K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech VI Semester Supple Examinations, 2021- Model Paper
Sub: STRUCTURAL ANALYSIS - I
(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Answer any five questions, choosing one question from each unit.
All questions carry equal marks.
UNIT-I

1. A beam AB of uniform section and 6 m span is built at the ends. A u.d.l of 30 kN/m runs over left half of the span and there is an additional concentrated load of 40 kN at right quarter. Determine the fixed end moments at the ends and the reaction. Draw BMD & SFD.

(Or)

2. 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 × 10^5 M Pa and I = 2.3 x 10^{-3} m^4.

UNIT-II

3. 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.
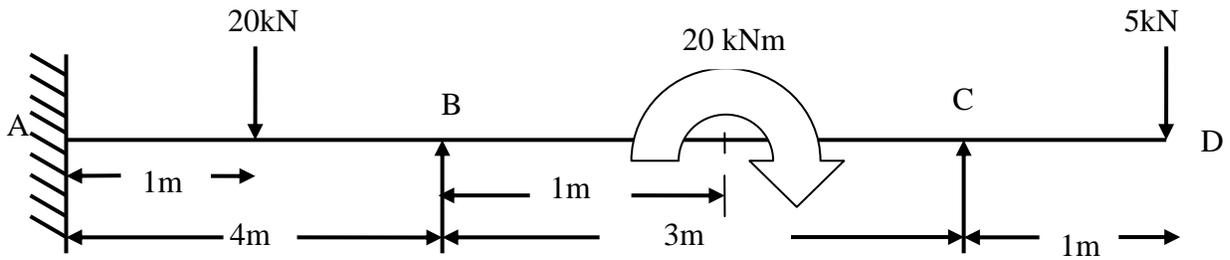
(Or)

4. Analyze the portal frame shown in figure by **slope deflection method** and sketch the BMD. All members have the same flexural rigidity.
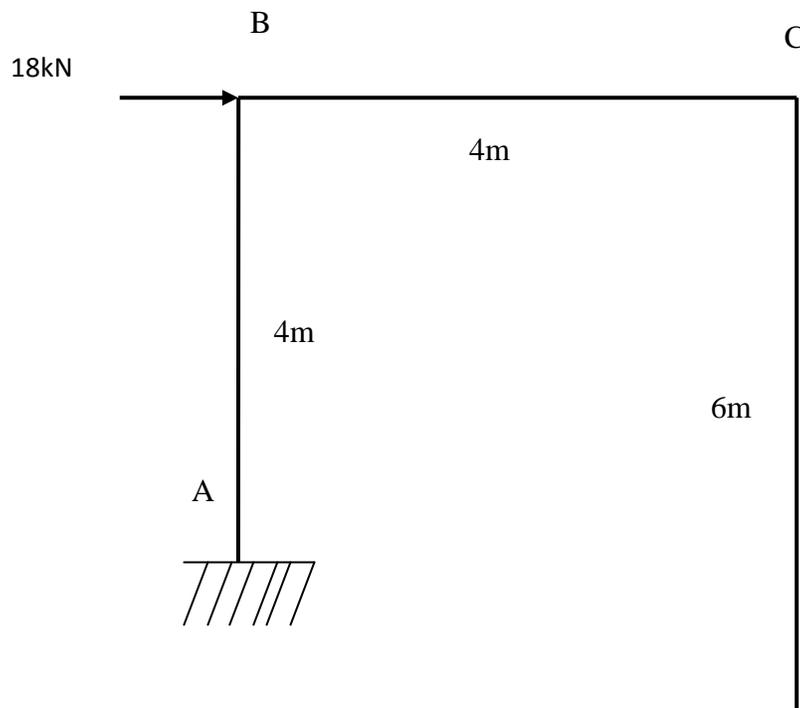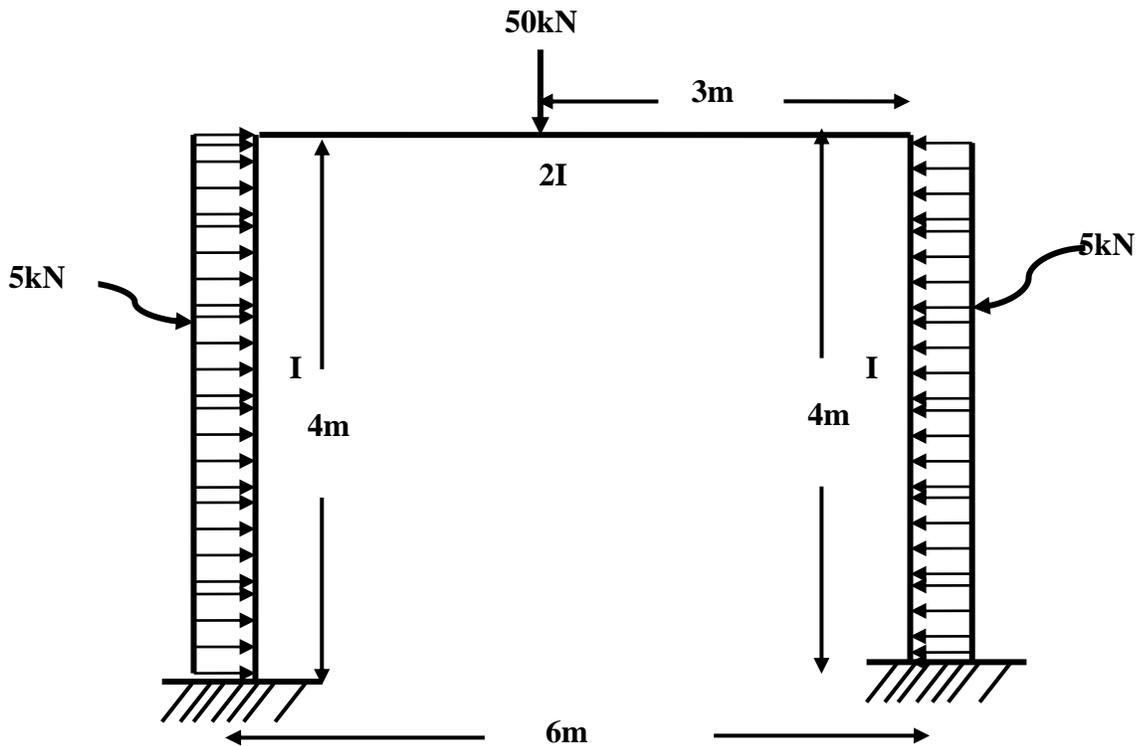
UNIT-III

5. Find the support moments and reactions for the continuous beam shown in fig by **Moment Distribution Method.**
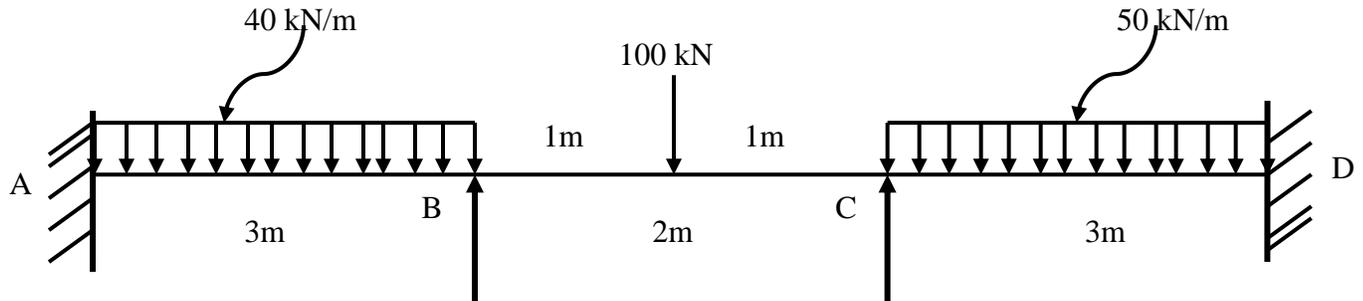

(Or)

6. Analyze the portal frame as shown in Fig by **Moment Distribution Method,** and sketch the BMD. All members have the same flexural rigidity.
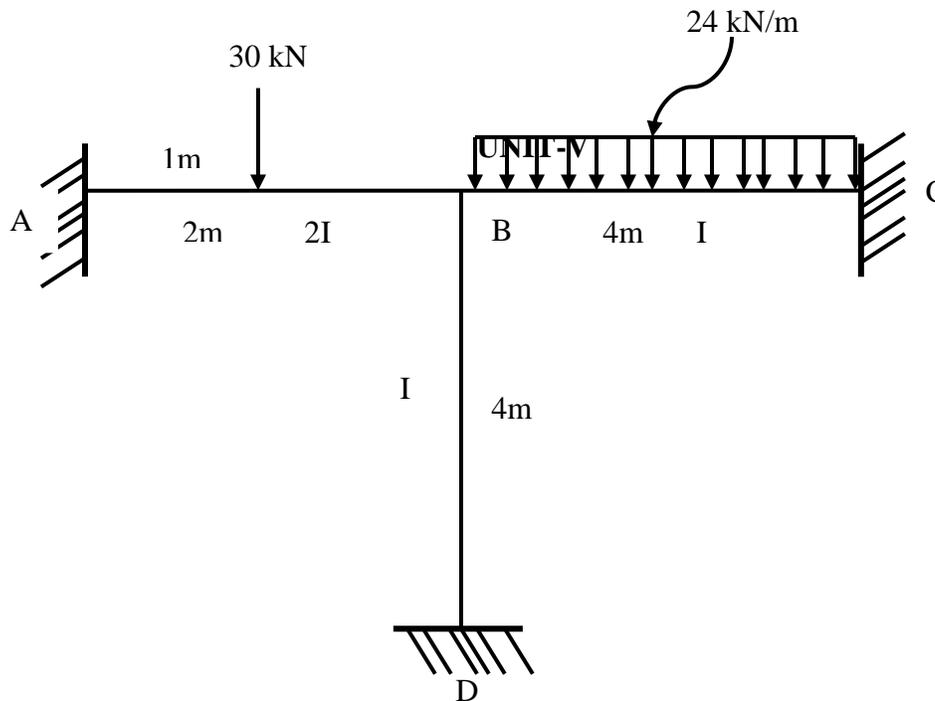
UNIT-IV

7. Determine the support moments for the continuous girder shown in Fig., by **Kani's method** if the support B sinks by 2.50 mm. For all members take $I=3.50 \times 10^7$ mm^4 and $E= 200$ kN/mm^2.

(Or)

8. Analyze the frame as shown in Fig by **Kani's Method,** and sketch the BMD. All members have the same flexural rigidity.

9. (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 by
    (b) Find the deflection at the free end of a cantilever of length L carrying a uniformly distributed load of w per unit run over the whole span. Assume uniform flexural rigidity.

(Or)

10. Find the vertical and horizontal deflections of the pin jointed truss shown in Fig. The area of the horizontal member is 150 mm^2 and the area of the members AC and BC are 200 mm^2 each. Take E= 200kN/mm^2.
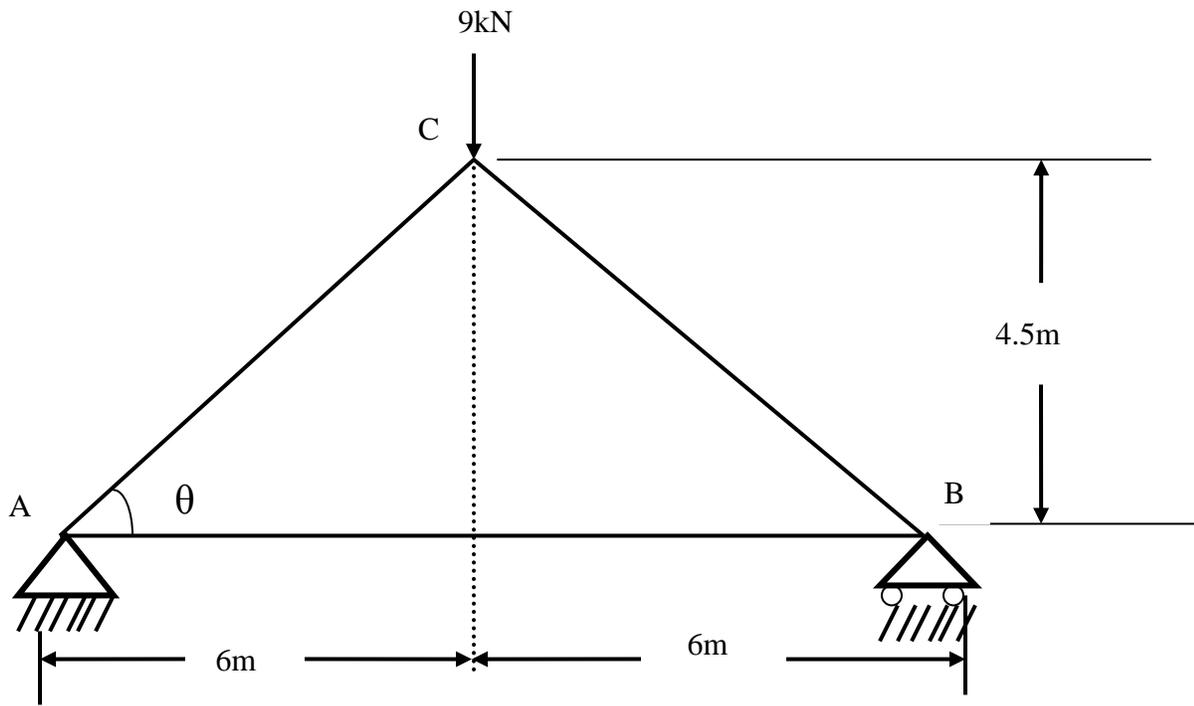
9kN

C

A

θ

B

4.5m

6m

6m

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech VI Semester Supple Examinations, 2021- Model Paper
Sub: DESIGN AND DATAILING OF REINFORCED CONCRETE STRUCTURES - I
(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Answer any five questions, choosing one question from each unit.
All questions carry equal marks.
Note: IS 456- 2000 Code is permitted.

UNIT-I

1. a) Define RCC, characteristics of RCC, write types of design methods, and explain working stress method, merits and demerits of working stress method.
   b) Draw the stress strain diagram, assumptions in the working stress method.
   c) Difference between working stress method and limit state design method.

(Or)

2. a) Explain limit state design method, types, characteristic strength of materials, characteristic loads.
   b) Stress strain curve for concrete, assumptions in the limit state design method.
   c) Derivation of stress block parameters with figures.

UNIT-II

3. Design a rectangular beam to resist a bending moment equal to 75 KN-m using
   I)   M25 Mix & Fe 415 grade steel   II) M25 Mix & Fe 550 grade steel

(Or)

4. Find the moment of resistant of a beam 25cm by 50cm deep if it is reinforced with 2 – 12mm dia bars in compression zone & 3 – 20mm dia bars in the tension zone, each an effective cover of 40 mm. assume (I) M20 Mix and Fe415 grade steel
                                          (II) M25 Mix and Fe500 grade steel

UNIT – III

5. Three beams T, L and doubly reinforced beams are subjected to a factored shear force of 200KN. If $f_{ck} = 20$ N/mm^2 & $f_y = 415$ N/mm^2 calculate shear reinforcement.
   (I)   The dimensions of the T – beam are $b_f = 1200$ mm, $d_f = 120$ mm, $b_w = 250$ mm, $d_w = 380$ mm. Effective cover on tension side = 40 mm. 3 – 22 mm dia bars on tension side.
   (II)   The dimensions of the L beam are $b_f = 1000$ mm, $d_f = 120$ mm, $b_w = 300$ mm, $d_w = 300$ mm. Effective cover on tension side = 40 mm. 4 – 22 mm dia bars on tension side.
   (III)   The dimensions of the doubly reinforced rectangular beam are b = 250 mm, D = 400 mm, effective cover on tension and compression side = 40mm. 3 – 16 mm dia bars on compression zone, 4 – 25 mm dia bars on the tension zone.

(Or)

6. Design a section of ring beam 50cm wide and 70cm deep subjected to a bending moment of 200 KN, twisting moment of 15 KN-m and a shear force of 150 KN at ultimate. Use M20 Mix and Fe 415 grade steel.

UNIT – 1V

7. Design a reinforced concrete slab for a room measuring 5m by 6m size. The slab is simply supported on all four edges, with corners held down and carries a super imposed load of 3000 N/m^2, inclusive of floor finishes etc. Use M20 Mix, Fe 415 grade steel and use IS code method.

(Or)

8. Design a dog legged stair for a building in which the vertical distance between the floors is 3.6 m. The stair hall measures 2.5m by 5m. The live load may be taken as 2500 N/m^2. Use M20 Mix and Fe 415 grade steel.

UNIT – V

9. Design a reinforced concrete column 400mm square, to carry an ultimate load of 1000KN at an eccentricity of 160mm. Use M20 grade of concrete and Fe250 grade steel.

(Or)

10. A rectangular cantilever beam of span 4m is 35cm by 65 cm in cross section. Bending moment at the support due to uniformly distributed service loads is 150 KN- m out of which 50% moment is due to permanent loads. Check the beam for deflection. It carries
3 – 25 mm dia bars in tension at an effective cover of 50mm. f_{ck} = 20 N/mm^2 and f_y = 415 N/mm^2.

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech VI Semester Supple Examinations, 2021- Model Paper
Sub: WATER RESOURCES ENGINEERING - I
(Civil Engineering)
Time: 03:00 Hrs.   Max. Marks: 70

Answer any five questions, choosing one question from each unit.
All questions carry equal marks.

UNIT – I
1. (a)   Define irrigation, state the points to be considered while recommending the necessity of irrigation.
   (b)   Write short notes on any five of the major irrigation projects in India.
(Or)
2. (a)   Define base, delta and duty and establish a relation between them.
   (b)   What should be the standard of the irrigation water?

UNIT – II
3. (a)   What is meant by balancing depth of canal section? Explain with sketch. Why it is required? How it is determined.
   (b)   What are the merits & demerits of canal lining?
(Or)
4. (a)   State Kennedy's theory and Lacey's theory.
   (b)   Design an irrigation channel by Lacey's theory having the following data.
           FSD = 5 cumec,   silt factor =1.0 ,   Side slope = ½:1

UNIT – III
5. (a)   Name the different types of weirs and describe each type with a neat sketches.
   (b)   Explain the causes of failure of a weir
(Or)
6. Explain step by step by procedure of design of vertical drop weir.

UNIT – IV
7. (a)   What is dam? How can you classify the dams?
   (b)   What are the different pool levels in reservoir? Explain with sketch.
(Or)
8.   How does sedimentation occur in a reservoir? How can sedimentation be controlled?

UNIT – V
9. (a)   Name the forces acting on a gravity dam? Enumerate any form with sketches.
   (b)   Distinguish between elementary profile and practical profile.
(Or)
10. (a) How can you classify the earthen dams? Explain with neat sketches.
    (b) Explain the cause of failure of a earthen dam.

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech VI Semester Supple Examinations, 2021- Model Paper
Sub: **TRANSPORTATION ENGINEERING - I**
(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Answer any five questions, choosing one question from each unit.
All questions carry equal marks.
UNIT – I

1. a.) Explain briefly about Engineering Surveys for Highway Alignment?   **7M**
    b.) Describe briefly about Road Network Patterns?   **7M**

(or)

2. The following data were collected for planning the road development program of a backward district.
    Total area = 9600 km^2, Agricultural and developed area = 3200 km^2, Existing railway track length = 110 km, Existing length of surfaced area = 322 km, Existing length of surfaced area = 425 km.
    Number of Towns/villages in different population ranges are as below:

Population	> 5000	2001 - 5000	1001 - 2000	501 - 1000	< 500
No of Towns & villages	8	42	140	290	540

    Calculate the additional length of surfaced and un surfaced roads for the road system based on Nagpur road plan formulae for this district.   **14M**

UNIT – II

3. a) Write a short notes on different types of Sight distances ?   **7M**
    b) Calculate the safe stopping sight distance on a level road stretch for a design speed   of
       50 kmph for   a) Two way traffic on a single lane road
                         b) Two way traffic on a two lane road
    Assume coefficient of friction as 0.35 and total reaction time of driver is 2.5 sec   **7M**
(Or)
4. Explain briefly about the Transition curves?   **14M**

UNIT – III

5. a) Write a short notes on Traffic speed studies ?   **7M**
   b) Describe briefly about Road Traffic Signs ?   **7M**
(Or)
6. a) Explain briefly about Accidental Studies ?   **7M**
   b) The 15 minute traffic counts on cross roads 1 and 2 during the peak hour are observed as 170 and 145 vehicles per lane respectively approaching the intersection in the direction of heavier traffic flow. If the amber times required as 3 sec and 2 sec for the two loads based on approach speeds, design the signal

timings by trial cycle method. Assume average time headway as 2.5 sec during the green phase?

7M

UNIT – IV

7. a) Explain briefly about the types of Grade separated intersections ?   **7M**

   b) Write short notes on the Advantages and Disadvantages of Rotary Intersections?   **7M**

(Or)

8. Describe briefly about the Traffic Islands?   **14M**

UNIT – V

9. a) Explain briefly about the Advantages and Limitations of the Flexible Pavements ?   **7M**

   b.) Describe briefly about the CBR test?   **7M**

(Or)

10. a) Write a short notes on the Types of joints in CC Pavements ?   **7M**

   b) Explain briefly about the Factors affecting design and performance of CC pavements? **7M**

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech VI Semester - Supple Examinations, 2021- Model Paper
Sub: REMOTE SENSING & GIS
(Civil Engineering)

Time: 03:00 Hrs.   Max. Marks: 70

Answer any FIVE Questions choosing One Question from each Unit.
All Questions carries equal marks

UNIT-I

1. a) Explain in detail the spectral signatures of vegetation and soil.   6 M
    b) State the concept of resolution? Explain the spatial and radiometric resolutions
       in detail.   8 M

(Or)

2. a) Describe the interaction of EMR with atmosphere.   8 M
    b) Describe the physics of Remote Sensing.   6 M

UNIT-II

3. Explain the satellite and Sensor characteristics of IRS IC & ID   14 M

(Or)

4. Explain various characteristics of sensors.   14 M

Unit- III

5. a) Explain the elements of visual interpretation techniques.   8M
    b) Explain about Image enhancement   6M

(Or)

6. Explain about spatial filtering and edge enhancement   14M

Unit – IV

7. a) Define GIS. Describe the key components of 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 natural resource management   14M

(Or)

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

Code:1502603

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, 2021
Sixth Semester Examination
Sub: Power Semiconductor Drives

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
   All questions carry equal marks.

UNIT-I
1. a) State the essential parts of Electric drives? What are the functions of a power
   modulator?   (8 marks)
   b) How do you define the active and passive load torques? What are the differences
      between the two   (6 marks)

OR

2. a) Explain the four quadrant operation of a motor driving a hoist load?   (8 marks)
   b) Derive the torque expression for loads with rotational motion ?   (6 marks)

UNIT-II
3. Explain discontinues and continuous modes of operation of single phase half controlled
   rectifier fed D.C separately excited motor?

OR

4. a) Explain the two quadrant operation of D.C separately excited motor fed from controlled
      rectifier?   (7 marks)
   b) Explain the braking methods employed for D.C separately excited motor?   (7marks)

UNIT – III

5. a) Explain the speed control of Induction motor by AC voltage Controller.   (7 marks)
   b) Explain Operation of Static Kramer Drive.   (7 marks)

OR

6.   Explain the operation Static Scherbius Drive.   (14 marks)

UNIT-IV

7. a) Derive the torque expression for Synchronous motor.   (7 marks)
   b) Explain the open loop operation of VSI fed Synchronous motor drive.   (7 marks)

OR

8. a) Explain self control of Synchronous motor by line commutated inverter?   (7 marks)
   b) Explain the Brushless d.c motor drive and enumerate its applications?   (7 marks)

UNIT-V

9. a) Explain the power factor improvement methods ?   (7 marks)
   b) Explain the losses in electrical drive system?   (7marks)

OR

10. a)What are various methods used for maintenance of motors?   (7 marks)
    b) Explain the energy conservation in electrical drives?   (7 marks)

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Code:1502604

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, 2021
Sixth Semester Examination
Sub: POWER SYSTEMS – III

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
       All questions carry equal marks. UNIT - I

UNIT-I

1. a) Obtain admittance matrix from basics using singular transformation.   [7]

   b) Obtain Y_{BUS} for a 4 - bus system with the following data.   [7]

Bus Code	Series Impedance(Z_{pq})	Shunt Admittance (y_{pq})
1 - 2	0.02 + j0.08	j0.08
2 - 3	0.04 + j0.16	j0.05
2 - 4	0.04 + j0.16	j0.025
3 - 4	0.01 + j0.04	j0.03

(OR)

2. The following is the system data for a load flow solution.

Line Admittances:

Active and Reactive Powers:

Bus Code	Admittance
1 - 2	2 - j8.0
1 - 3	1 -j4.0
2 - 3	0.666 - j2.664
2 - 4	1 - j4.0
3 - 4	2 - j8.0

Bus	P (pu)	Q (pu)	V (pu)	Remarks
1	-	-	1.06	Slack Bus
2	0.5	0.2	1+j1.0	Load bus
3	0.4	0.3	1+j1.0	Load bus
4	0.3	0.1	1+j1.0	Load bus

   Determine the voltages at the end of first iteration using G - S method. Take α = 1.6.   [14]

UNIT - II

2.   Explain clearly with detailed flowchart, the computational procedure for load flow solution using N-R
      method when the system contains all types of buses.   [14]

(OR)

3. Obtain the mathematical model for fast decoupled method of load flow analysis and State
   the assumptions made in this method.   [14]

UNIT - III

5. a) Define the following terms :
   i. Steady state stability limits   ii. Dynamic state stability limit
   iii. Transient state stability limit.   [6]

   b) A salient pole synchronous generator is connected to an infinite bus. Derive an

   expression for the electrical output power of the generator and draw P - δ curve.   [8]

(OR)

6. a) Derive an expression for steady state stability limit using ABCD parameters.   [7]

   b) Determine the Steady state stability limit of a system consisting of a generator

   equivalent reactance of 0.5 pu connected to an infinite bus through a series reactance

   of 1.0 pu. The terminal voltage of the generator is held constant at 1.2pu and the

   voltage of infinite bus is 1.0pu.   [7]

UNIT - IV

7.a) What is critical clearing angle? Derive the mathematical expression for critical clearing
   angle.   [7]

   b) A 50 Hz, 4 pole turbo generators rated 500 MVA, 11 KV has an inertia constant of
   18 MJ/MVA. Find (i) the stored energy in the rotor at synchronous speed.
   (ii) If the mechanical input is suddenly raised to 100 MW for an electrical load of
   40 MW, find the rotor acceleration, neglecting mechanical and electrical losses. [7]

(OR)

8.a) A generator operating at 50 Hz delivers 1 p.u/ power to an infinite bus through a
   transmission line. A fault takes place reducing the max. power transferable to 0.5
   p.u. Whereas before the fault this power was 2.0 p.u. and after the clearance of
   the fault it is 1.5 p.u. By using equal area criterion, determine the critical angle.   [6]

   b) Explain the method of solving swing equation by step - by -step method.   [8]

UNIT - V

9.a) Show that a travelling wave moves with a velocity of light on the overhead line and its

   speed is proportional to $\frac{1}{\sqrt{\epsilon_r}}$ on a cable with dielectric material of permittivity ϵ_r.   [9]

   b) A 500 KV surge travels on an Overhead line of surge impedance 400 ohms towards
   its junction with a cable which has a surge impedance of 40 ohm. Find i) transmitted

   voltage and current ii) reflected voltage and current.   [6]

OR

10. a) Explain the variation of current and voltage on an overhead line when one end of the
   Line is (i) short circuited and at the other end a source of constant emf is switched in.
                                                                              [6]

   b) A step wave of 75 KV travels on line having surge impedance 400 ohm and reaches the
   line termination where a capacitance of 2500μf is connected between line and earth. Find
   the voltage across the capacitance. Derive the formula used.   [8]

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Code:1502605

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, 2021
Sixth Semester Examination
Power System Operation & Control

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
All questions carry equal marks. UNIT - I

UNIT-I

1(a)Expalin the following terms with reference to thermal power plants.

   (1) Heat rate Curve (2)Cost curve
   (3)Incremental fuel cost (4)input-output characteristics

(b) A Constant load of 400 MW is supplied by two 210 MW generator 1 and 2,for which the   fuel cost characteristics are given as below.

$$C_1=0.05P_{G1}^2 +20P_{G1}+30.0 \text{ Rs/hr}$$

$$C_2=0.06P_{G2}^2 +15P_{G2}+40.0 \text{ Rs/hr}$$

The real power generation of units P_{G1} & P_{G2} are in MW.Determine (i)The most economical load sharing between the generators. (ii)The saving in Rs/day there by obtained compared to the equal load sharing between two generators.

OR

2.Derive the expression for economic operation of power system by considering the line   losses also develop the algorithm for the solution of problem.

Unit-II

3.(a)Discuss different constraints on unit commitment problem?
   (b)Explain the priority list scheme method for unit commitment with example.
OR

4.(a)What is meant by Unit commitment problem ?Expalin the need for unit commitment
      Problem in operation of power system?
   (b)Explain about forward dynamic programming approach for unit commitment problem?

Unit-III

5. (a)Derive the condition for optimally of short term hydro thermal scheduling problem?

   (b)What are the advantages of hydro thermal plant combination?

OR

6(a)A 100MVA synchronous generator operates on full load ata frequency of 50HZ.The load is suddenly reduced to 50MW.Due to time lag in governor system ,the steam value begins to close after 0.4s.Determine the change in frequency that occurs in this time.

(b)Expalin about turbine Speed governing system with neat sketch.

Unit-IV

7.(a)Develop the block diagram of the LFC of a single area system
   (b)Write the necessity of keeping frequency constant in power system?
                                                OR
8.Describe the steady state analysis of single area load frequency control?

Unit-V

9. Expalin clearly about proportional plus integral load frequency control of two area and its
   block diagram representation.

                                                OR

10. (a)Expalin about Tie-line bias control
    (b)Expain the combined operation of an LFC and Economic Dispatch control.

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Code:1502607

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, 2021
Sixth Semester Examination
Soft Computing Techniques

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
       All questions carry equal marks.

UNIT-I

1. Explain different approaches to Artificial Intelligence ?   14M

OR

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

UNIT-II

3. a) With neat diagram explain how the information is transferred in biological neuron ? 7M

   b) What is Activation function ? Explain different types of activation functions ?   7M

OR

4. a)Derive equations of change in weights for Back propagation network ?   8M

   b) Write the algorithm of Back propagation network ?   6M

UNIT-III

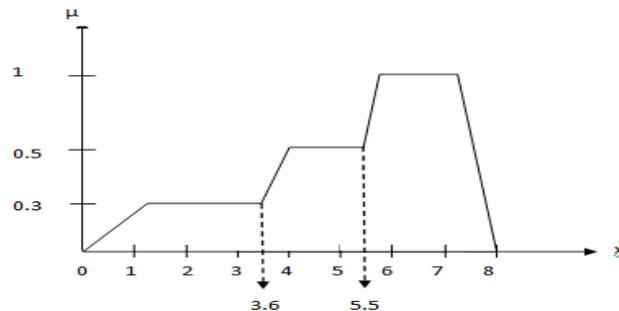5. Explain the pattern recognition by using neural networks ?   14M

OR

6. Explain the neural network application in short term load forecasting technique ?   14M

UNIT IV

7. What are the different operations on fuzzy sets and explain them with examples ?   14M

OR

8. Explain the different Defuzzification methods for the given figure ?

UNIT V

9. Explain the fuzzy logic implementation in speed control of Induction motor ?   14M

OR

10. Explain the fuzzy logic implementation in Automatic voltage regulator ?   14M

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
III B.Tech II semester (R15) Regular Examinations, July 2021
Design of machine elements-II
(Mechanical Engineering)
MODEL QUESTION PAPER
Time:3 hrs   Max Marks: 70
Answer five questions, selecting one Question from each unit
All Questions carry equal marks

UNIT-I
1. Design a helical tension spring for a spring loaded safety valve for the following Conditions. Diameter of valve seat= 65mm,   Operating pressure = 0.7MPa, Maximum pressure when the valve Blows off freely= 0.75mpa, Maximum lift of the valve when the pressure rises from 0.7 to 0.75 MPa = 3.5mm, Maximum allowable   stress= 550 MPa, G=84000Mpa, spring index=6

OR

2. A semielliptical laminated spring to carry a load of 6000 N is to consist of 7 leaves 65 mm wide two   Of the leaves extending the full length of the spring. The spring is to be 1.1m in length and attached   to the axle by two bolts80mm apart. The bolt holds the central portion of the spring so rigidly that   they may be considered equivalent to a band having a width equal to the distance between the   bolts. Assume a design stress for spring material as 350 MPa. P_b= 8MPa, Bending stress σ_b= 80MPa.   Determined   a) thickness of leaves   b) Deflection of spring   c) Diameter of the eye   d) Length of Leaves   e) Radius to a leaves should be initially bent.

UNIT-II
3. Design a journal bearing for a centrifugal pump from the following data.
 Load of the journal= 20000 N   Speed of the journal = 900 Rpm   Type of oil is SAE 10 For which the absolute viscosity at 55° c=0.017Kg/m-s   Ambient temperature of oil = 15.5^o c Maximum bearing pressure for the pump = 1.5 N/mm^2. Calculate also mass of the lubricating oil Required for artificial cooling if rise of temperature of oil be limited to 10^0 c. Heat dissipation coefficient   =1232W/ m^2/^{0}c

(OR)
4. (a) Write design procedure of hydrodynamic journal bearing.

   (b) Differences between hydrostatic & Hydrodynamic journal bearings.

UNIT-III
5. Select a suitable bearing which is to operate at 1500 rpm and is acted up on by a8000 N radial

load   and 5000 N thrust load .(a)The inner ring rotates the load is steady and continuous.

The safest shaft diameter from strength condition is 45 mm and the life expected is 500 hrs

(b) If the Outer ring is rotating and is subjected to a lighter shock , how the life of bearing

changes

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

6. (a) Classification of Rolling contact bearings

(b) Write merits & demerits of rolling contact bearings over sliding contact bearings

7. (a) Write Classification of gears
   (b) Write the procedure for designing a helical gear .

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

8. 7.5 kw is to be transmitted from a motor shaft rotating at 1440 rpm to another shaft with a speed reduction of 3:1 . the starting torque may be taken as 50% higher than the mean torque. The gears should be made of heat rerated steel and the shaft of mild steel. The pinion should have a minimum of 20 teeth. Design the gear drive.

9. Design a Cast Iron piston for a single acting four stroke engine for the following data. Cylinder bore =100 mm, Stroke=125 mm, maximum gas pressure= 5 N/mm^2, Indicated mean effective pressure =0.75 $N/mm^{2,}$ Mechanical efficiency = 0.80, Fuel consumption = 0.15 kg per brake power per hr, High calorific value = 42000 KJ/Kg, Speed =2000 rpm. Any other data required for the design may be assumed .

.

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

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

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
VI semester (R15) Regular Examinations, July 2021
OPERATIONS RESEARCH
(Mechanical Engineering)
MODEL QUESTION PAPER

Time: 3 hrs   Max Marks: 70
Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

Unit-I

1. A farmer has 1000 acres of land on which he can grow corn, wheat and soybeans. Each acre of corn costs Rs.100 for preparation requires 7 man days of work and yields a profit of Rs.30, an acre of wheat costs Rs.120 to prepare for preparation, requires 10 man days of work and yields a profit of Rs.40, and an acre of Soya beans costs Rs.70 to prepare requires 8 man days of work and yields a profit of Rs.20. If the farmer has Rs.100000 for preparation and can count on 8000 man-days of work, how many acres should be allotted to each crop to maximize profit?   (14M)

(OR)

2 a) What is duality in linear programming   (4M)
  b) The manager of an oil refinery must decide on the optimal mix of two possible blending   processes of which the inputs and outputs per production run are given in Table 1.

Table 1:

Process	Input(units)		Output (units)	
	Crude A	Crude B	Gasoline X	Gasoline Y
1	5	3	5	8
2	4	5	4	4

The maximum amount available of crude A and crude B are 200 units and 150 units respectively. Market requirements show that at least 100 units of gasoline X and 80 units of gasoline Y must be produced. The profits per production run from process 1 and process 2 are Rs.300 and Rs.400 respectively. Solve linear programming problem.   (10M)

Unit-II

3. A company is faced with the problem of assigning 4 machines to 6 different jobs. The profits are estimated as follows and are given in Table 2. Solve the problem to maximize the total profit.

Table 2:

Job\Machine	A	B	C	D
1	3	6	2	6
2	7	1	4	4
3	3	8	5	8
4	6	4	3	7
5	5	2	4	3
6	5	7	6	4

(OR)

4. A furniture company has plants in cities A, B and C which ship to four demand locations 1,2,3,4 with transportation cost in rupee as shown below. Determine minimum transportation cost Table 3.

Table 3:

Supply Plants	Demand Locations				Capacity
	1	2	3	4	
A	3	5	7	4	50
B	6	8	5	2	50
C	1	9	7	3	50
Requirements	20	60	30	40	

(14M)

Unit-III

5. a) What are the assumptions made in sequencing problems (4M)

   b) Find the sequence that minimizes the total elapsed time for 10 jobs through 2 machines M_1M_2 shown in Table 4. Find also total elapsed time

Table 4:

Job	A	B	C	D	E	F	G	H	I	J
Time on M_1	7	3	10	8	13	9	5	11	7	10
Time on M_2	6	5	15	7	12	12	2	8	5	11

(10M)

OR

6. A machine which requires an initial investment of Rs12000 has its salvage value at the end of the year i as Rs.(7000-500(i-1)). The operating and maintenance costs are given in Table 5.

Table 5:

i	1	2	3	4	5	6	7	8	9
R_i (Rs.)	1100	1300	1700	2100	2300	2700	3100	3500	3900

Determine optimal replacement year when money increases by 12% every year.   (14M)

Unit-IV

7 a) Explain various elements of Queue (4M)

   b) Arrival rate of a telephone booth are according to Poisson distribution with an average time of 9 minutes between two consecutive arrivals. The length of a telephone call is assumed to be exponentially distributed with mean 3 minutes

   i.   Determine the probability that a person arriving at the booth will have to wait.
   ii.   Average waiting length
   iii.   What is the probability that an arrival will have to wait for more than 10 minutes before the phone is free.
   iv.   What is the probability that the customer will have to wait more than 10 minutes before the phone is available and call also complete.
   v.   Find the fraction of a day that the phone will be in use
   vi.   The telephone company will install a second booth when convinced that an arrival would expect to have to wait at least 4 minutes for the phone. Find the increase in arrival rate to justify the second booth.   (10M)

(OR)

8 A bank has two tellers working on savings accounts. The first teller handles withdrawals only. The second teller handles deposits only. It has been found that the service time distribution for the deposits and withdrawals both are exponential with mean service time 3 minutes per customer. Depositors are found to arrive in a Poisson fashion throughout the day with mean arrival rate 16 per hour. Withdrawers also arrive in a Poisson fashion with mean arrival rate of 14 per hour. What would be the effect on the average waiting time for deposits and withdrawals if each teller could handle both withdrawals and deposits? What would be the effect if this could be only be accomplished by increasing service time to 3.5 minutes.

(14M)

Unit-V

9. (a) Explain various costs of inventory?   (4M)
    (b) Given the data for an item of uniform demand, instantaneous delivery time and back order facility. Annual demand=800 units; Cost of an item=Rs40; Ordering cost=Rs.800/order; Inventory carrying cost =40%/unit/year. Back order cost= Rs 10/unit/year. Find out
   i.   Economic order quantity
   ii.   Maximum number of backorders
   iii.   Time between orders
   iv.   Total annual cost
   v.   Maximum inventory   (10M)

(OR)

10. (a) What are the advantages of simulation   (4M)
    (b) Persons A and B work on a two station assembly line. The distribution of activity times at their stations is given in Table 6.
Table 6:

Time in minutes	10	20	30	40	50	60	70	80	Total
Time frequency for A	4	6	10	20	40	11	5	4	100
Time frequency for B	4	5	6	7	10	8	6	4	50

Simulate operations of the line for eight items. Use the following two digit random numbers.
Operation 1: 14 01 95 44 61 82 00 03
Operation 2: 36 76 55 25 97 41 13 34
Assuming that B must wait until A completes the first item before starting work. Determine idle time of person B and waiting time of job for operation 2.   (10M)

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K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
VI semester B.Tech (R15) Regular Examinations, July 2021
Dynamics of Machinery-II
(Mechanical Engineering)
MODEL QUESTION PAPER

Time:3 hrs   Max Marks: 70

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

Unit-I

1. (a) Explain the terms Spin, Precession and gyroscopic acceleration.   (4M)

   (b) An aero plane makes a complete half circle of 50 m radius, towards left, when flying at 200 Kmph. The rotary engine and the propeller of the plane has a mass of 400 kg with a radius of gyration of 300 mm. The engine runs at 2400 rpm clockwise, when viewed from rear. Find the gyroscopic couple on the aircraft and state its effect.   (10M)

(OR)

2. A racing car of mass 2500 kg has a wheel base of 2.5 m and track width of 1.5 m. The C.G is located at 0.5 m above the ground level, 1.5m from the rear axle. Each wheel has an effective diameter of 80 cm and M.I 0.75 Kg-m^2. The back axle ratio is 4. The drive shaft, engine flywheel and transmission are rotating in clockwise direction when viewed from the front with equivalent mass of 150 Kg with K=15 cm. Determine the load acting on the wheels if the car is rounding a curve of 100 m radius at 100 Kmph.   (14M)

Unit-II

3. Four masses A,B,C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7Kg and the radii of C and D make angles of 90^0 and 240^0 respectively with the radius of B. Find the magnitude of the masses A,C, and D and the angular position of A so that the system may be completely balanced.   (14M)

(OR)

4. (a) What are the requirements of Equivalent Dynamical system?   (4M)

    (b) The connecting rod of an engine weighing 60Kg is 100 cm long between centers. When suspended about small end center, it takes 175 sec for 100 oscillations. If the C.G is 40 cm from the big end center, find the error in the inertia torque due to angular acceleration of connecting rod by assuming the equivalent masses to be located at small and big ends, when the crank has rotated 60^0 from the IDC. The stroke of the engine is 40cm and engine speed is 300 rpm.   (10M)

Unit-III

5. The cranks and connecting rods of a 4 cylinder In-line engine running at 1800 rpm are 60 mm and 240 mm each respectively and the cylinders are spaced 150 mm apart. If the cylinders are numbered 1 to 4 in sequence from one end, the cranks appear at intervals of 90^0 in an end view in the order 1-4-2-3. The reciprocating mass corresponding to each cylinder is 1.5 kg; determine (i) unbalanced primary and secondary forces if any (ii) unbalanced primary and secondary couples if any, with respect to the plane of the engine.   (14M)

<center>(OR)</center>

6. (a) Explain the 'Direct and Reverse crank' method for determining unbalanced forces in radial engines. (7M)

(b) The pistons of a 60^0 twin V engine has strokes of 120 mm. The connecting rods driving a common crank has a length of 200 mm. The mass of the reciprocating parts per cylinder is 1 kg and the speed of the crank shaft is 2500 rpm. Determine the magnitude of the primary and secondary forces. (7M)

<center>**Unit-IV**</center>

7. (a) Discuss briefly with neat sketches the longitudinal, transverse and torsional vibrations. (4M)

(b) Calculate the whirling speed of a shaft 20 mm external diameter and 15 mm internal diameter and 60 cm long carrying a load of 1 kg at its mid point. The density of the shaft material is 40 kg/m^3. Assume shaft to be simply supported. (10M)

<center>**(OR)**</center>

8. (a) Define critical speed and Logarithmic decrement. (4M)

(b) A weight of 75 N hangs from a spring and makes damped oscillations. The time for 60 oscillations is 35 sec and the ratio of first to seventh displacement is found to be 2.5. Find (i) the stiffness of the spring (ii) the damping resistance in N/m/s (iii) if the oscillations were critically damped what is the damping resistance required in N/m/s. (10M)

<center>**Unit-V**</center>

9. The moments of inertia of 3- rotors A, B and C are respectively 250 kg-m^2, 300 kg-m^2 and 550 kg-m^2 respectively. The distance between A and B is 3 m and between B and C is 8 m. The shaft is 20 cm diameter and the modulus of rigidity for the shaft material is 7×10 N/m^2. Find the frequencies of the free torsional vibrations of the system. (10M)

<center>(OR)</center>

10. An electric motor rotating at 1500 rpm drives a centrifugal pump at 500 rpm through a single stage reduction gearing. The moment of inertia of the electric motor and the pump impeller are 400 Kg-m^2 and 1400 Kg-m^2 respectively. The motor shaft is 45 mm in diameter and 180 mm long. The pump shaft is 90mm in diameter and 450 mm long. Determine the frequency of torsional oscillations of the system, neglecting the inertia of the gears. The modulus of rigidity for the shaft material is 84 GN/m^2. (10M)

Code: (1503605)

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
VI semester (R15) Regular Examinations July 2021
Refrigeration and Air-conditioning

(Mechanical Engineering)
MODEL QUESTION PAPER

Time: 3 hrs   **Max Marks: 70**

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks
Unit-I

1. a) Explain an air-refrigerator working on a Bell-Coleman cycle. Derive an expression For the same? (8M)

   b) Enumerate the desirable properties of an ideal refrigerant? (6M)

(OR)

2. a) Explain the Necessity of cooling Aircraft? (7M)

   b) Explain boot strap air refrigeration system? (7M)

Unit-II

3 a) Explain the difference between the VCRS and VARS? (6M)

   b) A vapour compression refrigerator uses Methyl Chloride (R-40) and operates between temperature limits of -10°C and 45°C. At entry to the compressor the refrigerant is dry saturated after compression it acquires a temperature of 60°C. Find the C.O.P. of the refrigerator. The relevant properties of Methyl Chloride are as follows: (8M)

Saturation temperature in 0ºC	Enthalpy in kJ/Kg		Entropy in kJ/Kg	
	Liquid	Vapour	Liquid	Vapour
-10	45.4	460.7	0.183	1.637
45	133.0	483.6	0.485	1.587

(OR)

4. (a) Explain the working of simple vapour absorption refrigeration system?. (7M)

   (b) In a vapour absorption system, the heat is supplied to the generator by condensing steam at 3bar and 85% dry. The temperature in the evaporator is to be maintained at -10^{0}C. If the cooling water rejects heat at 30^{0}C in the condenser find the maximum COP of the system. (7M)

Unit-III

5. (a) Explain the working of Steam Jet Refrigeration system? (7M)

(b) Explain the working of Thermo-electric Refrigeration system? (7M)

(OR)

6. (a) Explain the Nomenclature of Refrigerant? (7M)

(b) Explain Global warming and ozone Depletion ? (7M)

Unit-IV

7. The pressure and temperature of mixture of dry air and water vapour are 736 mm of Hg and 21^0C DBT. The dew point temperature of the mixture is 15^0C. Determine the following

(i) Partial pressure of water vapour in the mixture.

(ii) Relative humidity

(iii) Specific humidity

(iv) Enthalpy of mixture per kg of dry air. (14M)

(v) Specific volume per kg of dry air.

(OR)

8. a) Explain and briefly with neat a sketch " sling psychrometer" (4M)

b) In a cooling application, moist air enters a refrigeration coil at the rate of 100 kg per min at 35^0C and 50 % RH. The apparatus dew point of coil is 5^0C and bypass factor 0.15. Determine

(i) Outlet state of moist air

ii) Cooling capacity of coil in tones of refrigeration. (10M)

Unit-V

9. **(**a) What do you mean by effective temperature? What are the factors contribute to

Effective temperature? (7M)

(b) Explain the comfort chart and sketch the chart (7M)

(OR)

10. (a) Explain schematically on the Psychometric diagram, summer air-conditioning system and

Winter air-conditioning system (7M)

(b) Explain the Human body reacts to change in temperature of environment. (7M)

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K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
IV B.Tech I semester (R15) Regular Examinations, July 2021
POWER PLANT ENGINEERING(Elective II)
(Mechanical Engineering)
MODEL QUESTION PAPER

Time:3 hrs   Max Marks: 70

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

Unit-I

1. Draw a general layout of a thermal power plant and explain the different circuits?

(OR)

2. Explain the need for condensers in a steam power plant and explain the operation of a barometric condenser

Unit-II

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

(OR)

4. What different methods are used to improve the thermal efficiency of open cycle gas turbine plant?

Unit-III

5. Give classifications of hydroelectric power plant. Draw a line diagram giving layout of a pumped storage power plant and describe it's working.

(OR)

6. Describe with the help of a neat sketch the construction and working of a fast breeder reactor Reactor ?

Unit-IV

7. A)What the different types of solar energy collectors
   b) Explain the working of a flat plate collector

`(OR)

8. Explain the working of MHD generaot with neat sketch?

Unit -V

9. a) A generating station has a maximum demand of 30MW ,a load factor of 0.6 ,aplant capacity of 0.48 and a plant use factor of 0.8 find
   - I.   the daily energy produced
   - II.   the reserve capacity of the plant
   - III. the maximum energy that could be produced if the plant were running all the time
   - IV.   the maximum energy that could be produced if the plant when running according to the operating schedule were fully loaded

10. An equipment in a power station cost Rs 15,60,000 and has a salvage value of Rs 60,000 at the end of 25 years. Determine the depreciated value of the equipment at the end of 25 years on the following methods
    - I.   Straight line method
    - II. Diminishing value method.

Subject: **DIGITAL SIGNAL PROCESSING**

Time: 3 Hours   Max.Marks:70

Answer any five questions, choosing one question from each unit.
All questions carry equal marks.

UNIT-1

1. (a) Explain the Classification of Signals &Systems with examples.   (7 M)

   (b) State and prove the Initial value theorem &Final value theorem of Z-transforms.   (7 M)

OR

2. (a) Find the Inverse Z-Transform of $X(z)= Z (Z^2-4z+5) / (z-3) (z-1) (z-2)$ for
   ROC (i) $2 < z < 3$ (ii) $z > 3$ (iii) $z < 1$ (7 M)

   (b) Determine the Z-Transform and ROC of the signal $x(n)=a^n.u(n)$.   (7 M)

UNIT-II

3. Find the DFT of a sequence x (n) = {1, 1, 0, 0}
   Find IDFT of y(k) ={1, 0, 1, 0}   (14 M)

OR

4. Given x (n) =2^n and N=8, Find x(k) using DIT-FFT Algorithm.   (14 M)

UNIT-III

5. Realize system with following difference equation in Direct form-I ,Direct form-II ,Cascade form and parallel forms
   y(n)=3/4.y(n-1)-1/8.y(n-2)+x(n)+1/3.x(n-1).   (14M)

OR

6. Determine the direct Form-II and Transposed Direct Form II for the given
   System y(n)=1/2.y(n-1)-1/4.y(n-2)+x(n)+x(n-1).   (14 M)

UNIT-IV

7. Explain steps to design the Analog Low pass Butterworth filter.   (14M)

OR

8. For the Analog Transfer Function H(s) = 2 / [(s+1)(s+2)]. Determine H(z) using
   Impulse Invariance method. Assume T=1 sec.   (14M)

UNIT-V

9. Design a Filter with $H_d (e^{jw}) = e^{-j3w}$ for $-\Pi/4 <= w <= \Pi/4$.   (14M)
                              $= 0$ for $\Pi/4 < w <= \Pi$.

   Using Hamming Window with N=7.

OR

10. Discuss about Spectral analysis of Non Sinusoidal signals and Non-stationary signals.   (14M)

Subject: MICRWAVE ENGINEERING

Time: 3 Hours   Max. Marks: 70

Answer any five questions, choosing **ONE** question from each unit.
All questions carry equal marks.

UNIT-1

1. (a) What is transit time effect and explain it's importance in microwave tubes?   (7M)
   (b) Explain the mathematical theory of bunching process of electron beam in two cavity
      klystron.   (7M)

OR

2. (a) Explain the structure and working of reflex klystron.   (7M)
   (b) Calculate the power output and efficiency of reflex klystron?   (7M)

UNIT-II

3. (a) Explain the construction and amplification process of Helical TWT.   (7M)
   (b) A TWT has the following parameters. V_o= 3kV, I_o=4mA, f = 10 GHz, Z_o = 30 ohms
      and N=50 , then calculate the i) Gain parameter ii) Power gain in dB.   (7M)

OR

4. (a) Explain the construction of 8 cavity magnetron.   (7M)
   (b) Derive the expression for Hull cut-off condition for cylindrical magnetron?   (7M)

UNIT-III

5. (a) Explain the Gunn effect using two valley theory.   (7M)
   (b) Write short notes on ' modes of Gunn diode'.   (7M)

OR

6. (a) Explain the operation of IMPATT diode.   (7M)
   (b) Explain the working of tunnel diode.   (7M)

UNIT-IV

7. (a) Explain about waveguide phase shifter and attenuator.   (7M)
   (b) State the properties of E plane Tee and H plane Tee.   (7M)

OR

8. (a) Explain the construction and operation of isolator and circulator.   (8M)
   (b) What is a directional coupler? A 20 dB coupler has a directivity of 30 dB. Then
      calculate value of isolation.   (6M)

UNIT-V

9. (a) Define VSWR? Describe the methods of measuring high and low VSWR.   (7M)
   (b) What type of precautions are needed while doing microwave measurements.   (7M)

OR

10. (a) Explain the methods of microwave power measurement using bolometer.   (7M)
    (b) Explain the methods of measuring attenuation.   (7M)

Subject: MICROCONTROLLERS & APPLICATIONS

Time: 3 Hours   Max. Marks: 70

Answer any five questions, choosing **ONE** question from each unit.
All questions carry equal marks.

UNIT-I

1. (a) Compare the differences between RISC and CISC.   [4 Marks]
   (b) Describe the internal architecture of the 8051 microcontroller with neat block diagram. [10 Marks]

OR

2. (a) List and explain the arithmetic instructions of 8051 microcontroller with examples.
   (b) Interface 16Kbytes of ROM and 8Kbytes of RAM to the 8051 microcontroller, such that the
       starting address of ROM is C000H and RAM is 8000H.

UNIT-II

3. (a) Write an ALP to find the maximum and minimum numbers in a given set of numbers. [8 Marks]
   (b) Write a program to generate a delay of 1 hour. Assume that the oscillator frequency is 12 MHZ.
[6 Marks]

OR

4. (a) What is an interrupt? Explain the interrupt structure of the 8051 µC.   [6 Marks]
   (b) List the SFRs of Timer/Counter. Explain.   [8 Marks]

UNIT-III

5. (a) Explain the major design rules for implementing RISC and ARM philosophy.   [6Marks]
   (b) What are the various registers in ARM? Explain.   [8Marks]

OR

6. (a) Explain interrupt and interrupt vector table.
   (b) Write a short note on ARM9 FAMILY.

UNIT-IV

7. (a) Explain addressing modes supported by ARM.   [6 Marks]
   (b) Explain Arithmetic and logical instructions of ARM.   [8 Marks]

OR

8. (a) Explain the thumb data processing instructions of ARM.   [8 Marks]
   (b) Explain Single register load-store instructions of ARM.   [6 Marks]

UNIT-V

9. (a) Define IOT. Explain the characteristics of IOT.   [6Marks]
   (b) Explain IOT enabling technologies.   [8Marks]

OR

10. (a) Explain how IOT is used in home automation.
    (b) Explain how IOT is used in energy systems.

Subject: **CONTROL SYSTES**

Time: 3 Hours   Max.Marks:70
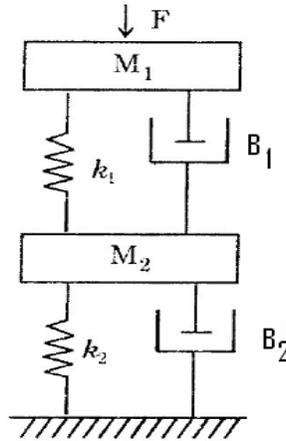
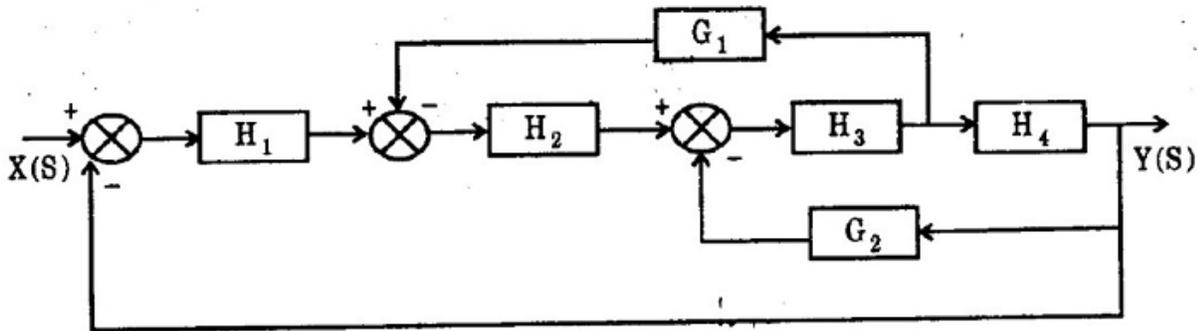Answer any five questions, choosing one question from each unit.
All questions carry equal marks.

UNIT - I

1. (a) Explain the governing equations of the following mechanical systems used in vehicle suspension.

(b) Using block diagram reduction technique finds the transfer function for the system shown in below Figure.

OR

2. (a) State and explain the Mason's gain formula.
   (b) Derive the transfer function and develop the block diagram of Armature controlled DC servo motor

UNIT-II

3. Derive the expressions for all the time domain specifications.

4. (a) Discuss the effect of PD and PI on performance o f a control system.
   (b) A unity feedback system is characterized by an open loop transfer function
$$G(s) = K/S(S+5)$$
Determine the gain K so that the system will have a damping factor of 0.7. For this value of K determine the natural frequency of the system. It is subjected to a unity step input. Obtain the closed loop response of the system in time domain.

UNIT-III

5. (a) Explain stability of a system based on location of roots in S- plane.
   (b) Test the stability of the system with the following characteristic equation by R-H Criterion $s^6 + 2s^5 + 8s^4 + 20s^2 + 16s + 16 = 0$

OR

6. A unity feedback system has an open loop function $G(s) = K/S(S^2+3S+10)$. Sketch the root locus

UNIT-IV

7. (a) Derive the expressions for frequency domain specifications of a second order system.
   (b) Given the open loop transfer function of a unity feedback system
$$G(s) = 1/S(S+3)(1+2S)$$
Draw the Bode plot and measure the frequency at which the magnitude is 0 dB.

OR

8. Draw the Nyquist plot for the system whose open loop transfer function is $G(S)H(S) = K/S(S+2)(S+10)$. Determine the range of K for which closed loop system is stable.

UNIT-V

9. Consider a unity feedback system with open loop transfer function
$$G(s) = K/S(1+S)(2+S)$$
Design a suitable compensator so that the compensated system has,
$$K_V = 10 \text{ sec}^{-1}, \text{ Phase margin} = 40^0, \text{ Gain margin} \leq 12 \text{ db}$$

OR

10. A unit feedback system has an open loop transfer function $G(s) = K / S (S+1) (0.2S+1)$. Design a phase lag compensator to meet the following specifications.

Velocity error constant $= 8$
Phase margin $\geq 40^o$

Code: 1514601

K.S.R.M COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, 2021
Sixth Semester Examination
Sub: Linear & Digital Integrated Circuit Analysis

Time: 3 Hrs.   Max Marks : 70

Note : Answer any **FIVE** questions by choosing one from each unit.
        All questions carry equal marks. UNIT - I

UNIT – I

1 (a).Explain about block diagram of IC741?   7M
   (b).Explain about inverting integrator using IC 741 with necessary waveforms?   7M

Or

2. (a).Explain about converters (I to V) and (V to I)?   7M
   (b). Explain about the Precision Rectifier?   7M

Unit II

3.(a)Explain Mono stable Multi vibrator using IC 555 with necessary equations ?   7M
   (b)Explain about IC 565 PLL and its basic principles?   7M

Or

4. (a). Explain Astable Multi vibrator using IC 555 with necessary equations?   7M

   (b) Explain about Schmitt Trigger using IC 555 with neat sketch?   7M

Unit III

5.(a) Explain the CMOS study state electrical behavior ?   7M
     (b) Explain the process of TTL logic families ?   7M

Or

6 (a) Explain the concept of CMOS/TTL interfacing?   7M
   (b) Explain bipolar logic families?   7M

Unit IV

7 (a) Write a VHDL program on 3 to 8 Decoder using Behavioral design?   10M
   (b) Difference between dataflow design and structural design with example?   4M

Or

8. (a). Explain about Functions and procedure? Write a program structure?   7M

   (b). Write a VHDL program on full adder using Data flow design?   7M

Unit V

9. (a) Explain multiplexer and de multiplexer code converters ?   10M
   (b) Difference between decoder and encoder?   4M

Or

10 (a) Explain about Latches and flip-flop?   7M
   (b) Write a VHDL model for Shift register?   7M

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Code:1514602

K.S.R.M COLLEGE OF ENGINEERING, KADAPA
(AUTONOMOUS)
MODEL QUESTION PAPER
FOUR YEAR B. TECH (R15) DEGREE EXAMINATIONS, 2021
Sixth Semester Examination
Sub: Microprocessors & Microcontrollers

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

Note : Answer any **FIVE** questions by choosing one from each unit.
      All questions carry equal marks. UNIT - I

UNIT-I
1. (a) What are the various data related addressing modes used in 8086
        microprocessor and how the data is retrieved from the memory in
        each case?
    (b) With neat diagram explain the architecture of 8086 micro processor?
OR
2. With neat diagram explain the 40 pins of 8086 microprocessor?
UNIT-II
3. (a) Describe the assembler directives?
    (b) Write an ALP to find out a biggest number from an array?
OR
4. (a) Write an ALP to find out the data is a palindrome or not?
    (b) Write an ALP to find average value from the given array of a data?
UNIT-III
5. (a) with a block diagram explain the roll of DMA controller to transfer a
        data from I/O devices to memory or vice versa?
    (b) Explain about IEEE – 488?

OR
6. (a) describe the following data transfer schemes:
      (i) Asynchronous   (ii) synchronous
    (b) With block diagram explain the operation of programmable interrupt
      controller 8259?
UNIT-IV
7. How do you interface a 4 phase stepper motor to 8086 microprocessor? draw the circuit and explain?
OR
8. Interface ADC to microprocessor. Draw the diagram clearly showing connections?
UNIT-V
9. With neat diagram explain the pins of 8051 Microcontroller?
OR
10. (a) With neat diagram explain the architecture of 8051 Microcontroller?   (b)Explain instruction sets
    of 8051

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