus bar (IVI = 1.0 pr) through transformers and a line of total reactance of 0.60 pu. The generator no load voltage is 1.20 pu and its inertia constant is H = 4 MW-s/MVA. The resistance and machine damping may be assumed negligible. The system frequency is 50 Hz. Calculate the frequency of natural oscillations if the generator is loaded to   14M
    (a) 50%   (b) 80% of its maximum power limit.

(OR)

6. (a) Explain the various methods of improving steady state stability limit in a power system.   4M
    (b) Derive the power angle equation of a power system. Also explain in detail, the power angle curve.   10M

UNIT – IV

7.   Find the critical clearing angle for the system shown in Fig. for a three phase fault at point P.   14M
      The generator is delivering 1.0 pu. Power under prefault conditions.
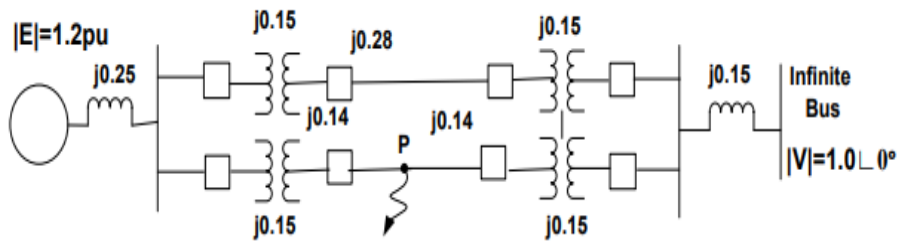
(OR)

8.   Derive the Critical Clearing Angle and Critical Clearing Time.   14M

UNIT-V

9.   (a)   A surge of 15 kV magnitude travels along a cable towards its junction with an   7M
            overhead line. The inductance and capacitance of the cable and overhead line are
            respectively 0.3 mH, 0.4 µF and 1.5 mH, 0.012 µF per km. Find the voltage rise at the
            junction due to the surge.

      (b)   Explain type of transients in power system   7M

(OR)

10.   (a)   Explain briefly about attenuation distortion   7M

      (b)   A 500 kV 2 µ sec rectangular surge on a line having a surge impedance of   7M
            350 ohms approaches a station at which the concentrated earth capacitance
            is 3000 pF. Determine the maximum value of the transmitted wave.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Power Semiconductor Drives (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) Derive the fundamental torque equation of any motor loaded system including the components of load torque.   7M
   (b) Explain the multi quadrant operation of electrical drives in detail.   7M

(OR)

2. (a) Briefly discuss various parts of an electric drive with neat block diagram. What are the functions of power modulator?   7M
   (b) What are the factors that decide the choice of an electric drive for a given application?   7M

UNIT – II

3. (a) Explain the drive operation in the following modes (a) Acceleration including starting (b) Deceleration including stopping.   7M
   (b) Explain how separately excited d.c. motor is controlled by single phase fully controlled rectifier by assuming continuous conduction mode. Also derive the expression for torque.   7M

(OR)

4. (a) Bring out the need for inner current control loop in the closed loop speed control scheme of a separately excited d.c motor and show that the same can be eliminated if the current error is clamped.   7M
   (b) Distinguish between class A and class B choppers with suitable examples of speed control of motors.   7M

UNIT – III

5. (a) Explain the operation of induction motor drive fed by an ac voltage controller for four quadrant operation   9M
   (b) Explain the concept of direct torque control for an induction motor with a neat sketch   5M

(OR)

6. (a) Explain the operation of voltage source inverter fed induction motor drive with neat diagram   7M
   (b) Explain the concept of vector control for an induction motor with a neat sketch.   7M

UNIT – IV

7. (a) Discuss the VSI method of speed control of synchronous motor.   7M
   (b) Compare the open loop and closed methods of speed control of a synchronous motor   7M

(OR)

8. (a) Explain the operation of a synchronous motor fed from an adjustable frequency current source, with circuit diagram and characteristics curves.   7M
   (b) How do you start a synchronous motor similar to an induction motor? What is the role of damper windings?   7M

UNIT-V

9. (a) Write a brief note on maintenance of motors.   7M
   (b) Briefly discuss the power factor improvement methods   7M

(OR)

10. (a) Briefly discuss the losses in an electric drive system.   7M
    (b) What are the measures to be adopted to conserve energy while operating a drive?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Microprocessors & Microcontrollers (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 Architecture of 8086 Microprocessor.　　8M

   (b) Write short notes on development of Microprocessors.　　6M

(OR)

2. Draw the Pin diagram of 8086 Microprocessor and explain each pin in detail.　　14M

UNIT – II

3. (a) Write an ALP in 8086 to add the given two 16-bit data.　　7M

   (b) Write an ALP in 8086 to reverse the given string.　　7M

(OR)

4. (a) Write an ALP in 8086 to find the largest number in a given block of data.　　7M

   (b) Write an ALP in 8086 to exchange a block of N bytes of data between source and destination.　　7M

UNIT – III

5. (a) What are the basic modes of operations of 8255 and explain in detail.　　7M

   (b) With a neat diagram explain the operation of 8257.　　7M

(OR)

6. (a) With a neat diagram explain the operation of interrupt controller 8259.　　7M

   (b) Explain the block diagram of 8251.　　7M

UNIT – IV

7. Explain in detail about how a traffic light controller is interfaced with 8086.　　14M

(OR)

8. Explain in detail about how an ADC is interfaced with 8086.　　14M

UNIT-V

9. Explain in detail about the Architecture of 8051.　　14M

(OR)

10. (a) Write short notes on Register set of 8051 Microcontroller.　　7M

    (b) Explain in detail about 8051 Microcontroller Instruction Set.　　7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Linear and Digital Integrated Circuit Analysis (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) Draw the block diagram of each block and explain in detail about each block.   8M
    (b) List out the ideal characteristics of OP-AMP and draw the OP-AMP equivalent circuit.   6M

(OR)

2. (a) Draw the circuit diagram of triangular waveform generator and derive the expression   8M
         for oscillation frequency f0.
    (b) Draw the output waveforms of inverting and non-inverting comparator.   6M

UNIT – II

3. (a) Explain the operation of a stable multi vibrator with the help of IC 555.   10M
    (b) Calculate the free running frequency of oscillations for an a stable multi vibrator using   4M
         555 timer with R_A = 6.8 kΩ, R_B = 3.3 kΩ and C = 0.1 μF.

(OR)

4. (a) Draw and explain the operation of PLL with neat block diagram.   8M
    (b) Explain the applications of PLL.   6M

UNIT – III

5. (a) Draw the circuit diagram of totem pole NAND gate and explain its operation.   8M

    (b) Explain low voltage CMOS logic and interfacing.   6M

(OR)

6. (a) Compare the performance of various logic families with reference to power dissipation,   7M
         propagation time delay, Fan in and Fan out.
    (b) Explain the concept interfacing between CMOS and TTL logic.   7M

UNIT – IV

7. (a) Explain structural design elements used in VHDL.   7M
    (b) Explain the terms: Entity declaration and structural description of VHDL. Give suitable   7M
         examples.

(OR)

8. (a) Discuss the steps in VHDL design flow.   7M
    (b) List out different operators used in VHDL. Give an example for each of them.   7M

UNIT-V

9. (a) Design a conversion circuit to convert a D flip flop to J-K flip flop.   7M
    (b) Design a 4-bit binary synchronous counter using 74*74.   7M

(OR)

10. (a) Explain the operation of 4 bit comparator and write VHDL code for it.   7M
    (b) Explain the operation of 4 to 2 priority encoder and write VHDL code for it   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Computer Networks (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. With the help of a neat diagram explain each layer of OSI model and give the list of protocols in each layer   14 M

(OR)

2. (a) Explain in detail about personal and local area networks   7 M
    (b) Discuss briefly about topologies   7 M

UNIT – II

3. (a) Explain about any two guided transmission media   7 M
    (b) Calculate the throughput of stop and wait protocol. If the frame size is 4800 bits, bit rate is 9600 bps and the distance between device is 2000 km, speed of propagation over the propagation transmission is 2,00,000 km/sec.   7 M

(OR)

4. (a) Explain in detail about selective repeat request protocol   7 M
    (b) Consider GB-4 protocol, if 15 packets are being transmitted, assuming every 8th packet is lost. Find in how many transmissions all the packets are being transmitted   7 M

UNIT – III

5. (a) Discuss in detail about ALOHA   7 M
    (b) Explain any two collision free protocols   7 M

(OR)

6. (a) The stations on a wireless ALOHA network are 600 km apart. Assuming the signals propogated at light speed. Determine the propogation time.   7 M
    (b) Explain about IPv4 by giving details about the header   7 M

UNIT – IV

7. Discuss in detail about elements of transport protocol   14 M

(OR)

8. (a) Explain about Remote Procedure Call   7 M
    (b) Describe Real time transport protocol   7 M

UNIT-V

9. Discuss in detail with examples about DNS   14 M

(OR)

10. (a) Explain the architecture of email.   7 M
    (b) Discuss message formats in email   7 M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Microcontrollers and Applications (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) Draw the pin diagram of 8051 Microcontroller and explain about each pin   7M
    (b) Explain with an example about the following with respect to 8051.   7M
        i)   Arithmetic instructions ii) Branch instructions

(OR)

2. (a) Explain each PORT circuitry available in 8051   7M
    (b) Interface 16Kbytes of ROM and 8Kbytes of RAM to the 8051 microcontroller, such that the starting address of ROM is C000H and RAM is 8000H   7M

UNIT – II

3. (a) Define the term assembler directive? and explain the with an example any three of them   7M
    (b) Write an assembly language program for interfacing an alphanumeric LCD to the 8051. Draw the interfacing diagram   7M

(OR)

4. (a) Explain interrupt structure of 8051   7M
    (b) Explain the different timers in the existing in 8051   7M

UNIT – III

5. (a) Explain addressing modes supported by ARM   6M
    (b) What is pipeline concept of ARM 7 architecture, explains it with proper block diagram. How it effects the system performance?   8M

(OR)

6. (a) Explain the architecture of the ARM7 core with a neat diagram.   7M
    (b) Explain briefly about the ARM9 Processor.

UNIT – IV

7. (a) Explain the major design rules for implementing RISC and ARM philosophy   7M
    (b) Explain Arithmetic and logical instructions of ARM   7M

(OR)

8. (a) How can we change the PSR contents through instructions in ARM? Explain different PSR instructions in ARM   7M
    (b) Write an assembly language program to transfer a block of data in memory using load and store instructions of the ARM47   7M

UNIT-V

9. (a) What is IoT? What is the impact of Internet of Things in our lives, explain with examples   7M
    (b) Discuss about various deployment models in IoT   7M

(OR)

10. (a) Sketch IoT with different Layers and explain   7M
    (b) Explain different communication models in IoT   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Control 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) Classify different types of control systems. List out merits and demerits of open loop and closed loop control system?   6M

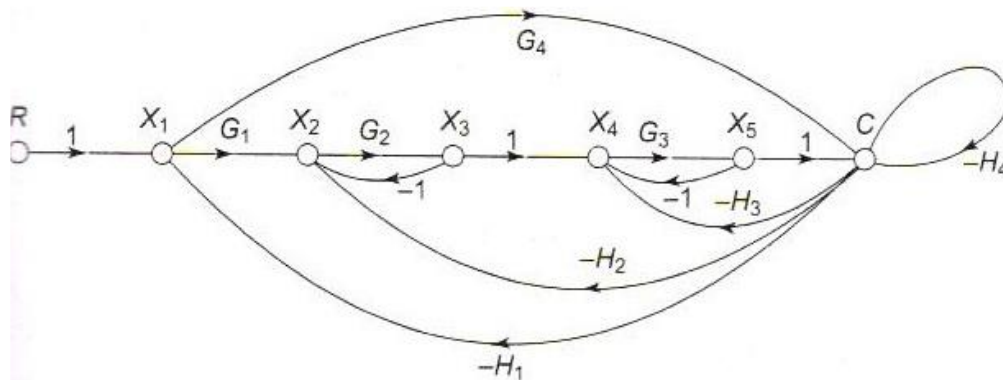   (b) For the signal flow graph shown below fig.1 using Mason's gain formula obtain $C(s)/R(s)$.   8M

Fig.(1)

(OR)

2. (a) Explain the effects of feedback in closed loop control systems.   6M

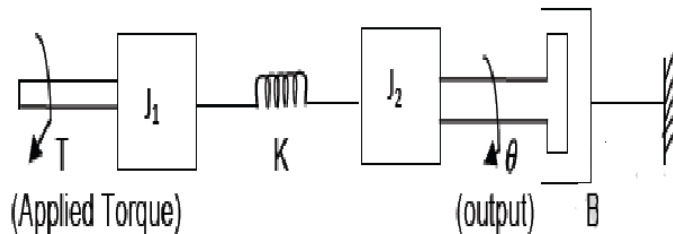   (b) Find the transfer function $\dfrac{T(s)}{\theta(s)}$ for the Fig. 2 shown   8M

Fig.(2)

UNIT – II

3. (a) Derive the time response of second order under damped system due to unit step input   6M

   (b) For a negative feedback control system having forward path transfer function: 8M

   $G(s) = \dfrac{K}{S\,(S+6)}$ and $H(s) = 1$, determine the value of gain K for the system to have damping ratio of 0.8. For this value of gain K, determine the complete time response specifications.

(OR)

4. (a) Define time constant and explain its importance   5M

   (b) The unit step response of a second order linear system with zero initial state is given by $c(t) = 1+1.25\ e^{-6t}$ (sin 8 t-tan-1 1.333). Determine the damping ratio, undamped natural frequency of oscillations and peak overshoot.   9M

UNIT – III

5. Construct the root locus diagram for the system given in Fig. 3 below. Hence find   14M

   (a) The maximum and minimum values of K for the system stability and

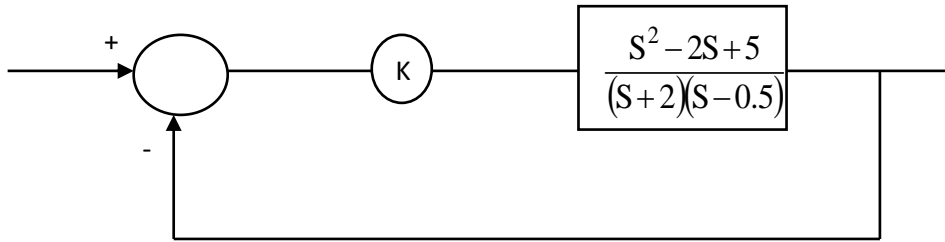   (b) The value of K in the system characteristic equation that gives a damping ratio of 0.6.

Fig.(3)

(OR)

6. A feedback control system has an open-loop transfer function   14M

   $G(s)\,H(s) = \dfrac{K}{S(S+3)(S^2+2S+2)}$. Find the root locus as K is varied from 0 to ∞. Also find the value of K on imaginary axis if locus crosses imaginary axis.

UNIT – IV

7. Draw the bode plots and find gain margin and phase margin of the system represented   14M
   by $G(s)\,H(s) = \dfrac{10(S+1)}{S(S+0.5)(S+3)(S+1)}$

(OR)

8. (a) State and explain the Nyquist stability criterion.   6M

   (b) The open loop transfer function of a negative feedback control system is given by   8M
   $G(s)H(s) = \dfrac{K}{(S+1)(S+2)(S+3)}$. Using Nyquist stability criterion, find the range of values of K for which the system remains stable

UNIT-V

9. A unity feedback system has an open loop transfer function $G(s) = \dfrac{K}{S(S+1)}$. Design a suitable lag compensator so that phase margin is 40° and the steady state error for ramp input is less than or equal to 0.2.   14M

(OR)

10. (a) What are different types of compensators available? Explain briefly.   7M

    (b) Show that the lead network and lag network inserted in cascade in an open loop acts as proportional-plus-derivative control (in the region of small ω) and proportional-plus-integral control (in the region of large ω) respectively.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Microwave Engineering (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 bunching process of two cavity klystron amplifier with Applegate diagram and also derive the equations for power efficiency.	10M
	(b)	Compare 'O' type and 'M' type tubes.	4M

(OR)

2.	(a)	Define Electronic Admittance of a reflex klystron and explain it with necessary equations	7M
	(b)	Draw and explain of Two-cavity klystron amplifier.	7M

UNIT – II

3.	(a)	Explain how gain of TWT amplifier is more compared to Klystron amplifiers?	7M
	(b)	What are the applications of Magnetron oscillator?	7M

(OR)

4.	(a)	What is Hull cut off condition? Derive the equation for Hull cut off voltage	7M
	(b)	Explain how cross field is used to generate oscillations in Magnetron?	7M

UNIT – III

5.	(a)	Draw the characteristics of Gunn diode and explain how negative resistance region is obtained?	7M
	(b)	Explain about Tunnel diode.	7M

(OR)

6.	(a)	Explain Varactor diode with neat sketch.	7M
	(b)	Discuss about construction and operation of Schottky Barrier diode.	7M

UNIT – IV

7.	(a)	From the first principles derive the S matrix parameters of Directional coupler.	7M
	(b)	Discuss the structure and principle of operation of Circulator.	7M

(OR)

8.	(a)	Derive scattering matrix of H – plane tee using S – parameter theory.	7M
	(b)	Explain with diagrams waveguide corner, bends, twists.	7M

UNIT-V

9.	(a)	Explain in detail the measurement of VSWR through return loss measurements.	7M
	(b)	Write advantages of hybrid MICs.	7M

(OR)

10.	(a)	Discuss in detail the power measurement using microwave devices	7M
	(b)	Give advantages and limitations of micro striplines.	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Digital Signal 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) A linear shift invariant system is described by the differential equation   9M

$$y(n) - \frac{3}{4}y(n-1) + \frac{1}{8}y(n-2) = x(n) + x(n-1)$$

with $y(-1) = 0$ and $y(-2) = -1$. Find
   - i.   the natural response of the system
   - ii.   the forced response of the system for a step input and
   - iii.   the frequency response of the system.

   (b) Prove that the sequences   5M
   - i. $x(n) = a^n u(n)$
   - ii. $x(n) = -a^n u(-n-1)$

   have the same $X(z)$ and differ only in ROC. Also plot their ROCs.

(OR)

2. (a) State and prove the following properties of Z-Transforms: 12M
   - i.   Time shifting
   - ii.   Differentiation in z-domain
   - iii.   scaling in z-domain
   - iv.   Convolution

   (b) Find the ROC and Z-transform of the causal sequence   2M
   $x(n) = \{1,0,-2,3,5,4\}$
      ↑

UNIT – II

3. (a) List and explain the properties of DFT.   5M
   (b) Find the linear convolution of the following sequences using DFT: 9M
   - i. $x(n) = \{1,-2,4\}, h(n) = \{2,1,2,1\}$
   - ii. $x(n) = \{2,3,4\}, h(n) = \{3,7,0,5\}$
   - iii. $x(n) = \{1,2,1\}, h(n) = \{2,0,1\}$

(OR)

4. (a) Develop DIF FFT algorithms for decomposing the DFT for $N = 12$ and draw the   7M
   flow diagrams for:
   - i. $N = 3 \times 4$ and
   - ii. $N = 4 \times 3$.

   (b) Explain radix-2 DIT FFT algorithm and draw the butterfly diagram for 8-point DIT   7M
   FFT.

UNIT – III

5. Obtain the direct form I, direct form II, cascade, and parallel structures for the   14M
   following systems:
   - i. $y(n) = -0.1y(n-1) + 0.72y(n-2) + 0.7x(n) - 0.252x(n-2)$
   - ii. $y(n) = -.01y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$

(OR)

6. (a) Discuss the basic elements used to construct the block diagram of discrete-time systems. 5M

   (b) Consider an FIR filter with system function 9M
   $$H(z) = 1 + 2.88z^{-1} + 3.4048z^{-2} + 1.74z^{-3} + 0.4z^{-4}$$

   Sketch the direct form and lattice realizations of the filter and determine in detail the corresponding input-output equations. Is the system minimum phase?

UNIT – IV

7. (a) Design a Digital Chebyshev Type-1 Band pass filter with following specification: 10M
   $$\left|H\left(e^{j\omega}\right)\right| = \begin{cases} -3dB, & 0.55\pi \le \omega \le 0.65\pi \\ -15dB, & 0 \le \omega \le 0.1\pi \quad and \quad 0.95\pi \le \omega \le \pi \end{cases}$$

   Using Bilinear transformation.

   (b) Compare Butterworth and Chebyshev approximations. 4M

(OR)

8. (a) Convert the analog filter with system function $H_a(s)$ into a digital IIR filter by means of the impulse invariance method. 9M
   $$H_a(s) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

   (b) Compare and contrast analog and digital filters. 5M

UNIT-V

9. (a) Design an FIR Digital Low pass filter using Hanning window whose cut-off frequency is 2 rad/s and length of window N=9. 9M

   (b) Discuss the frequency sampling method of FIR filter design. 5M

(OR)

10. (a) Explain FIR filter design using windowing method. 7M

    (b) List and explain the steps in the design of FIR filters. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Power Plant Engineering (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 and explain the general layout of different circuits in modern thermal power plant   14M

(OR)

2. Draw a neat line diagram of in plant coal handling and indicate the names of equipment's used at different stages?   14M

UNIT – II

3. Draw a neat diagram of a diesel power plant showing all systems and explain it?   14M

(OR)

4. (a) What are the advantages and disadvantages of closed cycle gas turbine over open cycle gas turbine plant?   7M

    (b) Make a schematic diagram of a gas turbine plant employing a generator. Draw T-ϕ (Temperature –Entropy).Diagram showing the above arrangement?   7M

UNIT – III

5. (a) Explain any five different types of spill ways with sketches?   7M

    (b) Define Hydrology. Draw and explain the hydrological cycle?   7M

(OR)

6. Explain the working principle of homogenous reactor with a neat sketch?   14M

UNIT – IV

7. (a) Describe with a neat sketch the working of a wing energy conversion system(WECS) with main components?   7M

    (b) Explain the working of a flat plate collector?   7M

(OR)

8. Demonstrate the working of closed cycle MHD system with a neat sketch and also write the advantages and disadvantages of MHD system?   14M

UNIT-V

9. (a) Explain the terms, Maximum demand. Demand factor, load factor, diversity factor with reference to a power system?   7M

    (b) what are the factors effecting the economics of generation and distribution of power?

(OR)

10. A generating station has a maximum demand of 20 MW, Load factor of 60%, plant capacity of 48%,and a plant use factor of 80% .Find
    i) The daily energy produced   ii)The reserve capacity of the plant
    iii) The maximum energy that could be produced daily if the plant were running all the time
    iv) The maximum energy that could be produced if the plant when running according to the operati
    ng schedule were fully loaded?   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Refrigeration and Air Conditioning (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 any four methods of Refrigeration methods. **8M**
   (b) A Carnot refrigerator requires 1.3KW per ton of refrigeration to maintain a temperature **6M**
       of -40^0C. Determine
       (i) COP of the refrigerator (ii) The temperature at which heat is rejected
       (iii) The amount of heat rejected in KJ/min

(OR)

2. (a) A refrigerator working on Bell-Coleman cycle operates between pressure limits of 1.05 **8M**
       bar and 8.5 bar. Air is drawn from the cold chamber at 10^0C. Air coming out of the
       compressor is cooled to 30^0C before entering the expansion cylinder. Expansion and
       compression follow the law $PV^{1.35}$ = constant. Determine COP of the system.
   (b) Describe the heat sources responsible for cooling the Aircraft. **6M**

UNIT – II

3. (a) Find the theoretical COP of a CO_2 machine working between the temperature range of **8M**
       25^0C and -5^0C. The dryness fraction of CO_2 gas during the suction stroke is 0.6.
       Following properties of CO_2 are given

Temp ^0C	Liquid		Vapor		Latent Heat KJ/Kg
	Enthalpy kJ/Kg	Entropy kJ/Kg-K	Enthalpy kJ/Kg	Entropy kJ/Kg-K	
25^0C	164.77	0.5978	282.23	0.9918	117.46
-5^0C	72.57	0.2862	321.33	1.2146	248.76

   (b) Explain the effect of sub cooling and superheating on the performance of VCRS with **6M**
       the help of T-S and p-h diagrams.

(OR)

4. (a) Explain the working principle of Electrolux refrigerator (3fluid absorption systems) **7M**
       with a neat sketch.
   (b) In an absorption refrigeration system, heating, cooling and refrigeration takes place at **7M**
       temperatures 120^0C, 30^0C and -10^0C. Find out.
       (i) Ideal COP of the system
       (ii) If the heating temperature is increased to 160^0C and refrigeration temperature is
           decreased to -20^0C, find out percentage change in ideal COP.

UNIT – III

5. (a) Explain the working principle of steam jet refrigeration system with a neat sketch. **7M**
   (b) In a Steam jet refrigeration system dry saturated steam at 7 bar abs. pressure is supplied. **7M**
       The flash chamber temperature is 5^oC, the condenser temperature is 40^oC, make up
       water is supplied at 20^oC. Assuming that quality of motive steam and flash vapour at
       the beginning of compression as 93% dry and efficiency of the nozzle, efficiency of
       entertainment and the efficiency of the thermo-compressor as 90%; 65%and91%
       respectively. Determine:
       (i) Weight of steam required per hour per ton of refrigeration.
       (ii) The volume of vapour removed from the °ash chamber per hour per ton of
       refrigeration.

(OR)

6. (a) Explain the working principle of a Vortex Tube with a neat sketch. **7M**

	(b)	Find the expression for mass of motive steam required for a steam jet refrigeration system.	**7M**

UNIT – IV

7.	(a)	Distinguish between 'Ventilation air' and 'Infiltrated air' with suitable examples.	**6M**
	(b)	A class room of 60 seating capacity is air-conditioned. The outdoor conditions are 32^0C DBT & 22^0C WBT and the required comfort conditions are 22^0C & 55% RH. The quantity of outdoor air supplied is $0.5 m^3$/min/student. The comfort conditions are achieved first by chemical dehumidifying the air and then cooling by cooling coil. Find, (i) DBT of air leaving the dehumidifier. (ii) Capacity of dehumidifier.	**8M**

(OR)

8.	(a)	Explain the following processes and represent it on psychometric chart.	**6M**

   i)   Cooling and dehumidification.
   ii)   Heating and humidification
   iii)   Adiabatic saturation temperature

	(b)	The following data apply to an air conditioning system: Room sensible heat =41868 kJ/hr room latent heat=41868 kJ/hr; inside design condition= 25^0C, 50% RH, outside design condition=35^0C,DBT, 27.8 WBT. Return air from the room is mixed with the outside air before entering the cooling coil in the ratio of 4:1. Return air from the room is mixed with the cooling air, i.e. after the cooling coil in the ratio of 1:4. Cooling coil by pass factor is 0.1. The air may be reheated if necessary before supplying to the conditioned space. Assume ADP as 10^0C and determine, i) Supply air conditions into the room ii) Refrigeration load due to the reheat iii) Total refrigeration capacity iv) The quantity of fresh air supplied.	**8M**

UNIT-V

9.	(a)	What is comfort air-conditioning? Draw a rough comfort chart.	**7M**
	(b)	Explain year-round air conditioning system with the help of a neat sketch.	**7M**

(OR)

10.		Calculate the following when the DBT is 35° C, WBT is 23° C and the barometer reads	
	(a)	750mm Hg: (i) Relative humidity (ii) Humidity ratio (iii) DPT (iv) Density (v) Enthalpy of atmospheric air	**8M**
	(b)	Explain with the help of a neat sketch the summer air conditioning for hot and dry outdoor conditions.	**6M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Dynamics of Machinery - II (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 expression for magnitude of gyroscopic couple.   7M

   (b) A uniform disc of diameter 300 mm and of mass 5 kg is mounted on one end of an arm of length 600 mm. The other end of the arm is free to rotate in a universal bearing. If the disc rotates about the arm with a speed of 300 r.p.m. clockwise, looking from the front, with what speed will it precess about the vertical axis?   7M

(OR)

2. (a) Discuss the effect of gyroscopic couple on a naval ship during pitching.   7M

   (b) An aeroplane makes a complete half circle of 50 metres radius, towards left, when flying at 200 km per hr. The rotary engine and the propeller of the plane have a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 r.p.m. clockwise when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it.   7M

UNIT – II

3. Discuss how a single revolving mass is balanced by two masses revolving in different planes   14M

(OR)

4. (a) Draw and explain Klien's construction for determining the velocity of the piston in a slider crank mechanism.   7M

   (b) If the crank and the connecting rod are 300 mm and 1 m long respectively and the crank rotates at a constant speed of 200 r.p.m., determine:
   a) The crank angle at which the maximum velocity occurs, and
   b) Maximum velocity of the piston.   7M

UNIT – III

5. Derive the following expressions, for an uncoupled two cylinder locomotive engine: 14M
   a) Variation of tractive force
   b) Swaying couple and
   c) Hammer blow

(OR)

6. A four cylinder vertical engine has cranks 150 mm long. The planes of rotation of the first, second and fourth cranks are 400 mm, 200 mm and 200 mm respectively from the third crank and their reciprocating masses are 50 kg, 60 kg and 50 kg respectively. Find the mass of the reciprocating parts for the third cylinder and the relative angular positions of the cranks in order that the engine may be in complete primary balance.   14M

UNIT – IV

7. Derive an expression for natural frequency of free vibrations of a shaft fixed at both ends carrying a uniformly distributed load.   14M

(OR)

8. (a) Sketch and explain the longitudinal and transverse vibrations.   7M

   (b) A shaft 50 mm diameter and 3 metres long is simply supported at the ends and carries three loads of 1000 N, 1500 N and 750 N at 1 m, 2 m and 2.5 m from the left support. The Young's modulus for shaft material is 200 GN/m^2. Find the frequency of transverse vibration.   7M

UNIT-V

9.   A single cylinder oil engine drives directly a centrifugal pump. The rotating mass of   14M
the engine, flywheel and the pump with the shaft is equivalent to a three rotor system
as shown in fig. the mass moment of inertia of the rotors A, B and C are 0.15, 0.3 and
0.09kg-m^2. Find the natural frequency of the torsional vibration. The modulus of
rigidity for the shaft material is 84kN/mm^2.
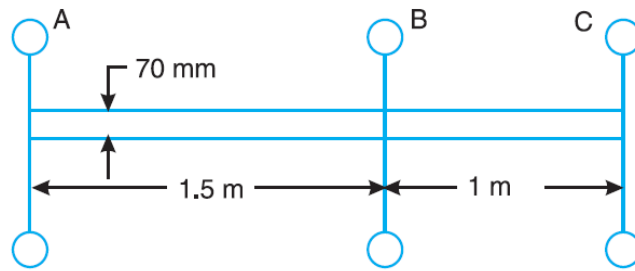
(OR)

10.   Discuss the vibration Isolation and Transmissibility.   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Operations Research (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 company is manufacturing two different products, A and B. Each product   14M
   has to be processed on two machines M_1 and M_2. Product A requires 2 hours
   on machine M_1 and 1 hour on machine M_2, product B requires 1 hour on
   machine M_1 and 2 hours on machine M_2. The available capacity of machine
   M_1 is 104 hours and that of machine M_2 is 76 hours. Profit per unit for product
   A is Rs.6 and that for B is Rs.11.

   (i) Formulate the problem.
   (ii) Find out the optimal solution by simplex method.

(OR)

2. Find the dual of the following primal problem and solve   14M

   Minimize $Z = 40x_1 + 200 x_2$

   Subject to the constraints

   $$4x_1 + 40x_2 \geq 160$$
   $$3x_1 + 10x_2 \geq 60$$
   $$8x_1 + 10x_2 \geq 80$$
   $$x_1, x_2 \geq 0$$

UNIT – II

3. A company has three plants A,B, and C and three warehouses P,Q and R. The   14M

   transportation cost per unit, demand of each warehouse and capacity of each

   plant are as given in the table below. Find the optimum transportation plan.

Plant	Warehouses			Capacity
	P	Q	R	
	Transportation cost(Rs.)			
A	50	80	100	400
B	22	90	40	500
C	70	100	55	300
Demand	400	400	400	

(OR)

4. A company solicits bids on each of four projects from five contractors. Only one project may be assigned to any contractor. The bids received (in thousands of rupees) are given in the following table. Contractor D feels to carry out project 3 and therefore, submits no bids. **14M**

Project	Contractor				
	A	B	C	D	E
1	18	25	22	26	25
2	26	29	26	27	24
3	28	31	30	-	31
4	26	28	27	26	29

(i) Use the Hungarian method to find the set of assignments with the smallest possible total cost.

(ii) What is the minimum total achievable cost?

UNIT – III

5. The data collected in running a machine , the cost of which is Rs.30,000 are given below: **14M**

Year	1	2	3	4	5
Resale value(Rs.)	21000	15000	10200	7200	4825
Cost of spares(Rs.)	2,000	2135	2440	2850	3400
Cost of labour(Rs.)	7000	8000	9000	10500	12500

Determine the optimum period for replacement of the machine.

(OR)

6. Solve the following sequencing problem, giving an optimal solution when passing is not allowed. **14M**

Job	A	B	C	D	E
Machine M_1	10	12	8	15	16
Machine M_2	3	2	4	1	5
Machine M_3	5	6	4	7	3
Machine M_4	14	7	12	8	10

UNIT – IV

7. In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day.   Assuming that the inter arrival time follows Poisson distribution and the service time distribution is exponential with an average 36 minutes, determine **14M**

   i)   Average number of trains in the queue.
   ii)   Probability that the queue size exceeds 10.
   iii)   If the input of the trains increases to an average of 33 per day, what will be the change in (i) and (ii) above?
   iv)   Expected waiting time in the queue.

(OR)

8. Patients arrive at one doctor clinic according to a poison process with a mean inter- arrival time of 20 minutes. Patients spend on an average of 15 minutes for treatment at the doctor. **14M**

(a) What is the probability that a new arrival need not wait for the doctor to be free?

(b) What is the expected number of patients in the clinic?

(c) How much time can a patient expect to wait for his turn?

(d) How much time can a customer expect to spend in the clinic?

(e) Management will put in another doctor when a patient's average time in the Queue exceeds 1.25 hours. How much must the average rate of arrivals increase to warrant a second doctor?

UNIT-V

9. (a) Derive an expression for Economic Run Length(ERL) for production inventory model with suitable assumptions. **6M**

(b) A toy manufacturer uses 48000 rubber wheels per year for its popular truck series. The firm makes its own wheels which it can produce at a rate of 800 perday. The toy trucks are assembled uniformly over the entire year. Carrying cost is Rs.1/- per wheel a year. Setup costs for a production run of wheels is Rs.45/-. The firm operates 240 days per year. Determine: **8M**

      i) The optimum run size

      ii) The minimum total annual cost.

      iii) The run time

(OR)

10. (a) Define simulation? Explain steps in simulation. **6M**

(b) A company trading in motor vehicle spares wishes to determine the level of stock it should carry for the items in its range. Demand is not certain and there is lead time for stock replenishment for one item X. The following information is obtained **8M**

Demand(units/day)	3	4	5	6	7
Probability	0.10	0.20	0.30	0.30	0.10

Carrying cost (per unit per day)=20 Paise

Ordering cost(per order) = Rs.5

Lead time for replacement = 3 days

Stock in hand at the beginning of the simulation exercise was 20 units. You are required to carry out a simulation run over a period of 10 days evaluating the following inventory rule : Order 15 units when present inventory plus any outstanding order falls below 15 units . The sequence of random number used is:

      0,1,1,5,1,8,6,3,5,7,1,2,9.

Using the first number for day one.

Your calculation should include the total cost of operating this inventory rule 10 days.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Design of Machine Elements - II (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 what you understand by A.M. Wahl's factor and state its importance in the design of helical springs?   6M

    (b) A concentric spring for an aircraft engine valve is to exert a maximum force of 5000 N under an axial deflection of 40 mm. Both the springs have same free length, same solid length and are subjected to equal maximum shear stress of 850 MPa. If the spring index for both the springs is 6, find (a) the load shared by each spring, (b) the main dimensions of both the springs, and (c) the number of active coils in each spring. Assume G = 80 kN/mm^2 and diametral clearance to be equal to the difference between the wire diameters.   8M

(OR)

2. (a) What is nipping in a leaf spring? Discuss its role. List the materials commonly used for the manufacture of the leaf springs.   4M

    (b) A semielliptical laminated spring to carry a load of 6000 N is to consist of 7 leaves 65 mm wide two of the leaves extending the full length of the spring. The spring is to be 1.1m in length and attached to the axle by two bolts 80 mm apart. The bolt holds the central portion of the spring so rigidly that they may be considered equivalent to a band having a width equal to the distance between the bolts. Assume a design stress for spring material as 350 MPa. P_b= 8MPa, Bending stress σ_b= 80MPa. Determined a) thickness of leaves b) Deflection of spring c) Diameter of the eye d) Length of Leaves e) Radius to a leaves should be initially bent.   10M

UNIT – II

3. (a) Draw a neat sketch of pressure distribution in a journal bearing and explain the process under static and dynamic conditions   4M

    (b) Design a journal bearing for a centrifugal pump from the following data: Load on the journal = 20 kN; Speed of the journal = 900 r.p.m.; Type of oil is SAE 10, for which the absolute viscosity at 55°C = 0.017 kg / m-s; Ambient temperature of oil = 15.5°C; Maximum bearing pressure for the pump = 1.5 N / mm^2. Calculate also mass of the lubricating oil required for artificial cooling, if rise of temperature of oil be limited to 10°C. Heat dissipation coefficient = 1232 W/m^2.°C.   10M

(OR)

4. (a) Explain with reference to a neat plot the importance of the bearing characteristic curve.   4M

    (b) Design a journal bearing for a centrifugal pump running at 1440 r.p.m. The diameter of the journal is 100 mm and load on each bearing is 20 kN. The factor ZN/p may be taken as 28 for centrifugal pump bearings. The bearing is running at 75°C temperature and the atmospheric temperature is 30°C. The energy dissipation coefficient is 875 W/m^2/°C. Take diametral clearance as 0.1 mm.   10M

UNIT – III

5. (a) Demonstrate the design procedure for cylindrical roller bearings and explain the applications of cylindrical and tapper roller bearings   6M

    (b) A ball bearing subjected to a radial load of 4000 N is expected to have a satisfactory life of 12 000hours at 720 r.p.m. with a reliability of 95%. Calculate the dynamic load carrying capacity of the bearing, so that it can be selected from manufacturer's catalogue based on 90% reliability. If there are four such bearings each with a reliability of 95% in a system, what is the reliability of the complete system?   8M

6. (a) Design a bearing of shaft rotating at constant speed is subjected to variable load. The bearings supporting the shaft are subjected to stationary equalent radial load of 4KN for 15% of time, 3.5KN for 25% of time, 1.5KN for 30% of time and no load for remaining time of cycle. If the total expected for the bearing is 19 million revolutions at 95% reliability, calculate dynamic load rating of the roller bearing? 8M

    (b) Write short notes on classifications and different types of antifriction bearings. 6M

UNIT – IV

7. Design a spur gear drive required to transmit 45 kW at a pinion speed of 800 r.p.m. The velocity ratio is 3.5 : 1. The teeth are 20° full-depth involute with 18 teeth on the pinion. Both the pinion and gear are made of steel with a maximum safe static stress of 180 MPa. Assume a safe stress of 40 MPa for the material of the shaft and key. 14M

(OR)

8. (a) What is a herringbone gear? Where they are used? 6M

    (b) Write the expressions for static strength, limiting wear load and dynamic load for helical gears and explain the various terms used therein. 8M

UNIT-V

9. Design a piston for a four stroke diesel engine consuming 0.3 kg of fuel per kW of power per hour and produces a brake mean effective pressure of the 0.7 N/mm^2. The maximum gas pressure inside the cylinder is 5 N/mm2 at a speed of 3500 r.p.m. The cylinder diameter is required to be 300 mm with stroke 1.5 times the diameter. The piston may have 4 compression rings and an oil ring. The following data can be used for design:

    Higher calorific value of fuel = $46 \times 103kJ/kg$; Temperature at the piston centre = 700 K; Temperature at the piston edge = 475 K; Heat conductivity factor = 46.6 W/m/K; Heat conducted through top = 5% of heat produced; Permissible tensile strength for the material of piston = 27 N/mm^2; Pressure between rings and piston = 0.04 N/mm^2; Permissible tensile stress in rings = 80 N/mm^2; Permissible Pressure on piston barrel = 0.4 N/mm^2; Permissible pressure on piston pin = 15 N/mm^2; Permissible stress in piston pin = 85 N/mm^2. Any other data required for the design may be assumed. 14M

(OR)

10. Design a connecting rod for four stroke petrol engine with the following data Piston diameter is 0.10 m, Stroke is 0.14 m, Length of the connecting rod from centre to centre is 0.315 m, Weight of the reciprocating parts is 18.2 N, Speed is 1500 rpm with possible over speed of 2500 rpm, Compression ratio is 4:1, Probable maximum explosion pressure is 2.45 MPa. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Unix and Shell Programming (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 the architecture of UNIX.   7M
   (b) Explain the advantages of Open Source Systems.   7M

(OR)

2. (a) Explain the structure of File System.   7M
   (b) Explain the allocation of disk block.   7M

UNIT – II

3. (a) Define a system call. Explain the syntax to for various file operations.   8M
   (b) Differentiate named pipe and unnamed pipe. Give example.   6M

(OR)

4. (a) Explain where to use Pipe concept. Give example for a pipeline of three commands.   8M
   (b) Explain popen function with example.   6M

UNIT – III

5. (a) Explain the layout of system memory.   7M
   (b) Explain the manipulation of process address space and give example.   7M

(OR)

6. (a) Explain process termination and awaiting process termination with examples.   8M
   (b) Explain the following commands: at, batch, cron and give examples.   6M

UNIT – IV

7. (a) Explain file handling commands in C shell.   7M
   (b) Explain shell variables.   7M

(OR)

8. (a) Explain passing arguments to shell script.   7M
   (b) Write a shell script that deletes all lines containing the word **Linux** in the files supplied as arguments to this shell script.   7M

UNIT-V

9. (a) Explain Process tracing.   7M
   (b) Explain Unix domain sockets.   7M

(OR)

10. (a) Explain the Inter Process Communication mechanism using Shared Memory.   8M
    (b) Explain the problem of multiprocessor system.   6M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Mobile Application Development (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)	How to create Android virtual devices?	7M
	(b)	How to create the first android project in Android studio?	7M

(OR)

2.	(a)	What is ADB? Why it is required?	7M
	(b)	Explain the basic architecture of Android Application stack?	7M

UNIT – II

3.	(a)	Explain in detail about Android activity life cycle?	7M
	(b)	Explain in detail about Event handling?	7M

(OR)

4.	(a)	Explain Toast concept with example?	7M
	(b)	What are the commonly used layouts and controls?	7M

UNIT – III

5.	(a)	Explain Table Layout with example?	7M
	(b)	Explain about Adapting to Screen Orientation?	7M

(OR)

6.	(a)	Create an Application for progress Bar?	7M
	(b)	Write usage of Assets?	7M

UNIT – IV

7.	(a)	List out and explain different types of dialogs in Android?	7M
	(b)	Write about usage of Spinner Control?	7M

(OR)

8.	(a)	Explain in detail about Fragment?	7M
	(b)	Explain in detail about Date Picker Dialog?	7M

UNIT-V

9.	(a)	What is Menu? List out and explain any two Menus?	7M
	(b)	Explain briefly about SQLite Open Helper Classes?	7M

(OR)

10.	(a)	Write usage of Action Bar?	7M
	(b)	How to create Context Menu? Give any Example?	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Data Mining (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 about Data mining and Knowledge Discovery in Databases.	7M
	(b)	Discuss about various Data mining tasks.	7M

(OR)

2.	(a)	What are the strategies used for dealing the missing Data? Explain.	6M
	(b)	Explain about mean, median, Range and variance	8M

UNIT – II

3.	(a)	Explain about the general approach for solving a classification problem.	7M
	(b)	Write the algorithm for decision tree induction	7M

(OR)

4.	(a)	What is meant by pre pruning and post pruning? Explain.	7M
	(b)	Explain about Holdout method and Random subsampling methods.	7M

UNIT – III

5.	(a)	Explain about Bagging by writing Bagging algorithm.	8M
	(b)	Given a confusion matrix, write the formulae for finding the TPR, TNR, FPR, FNR, Precision and Recall.	6M

(OR)

6.	(a)	Write Sequential covering algorithm	7M
	(b)	Explain about Maximum margin hyper planes.	7M

UNIT – IV

7.	Generate frequent itemsets for the following Transaction data set using FP- Growth algorithm. Consider min_Support =2.	14M

TID	Items
1	{i1,i2}
2	{i2,i3,i4}
3	{i1,i3,i4,i5}
4	{i1,i4,i5}
5	{i1,i2,i3}
6	{i1,i2,i3,i4}
7	{i1}
8	{i1,i2,i3}
9	{i1,i2,i4}
10	{i2,i3,i5}

(OR)

8.	(a)	What are the factors that affect the computational complexity of the Apriori Algorithm?	7M
	(b)	Write the Apriori algorithm for frequent item set generation.	7M

UNIT-V

9. (a) Briefly explain about different types of clusters.   8M

    (b) Differentiate between Agglomerative Hierarchical clustering and Divisive Hierarchical Clustering.   6M

(OR)

10. (a) Compare K-means and DBSCAN algorithms   7M

    (b) Write and explain CLIQUE algorithm.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Cryptography and Network Security (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 model for network security with neat diagram?   9M
    (b) Compare and contrast between cryptography and steganography?   5M

(OR)

2. (a) Define security attack? Explain in detail about the various types of attacks for which   7M
        internet work is vulnerable to?
    (b) Write about any two classical crypto systems with suitable examples.   7M

UNIT – II

3. (a) Explain various modes of operations about block ciphers?   10M
    (b) What are the steps to be followed in shift rows transformation of AES algorithm?   4M

(OR)

4. (a) Mention the strengths and weakness of DES algorithm.   4M
    (b) Explain Chinese remainder theorem. Using CRT find 'x' from the equations x = 7   10M
        mod 13 and x = 11 mod 12.

UNIT – III

5. (a) Users A and B use Diffie-Hellman key exchange scheme using prime q = 71 and   10M
        primitive root α=2.
        (a) User A has private key Xa = 5, what is A's public key Ya?
        (b) User B has private key Xb = 12, what is B's public key Yb?
        (c) What is the shared secret key?
    (b) Write principles of public key cryptography.   4M

(OR)

6. (a) Discuss clearly Secure Hash Algorithm(SHA)   10M
    (b) What are the applications of cryptographic hash functions   4M

UNIT – IV

7. (a) Write about HMAC algorithm. What need to be done to speed up HMAC algorithm?   8M
    (b) What are the different approaches to message authentication?   6M

(OR)

8. (a) Write and explain the digital signature algorithm.   9M
    (b) Discuss briefly on Schnorr digital signature scheme.   5M

UNIT-V

9. (a) What is Kerberos? Explain how it provides authenticated service.   8M
    (b) Differences between Kerberos version 5 and Kerberos version 4?   6M

(OR)

10. (a) Why does PGP compress the message? What are the reasons for compressing the   8M
        signature before encryption?
    (b) Explain firewalls and how they prevent intrusions.   6M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Design & Analysis of Algorithms (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) Write properties of algorithms and explain about time complexity and space complexity.   7M
    (b) Sort the list of numbers using bubble sort: 4,9,5,1,0   7M

(OR)

2. (a) Explain selection sort algorithm and simulate it for the following data: 20,12,10,15,2   7M
    (b) Write short notes on Brute force string matching.   7M

UNIT-II

3. (a) Discuss binary search algorithm and analyze its time complexity.   7M
    (b) Write and solve recurrence relation for Strassen's matrix multiplication.   7M

(OR)

4. (a) Briefly explain about Huffman codes.   7M
    (b) Compute the optimal solution for knapsack problem using greedy method N=3, M= 20, (p_1,p_2,p_3)= (25,24,15), (w_1,w_2,w_3) =(18,15,10).   7M

UNIT – III

5. (a) Construct optimal binary search tree for (a_1, a_2, a_3, a_4) = (do, if, read, while), p(1 : 4) = (3,3,1,1), q(0 : 4)= (2,3,1,1,1).   7M
    (b) Explain all pairs shortest path problem with example.   7M

(OR)

6. (a) Solve the solution for 0/1 knapsack problem using dynamic programming N=3 , m=6 profits (p_1,p_2,p_3) = (1,2,5) weights (w_1,w_2,w_3) = (2,3,4)   7M
    (b) Write short notes on reliability design problem.   7M

UNIT – IV

7. (a) Explain TSP using branch and bound method with example   7M
    (b) Identify Hamiltonian cycle from the following graph   7M
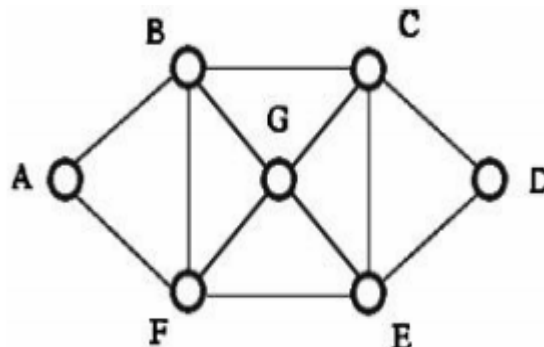
(OR)

8. (a) Describe control abstraction for LC Search   7M
    (b) Write an algorithm for N-queens problem using backtracking   7M

UNIT-V

9.   (a)   Draw the portion of state space tree generated by FIFO knapsack for the instance N=4   7M
            , (P1, P2, P3, P4)= (10, 10, 12, 18) , (w1, w2,w3,w4) = (2, 4, 6, 9) , m=15

    (b)   Write non deterministic algorithm for sorting and searching   7M

(OR)

10.   (a)   Distinguish NP- hard and NP-complete problems   7M

    (b)   Explain 3CNF satisfiability problem   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Sem. (R15) Reg. & Supple. Examinations of November - 2020
SUB: Object Oriented Analysis & Design (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. Write short notes on   14M
    a)Importance of modeling
    b)principles of modeling
    c)object oriented modeling

(OR)

2. Write about building blocks of the UML in Conceptual modeling of UML?   14M

UNIT – II

3. (a) Explain about the steps for modeling the Structural relationships with example.   10M
    (b) Discuss about short notes on class.   4M

(OR)

4. What is object diagram? Write common modeling techniques for object diagram.   14M

UNIT – III

5. Define Interaction diagram? Explain about the graphical representation of Interaction   14M
    diagram of UML in detail.

(OR)

6. What is use case? Describe the common modeling techniques of use case diagram.   14M

UNIT – IV

7. Write a Short note on the following :   14M
    (i) Event and signals
    (ii) Processes and Threads

(OR)

8. Distinguish between the activity and state chart diagram. And write modeling   14M
    techniques for state chart diagram.

UNIT-V

9. What is Component? Explain Component Diagram in detail?   14M

(OR)

10. Draw and explain the following diagrams for the ATM system: 14M
    (i) Class diagram
    (ii) Use case diagram