K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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 the interaction of EMR with atmosphere and earth surface feature.	8M
	(b)	Explain the advantages and limitations of remote sensing.	6M

(OR)

2.	(a)	What is electromagnetic spectrum? Explain with a neat sketch.	8M
	(b)	Explain in brief about the spectral signature concepts.	6M

UNIT – II

3.	What is resolution of a sensor? Describe all sensor resolutions.	14M

(OR)

4.	(a)	Explain in detail the types of remote sensor platforms.	8M
	(b)	Explain different types of sensors used in Indian remote sensing.	6M

UNIT – III

5.	Explain the methods of image classification.	14M

(OR)

6.	(a)	List various image enhancement techniques and explain each in detail.	8M
	(b)	Discuss Image Interpretation.	6M

UNIT – IV

7.	(a)	What are the components of GIS? Explain	8M
	(b)	Discuss abut CAM and VAM.	6M

(OR)

8.	(a)	Explain Database structures in GIS.	8M
	(b)	Explain various advantages and limitations of GIS.	6M

UNIT-V

9.	Explain the applications of remote sensing in water resources.	14M

(OR)

10.	Explain application of remote sensing for drought impact assessment.	14M

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

B.Tech. VI Sem (R15) Regular & Suppl. End Examinations of April/May 2019

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) Discuss in detail, the various factors controlling the highway alignment with sketches.   7M
    (b) What is the necessity of Realignment? List and explain the various steps in Realignment   7M

(OR)

2. (a) What are the objectives of highway Planning? Explain.   7M
    (b) Explain briefly about the third 20 year road development plan.   7M

UNIT – II

3. (a) Derive an expression for super elevation in highways.   7M
    (b) What are the various types gradients used in highways? Explain briefly.   7M

(OR)

4. (a) State the factors on which the Overtaking Sight Distance depends. Explain Briefly.   7M
    (b) A vertical summit curve is formed at the intersection of two gradients, **(+) 3.0** and **(–) 3.5**percent. Design the length of summit curve to provide a stopping sight distance for a speed of 65 kmph. Assume suitable data   7M

UNIT – III

5. (a) Write a note on the common methods of on-street parking?   7M
    (b) What are the functions of traffic signs?   7M

(OR)

6. (a) Discuss various traffic studies and their importance.   7M
    (b) What are the advantages and disadvantages of traffic signs?   7M

UNIT – IV

7. (a) List and explain the various advantages and disadvantages of Rotary.   7M
    (b) List the various advantages of at grade and Grade separated Intersections.   7M

(OR)

8. (a) Present the different types of islands and their functionality in reducing the conflicts.   7M
    (b) Present the design procedure of rotary as traffic Control Island.   7M

UNIT-V

9. (a) What are the factors influencing the design of pavements?   7M
    (b) Explain the roles of base course and sub base courses in pavements.   7M

(OR)

10. (a) What are the various factors to be considered in pavement design? Discuss the significance of each.   7M
    (b) Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of pavement   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) What is 'Irrigation'? Enumerate and explain the factors which necessitate irrigation. 7M
   (b) Explain the factors affecting duty. 7M

(OR)

2. (a) After how many days will you order irrigation in order to ensure healthy growth of crops, if (i) Field capacity of soil = 29% , (ii) Permanent willing percentage = 11%, (iii) Density of soil=1300 kg/m^3, (iv) Effective depth of root zone = 700mm, (v) Daily consumptive use of water for the given crop = 12mm. 7M

   For healthy growth moisture content must not below 25% of the water holding capacity between the field capacity and the permanent willing point.

   (b) Explain the vertical distribution of soil moisture with a neat sketch. 7M

UNIT – II

3. (a) What are the different types of canals? Explain. 7M
   (b) Compare Kennedy's theories for the design of irrigation channels in alluvial soil. 7M

(OR)

4. (a) Design a channel section using Lacey's theory for the following data: 7M
   Discharge (Q) = 5 m^3/sec   Silt factor (f) = 1.0   Side slope = ½(H):1(V).
   Also determine the bed slope of the channel.
   (b) What is balancing depth of a canal? Derive an expression for the same. 7M

UNIT – III

5. (a) Sketch the layout of a typical diversion head works and describe the functions of the various components of diversion head works. 7M
   (b) Discuss the causes of failure of weirs on permeable foundations and their remedies. 7M

(OR)

6. (a) Discuss Bligh's Creep theory for the design of weir constructed over pervious foundation. 7M
   (b) Explain Khosla's method of independent variables. 7M

UNIT – IV

7. (a) Explain the classification of dams. 7M
   (b) What factors affect the selection of site for a dam? Explain. 7M

(OR)

8. (a) Explain the various zones of storage in a reservoir with a neat sketch. 7M
   (b) How would you determine the reservoir capacity required for a specified yield using mass curve. 7M

UNIT-V

9. (a) Discuss the various causes of failure of a gravity dam. 7M
   (b) What is 'Elementary profile' of a gravity dam? Derive expression for base with of elementary profile for no tension. 7M

(OR)

10. (a) Explain different types of earth dams with neat sketches. 7M
    (b) Describe the various methods adopted for controlling seepage through earth dams. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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. How the following factors
    (i) Partial safety factor for load   5M
    (ii) Partial safety factor for material strength   5M
    (iii) Difference between cube strength and strength of concrete in structure.   4M

(OR)

2. Explain the following
    (i) Explain the Stress-Strain curve for steel   7M
    (ii) Explain the Stress-Strain curve for concrete   7M

UNIT – II

3. Design a simply supported rectangular beam to carry 30 KN/M superimposed load over a span of 6m on 500 mm wide supports. Use M15 grade concrete and Fe 415 grade steel.   14M

(OR)

4. Determine the moment of resistance of the T-beam for the following data: bf=1000mm, D_f =100mm, b_w =300mm, d' =50mm, d=450mm and A_{st}=4-25mm. Use M20 concrete and Fe415 steel.   14M

5. Design of bent-up bars as shear reinforcement, A rectangular beam of section 300 mm width by 500 mm effective depth is reinforced with four 20 mm bars, out of which two bars are bent at the ends of the beam at 45°.Determine the additional shear reinforcement required, if the Factored shear force at the critical section is 320 kN. Consider concrete of grade M25 and steel of grade Fe 415.   14M

(OR)

6. Determine the cracking torque of a rectangular concrete beam of size 250 mm by 500 mm, assuming M25 concrete using (i) plastic theory, (ii) IS code, and (iii) ACI code formulae.   14M

UNIT – IV

7. Design a simply supported roof slab for a room 8mx3.5m clear in size if the live load is 5kN/m². Use M20 concrete and Fe415 steel.   14M

(OR)

8. Design a dog-legged stair for a building in which the vertical distance between the floors is 3.6m. The stair hall measures 2.5m x 5m. The live load is taken as 2500 N/m^2 Use M20 grade and Fe 415 steel bars. Create a bar bending schedule for the design with neat sketch.   14M

UNIT-V

9. Design as axially load tied column $400mm \times 400mm$ pinned at both ends with an unsupported length of 3m for carrying a factored load of 300 KN. Use M20 grade of concrete and Fe 415 steel.   14M

(OR)

10. A rectangular cantilever beam of span 10m having size 300mmx600mm in cross section. BM at the support due to UDL is 200kN-m at service loads out of which 50% is due to permanent loads. It carries 4-20mm bars in tension. Use M20 concrete and Fe415 steel. Calculate total deflection.   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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. A continuous beam ABC is built-in at A and C and is carried over simple roller support at B. Span AB = 8.5 m and span BC = 7.5 m. It carries a uniformly distributed load of 17 kN/m over the span AB and a point load of 26 kN is acting in the span BC, 3.5 m from the middle support B. The middle support B sinks by 8 mm with respect to supports A and C. Find the moments and reactions at all the supports and draw the bending moment and shear force diagrams using Clapeyron's theorem of three moments. Assume $E = 2.1 \times 10^3$ MPa and $I = 2.3 \times 10^{-3}$ m^4.   14M

(OR)

2. (a) Differentiate between determinate and Indeterminate Structures.   7M

    (b) Derive an expression for Strain Energy due to bending.   7M

UNIT – II

3. Analyse the frame using Slope deflection method. Draw SFD and BMD.   14M
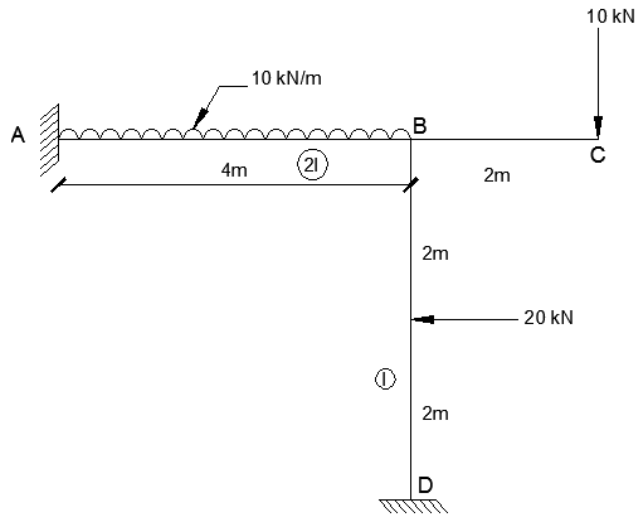

Fig 1.

(OR)

4. Analyse the continuous beam using Slope Deflection method and draw BMD. Support B sinks by 1.0 mm and C rises upto 0.5mm relative to support A. Take EI = 30000 kN- m^2. Refer **Fig 2** .   14M
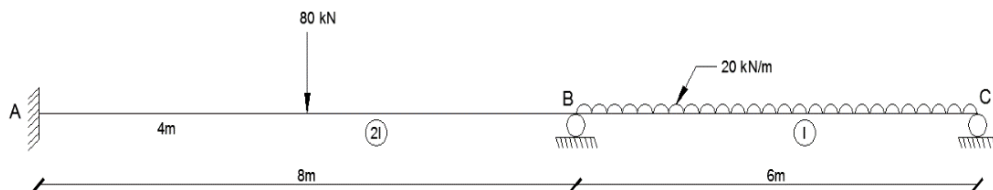

Fig 2 .

UNIT – III

5. Analyse the continuous beam shown in **fig 3.** Using Moment Distribution method. Sketch   14M
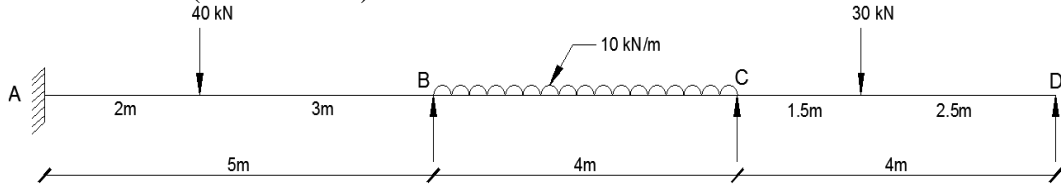   SFD and BMD. (EI is constant).

Fig 3.

(OR)

6. Analyse the frame shown in **fig 4.** by Moment Distribution method. Draw BMD. (EI   14M
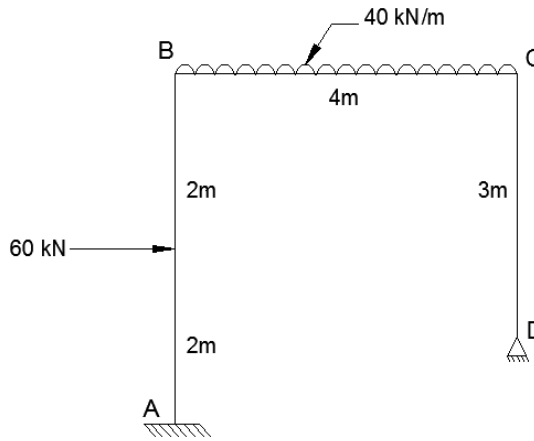   constant).

Fig.4

UNIT – IV

7. Analyse the frame shown in **Fig.5** by Kani's method. Draw the bending moment diagram.   14M
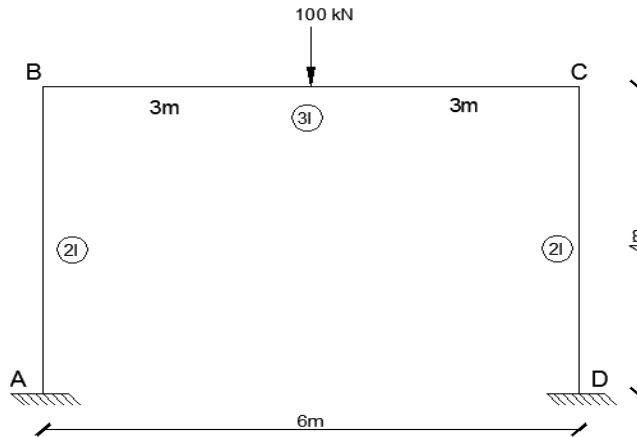

Fig.5

(OR)

8. Analyse the multistory building frame shown in **fig.6** by Kani's method and draw BMD   14M
    only. Use principle of symmetry only.
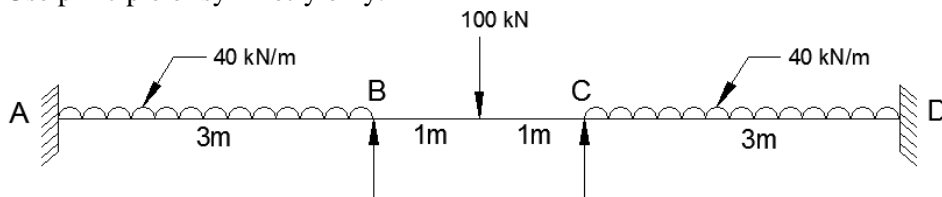
Fig.6

UNIT-V

9. (a) State and prove Maxwell's reciprocal theorem.   7M

    (b) State Castigliano's first and second theorem.   7M

(OR)

10.   Find the deflection under concentrated load for beam shown in **fig 7.** Use Strain Energy
         method. Take $E = 2 \text{ x } 10^8 \text{ kN/m}^2$,$I = 14 \text{ x } 10^{-6}\text{m}^4$
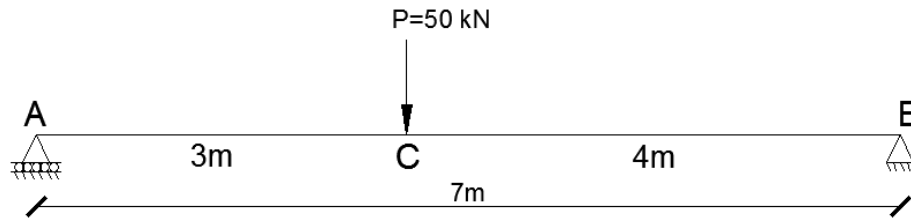
P=50 kN

A   C   B   14M

3m   4m

7m

Fig.7

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
SUB: Managerial Economics and Financial Analysis (Common to 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. Explain the relationship of Managerial Economics with other disciplines   14M

(OR)

2. Describe the factors determining the Elasticity of Demand.   14M

UNIT – II

3. Explain the law of returns to scale in detail.   14M

(OR)

4. Ranjan enterprises Ltd deals in the supply of software parts of a computer. The following cost data is available for two successive periods: 14M

	Year I (Rs.)	Year II (Rs.)
Sales	50,000	1,20,000
Fixed costs	10,000	20,000
Variable cost	30,000	60,000

Determine a) Break-even point b) Margin of safety

UNIT – III

5. Discuss the various types of Market structures.   14M

(OR)

6. Explain various pricing methods and the objectives of pricing policy?   14M

UNIT – IV

7. Enumerate the Merits and Demerits of Partnership firm   14M

(OR)

8. Explain Discounted cash flow techniques of Capital Budgeting with suitable examples.   14M

UNIT-V

9. From the following trial balance and additional information, you are required to prepare Final Accounts   14M

Trial Balance as on 31st March, 2018

Particulars	Debit (Rs)	Credit (Rs)
Current Liabilities		50,000
Wages	10,000	
Capital		2,00,000
Machinery	2,10,000	
Sales		5,000
Purchases	25,000	
Opening stock	4,000	
Cash	4,000	
Advertisement	20,300	
Interest Received		20,000
Income tax	1700	
	2,75,000	**2,75,000**

Additional Information: Closing stock Rs. 2,500

10. From the following calculate   14M
    (i) Gross Profit Ratio;   (ii) Net Profit Ratio,
    (iii) Working Capital Turnover ratio,   (iv) Networth to Debt ratio

Particulars	Rs
Sales	25,20,000
Cost of sales	19,20,000
Net Profit	3,60,000
Inventory	8,00,000
Other Current Assets	7,60,000
Fixed Assets	14,40,000
Networth	15,00,000
Debt	9,00,000
Current Liabilities	6,00,000

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) Explain in detail about symbolic reasoning system.   7M
    (b) Explain the concept of expert system.   7M

(OR)

2. What is the basic motivation towards the development of AI approaches? Explain.   14M

UNIT – II

3. (a) Explain back propagation rule with flow chart.   7M
    (b) Determine 3- input AND gate realization using McCulloch Pitts neural model?   7M

(OR)

4. (a) Explain different types of neural network architectures.   7M
    (b) Determine 3- input NAND gate realization using McCulloch Pitts neural model?   7M

UNIT – III

5. Draw the block diagram and structure of pattern recognition procedure with proper   14M
    explanation.

(OR)

6. Write the importance of neural networks in control systems with example.   14M

UNIT – IV

7. (a) Write the various properties and operations of fuzzy sets with examples.   7M
    (b) Let $\tilde{A} = \{(x_1, 0.2)\ (x_2, 0.7)\ (x_3, 0.4)\}, \tilde{B} = \{(y_1, 0.5)\ (y_2, 0.6)\}$ be the two fuzzy sets   7M
        defined on a universe set $x = \{x_1, x_2, x_3\}$, $y = \{y_1, y_2\}$. Then find fuzzy relations
        resulting out fuzzy cartesian product $\tilde{A} \times \tilde{B}$?

(OR)

8. Explain the step by step procedure and architecture of fuzzy logic controller.   14M

UNIT-V

9. Explain in detail about any one application of neuro fuzzy technique in power   14M
    systems.

(OR)

10. Discuss how the fuzzy logic is used for industrial applications?   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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. Derive an iterative algorithm for solving the optimum dispatch equation of an 'n' bus power system taking into account the effects of system losses

(OR)

2. (a) For a simple two unit system the loss coefficients are:
    $B_{11} = 0.001$; $B_{12} = -0.0005$; $B_{22} = 0.0024$
    $dC_1/dP_1 = 0.08P_1 + 16$ Rs/MWhr. $dC_2/dP_2 = 0.08P_2 + 12$ Rs/MWhr.
    Find the generation P1 and P2 for $\lambda = 50$, also compute the transmission loss and total load

    (b) A system consists of two generators with the following characteristics:
    $F_1 = (7 P_1 + 0.03P_1^2 + 70) \, 10^6$; $F_2 = (5 P_2 + 0.05 P_2^2 + 100) \, '10^6$
    Where F and P are fuel input in K-cal/hr and unit output in MW respectively. The daily load cycle is given as follows.

Time	Load
12 midnight 6 am	50 MW
6 am to 6 pm	150 MW
6 pm to 12 midnight	50 MW

    Give the economic schedule for the three periods of the day

UNIT – II

3.   Derive the model of a speed governing system and represent it by a block diagram.

(OR)

4. Discuss the transfer function of the speed governor

UNIT – III

5. Draw the block diagram representation of a single area system and deduce the expression for the static and dynamic response of the system under uncontrolled case?

(OR)

6. Two generators with ratings 100 MW and 300 MW operate at 50 Hz frequency. The system load increases by 100 MW when both the generators are operating at about half of their capacity. The frequency then falls to 49.5 Hz. If the generators are to share the increased load in proportion to their ratings, what should be the individual regulations? What should be regulations if expressed in**,** per unit Hertz/per unit megawatt?

UNIT – IV

7. Draw the block diagram of proportional plus integral controller and show the steady state frequency error

(OR)

8. (a) Discuss the advantages and disadvantages of different types of compensating equipment for transmission systems

    (b) What does it mean by load compensation?

UNIT-V

9. (a) Explain the role of independent system operator (ISO).

    (b) Mention the reasons for restructuring / deregulation of power industry

(OR)

10.   Explain clearly the objectives of independent system operators

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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.   The figure below shows a three bus power system   14M
        Bus 1: Slack bus   V = 1.05+j 0 p.u.
        Bus 2: P-V bus   V = 1.0 p.u.   Pg = 3 p.u.
        Bus 3: P-Q bus P_L = 4 p.u. Q_L = 2 p.u.
        Carry out one iteration of load flow solution by Gauss-Siedal method. Neglect the
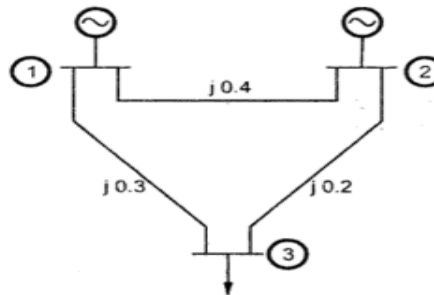   limits on reactive power generation.

Fig.1

(OR)

2. (a) Derive the generalized expressions for elements of Jacobian matrix for decoupled   10M
         Load flow method.

    (b) What are the advantages of Y_{bus} over Z_{bus}?   4 M

UNIT – II

3.   Write the step by step procedure for Newton Raphson load flow solution, along with   14M
        its flowchart.

(OR)

4.   Consider the two bus system, whose bus and line data are given below.   14M
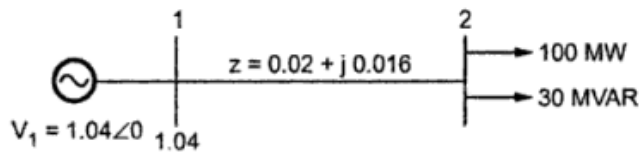
Fig.2

Bus data

Bus number	Type	Generator		Load		Voltage p.u.	Angle	Reactive Power limit	
		P_G	Q_G	P_D	Q_D			Q_{min}	Q_{max}
1	Slack	0	0	0	0	1.04	0	0	0
2	PQ	0	0	100	30	1.0	0	0	0

Base MVA: 100 MVA

Line data

Bus from	To	R p.u.	X p.u.	½ B1 p.u.	Tap position
1	2	0.02	0.016	0	1

Obtain the power flow solution by fast decoupled method for two iterations.

UNIT – III

5. A generator with constant excitation supplies 30 MW through a step up transformer and a high voltage line to an infinite bus bar. If the steady state stability limit of the system is 60 MW, determine the maximum permissible sudden increase of generator output (resulting from sudden increase in prime mover output) if the stability is to be maintained. Assuming resistance of generator, lines and transformers are neglected. 14M
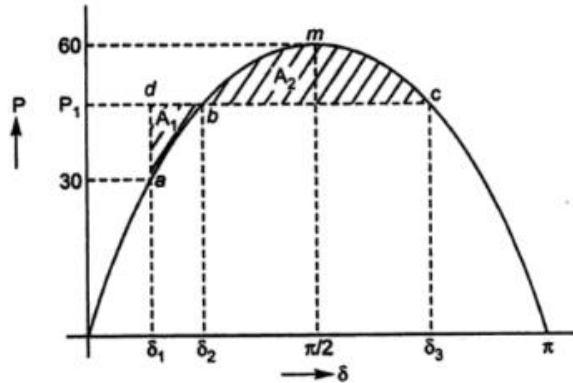

Fig. 3

(OR)

6. Derive the power flow equations of a two machine system with and without losses 14M

UNIT – IV

7. (a) Derive the expression for solution of swing equation of one machine system by point by point method. 7M

   (b) Describe how equal are criterion can be used for calculating the critical clearing angle. 7M

(OR)

8. (a) What are different methods of improving power system stability? Explain them in brief. 10M

   (b) What are the limitations of equal area criteria? 4M

UNIT-V

9. An overhead line is connected to terminal apparatus through a length of single-phase cable, the characteristic impedances being 500 and 25 ohms, respectively. A travelling wave of vertical front and infinite tail of 230 kV magnitude originates in the line and travels towards the junction with the cable. Calculate the energy transmitted into the cable during a period 5 µs after the arrival of the wave at the junction. What voltage is reflected back into the line? 14M

(OR)

10. Explain the steps involved in Bewely's lattice diagram construction with an example. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) Explain with neat block diagram about Electric Drive?   7M
   (b) Discuss the Advantages of Electrical Drive over Mechanical Drives?   7M

(OR)

2. (a) Explain the fundamentals of thyristor controlled drives and their operation.   7M
   (b) Draw the Four Quadrant Diagram of Electrical Drive for motoring and   7M
       Braking Operations?

UNIT – II

3. (a) A 230V, 1000rpm, 30A separately excited motor has armature resistance and   7M
       inductance of 0.7Ω and   50mH. Motor is controlled in regenerative braking by a
       chopper operating at 800Hz from a dc source of 230V assuming a continuous
       conduction.
       i.   Calculate duty ratio of chopper by rated torque and the speed of 800rpm
       ii. What will be the motor speed for duty ratio of 0.6 and rated motor torque
       iii. What will be the maximum allowable speed of motor. If a chopper has a
            maximum duty ratio of 0.9 and maximum allowable motor current is twice
            rated current.
       iv. Calculate the power fed to source for operating condition in (iii).
   (b) Derive Expression for in discontinuous mode of DC Separately Excited motor fed   7M
       from a Single phase fully controlled Rectifier?

(OR)

4. (a) Draw and Explain First Quadrant and Second Quadrant operation of DCSEM when it   7M
       is fed from a chopper?
   (b) A 230V separately excited dc motor takes 50A at a speed of 800rpm. It has armature   7M
       resistance of 0.4. This motor is controlled by a chopper with an input voltage of 230V
       and frequency of 500Hz. Assuming continuous condition through-out, calculate and
       plot speed-torque characteristics for:
       i.   Motoring operation at duty ratios of 0.3 and 0.6.
       ii. Regenerative braking operation at duty ratios of 0.7 and 0.4.

UNIT – III

5. A 440V, 50Hz, 970 rpm, 6-pole, Y-connected, 3-phase wound rotor induction motor   14M
   has following parameters referred to the stator: The stator to rotor turns ratio is 2.
   Motor speed is controlled by Static Scherbius Drive. Drive is designed for a speed
   range of 25% below the synchronous speed. Maximum value of firing angle is 1650^0.
   Calculate
   (i) Transformer turns ratio.   (ii) Torque for a speed of 780rpm and $\alpha = 140^0$

<div align="center">(OR)</div>

6. (a) Discuss about various speed control arrangements using Voltage Source Inverter?   7M

   (b) A 3-ϕ, 415V, 50Hz, 4-pole, star connected induction motor has the following   7M
   equivalent circuit parameters: $R_1 = 1.01\Omega$, $R_2' = 0.69\Omega$, $X_1 = 1.08\Omega$, $X_2' = 1.60\Omega$,
   $X_m = 36\Omega$. The no load loss is negligible. The rated torque, proportional to square of
   the speed, is 42 N-m, at full load speed of 1450 rpm for a motor speed of 1290 rpm,
   determine (a) load torque, (b) rotor current I_2' (c) The stator supply voltage

<div align="center">**UNIT – IV**</div>

7. (a) Explain about Self and Separate control of Synchronous Motor?   7M

   (b) A 6 MW, 3-phase, 11 kV, Y-connected, 6-pole, 50Hz, 0.9(leading) power factor   7M
   synchronous motor has $X_s=9\Omega$ and $R_s=0$. Rated field current is 50A.Machine is
   controlled by variable frequency control at constant v/f ratio up to the base speed and
   at constant V above based speed. Determine

   (i)   Torque and field current for the rated armature current, 750rpm and 0.8
         leading power factor

   (ii) Armature current and power factor for half the rated motor torque, 1500rpm
         and rated field current.

<div align="center">(OR)</div>

8. (a) Explain with neat diagram about Load Commutated Inverter fed Synchronous motor   7M
   speed control?

   (b) Explain the open loop operation of VSI fed Synchronous motor drive   7M

<div align="center">**UNIT-V**</div>

9. (a) Explain the energy conservation in electrical drives?   7M

   (b) Explain the losses in electrical drive system?   7M

<div align="center">(OR)</div>

10. (a) Explain the power factor improvement methods?   7M

    (b) What are various methods used for maintenance of motors?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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 with neat diagram.	7M
	(b)	Name and explain any seven addressing modes used in 8086 using suitable examples.	7M

(OR)

2.	Discuss about 8085 instruction set with an example.	14M

UNIT – II

3.	(a)	Explain about different stages of software development.	7M
	(b)	Write an ALP to find out a largest number from an array of 8 numbers?	7M

(OR)

4.	(a)	Write an assembly language program in 8086 to sort an array of 10 numbers in descending order.	7M
	(b)	Write an ALP to convert BCD to ASCII Code.	7M

UNIT – III

5.	(a)	Explain about Interrupt driven and DMA type schemes.	7M
	(b)	Draw the internal block diagram of 8257 and explain about each block.	7M

(OR)

6.	(a)	Distinguish between asynchronous and synchronous data transfer schemes.	7M
	(b)	Draw the block diagram of 8251 and explain each block.	7M

UNIT – IV

7.	Explain interfacing of Traffic light controller to 8086 microprocessor with neat diagram.	14M

(OR)

8.	With neat diagram explain about interfacing of ADC to microprocessor.	14M

UNIT-V

9.	(a)	What is microcontroller? List the features of 8051 microcontroller. Name the five interrupt sources of 8051.	7M
	(b)	What are the steps involved in programming the 8051 to receive data serially?	7M

(OR)

10.	(a)	Explain the architecture of 8051 microcontroller with neat diagram.	10M
	(b)	Write a program in 8051 to perform multiplication of two numbers.	4M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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)	Explain briefly the DC characteristics of Op-amp.	8M
	(b)	Define Op-amp comparator and explain the operation with neat diagrams?	6M

(OR)

2.	(a)	Explain the operation of precision rectifier.	6M
	(b)	Discuss ideal and AC characteristics of Operational Amplifier.	8M

UNIT – II

3.	(a)	Explain the operation Schmitt Trigger using 555 timer.	7M
	(b)	Explain the operation 555 timer in monostable mode with neat diagrams.	7M

(OR)

4.	(a)	What is PLL? Explain the principle of PLL.	6M
	(b)	Explain any two applications of PLL with neat diagrams.	8M

UNIT – III

5.	(a)	What is logic family? Briefly discuss different types of logic families.	7M
	(b)	Explain CMOS dynamic state electrical behavior.	7M

(OR)

6.	(a)	With neat diagram explain the operation of 2 input NOR gate using TTL logic.	8M
	(b)	Discuss briefly about Emitter Coupled Logic.	6M

UNIT – IV

7.	(a)	Discuss the steps of design flow in VHDL.	7M
	(b)	Write notes on behavioral design elements in VHDL.	7M

(OR)

8.	(a)	Write notes on functions in VHDL with example.	7M
	(b)	What is the difference between structural and behavioral programming styles in VHDL?	7M

UNIT-V

9.	(a)	Design a full subtractor circuit using 4 X 1 multiplexer.	7M
	(b)	Design 2 bit magnitude comparator along with VHDL code.	7M

(OR)

10.	(a)	Design a 3 bit binary synchronous counter.	6M
	(b)	Design a 4 bit universal shift register and explain its working.	8M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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.	(a)	Explain with a neat sketch, the functions of the protocols used in each layer of the OSI model and illustrate how communication is taking place between two end systems.	7M
	(b)	Compare and contrast LAN, MAN, WAN and home networks.	7M

(OR)

2.	(a)	Discuss the "Bad Timing" problem of OSI reference model. Write short notes on Wireless LAN's.	7M
	(b)	Define Topology. Discuss in brief about computer network topologies.	7M

UNIT – II

3.	(a)	Explain guided and unguided transmission media in physical layer.	7M
	(b)	Briefly explain about data link layer design issues.	7M

(OR)

4.	(a)	What are the various types of error detection methods?	7M
	(b)	Explain a go back n protocol and selective repeat protocol.	7M

UNIT – III

5.	(a)	What are the static routing algorithms? Explain the concept of flooding	7M
	(b)	Explain the prevention polices of congestion.	7M

(OR)

6.	(a)	Explain the network layer design issues	7M
	(b)	Explain the ALOHA protocols and CSMA	7M

UNIT – IV

7.	(a)	What are the functions of transport layer? State transport service primitives.	7M
	(b)	Explain Elements of transport protocols	7M

(OR)

8.	(a)	Discuss various kinds of transport services	7M
	(b)	Describe the performance issues of UDP	7M

UNIT-V

9.	(a)	What is World Wide Web? Explain details about HTTP	7M
	(b)	Distinguish between symmetric and asymmetric encryption.	7M

(OR)

10.	(a)	Differentiate static, dynamic and active documents used in World Wide Web.	7M
	(b)	Explain in brief about DNS	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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.		Draw and explain the internal architecture of 8051 microcontroller	14M

(OR)

2.	(a)	What is addressing mode and explain addressing modes of 8051 microcontroller	7M
	(b)	Explain about the memory organization of 8051 microcontroller	7M

UNIT – II

3.	(a)	What is assembler directive and explain about the following directives 　　i) ORG;　ii) END;　　iii) EQU	7M
	(b)	Write an ALP to add the unsigned numbers found in internal RAM locations 25h,26h and 27h together and put the result in RAM locations 30h,31h	7M

(OR)

4.	(a)	Explain about Tmod and Tcon registers	7M
	(b)	Generate a Square wave of 50% duty cycle on P1.5 bit using timer0	7M

UNIT – III

5.	(a)	What is current program status register? Explain the generic structure of program status register as ARM core.	7M
	(b)	What are the various processor modes of ARM? What is thin order of privilage? Explain	7M

(OR)

6.	(a)	Briefly discuss about the ARM processor families	7M
	(b)	What is vector table and explain in detail	7M

UNIT – IV

7.	(a)	Explain how the change of modes take place in ARM?	6M
	(b)	How can we change the PSR contents through instructions in ARM? Explain different PSR instructions in ARM.	8M

(OR)

8.		Explain different data processing instructions in ARM 7 (with examples).	14M

UNIT-V

9.	(a)	Explain about the physical design of IOT	7M
	(b)	Explain IOT enabling Technologies	7M

(OR)

10.	(a)	Explain how IOT is used in energy systems.	7M
	(b)	Explain how IOT is used in irrigation systems.	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
SUB: CONTROL SYSTEMS (ECE)

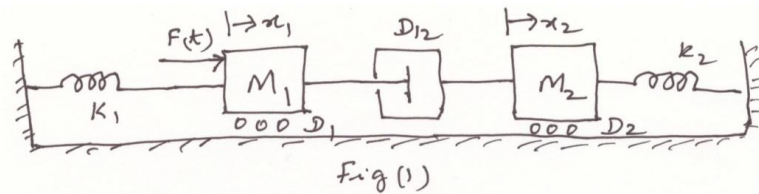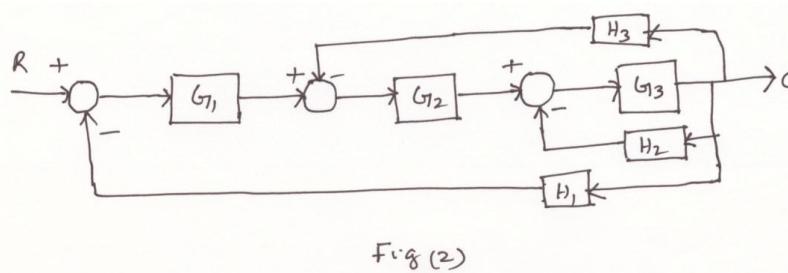Time : 3 Hours   Max. Marks: 70

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

UNIT - I

1. (a) Derive the systems equations and find the value of $X_2(s)/F(s)$ for the system shown in fig(1).   7M

Fig (1)

   (b) Using block diagram reduction technique, find the transfer function for the system shown in fig(2).   7M

Fig (2)

(OR)

2. (a) State and explain the Mason's gain formula?   6M
   (b) Draw the signal flow graph for fig(2) and determine its overall gain using Mason's formula.   8M

UNIT – II

3. (a) Derive the time response of second order system with unit step input.   7M
   (b) The OLTF of a UFB control system is $L(S) = 10/S(1+0.25)$. If the system is subjected to a unit step input, calculate   7M
       (i) Undamped material frequency,   (ii) Damping Ratio
       (iii) Percentage of over shoot,   (iv) Time to reach first maximum

(OR)

4. (a) Explain time response of first order system?   4M
   (b) Derive steady state errors and error constants.   5M
   (c) Briefly explain PD,PI and PID controllers.   5M

UNIT – III

5. (a) Define the stability and necessary conditions for stability.   4M
   (b) Explain Routh-Hurwitz criterion including special cases?   5M
   (c) Apply R-H criterion to determine the stability of the fourth order system given by   5M
       $S^4 + 8S^3 + 18S^2 + 16S + 5 = 0$

(OR)

6. (a) Explain the various rules for construction of Root loci. 7M
    (b) A feedback control system has is OLTF as G(S) H(S) = K/ S(S+3)(S+S+6) 7M
        Sketch the Root locus.

UNIT – IV

7. (a) Explain the correlation between time and frequency response. 7M
    (b) Sketch the Bode plot for the following OLTF,G(S) = 10/S(S+2)(S+5) 7M
        Find the gain margin and phase margin.

(OR)

8. (a) Write the frequency domain specifications? 7M
    (b) The OLTF of a UFB control system is G(S) = 2/S(1+S)(1+0.55) 7M
        Sketch the Nyquist plot and examine its stability?

UNIT-V

9. Consider a UFB system OLTF G(S) = K/S(S+1)(S+2). Design a suitable 14M
    compensator so that the compensated system has, $K_V = 10$ sec^{-1}, Phase margin $=40^0$,
    Gain margin <= 12db.

(OR)

10. A UFB system has an OLTF G(S) = K/S(S+1)(0.25+1). Design a phase lag 14M
    compensator to meet the following specifications. Velocity error constant =8, phase
    margin >=40^0.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) With the help of Applegate diagram, explain the bunching process and hence the velocity modulation in Klystron amplifier. — 7M
   (b) State the limitations of conventional tubes at high frequencies — 7M

(OR)

2. (a) Explain how velocity modulation is converted into current modulation with Applegate diagram and also derive the equation for output power efficiency. — 10M
   (b) Compare 'O' type and 'M' type tubes. — 4M

UNIT – II

3. (a) Explain with neat sketch, the principle of operation of a TWT amplifier and write the equations for the maximum voltage gain and efficiency. — 7M
   (b) Derive equation for Hull cut-off voltage in a Magnetron — 7M

(OR)

4. (a) Explain how TWT is increased gain by increasing the bunching of electrons and derive the equation of gain. — 10M
   (b) What are the applications of Magnetron oscillator? — 4M

UNIT – III

5. (a) Discuss in detail the principle of operation of GUNN diode considering the two valley model theory and sketch its volt-ampere characteristics — 10M
   (b) Explain Tunnel diode characteristics. — 4M

(OR)

6. (a) Explain about Gunn Oscillation modes — 7M
   (b) Explain Parametric amplifier. — 7M

UNIT – IV

7. (a) Derive the S-Matrix of a Directional Coupler. — 7M
   (b) Explain the different types of Microwave attenuators. — 7M

(OR)

8. (a) Derive the S-Matrix of H-Plane Tee. — 7M
   (b) Explain Faraday rotation. — 7M

UNIT-V

9. (a) Describe how the frequency of a given microwave source can be measured Using two different methods. — 7M
   (b) Explain the method of measurement of reflex coefficient . — 7M

(OR)

10. (a) What are the different possible errors that will effect VSWR measurements? — 7M
    (b) Explain materials and fabrication. — 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) Find Z-Transform of $x(n) = -a^n u(-n-1)$ and indicate its ROC in Z -plane?   10M
    (b) State and prove time convolution property of Z-Transforms.   4M

(OR)

2. (a) State and prove any three properties of Z-Transform.   8M
    (b) With respect to Z transforms define the properties of ROC.   6M

UNIT – II

3. (a) Compute the DFT of the sequence $x(n) = \sin[n\pi/4]$, where N=8 using DIT FFT algorithm.   10M
    (b) Write computation efficiency of FFT over DFT.   4M

(OR)

4. (a) Determine the IDFT of the sequence   10M
         $X(K) = (6,- \sqrt{2} - j4.8284, -2 + j2, \sqrt{2} - j0.8284, -2, \sqrt{2}+j0.8284, -2 - j2, -\sqrt{2} - j4.8284)$.
    (b) How FFT is more efficient to determine DFT of sequence?   4M

UNIT – III

5. (a) Compare direct form I and direct form II realization of IIR systems.   4M
    (b) Realize   10M

$$H(Z) = \frac{1 + 0.6z^{-2} + 0.2z^{-1}}{3 + 5z^{-1} + 4^{-2}}$$

     using Direct form I and Direct form II structures.

(OR)

6. (a) Describe the basic structure of FIR filters - Direct form & Cascade form.   7M
    (b) Describe the basic structure of IIR filters - Transposed form & Cascade form.   7M

UNIT – IV

7. (a) Compare Butter worth and Chebyshev filter designs?   4M
    (b) Use bilinear transformation method to obtain H(Z) if T= 1 sec and H(s) is   10M
         $1/(s+1)(s+2)$, $1/(s^2+\sqrt{2}s +1)$.

(OR)

8. (a) Explain the impulse invariance method of IIR filter design.   7M
    (b) Derive the expression for Bilinear Transform.   7M

UNIT-V

9. (a) Compare IIR and FIR Filters?   4M
    (b) Give the design procedure for designing FIR filters using Fourier Transform method and Windowing techniques?   10M

(OR)

10. (a) Explain about Keiser window and give its time domain and frequency domain descriptions?   5M
    (b) Realize an FIR filter with impulse response is given by $h(n) = (1|2)^n [u(n)-u(n-5)]$ 9M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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.	What are the different types of power plants, where electricity produced bulk quantities in India?	14M

(OR)

2.	(a)	Enumerate the stages involved in handling of the coal	7M
	(b)	Define a steam condenser and state its functions	7M

UNIT – II

3.	(a)	What factors should be considered while selecting a site for a diesel power plant	7M
	(b)	List various advantages and disadvantages of diesel power plant	7M

(OR)

4.	(a)	List the various advantages and limitations of a GTPP	4M
	(b)	Which are the methods used to improve thermal efficiency of open cycle as turbine plant? Explain regeneration in detail.	10M

UNIT – III

5.	Identify the essential features /elements of Hydro electric power plant. explain any one dam used in Hydro electric power plant	14M

(OR)

6.	With a neat sketch explain the working principle of fast breeder reactor.	14M

UNIT – IV

7.	(a)	What are the general arrangements of tidal power plant? Explain	9M
	(b)	List out advantages and limitations of solar power plant	5M

(OR)

8.	(a)	with help of a sketch Explain flat plate collector	7M
	(b)	Write advantages, limitations and applications of MHD System	7M

UNIT-V

9.	The maximum demand of a power plant is 96000KW and the daily load curve is described as follows	14M

Time hours	0-6	6-8	8-12	12-14	14-18	18-22	22-24
Load MW	48	60	72	60	84	96	48

　　(i)　Determine the load factor of power station
　　(ii)　What is the load factor of standby equipment rated at 30MW that takes up all load in excess of 72MW?
　　(iii)　Also Calculate its use factor.

(OR)

10.	(a)	What are the different types of pollution coming from nuclear power plant? explain briefly	7M
	(b)	List out various technologies to control the pollution in power plants	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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. 6M

   (b) A Carnot refrigerator requires 1.3KW per ton of refrigeration to maintain a temperature of -40^{0}C. Determine 8M

   (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 bar and 8.5 bar. Air is drawn from the cold chamber at 10^{0}C. Air coming out of the compressor is cooled to 30^{0}C before entering the expansion cylinder. Expansion and compression follow the law $PV^{1.35}$ = constant. Determine COP of the system. 8M

   (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 25^{0}C and -5^{0}C. The dryness fraction of CO_2 gas during the suction stroke is 0.6. Following properties of CO_2 are given 8M

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

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

(OR)

4. (a) Explain the working principle of Electrolux refrigerator (3fluid absorption systems) with a neat sketch. 7M

   (b) In an absorption refrigeration system, heating, cooling and refrigeration takes place at temperatures 120^{0}C, 30^{0}C and -10^{0}C. Find out. 7M

      (i) Ideal COP of the system

      (ii) If the heating temperature is increased to 160^{0}C and refrigeration temperature is decreased to -20^{0}C, find out percentage change in ideal COP.

UNIT – III

5. (a) Explain the working principle of steam jet refrigeration system with a neat sketch. 6M

   (b) In a Steam jet refrigeration system dry saturated steam at 7 bar abs. pressure is supplied. The flash chamber temperature is 5°C, the condenser temperature is 40°C, make up water is supplied at 20°C. 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: 8M

   (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.

<div align="center">(OR)</div>

6. (a) What are the desirable properties of refrigerants and how do you select? 7M
   (b) How do you classify refrigerants? 7M

<div align="center">**UNIT – IV**</div>

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 $0.5m^3$/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

<div align="center">(OR)</div>

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: 8M
   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.

<div align="center">**UNIT-V**</div>

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

<div align="center">(OR)</div>

10. (a) Calculate the following when the DBT is 35° C, WBT is 23° C and the barometer reads 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) Regular & Supple Examinations of April/May 2019
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) How do the effects of gyroscopic couple and of the centrifugal force make the rider of a two wheeler to tilt on one side? — 10M
   (b) What is the effect of gyroscopic couple on ships and explain the terms pitching and rolling. — 4M

(OR)

2. (a) The rotor of the turbine of a ship has a mass of 2500 kg and rotates at a speed of 3200 rpm counter-clockwise when viewed from stern. The rotor has radius of gyration of 0.4m. Determine the gyroscopic couple and its effect when — 10M
   i) The ship steers to the left in a curve of 80m radius at a speed of 15 knots (1 knot =1860 m/h)
   ii) The ship pitches 5 degrees above and 5 degrees below the normal position and the bow is descending with its maximum velocity. The pitching motion is simple harmonic with a periodic time of 40 seconds.
   (b) How does the gyroscopic couple influence the stability of four wheeler when it is taking a turn? — 4M

UNIT – II

3. (a) How the different masses rotating in different planes are balanced? — 10M
   (b) What is the difference between crank-pin effort and crank effort? — 4M

(OR)

4. (a) In a slider crank mechanism, the length of the crank and connecting rod are 150mm and 600mm respectively. The crank position is 60^0 from inner dead centre. The crank shaft speed is 450rpm (clockwise). Using analytical method, determine — 10M
   (i) Velocity and acceleration of the slider,
   (ii) Angular velocity and angular acceleration of the connecting rod.
   (b) Define inertia force and inertia torque. — 4M

UNIT – III

5. Derive the following expressions for an uncoupled two cylinder locomotive engines: — 14M
   (i) Variation tractive force, (ii)Swaying couple, (iii) Hammer Blow

(OR)

6. The reciprocating mass per cylinder in a 60^0 V-twin engine is 1.5kg. The stroke and connecting rod length are 100mm and 250mm respectively. If the engine runs at 2500 rpm., determine maximum and minimum values of the primary forces. Also find out the resultant secondary force. — 14M

UNIT – IV

7. (a) Describe Dunkerley's method to find the natural frequency of a shaft carrying several Loads. — 7M
   (b) A shaft 50 mm diameter and 3 m long is simply supported at its ends and carries three loads of 1000 N, 1500N and 750N at 1m, 2m and 2.5m from the left support. Modulus of elasticity is 200 GN/m^2. Find the frequency of transverse vibrations. — 7M

(OR)

8. A shaft 1.5 m long, supported in flexible bearings at the ends carries two wheels each of 50 kg mass. One wheel is situated at the center of the shaft and the other at distance of 375 mm from the center towards left. The shaft is hollow of external diameter 75mm and internal diameter 40 mm. The density of the material is 7700kg/m^3 and its modulus of elasticity is 200 GN/m^2. Find the lowest whirling speed of the shaft, taking into account the mass of the shaft. — 14M

UNIT-V

9. A steel shaft 1.5m long is 95mm in diameter for the first 0.6m of its length, 60mm in diameter for the next 0.5m length and 50mm in diameter for the remaining 0.4m of its length. The shaft carries two flywheels at two ends, the first having a mas of 900kg and 0.85m radius of gyration located at the 95mm diameter end and the second having a mass of 700kg and 0.55mradius of gyration located at the other end. Determine the location of the node and the natural frequency of free torsional vibration of the system. The modulus of rigidity of shaft material may be taken as 80GN/m^2. — 14M

(OR)

10. A body of mass 20kg is suspended from a spring which deflects 15mm under this load. Calculate the frequency of free vibration and verify that a viscous damping force of 1000N at a speed of 1 m/s is just sufficient to make the motion a periodic. — 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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. An oil company produces two grades of gasoline P and Q which it sells at Rs. 30 and Rs. 40 per litre. The company can buy four different crude oils with the following constituents and costs:

Crude oils	Constituents			Price/litre(Rs.)
	A	B	C	
1	0.75	0.15	0.10	20.00
2	0.20	0.30	0.20	22.50
3	0.70	0.10	0.20	25.00
4	0.40	0.10	0.50	27.50

    Gasoline P must have at least 55% of constituent A and not more than 40% of C. Gasoline Q must not have more than 25% of C. Determine how the crudes should be used to maximize the profit?

(OR)

2. Find all the basic solutions to the following problem:

    Maximize $Z= x_1 + 3x_2 + 3x_3$
    Subjected to $x_1 + 2x_2 + 3x_3 = 4$
    $2x_1 + 3x_2 + 5x_3 = 7$

    Also find which basic solutions are Basic feasible, Non –degenerate basic feasible, and Optimal basic feasible.

UNIT – II

3. Find the optimum solution to the following transportation problem in which the cells contains the transportation cost in rupees.

	W_1	W_2	W_3	W_4	W_5	Availability
F_1	7	6	4	5	9	40
F_2	8	5	6	7	8	30
F_3	6	8	9	6	5	20
F_4	5	7	7	8	6	10
Required	30	30	15	20	5	100

(OR)

4. Four different jobs can be done on four different machines. The set-up and take down time costs are assumed to be prohibitively high for change over's. The matrix below gives the cost in rupees of producing job *I* on machine *J*.

	M_1	M_2	M_3	M_4
J_1	5	7	11	6
J_2	8	5	9	6
J_3	4	7	10	7
J_4	10	4	8	3

    How should the jobs be assigned to the various machines so that the total cost is minimized? And also formulate the mathematical model for the problem.

UNIT – III

5. The Cost of a machine is Rs.6100 and its scrap value is Rs 100 the maintenance costs found from the experience as follows

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs)	100	250	400	600	900	1200	1600	2000

   When should machine replaced?

(OR)

6. A machine operator has to perform two operations, turning and threading, on a number of different jobs. The time required to perform these operations (in Minutes) for each job is known. Determine the order in which the jobs should be processed in order to minimize the total time required to turn out all the jobs.

Job	Time for turning (Minutes)	Time for threading (Minutes)
1	3	8
2	12	10
3	5	9
4	2	6
5	9	3
6	11	1

   Also find the total processing time and idle times for turning and threading operations

UNIT – IV

7. A branch of national bank has only one typist. Since the typing work varies in length (number of pages to be typed) the typing rate is randomly distributed approximating a Poisson distribution with mean service rate of 8 letters per hour. The letters arrive at a rate of 5 per hour during the entire 8-hours work day. If the typewriters valued at Rs 1.50 per hour.

   Determine i) Equipment utilization, ii) The percent time that an arriving has to wait, iii) Average system time, iv) Average cost due to waiting on the part of type writer i.e it remaining idle.

(OR)

8. Ships arrive at a port at the rate of one in every 4 hours with exponential of inter-arrival times. The time a ship occupies a berth for unloading has exponential distribution with an average of 10 hours. If the average delay of ships waiting for berths is to kept below 14 hours, how many berths should be provided at the port ?

UNIT-V

9. As stockist has to supply 12000 units of a product per year to his customer. The demanded is fixed and known and the shortage cost is assumed is to be infinite. The inventory holding cost is Rs 0.20 per unit per month and the ordering cost per order is Rs 350. Determine
   (i)The optimum lot size
   (ii) Optimum scheduling period
   (iii) Minimum total variable yearly cost.

(OR)

10. Describe the various steps in simulation Processes?

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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 railway wagon moving at a velocity of 2 m/s is brought to rest by a bumper consisting of two helical compression springs arranged in parallel. The springs are compressed by 150 mm in bringing the wagon to rest. The mass of the wagon is 1000 kg. The spring index as 6. The springs are made of oil- hardened and tempered steel wire with ultimate tensile strength of 1500 N/mm^2 and modulus of rigidity of 81370 N/mm^2. The permissible shear stress for the spring wire can be taken as 50% of the ultimate tensile strength. Design the springs and calculate: 14M
    (i) Maximum force on each spring,   (ii) wire diameter,
    (iii) Mean coil diameter and   (iv) number of active coils.

(OR)

2. (a) Explain the design of spring against fluctuating load.   7M
   (b) Explain the surge in spring?   7M

UNIT – II

3. A 100 mm diameter full journal bearing supports a radial load of 5000N, the bearing is 100 mm long shaft operates at 4000 rpm. Assume permissible minimum film thickness of 0.025 mm and diametral clearance of 0.152 mm determine   14M
   (i) Viscosity of the suitable oil; (ii) Coefficient of friction, (iii) Heat generated.

(OR)

4. Following data is given for a 360^0 hydrodynamic bearing: radial load =3.2 KN, Journal speed= 1490 rpm, l/d ratio=1, unit bearing pressure=1.3 Mpa, radial clearance= 0.05 mm, viscosity of lubricant=25 cp. Assuming that the total heat generated in the bearing is carried by the total oil flow in the bearing, calculate: 14M
    i) Journal diameter and bearing length   ii) coefficient of friction
    iii) power lost in friction   iv) minimum oil film thickness
    v) flow requirement in 1 liter/min   vi) temperature rise

UNIT – III

5. A ball bearing is operating on a work cycle consists of three parts   14M
   (i) A radial Load of 3000N at 1440 rpm for ¼ cycle
   (ii) A radial Load of 5000N at 720 rpm for ½ cycle
   (iii) A radial Load of 2500N at 1440 rpm for the remaining cycle.
   The expected life of the bearing is 10000 hours. Calculate the dynamic load carrying capacity of the bearing.

(OR)

6. (a) Explain (i) Static load carrying capacity, (ii) Dynamic load carrying capacity   7M
   (b) Explain (i) Life of the bearing,   (ii) Reliability of the bearing   7M

UNIT – IV

7.   A compressor running at 250 rpm is driven by a 15 KW at 870 rpm motor through a   14M
pair of $14\frac{1}{2}^0$ full depth spur gear. UseC30 steel for pinion and C45 steel for gear.
Design a gear drive and check for dynamic load.

(OR)

8.   A motor shaft rotating at 1500 rpm has to tranmit 15 KW to ma low speed shaft with   14M
a speed reduction of 3:1. The teeth are $14\frac{1}{2}^0$ involute with 25 teeth on the pinion.
Both the pinion and gear are made of steel m with a maximum safe stress of 200 Mpa.
A safe stress of 40 Mpa may be taken for the shaft on which the gear is mounted and
for the key.
Design a spur gear drive to suit the above conditions. Assume starting torque to be
25% higher than the running torque.

UNIT-V

9.   The connecting rod of petrol engine is designed for the following data.   14M
Piston dia=80 mm, stroke=120 mm, weight of reciprocating parts=15 N, length of
connecting rod=240 mm, Max speed=240 rpm, explosion pressure corresponding to
10^0 of crank angle is 3 Mpa. Factor of safety is 6, If the connecting rod is to be made
of 40Cr steel. Find the dimensions of I section of the connecting rod.

(OR)

10. (a) Write the types of cylinder liners? Explain   7M

      (b)   Write the design procedure of a cylinder   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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 UNIX architecture with a neat diagram.　　　　　　　8M
　　(b)　Explain the structure of the regular files.　　　　　　　　6M

(OR)

2.　(a)　Explain the allocation of disk-block.　　　　　　　　　　7M
　　(b)　Explain buffer cache.　　　　　　　　　　　　　　　　7M

UNIT – II

3.　(a)　Explain mounting and un-mounting File system.　　　　　　8M
　　(b)　Write the syntax of read and write functions and also differentiate them.　6M

(OR)

4.　(a)　Explain pipe system call and also explain reading and writing pipes.　8M
　　(b)　Write a C program to implement "ls" command through pipe function.　6M

UNIT – III

5.　(a)　Explain various states of processes with a neat diagram.　　7M
　　(b)　Write a C program to demonstrate SIGTERM signal.　　　　7M

(OR)

6.　(a)　Write a C program to differentiate fork and vfork functions for processes.　8M
　　(b)　Explain the layout of system memory.　　　　　　　　　6M

UNIT – IV

7.　(a)　Differentiate the variables in Korn shell and C shell.　　　8M
　　(b)　Explain the alias command in C shell with at least four options.　6M

(OR)

8.　(a)　Explain the two special files in UNIX that can be used by any shell.　7M
　　(b)　Explain positional parameters in shell programming.　　　7M

UNIT-V

9.　(a)　Define a Semaphore. Write a C program to create a semaphore and print its ID.　6M
　　(b)　Explain problem of Multiprocessor system.　　　　　　　8M

(OR)

10.　(a)　Explain the following functions for IPC.　　　　　　　　8M
　　　　(i) shmget;　　(ii) semget;　　(iii) msgget
　　(b)　Explain process tracking.　　　　　　　　　　　　　　6M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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)	Explain in detail about Android software stack?	7M
	(b)	How to create new Android project in android studio?	7M

(OR)

2.	(a)	How to launch Android application on a Handset?	7M
	(b)	What is TextView control? Explain with Example?	7M

UNIT – II

3.	(a)	Write about Role of the Android Manifest file in Android project?	7M
	(b)	Write any example code to show the Toast concept?	7M

(OR)

4.	(a)	Explain EditText control with example?	7M
	(b)	List out and explain commonly used controls and layouts in Android?	7M

UNIT – III

5.	Write about Adapting to screen orientation with example?	14M

(OR)

6.	(a)	Explain Table layout with example?	7M
	(b)	Write an Application using Progress Bar?	7M

UNIT – IV

7.	Write about Lifecycle of a Fragment?	14M

(OR)

8.	Explain in detail about ListView control with example?	14M

UNIT-V

9.	What is menu? List out various types of Menus? Explain each menu with example?	14M

(OR)

10.	Write an application for Login page which contains username, password, submit button, reset button. When username="MAD" and password="2019" display "welcome user" otherwise shows "invalid user"?	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) What is Data mining? Describe the process of Knowledge Discovery in Databases   8M
    (b) Write short notes on the following   6M
        i) Temporal Data,   ii) Sequence Data,   iii) Time series Data

(OR)

2. (a) Discuss the various OLAP operations in the Multidimensional Data Model.   8M
    (b) Briefly explain about various Data preprocessing strategies.   6M

UNIT – II

3. (a) Explain the process of Decision Tree Induction with an algorithm   8M
    (b) What is confusion matrix? How can you calculate Accuracy and Error rate when a   6M
        confusion matrix for a 2-class problem is given

(OR)

4. (a) Discuss the methods used to evaluate the performance of a Classifier.   7M
    (b) Briefly explain about methods for expressing attribute test conditions for different   7M
        types of attributes in decision tree induction

UNIT – III

5. (a) Describe Support Vector Machines in the case of objects are linearly separable.   7M
    (b) How does the Naive Bayesian classification works? Explain.   7M

(OR)

6. (a) Write and explain k-Nearest Neighbor Classification algorithm   7M
    (b) What is Rule based Classification. How can you evaluate the quality of a   7M
        classification rule?

UNIT – IV

7. Explain frequent item sets generation using Apriori algorithm.   14M

(OR)

8. (a) Define Support and Confidence of an association rule. How can you formulate the   7M
        Association mining problem?
    (b) What is meant by Maximal frequent itemsets and closed frequent itemsets. Give an   7M
        example.

UNIT-V

9. (a) Explain about DBSCAN clustering technique with an example.   7M
    (b) What are the different types of Hierarchical clustering? Explain them.   7M

(OR)

10. (a) What is cluster analysis? Briefly Explain different types of clusters   8M
    (b) Briefly explain about Core Points, Border Points and Noise Points.   6M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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 Hill Cipher encryption technique with an example.	7M
	(b)	What is meant by transposition technique? Discuss Rail fence technique with an example.	7M

(OR)

2.	(a)	Describe various security services and security mechanisms.	7M
	(b)	Describe different terms in symmetric and asymmetric cryptography.	7M

UNIT – II

3.	(a)	With neat illustration explain AES algorithm?	7M
	(b)	What is the difference between Block cipher and stream cipher? Explain DES with appropriate diagrams.	7M

(OR)

4.	(a)	Discuss modular arithmetic and explain GF(2n) fields with addition and multiplication.	8M
	(b)	Write short notes on i) Quadratic Congruence ii) factorization	6M

UNIT – III

5.	(a)	What is meant by Public-Key cryptography? Explain RSA algorithm with an example	7M
	(b)	Discuss Diffie – HellMan Key exchange technique with an example.	7M

(OR)

6.	(a)	List out the applications of cryptographic Hash – functions. Discuss briefly on Hash functions based on Cipher Block Chaining technique.	8M
	(b)	Describe in detail about the principles of public key cryptosystems.	5M

UNIT – IV

7.	(a)	Discuss security of MACs and HMAC.	7M
	(b)	What are the different approaches to message authentication?	7M

(OR)

8.	(a)	Briefly explain digital signature standard.	7M
	(b)	Discuss briefly on Schnorr digital signature scheme.	7M

UNIT-V

9.	(a)	What is PGP? Explain the general format of PGP message.	7M
	(b)	What is S/MIME? Discuss variety of MIME content types.	7M

(OR)

10.	(a)	What is the motivation for Kerberos? Discuss Kerberos version 4.	9M
	(b)	Explain the principles of Remote user authentication.	5M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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) What is an algorithm? Explain its characteristics in detail.   7M
    (b) Write the algorithm for bubble sort and find its best and worst case efficiency.   7M

(OR)

2. (a) What is space complexity? Illustrate with an example for fixed and variable   7M
        part in space complexity.
    (b) Write an algorithm for sequential search and derive its best and worst case time complexity. 7M
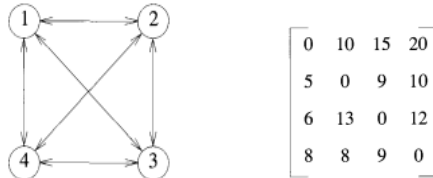
UNIT – II

3. (a) Explain working of merge sort algorithm with an example.   7M
    (b) Explain divide-and-conquer technique. Write a recursive algorithm for finding the maximum   7M
        and minimum element from the list.

(OR)

4. (a) Solve the greedy knapsack problem where N=4, m=10, p= (40, 42, 25, 12), w=(4, 7, 5, 3).   7M
    (b) Discuss Strassen's matrix multiplication and derive its time complexity.   7M

UNIT – III

5. (a) What is All – Pair Shortest Path problem (APSP)? Write Floyd's APSP   7M
        algorithm and analyze it.
    (b) Describe the travelling sales person problem. Find minimum cost tour for the following   7M
        graph using dynamic programming.

$$\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

(OR)

6. (a) Explain multistage graphs with example. Write multistage graph algorithm to forward   7M
        approach.
    (b) How the reliability of a system is determined using dynamic programming? Explain.   7M

UNIT – IV

7. (a) Write a non-recursive algorithm for preorder traversal of a binary tree T.   7M
    (b) Define Bi-connected component with an example and explain its properties.   7M

(OR)

8. (a) State N-Queens problem. Explain 8-queens problem using backtracking.   7M
    (b) Write an algorithm for finding all m-coloring of a graph and explain with an example.   7M

UNIT-V

9. (a) Explain LC branch and bound and FIFO branch and bound.   7M
    (b) Explain Non Deterministic search and sorting algorithms.   7M

(OR)

10. (a) Draw the portion of state space tree generated by LCBB for the 0/1 Knapsack   7M
        instance: n = 5, (p1,p2,…,p5) = (10,15,6,8,4), (w1,w2,..,w5) = (4,6,3,4,2) and
        m=12. Find an optimal solution using fixed – tuple sized approach.
    (b) With a neat diagram, explain the relevance of NP-hard and NP-complete problems.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Regular & Supple Examinations of April/May 2019
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. (a) Write about Structural things of UML vocabulary. Give UML notation.   7M
   (b) What are Principles of modeling? Explain.   7M

(OR)

2. Explain Common mechanisms in the UML in detail.   14M

UNIT – II

3. What is Relationship? Explain about the steps for modeling the Single inheritance and   14M
   Structural Relationships with example.

(OR)

4. Define Class Diagram. Explain about the graphical representation of Class diagram   14M
   with example.

UNIT – III

5. What is Interaction? Explain about the messages, links and sequencing.   14M

(OR)

6. Define Use case? And Write common modeling techniques for Use case diagram with   14M
   example.

UNIT – IV

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

(OR)

8. Explain about State chart diagram in detail.   14M

UNIT-V

9. What is deployment diagram? Explain briefly about common modeling techniques for   14M
   deployment diagram?

(OR)

10. Draw and explain the following diagrams for the unified library management
    application:
    a) Class diagram   7M
    b) Use case diagram   7M