

Q.P. Code: 255212

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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 various elements involved in remote sensing with neat sketch. 8M
 - (b) Give a brief account of atmospheric windows 6M
- (OR)
2. (a) What is Spectral Reflectance Curve? Draw the spectral reflectance curves for healthy vegetation, soil and water. 8M
 - (b) Describe the physics of Remote Sensing. 6M

UNIT – II

3. (a) Distinguish between Whiskbroom scanner and Push-broom scanner. 8M
 - (b) List out important satellites and their sensors. 6M
- (OR)
4. (a) Define platform? Briefly explain the types of remote sensor platforms. 8M
 - (b) Write short notes on (i) Sun-synchronous satellite, (ii) Geostationary satellite 6M

UNIT – III

5. Explain the term visual image interpretation. Discuss various elements of visual image interpretation. 14M
- (OR)
6. (a) What is supervised classification? What are the basic steps and stages involved in a supervised classification? 8M
 - (b) What are the different spatial filtering techniques used in image processing? 6M

UNIT – IV

7. (a) Explain data manipulation and analysis in GIS. 8M
 - (b) Explain Computational Analysis Methods (CAM). 6M
- (OR)
8. Explain in detail about functions of GIS. 14M

UNIT-V

9. Explain the applications of remote sensing in watershed management 14M
- (OR)
10. Explain the application of remote sensing in land use and land cover analysis. 14M

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SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VI Sem (R15) Supple. Examinations of November 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) What are the uses of map study in engineering surveys for highway location? 7M
(b) What are the various methods of classifying the roads? Briefly outline the classification based on location and function as suggested in the Nagpur road plan. 7M

(OR)

2. (a) Explain the necessity and objectives of highway planning. 7M
(b) Write about various road patterns? What are the differences between good and improper alignment? 7M

UNIT – II

3. (a) Explain the elements of highway geometric design. 7M
(b) For a highway with design speed of 100kmph, determine the safe OSD (assume acceleration as 0.50 m/s^2 , and reaction time = 2.0s) 7M

(OR)

4. (a) Derive an expression for finding the stopping sight distance at level and at grades. 7M
(b) Explain curve resistance & compensation in gradient on horizontal curves? 7M

UNIT – III

5. (a) What the objectives and application are of spot speed studies? 7M
(b) What are the advantages and disadvantages of traffic signal? 7M

(OR)

6. (a) Explain how the speed and delay studies are carried out. What are the various uses of delay studies? 7M
(b) Draw a neat sketch of a full clover leaf and show the movement of traffic. 7M

UNIT – IV

7. (a) What are the requirements of at grade intersection? 7M
(b) Present on different types of intersections. 7M

(OR)

8. (a) Briefly explain the various design factors to be considered in the design of rotary. 7M
(b) With neat sketches, explain the Different types of traffic Islands and conflicts at Intersections 7M

UNIT-V

9. (a) Explain briefly about the steps involved in the construction of CC pavements. 7M
(b) What is the influence of repetitive loads in the pavement design? 7M

(OR)

10. (a) Explain the roles of base course and sub base courses in pavements. 7M
(b) Discuss about the critical combination of stresses to be considered in rigid pavements. 7M

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SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) Write a note on the crop seasons and principal crops of India. 7M
(b) Define the terms 'duty' and 'delta'. What are the methods of improving duty of water? 7M

(OR)

2. (a) Explain the various types of irrigation efficiencies. 7M
(b) With a neat sketch explain the classification of soil water. 7M

UNIT – II

3. (a) How irrigation canals are classified? Explain. 7M
(b) Explain the procedure for designing an irrigation channel using Kennedy's theory. 7M

(OR)

4. (a) Design an irrigation channel in alluvial soil according to Lacey's silt theory for the following data: (i) Full supply discharge = $10 \text{ m}^3/\text{sec}$. (ii) Lacey's silt factor = 0.9, (iii) Side slope of channel = $\frac{1}{2}(H):1(V)$ 7M
(b) What is a canal lining? Discuss its advantages and disadvantages. 7M

UNIT – III

5. (a) What is a weir? Describe with neat sketches of various types of weirs. 7M
(b) Explain the salient features of Bligh's creep theory for the design of weir constructed over pervious foundation. 7M

(OR)

6. (a) What are the causes of failure of hydraulic structures on permeable foundations? Give their remedies. 7M
(b) Discuss Khosla's method of design of weirs on permeable foundations. 7M

UNIT – IV

7. (a) Discuss the various factors which govern the selection of type of dam. 7M
(b) Describe the various types of reservoirs. 7M

(OR)

8. (a) Explain the terms: 7M
(i) Dead storage, (ii) Useful storage, (iii) surcharge storage, and (iv) Valley storage.
(b) What is a 'Mass curve'? How is it used in the determination of reservoir capacity required for a specified yield? 7M

UNIT-V

9. (a) Explain the various forces acting on a gravity dam. 7M
(b) Derive an expression for the limiting height of a low gravity dam. Differentiate between low and high gravity dams. 7M

(OR)

10. (a) What is an 'earth dam'? What are the criteria for safe design of earth dams? 7M
(b) Explain the graphical method used for determination of seepage line in a homogeneous earth dam with a horizontal drainage blanket. 7M

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SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. (a) What is meant by limit state? Discuss the different "limit states" to be considered in reinforced concrete design 5M
- (b) Explain the basis for the selection of partial load and safety factor by the code for "Serviceability" 5M
- (c) Why is the partial safe factor for concrete greater than for reinforcing steel in the consideration of ultimate limit states? 4M

(OR)

2. Describe the salient features of design philosophies? 14M

UNIT - II

3. Determine the moment capacity of the doubly reinforced beam of $b = 300\text{mm}$, $d' = 90\text{mm}$, $d=600\text{mm}$, $A_{st} = (4-32\text{mm}) + (4-16\text{mm})$ dia and $A_{sc} = (2-32\text{mm}) + (2-20\text{mm})$ dia. Use M20 concrete and Fe415 steel. 14M

(OR)

4. Design A Simply supported flanged beam for the following data: $D_f=100\text{mm}$, $D = 750\text{mm}$, $b_w = 350\text{mm}$, $d' = 90\text{mm}$, $d=660\text{mm}$, spacing of beams = 4m c/c, and effective span = 12m, and imposed loads = 12kN/m^2 . Use M20 concrete and Fe415 steel. 14M

UNIT - III

5. A rectangular beam of size 230 mm width and 450 mm effective depth is reinforced with four bars of 20 mm diameter. Determine the required vertical shear reinforcement to resist the factored shear force of (i) 70 kN, (ii) 250 kN, and (iii) 400 kN. Consider concrete of grade M25 and steel of grade Fe 415. 14M

(OR)

6. The T-beam given is subjected to the following factored loads: bending moment of 150 kNm, shear of 120 kN, and torsion of 60 kNm. Assuming M30 concrete and Fe 415 steel, design the reinforcements as per IS 456. Assume severe environment. 14M

UNIT - IV

7. Design a reinforced concrete slab of clear dimensions 4.5mx6m with two adjacent edges Discontinuous. The slab is subjected to a live load of 3.5kN/m^2 and floor finish of 1kN/m^2 . Assume the width of support is 300mm. 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 3.2m. The stair hall measures 2.5m x 5m. The live load is taken as 2000 N / m^2 Use M20 grade and Fe 415 steel bars. 14M

UNIT-V

9. Design the reinforcement of a column of size 450mmx450mm, subjected to a factored axial load of 1200kN and a factored moment of 350kN-m about the centroidal axis. Use M20 concrete and Fe415 steel. Sketch the reinforcement details. 14M

(OR)

10. A rectangular cantilever beam of span 8m having size 400mmx500mm in cross section. BM at the support due to UDL is 250kN-m at service loads out of which 45% is due to permanent loads. It

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Use M25 concrete and Fe415 steel. Calculate total def

SET - 2

SUB: STRUCTURAL ANALYSIS - I (CE)

Time : 3 Hours

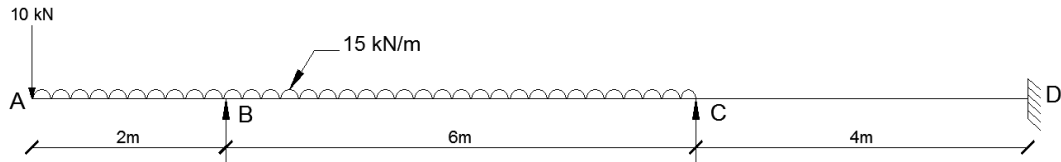
Max.

Marks: 70

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

UNIT - I

1. Analyse the beam shown in **fig below**. and draw shear force and bending moment diagrams by using Clapeyron's theorem. 14M



(OR)

2. (a) Determine the static and kinematic indeterminacy for the following structures as shown in **fig.1** 7M

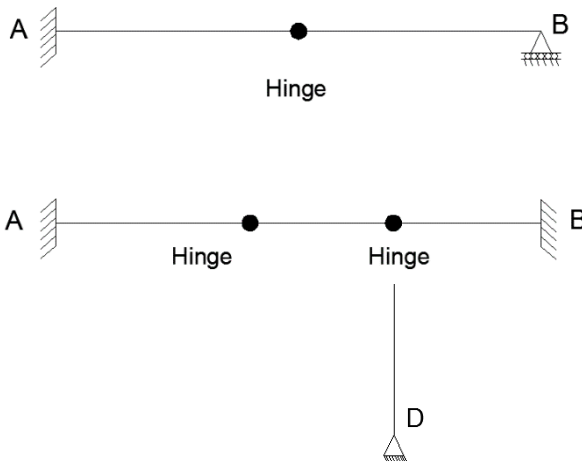


Fig.1

- (b) A beam AB of uniform section and 8 m span is built at the ends. A uniformly distributed load of 35 kN/m runs over left half of the span and there is an additional concentrated load of 20 kN at 2m interval from both left and right support. Determine the fixed end moments at the ends and the reaction. Draw BMD & SFD. 7M

UNIT - II

3. Analyse the continuous beam as shown in **fig 2**. By slope deflection method. Draw BMD and SFD. 14M

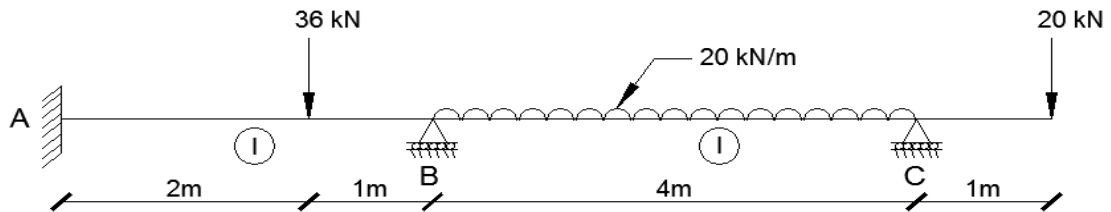


Fig 2.

(OR)

4. A continuous beam ABC is built-in at A and C and is carried over simple support at B. Span AB = 6 m and span BC = 4 m. It carries a clockwise couple of 30 kNm in the mid span AB, and a point load of 10 kN is acting in the span BC, 2 m from the middle support B. Obtain the support moments by **slope deflection method** and sketch the BMD. 14M

UNIT – III

5. Analyse the given frame shown in **fig.3** by moment distribution method and draw BMD and SFD. 14M

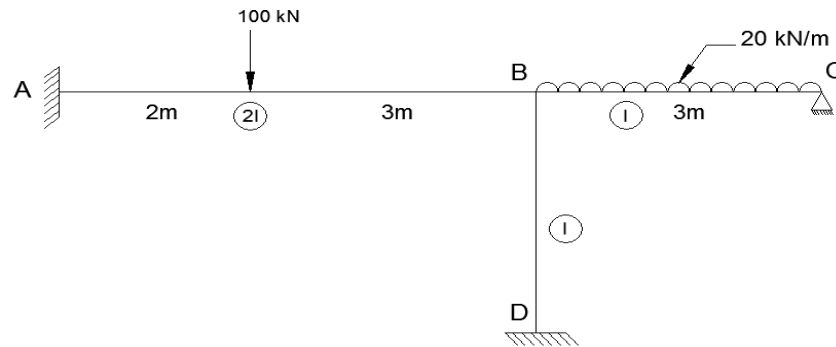


Fig.3

(OR)

6. Analyse the continuous beam shown in **fig 4**. Using Moment Distribution method. Sketch SFD and BMD. (EI is constant). 14M

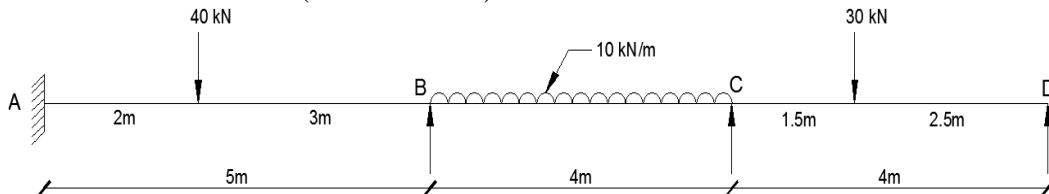


Fig.4

UNIT – IV

7. Analyse the frame shown in **fig 5** by kani's method. Draw Bending moment diagram and Shear force Diagram. 14M

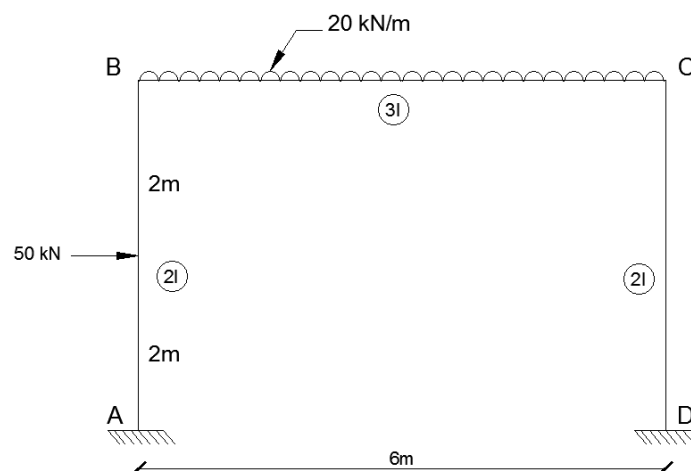


Fig.5

(OR)

8. Determine the support moments of a continuous girder shown in **fig.6** by Kani's method. Take $E = 200 \text{ kN/mm}^2$, $I = 3.5 \times 10^7 \text{ mm}^4$ 14M

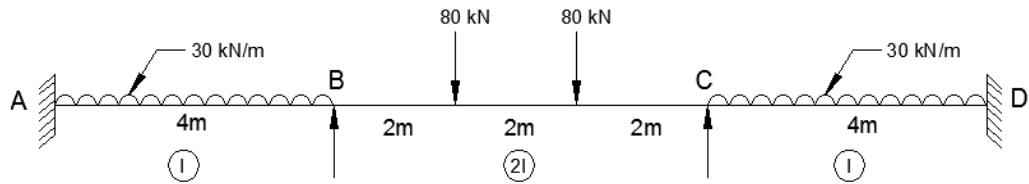


Fig.6

UNIT-V

9. (a) State Castigliano's first and second theorem 7M
 (b) State the Betti's law and Maxwell's theorem of reciprocal deflections 7M
- (OR)
10. (a) Find the deflection at the centre of a simply supported beam of span L carrying a uniformly distributed load of w per unit run over the whole span. Assume uniform flexural rigidity. 7M
 (b) Find the deflection at the free end of a cantilever beam of length L carrying a uniformly distributed load of ' w ' per unit run over the whole span. Assume uniform flexural rigidity. 7M

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SET - 2

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

B. Tech VI Sem. (R15) Supple. Examinations of November 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. State the nature and scope of Managerial Economics. 14M

OR

2. Discuss the various determinants of Demand. 14M

UNIT – II

3. Describe the properties of Isoquants and Isocost curves. 14M

(OR)

4. Discuss the significance of Break Even Analysis in the present competitive environment. 14M

UNIT – III

5. How price is fixed in Perfect competition? Explain 14M

(OR)

6. Discuss the various pricing practices with examples. 14M

UNIT – IV

7. Define Partnership. List out its essential features 14M

(OR)

8. What is the importance of capital in an organization? Discuss various types of capital. 14M

UNIT-V

9. You are required to prepare Final Accounts using the below trial balance. 14M

Particulars	Amount (Rs)	Particulars	Amount (Rs)
Opening stock	6,250	Plant and Machinery	31,150
Sales	59,000	Return outwards	6,900
Depreciation	3,335	Cash	4,475
Commission(Cr)	1,055	Salaries	3,750
Insurance	1,900	Debtors	9,525
Carriage Inwards	1,500	Discount(Dr)	1,640
Furniture	3,350	Bills Receivable	13,650
Capital	46,140	Bank OD	20,000
Creditors	8,900	Purchases	43,395
Bills Payable	2,705	Cash at bank	235
Carriage outwards	1,000	Return inwards	8,295
Bad Debts	900	Closing stock	18,500

(OR)

10. The following figures related to trading activities of a company for the year ended 31-03-2018.

14M

Particulars	Rs	Particulars	Rs
Cash	18,000	Creditors	50,000
Debtors	1,42,000	Outstanding expenses	15,000
Closing stock	1,80,000	Tax payables	75,000
Bills payable	27,000		

- Calculate (i) Current Ratio
(ii) Liquidity Ratio
(iii) Absolute Liquidity Ratio.

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SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. Explain the following 14M
i) Rule based system ii) Knowledge representation
(OR)
2. Explain in detail various approaches of Artificial Intelligence. 14M

UNIT – II

3. (a) List the types of learning methods? Explain them. 7M
(b) Determine 3- input OR gate realization using McCulloch Pitts neural model? 7M
(OR)
4. (a) Explain about perceptron learning rule. 7M
(b) Determine 3- input NOR gate realization using McCulloch Pitts neural model? 7M

UNIT – III

5. Write the importance of neural networks in control systems with example. 14M
(OR)
6. What is meant by load forecasting problem? Explain the role of ANN in load forecasting? 14M

UNIT – IV

7. (a) Define defuzzification and explain its methods. 7M
(b) Explain about 7M
i) Membership function & ii) Aggregation of fuzzy rules
(OR)
8. (a) What are the various properties and operations of crisp sets? 7M
(b) Consider a set $P = \{P_1, P_2, P_3, P_4\}$ of variety of plants, $D = \{D_1, D_2, D_3, D_4\}$ pf various designs affecting the plant $S = \{S_1, S_2, S_3, S_4\}$ be the common systems of the design. Let R be a relation $\tilde{R} = P \times D$ and $\tilde{S} = D \times S$. Find the maximum composition of the relation $\tilde{R} \& \tilde{S} = \tilde{R} \circ \tilde{S}$. 7M

$$\text{Where } \tilde{R} = \begin{bmatrix} 0.6 & 0.6 & 0.9 & 0.8 \\ 0.1 & 0.2 & 0.9 & 0.8 \\ 0.9 & 0.8 & 0.4 & 0.8 \\ 0.9 & 0.8 & 0.1 & 0.2 \end{bmatrix} \text{ and } \tilde{S} = \begin{bmatrix} 0.1 & 0.2 & 0.9 & 0.9 \\ 1 & 1 & 0.4 & 0.6 \\ 0 & 0 & 0.5 & 0.9 \\ 0.9 & 1 & 0.8 & 0.2 \end{bmatrix}$$

UNIT-V

9. Explain in detail about application of fuzzy technique in Induction Motor control. 14M
(OR)
10. Explain the role of fuzzy logic in automatic generation control. 14M

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SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. Explain heat rate curve and incremental production cost characteristics
(OR)
2. What is meant by optimal generation allocation? Derive the conditions for optimal allocation of generation among the generators in a thermal plant including transmission losses

UNIT – II

3. What is the significance of penalty factor in economic scheduling? Using Lagrangian multipliers, develop mathematical expressions for the solution of economic hydrothermal scheduling problem
(OR)
4. Explain about the short term hydro thermal scheduling

UNIT – III

5. Explain the load frequency problem with an example of two plants connected through a tie line
(OR)
6. Write a note on load frequency control and economic dispatch control systems

UNIT – IV

7. What are the objectives of reactive power compensation in a transmission system? Explain the behavior of an uncompensated transmission line under load
(OR)
8. Explain about shunt reactor and capacitor type compensation

UNIT-V

9. Explain in detail the importance and features of congestion management
(OR)
10. Illustrate the concept of inter-zonal/ intra-zonal congestion management with example

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. (a) Consider the power system in Figure 1. Each generator and the line have impedance of $(0.1+j0.1)$ p.u. and $(0.2+j0.2)$ p.u. respectively, neglecting line charging admittances from Y_{bus} by direct inspection method. 8M

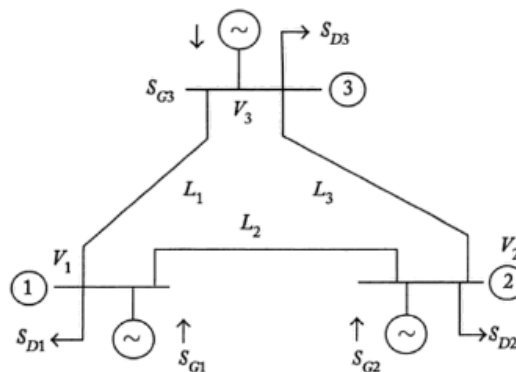


Fig.1

- (b) For the power system network shown in Figure 1, a new line L4, with an impedance of $0.25 + j0.25$ p.u. is added between bus 1 and 2. Obtain the modified Y_{bus} . 6M
- (OR)
2. (a) Derive the basic equations for the load flow study using Gauss-Seidel method. With respect to this method, explain the following: 9M
 (i) Acceleration factor. (ii) Handling of PV buses.
- (b) What are different types of buses in load flow studies? Explain the importance of slack bus in load flow analyses. 5M

UNIT - II

3. Compare Gauss-Seidel, Newton Raphson, Decoupled and Fast decoupled methods with respect to 14M
 i) Number of iterations, ii) Convergence characteristics, iii) Initial values
- (OR)
4. (a) Obtain the voltages of the system shown in figure 2, after one iteration. The line admittances are in per unit on a 100 MVA base. Use fast decoupled power low method. 10M

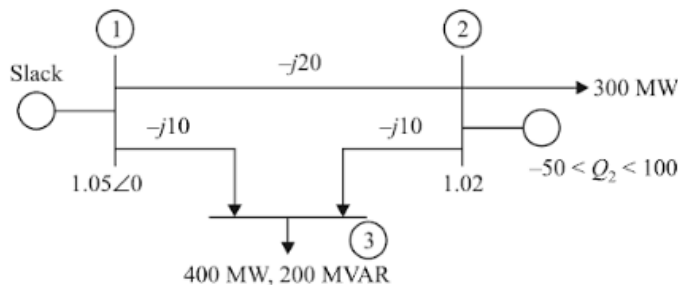


Fig.2

- (b) What are the advantages of Newton Raphson method over Gauss-Siedal method? 4M

UNIT – III

5. Consider the power system network shown in figure below. 14M

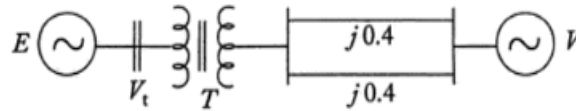


Fig.3

Generator reactance and terminal voltages are given as:

$$x_d^1 = 0.2 \text{ p.u. and } V_t = 1.0 \text{ p.u.}$$

Transfer reactance is 0.1 p.u. Infinite bus voltage is 1.0 p.u. Generator is feeding 1.0 p.u. power to the infinite bus. Calculate:

- (i) Generator emf behind the transient reactance
 - (ii) Maximum steady-state power limit that can be transferred under the condition when a three phase fault occurs at the midpoint of one of the line.
- (OR)
6. (a) Draw and explain power angle curve of a synchronous machine. 7M
 (b) Discuss in brief various methods of improving steady state stability. 7M

UNIT – IV

7. (a) Explain how is the equal area criterion applied when there is a sudden (i) increase in power input and (ii) decrease the power output due to a three phase fault? 7M
 (b) A generator rated 75MVA is delivering 0.8 p.u power to a motor through a transmission line of reactance $j0.2$ p.u. The terminal voltage of the generator is 1.0p.u and that of the motor is also 1.0 p.u. Determine the generator emf behind transient reactance. Also find the maximum power that can be transferred. 7M

(OR)

8. Derive the swing equation of single machine connected to infinite bus and also write the assumptions to derive it. 14M

UNIT-V

9. With the neat diagrams discuss the behavior of travelling wave when it reaches the end of 14M
 (i) Open circuited transmission line, (ii) Short circuited transmission line

(OR)

10. (a) A unit step voltage is travelling on a long line of surge impedance Z_1 . It reaches the junction with a cable of finite length whose far end is open. The cable has a surge impedance of Z_2 , and the time of one-way wave travel on it is T. Draw the Bewely's lattice diagram and find from it the value of voltage at the junction at time $4T$. Assume $Z_1/Z_2 = 9$. 7M
 (b) A unit –step voltage wave is travelling along a line of characteristics impedance Z_c . The line terminates in a shunt inductance L. Derive the expression for voltage at the line and the inductance junction as a function of time. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) Draw the Four Quadrant Diagram of Electrical Drive for motoring and Braking Operations 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) Explain with neat block diagram about Electric Drive? 7M

UNIT – II

3. (a) Derive Expression Armature current in Discontinuous mode of DC Separately Excited motor fed from a Single phase fully controlled Rectifier? 7M
(b) A 200V, 1000 rpm 13A separately excited DC motor has armature circuit resistance and inductance of 3 ohm and 100mH. It is fed from a 1- ϕ half controlled rectifier with AC source voltage of 230V, 50Hz. Calculate 7M
i. Motor torque for $\alpha = 30^\circ$ and speed 400 rpm
ii. Motor speed for $\alpha = 30^\circ$ and $T = 70$ N-m
(OR)
4. (a) Explain Braking methods for DC Separately Excited Motor? 7M
(b) A 220V, 1000rpm, 60A separately excited motor with armature resistance of 0.6Ω fed from a Circulating current dual converter with AC source voltage line voltage=165V. Determine converter firing angles for the following operating points: 7M
i. Motoring operation at rated motor torque and 900rpm
ii. Braking operation at rated motor torque at 900 rpm
iii. Motoring operation at rated motor torque and -900 rpm
iv. Braking operation at rated motor torque at -900 rpm

UNIT – III

5. (a) Explain characteristics of Stator voltage control of an Induction Motor with AC Voltage Controller? 7M
(b) A 3kW, 400V, 50Hz, 4-pole, 1400 rpm, delta connected induction motor has the following parameters referred to stator. $R_s = 2.5\Omega$; $R_r = 4.5\Omega$; $X_s = X_r = 6\Omega$. Speed control is achieved by stator voltage control method. When driving a fan load, the motor runs at rated speed and rated voltage calculate the voltage to be applied to the motor for 1300 rpm. 7M

(OR)

6. (a) Derive the Expression in Static Resistance control method for the speed control of Induction Motor? 7M
- (b) A 440V ,50Hz ,6pole Star connected wound rotor motor has following parameters: 7M
- $R_1 = 0.5\Omega$, $R'_2 = 0.4\Omega$, $X_1 = X'_2 = 1.20\Omega$, $X_m = 50\Omega$,Stator to rotor turns ratio is 3.5. Motor is controlled by Static rotor resistance control method .External resistance is chosen such that the break down torque is produced at stand still for a duty ratio of zero. Calculate the value of external resistance. How duty ratio should be varied with speed so that motor accelerates at max. Torque.

UNIT – IV

7. (a) Explain self control of Synchronous motor by line commutated inverter? 7M
- (b) Explain the Brushless d.c motor drive and enumerate its applications? 7M
- (OR)
8. (a) Derive the torque expression for Synchronous motor. 7M
- (b) A 6 MW, 3-phase, 11 kV, Y-connected, 6-pole, 50Hz, 0.9(leading) power factor 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.

UNIT-V

9. (a) Explain about Energy Efficient operation of drives? 7M
- (b) Brief about the maintenance of Electrical Drives? 7M
- (OR)
10. (a) What are the measures of energy conservation in Electrical drives? 7M
- (b) Explain the power factor improvement methods? 7M

Q.P. Code: 356012

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. Explain the 40 pins of 8086 microprocessor with neat diagram 14M
(OR)
2. (a) Explain the architecture of 8085 microprocessor with neat diagram. 7M
(b) Name and explain different addressing modes used in 8085 using suitable examples. 7M

UNIT – II

3. (a) Explain various assembler directives with examples. 8M
(b) Write an ALP in 8086 to divide 16 bit number by 8 bit number. 6M
(OR)
4. (a) Write an ALP in 8086 to search for a byte in a given set of 10 numbers. 7M
(b) Write an ALP to find Factorial of given number using CALL and RET instructions 7M

UNIT – III

5. (a) Explain 8257 DMA interface to 8086 microprocessor. 7M
(b) Draw the block diagram of 8253 and explain each block. 7M
(OR)
6. (a) Draw the internal block diagram of 8259 and explain about each block. 7M
(b) With neat diagrams explain the five modes of operation of 8253 in detail. 7M

UNIT – IV

7. Illustrate with block diagram and discuss various modes of operation of 8255PPI. 14M
(OR)
8. Interface four chips of 16k x 8 ROM and four chips of 16k x8 RAM with 8086 14M
according to the following map for ROM 1 to 4 from F0000H-FFFFFH, RAM 1 to 4
from C0000H-CFFFFH. Neatly draw the interface diagram with required signals and
decoding logic.

UNIT-V

9. Explain the Instruction set of 8051 microcontroller. 14M
(OR)
10. (a) List out SFRs of 8051 and discuss the PSW register format. 7M
(b) Explain the bit format of TCON and SCON register of 8051. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**B. Tech VI Sem. (R15) Supple. Examinations of November 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 the operation of Inverting and non-inverting op-amp amplifier circuits with neat diagram. 8M
- (b) Define Integrated circuit along with classification and package types? 6M
- (OR)
2. (a) Discuss about Voltage to Current (V to I) and Current to Voltage (I to V) converters? 7M
- (b) Explain the operation of Op-amp Log amplifier. 7M

UNIT – II

3. (a) Explain briefly the functional diagram of 555 timer. 7M
- (b) Explain the operation 555 timer in Astable mode with neat diagrams. 7M
- (OR)
4. (a) Explain the basic building blocks of PLL with neat diagram. 8M
- (b) What is the use of PLL? Define lock in range, Capture range and pull-in-time. 6M

UNIT – III

5. (a) What is CMOS logic? Give brief introduction about MOS transistors. 7M
- (b) Draw & Explain implementation of 2 input NAND gate using CMOS logic. 7M
- (OR)
6. (a) What is bipolar logic? Explain inverter operation using bipolar logic. 7M
- (b) Distinguish between CMOS, TTL & ECL Technologies. 7M

UNIT – IV

7. (a) Discuss different data types and constants in VHDL. 6M
- (b) Describe libraries and packages in VHDL. 8M
- (OR)
8. (a) Write notes on structural design elements in VHDL. 7M
- (b) What is the difference between functions and procedures? Explain with suitable example. 7M

UNIT-V

9. (a) Design 1: 8 de-multiplexers using 1:4 de-multiplexers. 8M
- (b) Design D-flip flop by using JK flip flop along with VHDL code. 6M
- (OR)
10. (a) Draw and explain the operation of 3 X 8 decoder along with VHDL code. 7M
- (b) Explain J-K flip flop along with truth table. Write the VHDL program for J-K flip flop. 7M

Q.P. Code: 455212

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) Differentiate between OSI and TCP /IP reference models. 7M
(b) Explain detail about Network Hardware. How network hardware support the communication of two systems? 7M

(OR)

2. (a) Discuss in brief about TCP/IP protocol Suite. 7M
(b) Give brief description about the co-axial cables and also mention their disadvantages. 7M

UNIT – II

3. (a) Write the differences between bridged Ethernet, switched Ethernet and full duplex Ethernet 7M
(b) Explain in detail, how sliding window protocol is used in HDCC for full duplex lines with window size 4. 7M

(OR)

4. (a) What is sliding window? How it is used in noisy channels for error control 7M
(b) What are the draw backs of stop and wait protocol? How can they overcome by sliding window protocol? 7M

UNIT – III

5. (a) Explain detail about the carrier sense multiple access protocols 7M
(b) Describe the working principle of Carrier sense multiple access with collision Detection (CSMA/CD). 7M

(OR)

6. (a) Explain in detail about broadcast and multicast routings. 7M
(b) What is the format of IPv4 header? Describe the significance of each field. 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) Define UDP and discuss the different fields of the format of a used datagram 7M
(b) Discuss various kinds of transport services 7M

UNIT-V

9. (a) In detail write about WAP protocol implementation for wireless Web 7M
(b) Discuss in detail about firewalls. 7M

(OR)

10. (a) What is electronic E-mail? Describe in brief about the two architectures of EMail. 7M
(b) What is a name server? List and explain the features of various name servers. 7M

Q.P. Code: 455412

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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 the pin diagram of 8051 and explain the functioning of each and every pin. 14M
(OR)
2. (a) Explain the use of SFRS. 8M
(b) Write in detail about the instruction SJMP 6M

UNIT – II

3. Explain about the interrupt structure of 8051 microcontroller 14M
(OR)
4. (a) Write an ALP to multiply the unsigned number in register R3 by the unsigned number on port 2 and put the result in external RAM locations 10h and 11h. 8M
(b) Explain the working of Timers in auto reload and Split timer modes 6M

UNIT – III

5. (a) Explain the major design rules for implementing RISC and ARM philosophy. 6M
(b) What are the various registers in ARM? Explain. 8M
(OR)
6. (a) Write a short note on ARM9 FAMILY. 6M
(b) Write a short note on Instruction pipeline 8M

UNIT – IV

7. (a) What is Thumb state? Explain 6M
(b) Discuss about ARM addressing modes 8M
(OR)
8. (a) Explain branch instructions of ARM 7M
(b) Explain Multi register load-store instructions of ARM. 7M

UNIT-V

9. (a) Define IOT. Explain the characteristics of IOT. 6M
(b) Explain IOT enabling technologies. 8M
(OR)
10. (a) Explain how IOT is used in irrigation systems. 7M
(b) Explain how IOT is used in home automation. 7M

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

Time : 3 Hours

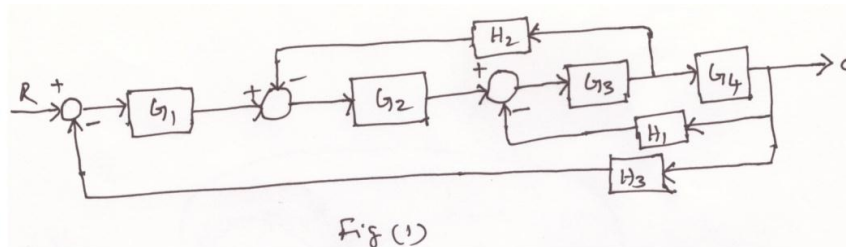
Max.

Marks: 70

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

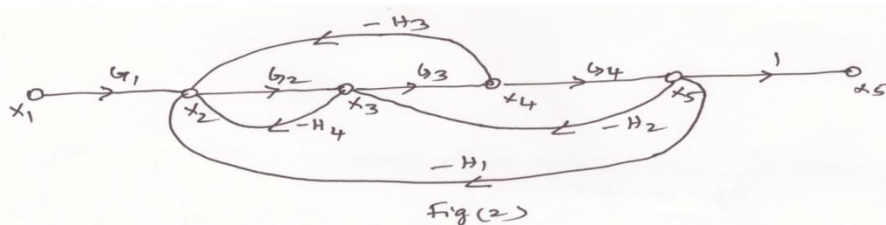
UNIT - I

1. (a) Briefly discuss the effects of feedback. 3M
- (b) Write the rules of block diagram reduction techniques. 3M
- (c) Using block diagram reduction technique, determine the transfer function for the system shown in fig(1) 8M



(OR)

2. (a) Derive the transfer function of an field controlled d.c servo motor. 6M
- (b) Find the overall gain of the signal flow graph shown in fig (2) using Mason gain formula. 8M



UNIT - II

3. (a) Define i) rise time, ii) delay time, iii) settling time, and iv) over shoot for a second order system. 7M
 - (b) The OLTF of a UFB control system is given by $G(s) = \frac{K}{S(1+ST)}$ 7M
 - i) By what factor should the amplifier gain K be multiplied so that the damping ratio is increased from a value of 0.2 to 0.6.
 - ii) By what factor should the amplifier gain k be multiplied so that the overshoot of unit step response is reduced from 80% to 20%?
- (OR)
4. (a) Differentiate between type0, type1 and type2 system. For type2 system, determine the steady state error for position, acceleration and velocity inputs. 7M
 - (b) Discuss the effect of PD and PI on performance of a control system. 7M

UNIT – III

5. (a) What are the necessary and sufficient conditions for a system for a system to be stable? Define absolute stability and marginal stability. 7M
(b) Apply R-H criterion for the following OLTF of a UFB control system and find the value of K for the system to be stable. 7M

$$G(s) = K/S(S + 2)(S^2 + 6S + 25)$$

(OR)

6. (a) Write the Rules of root loci. 7M
(b) Obtain the root locus for a UFB system with OLTF $G(s) = K/S(S^2 + 6S + 10)$ 7M

UNIT – IV

7. (a) Explain briefly about Gain Margin and Phase Margin. 7M
(b) Sketch the Bode plot for the following given OLTF 7M

$$20/(1 + 0.2S)(1 + 0.4S)(1 + S)$$

(OR)

8. (a) State and explain Nyquist stability criterion. 7M
(b) Sketch the nyquist plot of the OLTF of a UFB system is given by 7M

$$G(s) = k/S(1 + 0.1S)(1 + S)$$

Comment on its stability.

UNIT-V

9. (a) Derive an expression for the transfer function of phase lead Network. 7M
(b) Explain the types of compensation techniques in brief.. 7M

(OR)

10. (a) What do you understand by the term cascade compensation? How do you carry out the compensation in frequency domain? 7M
(b) Design a cascade compensator on a system that will give approximately 15% overshoot to a unit step input while the settling time is decreased by a factor of 2.5 and $k_v \geq 20$. 7M

The OLTF of the system with UFB is given by $G(s) = K/S(S + 3)(S + 9)$

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) Draw the mode curves of Reflex klystron and derive the relation between mode number and repeller in Reflex klystron 7M
(b) In a two-cavity klystron the parameters are, input power=10mW, voltage gain=20dB, Rsh of input cavity =25K Ω , Rsh of output cavity =35K Ω , load resistance = 40 K Ω . Find input voltage, output voltage and the power to the load 7M

(OR)

2. (a) Derive the L_{opt} required in 2-cavity Klystron to form a bunch? 7M
(b) Derive the mode equation in Reflex Klystron Oscillator? 7M

UNIT – II

3. (a) Explain how 8-cavity cylindrical Magnetron is used to produce oscillations. 7M
(b) Derive the Hartree anode Voltage equation for linear magnetron. 7M

(OR)

4. (a) List and explain different types of magnetrons 7M
(b) A normal circular magnetron has the following parameters: Inner radius 0.15 m, outer radius 0.45 m, Magnetic flux density 1.6 milli weber/. (i) Determine Hull cut-off voltage, (ii) Determine the Hull cut-off magnetic flux density if the beam voltage is 4000 V. 7M

UNIT – III

5. (a) Explain i) RWH Theory ii) PIN diode 7M
(b) Explain about Gunn oscillation modes. 7M

(OR)

6. (a) Explain the operation of IMPATT diode. 7M
(b) Explain shottky Barrier diode with neat sketch. 7M

UNIT – IV

7. (a) Explain the various construction methods and applications of circulator 7M
(b) Explain the design & Working principle of a Gyrator? 7M

(OR)

8. (a) What is magic tee? Derive the S matrix of a Magic Tee. 7M
(b) Define a Microwave junction. Explain how it is described by using S-Parameters. 7M

UNIT-V

9. (a) Explain the double minima method of measuring VSWR. 7M
(b) Explain micro strip lines with neat sketch. 7M

(OR)

10. (a) Explain the procedure for measuring attenuation with neat diagram 7M
(b) List out advantages of MIC's and hybrid MIC's. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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 the Z-transform of $x(n) = (1/8)^n u(n)$ and its ROC. 10M
 (b) List the applications of Z-Transforms. 4M
- (OR)
2. (a) Find the Z-Transform $x[n] = (1/3)^n \sin(\frac{\pi}{4}n) u(n)$. 7M
 (b) State and prove the Initial value theorem & Final value theorem of Z- transforms. 7M

UNIT - II

3. (a) Find the DFT of the following sequence using FFT DIF?
 $X(n) = \{1,2,3,5,5,3,2,1\}$ 8M
 (b) Find the values of W_N^K , When $N=8$, $k=1$, $K=2$ and $k=3$. 6M
- (OR)
4. (a) Define IDFT and find IDFT of the given sequence $X(K) = \{1,2,3,4\}$ 8M
 (b) State all properties of DFT. 6M

UNIT - III

5. (a) Describe the basic structure of FIR filters - Linear phase structure & Lattice structures. 7M
 (b) A Digital filter has input and output given by the following equations, realize the system in parallel form $x(n) = \delta(n) + \frac{1}{4}\delta(n-1) - \frac{1}{8}\delta(n-2)$; $y(n) = \delta(n) - \frac{3}{4}\delta(n-1)$ 7M
- (OR)
6. (a) Obtain the direct form I, direct form II and Cascade form realization of the following system functions. 10M
 $Y(n) = 0.1 y(n-1) + 0.2 y(n-2) + 3x(n) + 3.6 x(n-1) + 0.6 x(n-2)$.
 (b) Explain Transposed forms. 4M

UNIT - IV

7. (a) Explain the impulse invariance method of IIR filter design. 6M
 (b) Transform the following filter into Digital filter using impulse Invariance method 8M

$$H(S) = \frac{1}{(S^2 + 0.25s + 4)(s + 0.25)}$$

(OR)

8. (a) Design a Digital LPF is expected to meet the following specifications with sampling frequency of 200KHz; Pass band Ripple = -2 dB; Pass band Edge frequency = 5KHz; Stop band Ripple = -40 dB; Stop band Edge frequency = 100 KHz Using impulse invariance method using butter worth approximation? 7M
 (b) Convert the Analog filter to a digital filter whose system function is 7M

$$H(s) = \frac{1}{(s + 2)^2 + (s + 1)}$$

Use bilinear transformation.

UNIT-V

9. (a) What are the effects of windowing? Comparing various windowing techniques. 4M
 (b) The desired frequency response of a low pass filter is 10M

$$H_d(e^{jw}) = \begin{cases} e^{-j3w} & : -\frac{3}{4}\pi \leq w \leq \frac{3}{4}\pi \\ 0 & : \text{else where} \end{cases}$$

Determine $H(e^{jw})$ for $M=7$ using a rectangular window.

(OR)

10. (a) What is Hamming Window function? Obtain its frequency domain characteristics. 6M
 (b) Design a High Pass FIR filter whose cut-off frequency is 1.2 radians/sec and $N = 9$ using Hamming Window. 8M

Q.P. Code: 555212

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. Draw a general layout of a steam power plant and explain the different circuits 14M
(OR)
2. (a) how do you define a good ash handling equipment with their characteristics 7M
(b) Classify the dust collectors? Explain the principles used in dust collector 7M

UNIT – II

3. (a) Why supercharging is necessary in diesel power plant. explain briefly 7M
(b) Explain the cooling system of a diesel power plant 7M
(OR)
4. While selecting site for gas turbine power plant what are the considerations. And write advantages of a gas turbine power plant over diesel power plant 14M

UNIT – III

5. Write a short notes on (i) pressurized water reactor, (ii) Boling water reactor 14M
(OR)
6. List out and briefly explain auxiliaries are essential for starting the generating of Hydro plant. And identify which auxiliaries are not needed. 14M

UNIT – IV

7. Describe photovoltaic cell in detail 14M
(OR)
8. Identify the main types of focusing collector. Explain any one in detail 14M

UNIT-V

9. A base load station having a capacity of 18MW a standby station having a capacity of 20MW share a common load. Find (i) Annual load factor ; (ii) Use factor ; (iii) Capacity factor of the two power station from the following data:
Annual standby station output=7.35x10⁶ kWh
Annual base load station output=101.35 kWh
Peak load on the standby station =12MW
Hours of use of standby station during the year =2190 hours

(OR)

10. The maximum demand of a power plant is 80000KW 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	40	50	60	50	70	80	40

- (i) Determine the load factor of power station
(ii) What is the load factor of standby equipment rated at 25MW that takes up all load in excess of 60MW?
iii) Also Calculate its use factor

Q.P. Code: 555412

SET - 2

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

B. Tech VI Sem. (R15) Supple. Examinations of November 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) Define COP. Differentiate Heat Engine, Heat Pump and Refrigerator. 4M
(b) An air refrigerator working on Bell-Coleman cycle takes air into the compressor at 1 bar and -5°C . It is compressed to 5 bar and cooled to 25°C at the same pressure. It is further expanded in the expander to 1 bar and discharged to take the cooling load. The isentropic efficiencies of the compressor and expander are 85% and 90% respectively. Find: 8M
(i) Refrigeration capacity of the system if the air circulation is 40 kg/min
(ii) KW capacity of the motor required to run the compressor.
(iii) COP of the system.

(OR)

2. (a) Derive an expression for COP of a Bell-Coleman air refrigeration cycle. 7M
(b) Explain the working principle of a simple evaporative air craft refrigeration system. 7M

UNIT – II

3. (a) A vapour compression refrigeration plant works between pressure limits of 5.3 bar and 2.1 bar. The vapour is super heated at the end of compression, its temperature being 37°C . The vapour is super heated by 5°C before entering the compressor. If the specific heat of super heated vapour is 0.63 kJ/Kg-K, find the COP of the plant. Use the data given below. 8M

Pressure Bar	Saturation Temp $^{\circ}\text{C}$	Liquid heat, kJ/Kg	Latent Heat, kJ/Kg
5.3	15.5	56.15	144.9
2.1	-14.0	25.12	158.7

- (b) Explain the differences between expander and throttling device. 6M

(OR)

4. (a) Explain the working principle of four shell Li-Br- water vapour absorption refrigeration system. 7M
(b) Derive an expression for calculation of maximum COP for ideal vapour absorption refrigeration system. 7M

UNIT – III

5. (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

(OR)

6. (a) Explain the nomenclature of refrigerants with suitable examples. 7M
(b) Discuss the effect of refrigeration and air conditioning on global warming. 7M

UNIT – IV

7. (a) In a laboratory test a psychrometer recorded 36°C DBT and 30°C WBT calculate the following terms. 8M
i) Vapour pressure, ii) Relative humidity, iii) Specific humidity,
iv) Degree of saturation, v) Dew point temperature, vi) Enthalpy of the mixture.
- (b) The temperature and relative humidity of air at a place are 33°C and 68% respectively. Find i) dew point temperature ii) humidity ratio iii) specific volume of the moist air. Assume the pressure as 1.013 bar and the universal gas constant as 8.3143 kJ/kgmole.k 6M
- (OR)
8. (a) Elaborate the term 'RSHF' and what loads are considered in fixing 'RSHF'? 6M
(b) The amount of air supplied to an air conditioned hall is 300 m³/min. The atmospheric conditions are 35°C DBT and 55% RH. The required conditions are 20°C DBT and 60% RH. Find the Sensible Heat and Latent Heat removed from air per minute 8M

UNIT-V

9. (a) Explain the winter air-conditioning system with the help of a neat sketch. 7M
(b) Define the "human comfort" and Briefly explain the requirements of human comfort air conditioning. 7M
- (OR)
10. (a) Define the term "effective temperature" and explain its importance in air conditioning system. Describe the factors which affect effective temperature. 7M
(b) Explain the working of window air-conditioner with a neat sketch. 7M

Q.P. Code: 555612

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) An aeroplane makes a half circle of 100 m radius towards when flying at 400 kmph. The engine and propeller of plane weigh 500 kg, and have a radius of gyration of 30 cm. The engine rotates at 3000 rpm ccw, when viewed from the front end. Find the gyroscopic couple. 7M
- (b) What is the effect of gyroscopic couple on steering of ship? 7M
- (OR)
2. (a) A uniform disc of 150mm diameter has a mass of 5kg. It is mounted centrally in bearings which maintain its axle in a horizontal plane. The disc spins about its axle with a constant speed of 1000 rpm. While the axle precesses uniformly about the vertical at 60rpm. The directions of rotation of disc is anti clock wise direction. If the distance between the bearings is 100mm, find resultant reaction at each bearing due to the mass and gyroscopic effects. 10M
- (b) Write the expression for gyroscopic couple. 4M

UNIT – II

3. (a) Explain the method of balancing of different masses revolving in the same plane. 10M
- (b) What is the difference between piston effort and crank effort? 4M
- (OR)
4. (a) Discuss briefly the following: D' Alembert's Principle, Dynamically equivalent system. 10M
- (b) Why is balancing of rotating parts necessary for high speed engines? 4M

UNIT – III

5. A single – cylinder reciprocating engine has the following data : Speed of the engine = 240 rpm; Stroke = 320 mm; Mass of the reciprocating parts = 70 kg ; Mass of the revolving parts = 52.5 kg at the crank radius.; If 65 % of the reciprocating parts and all the revolving parts are to be balanced, find the (i) balancing mass required at a radius 600 of 300 mm, and (ii) unbalanced force when the crank has turned 45° from the T.D.C. 14M
- (OR)
6. (a) Explain the terms : Primary disturbing force and secondary disturbing force. 4M
- (b) Explain the procedures for balancing of V-engine. 10M

UNIT – IV

7. (a) Describe, with relevant sketches, the Equilibrium method to find the natural frequency of free longitudinal vibrations. 7M
- (b) Find the natural frequency of transverse vibrations of a system, having several point loads attached to the same shaft, by Dunkerley's method. 7M
- (OR)
8. Find the frequency of transverse vibrations of a shaft which is simply supported at the ends and is of 40 mm in diameter. The length of the shaft is 5 m. The shaft carries three point loads of masses 15kg, 35kg and 22.5 kg at 1 m, 2 m and 3.4 m respectively from the left support. The Young's modulus for the material of the shaft is 200 GN/m^2 . The weight of the shaft is 18.394 N per meter length. 14M

UNIT-V

9. (a) In the case of free torsional vibrations of two – rotor system, prove that the node divides the length of the shaft in the inverse ratio of the moments of inertia of the corresponding rotors. 10M
- (b) Define the term 'node' and explain how it is obtained. 4M
- (OR)
10. A shaft of length 1.25 m is 75 mm in diameter for the first 275 mm of its length, 125 mm in diameter for the next 500 mm length, 87.5 mm in diameter for the next 375 mm length and 175 mm in diameter for the remaining 100 mm of its length. The shaft carries two rotors at two ends. The mass moment of inertia of the first rotor is 75 kgm^2 whereas of the second rotor is 50 kg m^2 . Find the frequency of natural torsional vibrations of the system. The modulus of the rigidity of shaft material may be taken as 80 GN/m^2 . 14M

Q.P. Code: 555812**SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. A company manufacturing air coolers has, at present, firm orders for the next 6 months. The company can schedule its production over the next 6 months to meet orders on either regular or overtime basis. The order size and production costs over the next six months are as follows.

Month	1	2	3	4	5	6
Orders	640	660	700	750	550	650
Cost/unit (Rs) for regular production	40	42	41	45	39	40
Cost/unit (Rs) for overtime production	52	50	53	50	45	43

With 100 air coolers in stock at present, the company wishes to have at least 150 air coolers in stock at the end of 6 months. The regular and over time production in each month is not to exceed 600 and 400 units respectively. The inventory carrying cost for air coolers is Rs 12. Per unit/ month. Formulate the L.P model to minimize the total cost

(OR)

2. A firm manufactures four different machine part M_1 , M_2 , M_3 and M_4 made of copper and zinc. The amounts of copper and zinc required for each machine part, their exact availability and the profit earned from one unit of each machine part are as follows:

	M_1	M_2	M_3	M_4	Exact Availability
Copper	5	4	2	1	100
Zinc	2	3	8	1	75
Profit	12	8	14	10	

How many of each part be manufactured to maximize the profit? For this problem find

- Basic solution
- Basic feasible solution
- Non degenerate basic feasible solutions, and Optimal basic feasible solution.?

UNIT - II

3. Find the basic feasible solution of the following transportation problem by North-West corner rule. Also find the optimal transportation plan?

	1	2	3	4	5	Availability
A	4	3	1	2	6	80
B	5	2	3	4	5	60
C	3	5	6	3	2	40
D	2	4	4	5	3	20
Required	60	60	30	40	10	200

(OR)

4. Solve the following assignment problem?

	I	II	III	IV	VI
1	11	17	8	16	20
2	9	7	12	6	15
3	13	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	13

UNIT – III

5. The purchase price of a machine is Rs.52000. The installation charges amount to Rs 14400 and its scrap value is only 6400. The maintenance cost in various years is given below:

Year	1	2	3	4	5	6	7	8
Maintenance Cost	1000	3000	4000	6000	8400	11600	16000	19200

After how many years should the machine be replaced? Assume that the machine replacement can be done only at the year ends

(OR)

6. There are five jobs, each of which is to be processed through three machines A, B and C in the order ABC. Processing times in hours are

Job	A	B	C
1	3	4	7
2	8	5	9
3	7	1	5
4	5	2	6
5	4	3	10

Determine the optimum sequence for the five jobs and the minimum elapsed time. Also find the idle time for three machine and waiting time for the jobs.

UNIT – IV

7. A person repairing radios find that the time spent on the radio sets has exponential distribution with mean 20 minutes. If the radios are repaired in the order in which they come in and their arrival is approximately poisson with an average rate of 15 for 8 hours day. What is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in?

(OR)

8. A library wants to improve its service facilities in terms of the waiting time of its borrowers. The library has two counters at present and borrowers arrive according to Poisson distribution with arrival rate 1 every 6 minutes and service time follows exponential distribution with a mean of 10 minutes. The library has relaxed its membership rules and a substantial increase in the number of borrowers is expected. Find the number of additional counters to be provided if the arrival rate expected to be twice the present value and the average waiting time of the borrowers must be limited to half the present value.

UNIT-V

9. A particular item has a demand of 9000 units/year. The cost of one procurement is Rs 100 and the holding cost per unit is Rs 2.40 per year. The replacement is instantaneous and no shortage are allowed. Determine
 (i) The economic lot size ; (ii) The number of orders per year , (iii) The time between orders.
 The total cost per year if the cost of one unit is Re.1

(OR)

10. Explain applications of simulations with suitable examples?

Q.P. Code: 556012

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. Design a spring for a balance to measure 0 to 1000 N over a scale of length 80 mm. the spring is to be enclosed in a casing of 25mm diameter. The approximate number of turns is 30. The modulus of rigidity is 85 Kn/mm². Also calculate the maximum shear stress induced. 14M
(OR)
2. A Helical compression spring is used to absorb the shock. The initial compression of the spring is 30 mm and it is further compressed by 50 mm while absorbing the shock. The spring is to be absorb 275 j of energy during the process. The spring index as 6. The spring is made of cold drawn steel wire (G= 82000 N/ mm²). The constants A and m can be taken as 1753 and 0.182 respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate (i) free length, (ii) wire diameter, (iii) mean coil diameter and (iv) number of active coils 14M

UNIT – II

3. (a) Explain the hydrodynamic lubrication? 7M
(b) Give the applications of hydrodynamic journal bearings? 7M
(OR)
4. A full journal bearing of 50 mm diameter and 100 mm long has a bearing pressure of 1.4 N/mm². The speed of the journal is 900 rpm and the ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil whose absolute viscosity at the operating temperature of 75⁰C may be taken as 0.011 kg/m-s. The room temperature is 35⁰C. Find : 1. The amount of artificial cooling required 2. The mass of the lubricating oil required, if the difference between the outlet and inlet temperature of the oil is 10⁰C. Take specific heat of the as oil as 1850 J/kg/⁰C. 14M

UNIT – III

5. A ball bearing is subjected to a radial force of 2500 n and an axial force of 1000 N, The dynamic load carrying capacity of the bearing is 7350 N. The values of X and Y are 0.56 and 1.6 respectively. The shaft is rotating at 720 rpm. Calculate the life the bearing. 14M
(OR)
6. Select a single row deep groove ball bearing for a radial load of 4000N and an axial load of 5000N. operating at a speed of 1600 rpm for an average life of 5 years at continuous running. Assume Uniform and steady load. 14M

UNIT – IV

7. A pair of helical gears consists of 30 teeth on pinion on pinion meshing with a 80 teeth gear. The pinion rotates at 900 rpm. The normal pressure angle is 20⁰ while the helix angle 25⁰. The face width is 50 mm and the normal module is 4 mm. the pinions as well as gear are made of steel having ultimate strength of 6000 Mpa and heat treated to a surface hardness of 300 BHN. The service factors of safety are 5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load. Calculate the power transmitting capacity of the gears 14M
(OR)
8. (a) Write the design procedure of a spur gear 10M
(b) What is full depth involute gear tooth system 4M

UNIT-V

9. Design an aluminium alloy piston for a single acting four stroke petrol engine for the following data. 14M
Cylinder bore= 400 mm, stroke=375 mm, max gas pressure=9 Mpa, Brake mean effective pressure= 2 Mpa, Fuel consumption=0.22 kg/kW/hr, speed=50 rpm. Assume any other data needed.
(OR)
10. (a) What are the forces acting on connecting rod? 7M
(b) Why connecting rods are are made of I-section? 7M

Q.P. Code: 655212

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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 the internal representation of file system. 8M
(b) Explain the process of inode assignment to a new file. 6M

(OR)

2. (a) Explain file system in UNIX. 7M
(b) Explain the concept of conversion of a path name to an inode. 7M

UNIT – II

3. (a) Explain readv and writev system calls with syntax. 7M
(b) Differentiate symbolic link and hard link with example. 7M

(OR)

4. (a) Explain the mounting a file system and write its advantages. 7M
(b) Differentiate named pipe and unnamed pipe. 7M

UNIT – III

5. (a) Explain the categorization of processes and also explain how to move a process from one type to another type of processes. 7M
(b) Write a C program to demonstrate SIGKILL signal. 7M

(OR)

6. (a) Write a C program to demonstrate the termination of child and parent processes execution. 7M
(b) Explain process address space. 7M

UNIT – IV

7. (a) Differentiate the exporting variables in Korn shell and C shell. 8M
(b) Explain On-Off variables in C shell. 6M

(OR)

8. (a) Distinguish between a sequence of commands, a group of commands and a chain of commands. 7M
(b) Explain the two modes for changing the permissions of a file with example. 7M

UNIT-V

9. (a) Define a message queue. Write a C program to create a message queue and print its ID. 6M
(b) Explain solution with Master and Slave processor 8M

(OR)

10. (a) Explain the following briefly. 8M
(i) Semaphores; (ii) Message Queues
(b) Explain multi-processor system. 6M

Q.P. Code: 655412

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) What is TextView control? Explain with Example? 7M
(b) What is ADB? Why it is required? 7M

(OR)

2. (a) What is Virtual device and SDK manager explain? 7M
(b) Explain the procedure of installing Android SDK? 7M

UNIT – II

3. (a) Explain CheckBox control with example? 7M
(b) Explain OnClickListener interface with java code? 7M

(OR)

4. (a) Explain Mutually Exclusive button with example? 7M
(b) Explain Button control with example? 7M

UNIT – III

5. What is Layout? List out the various types of Layouts? Explain any two layouts with example? 14M

(OR)

6. (a) Write usage of Drawable Resources in Android? 7M
(b) Explain Table layout with example? 7M

UNIT – IV

7. Explain in detail about Dalvik Debug Monitor service (DDMS)? 14M
(OR)

8. List out and explain different types of dialogs in Android? 14M

UNIT-V

9. Create an application which shows context menu with ListView? 14M

(OR)

10. Write an application for Student Registration Data entry form using SQLite database? 14M

Q.P. Code: 655612

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) How can you Calculate the Range and Variance? Explain with an example 6M
(b) Briefly Explain about various Data mining tasks. 8M

(OR)

2. (a) Write short notes on the following. 6M
i) Euclidean distance, ii) City-block distance , iii) Minkowski distance
(b) Discuss the various OLAP operations in the Multidimensional Data Model. 8M

UNIT – II

3. (a) Write a skeleton Decision tree induction algorithm. 7M
(b) Explain general approach for solving a classification problem. 7M

(OR)

4. Explain about the following. 14M
i) Hold out method, ii) Random subsampling, iii) Cross validation, iv) Bootstrap

UNIT – III

5. (a) Given a confusion matrix, write the formulae for finding the TPR, TNR, FPR, FNR, Precision and Recall. 6M
(b) Describe Rule-Based Classifier. 8M

(OR)

6. (a) Write Sequential covering algorithm 7M
(b) Describe Nearest-Neighbor Classifiers 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	{a,b}
2	{b,c,d}
3	{a,c,d,e}
4	{a,d,e}
5	{a,b,c}
6	{a,b,c,d}
7	{a}
8	{a,b,c}
9	{a,b,d}
10	{b,c,e}

(OR)

8. (a) Explain with an example, how can you generate rules from a given frequent itemset. 7M
(b) Explain Support and Confidence of an association rule with an example. 7M

UNIT-V

9. (a) Explain about k-means clustering by writing the algorithm. 7M
(b) Differentiate between Agglomerative Hierarchical clustering and Divisive Hierarchical Clustering. 7M

(OR)

10. (a) Explain about BIRCH clustering technique 7M
(b) Briefly explain about different types of clusters. 7M

Q.P. Code: 655812

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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) Define security attack? Explain in detail about the various types of attacks for which internet work is vulnerable to? 7M
(b) Write about any two classical crypto systems with suitable examples. 7M
(OR)
2. (a) Write short notes on security mechanisms. 8M
(b) Compare and contrast between steganography and cryptography 6M

UNIT – II

3. (a) Write short notes on Chinese remainder theorem 7M
(b) Explain Linear congruence with an example. 7M
(OR)
4. (a) Explain any two modes of operations about block ciphers? 6M
(b) Write ten strengths of the Data encryption Standard 8M

UNIT – III

5. (a) Perform Encryption and Decryption using the RSA algorithm. 8M
 $p = 11, q = 13, e = 11, m = 7$
(b) Explain Secure Hash Algorithm (SHA) briefly. 6M
(OR)
6. (a) Explain in detail about ELGamal Cryptosystem 7M
(b) Illustrate Diffie - Hellman key exchange scheme? 7M

UNIT – IV

7. (a) Define Message Authentication code and explain requirements for MAC. 8M
(b) Explain in detail about HMAC 6M
(OR)
8. (a) Explain two approaches to digital signature. 8M
(b) Discuss briefly on Schnorr digital signature scheme. 6M

UNIT-V

9. (a) Discuss three configurations of firewall? 6M
(b) Write short notes on i) Trapdoors ii) Trojan horses 8M
(OR)
10. (a) What is meant by user authentication? Explain the principles of Remote user authentication. 7M
(b) Distinguish between Kerberos version 5 and version 4? 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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 do you mean by performance analysis? Give the algorithm for matrix multiplication and find the time complexity of the algorithm using tabular method. 7M
(b) What is asymptotic notation? Explain different types of notations with examples. 7M

(OR)

2. (a) Write an algorithm for selection sort and analyze its time complexity. 7M
(b) Explain in detail about brute force string matching with an example. 7M

UNIT - II

3. (a) Discuss the working strategy of quick sort and Illustrate the tracing of quick sort algorithm for the following set of numbers. 7M
25, 10, 72, 18, 40, 11, 64, 58, 32, 9.
(b) Define minimum cost spanning tree (MST). Write prim's algorithm to construct minimum cost spanning tree. 7M

(OR)

4. (a) Write an algorithm to perform binary search and derive its run time complexity. 7M
(b) What is job sequencing with deadline problem? Let $n=5$, profits=(10,2,33,11,40) and deadlines=(3,1,1,2,2) respectively. Find the optimal solution using greedy algorithm. 7M

UNIT - III

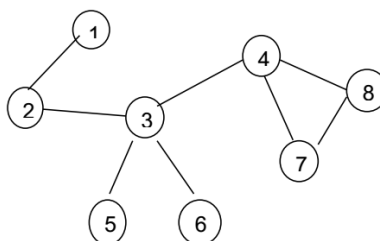
5. (a) What is the principle difference between the divide and conquer and dynamic programming technique? 7M
(b) Explain in detail about the Reliability Design problem. 7M

(OR)

6. (a) Write a Bellman-Ford algorithm to compute shortest paths and explain it with a simple example. 7M
(b) Describe the Dynamic 0/1 Knapsack Problem. Find an optimal solution for the dynamic programming 0/1 knapsack instance for $n=3$, $m=6$, profits are $(p_1, p_2, p_3) = (1, 2, 5)$, weights are $(w_1, w_2, w_3) = (2, 3, 4)$. 7M

UNIT - IV

7. (a) Write an algorithm for BFS traversal and explain how it can be used to identify the connected components in a graph with example. 7M
(b) Write an algorithm to determine the articulation points and find the articulation points for the following graph as shown in figure. 7M



(OR)

8. (a) Explain the basic principle of Backtracking and list the applications of backtracking. 7M
(b) Find all the possible subsets of w that sum to m . Let $w=\{5,7,10,12,15,18,20\}$ and $m=35$ and draw the portion of the state space tree that is generated. 7M

UNIT-V

9. (a) Explain how branch and bound technique is used to solve 0/1 knapsack problem. 7M
(b) Discuss in detail about deterministic and non-deterministic algorithm with an example. 7M

(OR)

10. (a) What is LC – Search? Discuss LC – Search algorithm. 7M
(b) What is a Decision tree? Draw a Decision tree for a game of three questions. 7M

Q.P. Code: 656212

SET - 2

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech VI Sem. (R15) Supple. Examinations of November 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. Write Basic building blocks of the UML in Conceptual modeling of UML? 14M
(OR)
2. (a) What is modeling? Write about the importance of modeling in UML 4M
(b) Explain about the modeling of System Architecture in detail. 10M

UNIT – II

3. Discuss about Interface, Types and Roles. 14M
(OR)
4. What is Class diagram? Discuss about common modeling techniques for simple collaboration and logical data base schema in class diagram. 14M

UNIT – III

5. Define Interaction diagram? Explain about the following:
(a) Sequence Diagram 7M
(b) Collaboration Diagram 7M
(OR)
6. Write briefly about Swimlanes, Forking and Joining in Activity diagram with an example. 14M

UNIT – IV

7. Explain briefly about Event and Signals? 14M
(OR)
8. Write short notes on 14M
(i) Sub states; (ii) Sequential Sub States; (iii) Concurrent Sub states.

UNIT-V

9. What is Component? Explain Component Diagram In Detail? 14M
(OR)
10. Explain and Draw the Use case diagram and Interaction diagram for Library application. 14M