AR13

CODE: 13CE3014 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular / Supplementary Examinations, November-2016

STRUCTURAL ANALYSIS -II

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

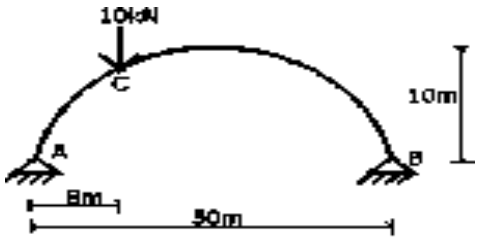
1. a) What are the internal forces developed in the arch?
b) What are the assumptions made in portal method?
c) Write fixed end moments and support reactions due to sinking of supports.
d) How do you take, support condition of column bases into consideration in the calculation of displacement factor
e) If the further ends is hinged or overhang, what is the stiffness of the member?
f) Why does rigid jointed frame sway?
g) What are the advantages of Kani's method over moment distribution method
h) Write flexibility matrix for beam element with 2 redundant moments.
i) Define stiffness influence coefficient
j) Define static indeterminacy of structure and what is the static indeterminacy for the fixed beam.

PART-B

Answer one question from each unit **[5x12=60M]**

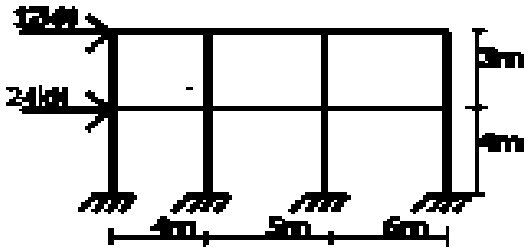
UNIT-I

2. A parabolic arch hinged at the ends has a span of 50m and a rise of 10m. A concentrated load of 10kN acts at 8m from left hinge (Fig). The second moment of inertia varies as the secant of the inclination of the arch axis. Calculate horizontal thrust and the reactions at the hinge. Also calculate the bending moment at the section. **12M**



(OR)

3. Analyze the frame by cantilever method. All columns having equal cross section area **12M**

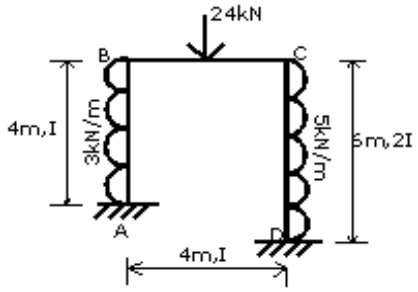


UNIT-II

4. A continuous beam ABCD, 28m long is continuous over three spans of 10m, 10m and 8m. there is a udl of 3kN/m over each of 10m span and 6kN/m over the 8m span. The ends are freely supported and during loading support B sinks by 1cm. find the end moments and draw BMD for the beam. Analyze the problem by slope deflection method. Take E=2x10^{6}N/cm^2, I=30000 cm^4 **12M**

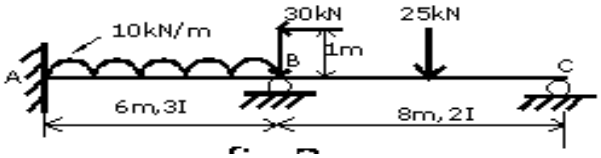
(OR)

5. Analyze the given portal frame slope deflection method, sketch BMD **12M**



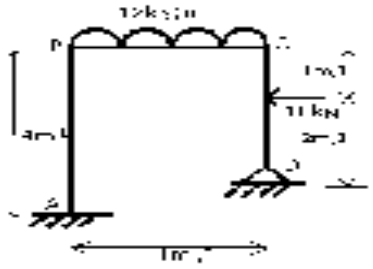
UNIT-III

6. Analyze the given continuous beam by moment distribution method and sketch BMD **12M**



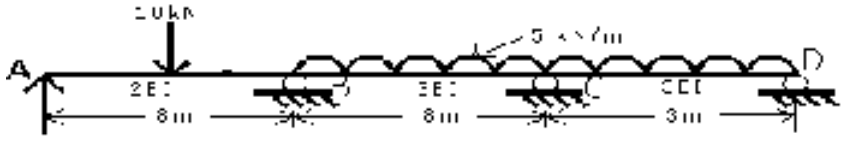
(OR)

7. Analyze the given portal frame by moment distribution method (fig.) and sketch bending moment diagram **12M**



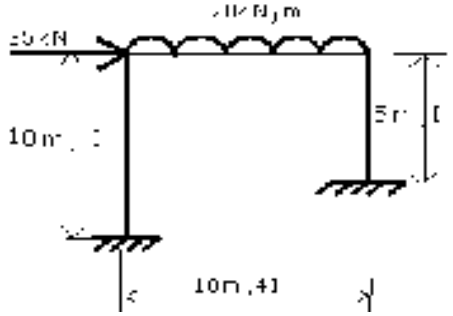
UNIT-IV

8. Analyse the given 3span continuous beam by Kani's method. **12M**



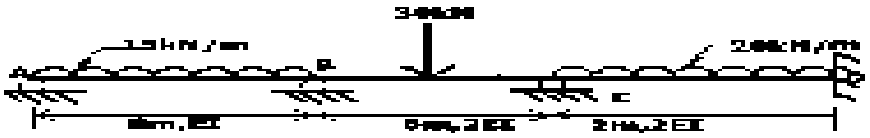
(OR)

9. Analyze the given portal frame by flexibility method. Draw BMD & SFD



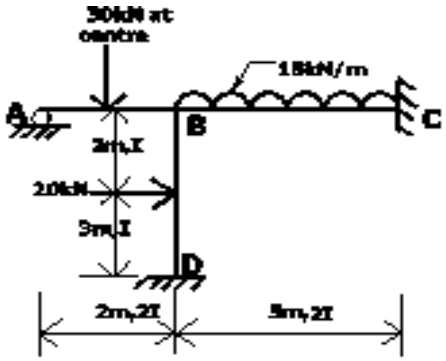
UNIT-V

10. Analyse the continuous beam shown below using displacement method. **12M**



(OR)

11. Analyse the portal frame shown below by stiffness matrix method. **12M**



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AR13

CODE: 13EC3047 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular / Supplementary Examinations, November-2016

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Draw circuit diagram of series type ohm meter
   b) Define the term fidelity
   c) What is a wave analyser
   d) Draw a block diagram of standard signal generator
   e) How do the X shift and Y shift do in CRO
   f) What are major components of CRO
   g) Draw the circuit diagram of Anderson bridge
   h) Define the term null as its applies to bridge measurement
   i) Write advantages of LVDT
   j) Write principle of capacitance transducer.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a Draw the circuit diagram and explain the operation of series type ohm meter
   b Draw the block diagram of digital voltmeter and explain it operation

(OR)

3. a Write ideal characteristics of voltmeter how we can design practically
   b list out errors generated in instruments explain each error.

UNIT-II

4. a Explain with help of a block diagram the working of a spectrum analyzer
   b Explain with the help of a block diagram working of a harmonic distortion analyzer

(OR)

5. a Draw block diagram of random noise generator explain each block
   b Draw block diagram of sweep generator explain each block

UNIT-III

6. Draw circuit diagram of dual trace CRO write its advantages

(OR)

7. a Discuss about vertical section of dual beam CRO
   b How we can measure voltage and frequency using CRO

UNIT-IV

8. a Draw the circuit diagram of Schering bridge and explain its operation
   b Draw the circuit diagram of Maxwell bridge and explain its operation

(OR)

9. a What are the detectors used for AC bridges?
   b Draw kelvin double bridge circuit explain its operation

UNIT-V

10. a Write advantages and limitations of resistance thermometer
    b Explain about thermistor and write its advantages

(OR)

11. a Draw and explain LVDT transducer
    b Write short notes on thermocouples

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CODE: 13ME3017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular / Supplementary Examinations, November-2016

THERMAL ENGINEERING - II
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Sketch Regenerative cycle on T-s diagram.
   b) What is the difference between Higher and lower calorific values?
   c) What are the important considerations while selecting a boiler?
   d) What is the function of Fusible plug in the boilers?
   e) List out different types of nozzles used in practice.
   f) What are the advantages of using condenser in the power plants?
   g) What is the principle in Pressure compounding method.
   h) Define blade velocity coefficient and blade diagram efficiency.
   i) What is the principle used in reheating technique applied to gas turbine power plants.
   j) Define thrust power and propulsive efficiency.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a. Briefly discuss the methods used to improve the performance of steam power plants 6M
   b. A simple Rankine cycle works between pressure of 30 bar and 0.04 bar, the initial conditions of steam being dry saturated. Calculate the cycle efficiency, work ratio and specific steam consumption.. 6M

(OR)

3. a. Write a short notes on Calorific value of fuels. 4M
   b. A gaseous fuel has the following combination by volume: Hydrogen(H_2) = 40; Carbon monoxide (C0) =10 ; Nitrogen(N_2) =3; Methane(CH_4) =40; Carbon dioxide(CO_2)=5; and Oxygen(O_2) =2. Find (a) the amount of air required for complete combustion of $1m^3$ of the gas (ii) the volumes of individual dry flue gases if 50% excess air is supplied. 8M

UNIT-II

4. a. Briefly explain the working of Babcock and Wilcox boiler with a neat sketch. 6M
   b. List out different accessories used in boilers and discuss the working of any one importance accessory. 6M

(OR)

5. a. Briefly explain the working of (i) Water level indicator (ii) Blow off cock valve 6M
   b. What is meant by Draught and discuss briefly different draughts used in boilers. 6M

UNIT-III

6. a. Derive the expression for determining exit velocity of a nozzle. 4M

   b. Steam enters a group of nozzles of a steam turbine at 1.2 bar, 220 C and leaves at 1.2 bar. The steam turbine develops 220 kW with a specific steam consumption of 13.5 kg/kWh. If the diameter of nozzles at throat is 7mm, calculate the no. of nozzles. 8M

(OR)

7. a. Briefly explain the working of any one type of Low level jet condenser with a neat sketch 6M

   b. Distinguish between Jet and Surface condensers. 6M

UNIT-IV

8. a. Briefly explain the working of a simple impulse turbine with simplified sketch. 4M

   b. In a De Laval turbine steam issues from the nozzle with a velocity of 1200 m/s. The nozzle angle is 20^0, the mean blade velocity is 400 m/s, and the inlet and outlet angles of blades are equal. The mass of steam flowing through the turbine per hour is 800 kg. Calculate: 8M

      i. Blade angles
      ii. Relative velocity of steam entering the blades.
      iii. Tangential force on the blades.
      iv. Power developed
      v. Blade efficiency.

   Take blade velocity coefficient = 0.8

(OR)

9. a. What is necessity of compounding in steam turbines and discuss any one method of compounding. 6M

   b. A Parson's reaction turbine, while running at 400 r.p.m consumes 30 tonnes of steam per hour. The steam at a certain stage is at 1.6 bar with dryness fraction of 0.9 and the stage develops 10 kW. The axial velocity of flow is constant and equal to 0.75 of the blade velocity. Find mean diameter of the drum and the volume of steam flowing per second. Take blade tip angles at inlet and exit as 35^0 and 20^0 respectively. 6M

UNIT-V

10. a. Briefly explain the method of regeneration as applied to gas turbine power plants. 6M

    b. A gas turbine takes in air at 27°C and 1 bar. The pressure ratio is 4 and the maximum temperature in the cycle is 560°C. The compressor and turbine efficiencies are 0.83 and 0.85 respectively. Determine the overall efficiency if the regenerator effectiveness is 0.75 6M

(OR)

11. a. Briefly explain the working of Turbojet with the help of a neat sketch and mention its advantages. 6M

    b. A turbo jet engine consumes air at the rate of 60.2 kg/s when flying at a speed of 1000 km/hr. Calculate (i) exit velocity of the jet when enthalpy change for the nozzle is 230 kJ/kg and velocity coefficient is 0.96. (ii) Fuel flow rate in kg/s, when air fuel ratio is 70:1 and (iii) thrust specific fuel consumption 6M

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Correction

6.

b. Steam enters a group of nozzles of a steam turbine at **<u>12 bar</u>**, 220 C and leaves at 1.2 bar. The steam turbine develops 220 kW with a specific steam consumption of 13.5 kg/kWh. If the diameter of nozzles at throat is 7mm, calculate the no. of nozzles.

Correction

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b. Steam enters a group of nozzles of a steam turbine at **<u>12 bar</u>**, 220 C and leaves at 1.2 bar. The steam turbine develops 220 kW with a specific steam consumption of 13.5 kg/kWh. If the diameter of nozzles at throat is 7mm, calculate the no. of nozzles.

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AR13

CODE: 13EC3017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular / Supplementary Examinations, November-2016
PULSE AND DIGITAL CIRCUITS
(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1.a) Write the drawbacks of RL linear wave shaping circuit compared to RC circuit?
b). When does a low-pass circuit preserve the pulse shape?
c). Why the clamping circuit is also called a dc inserter?
d). What do you mean by delay time of a transistor?
e). Is Bi-stable multi vibrator a flip-flop, justify.
f). Why is the triggering signal required in mono stable multi vibrator.
g). What do you mean by relaxation circuit?
h). Mention the basic Principle of Bootstrap time base generator.
i). What are the types clipper circuits.
j). Define multi-vibrator.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) What are the drawbacks of uncompensated attenuators? Prove that the condition to prevent input signal from distortion is R1C1 = R2C2, in an adequately compensated attenuator. [7M]
b) An RC differentiator circuit is driven from a 500Hz symmetrical square wave of 10V Peak-to peak. Calculate the output voltage levels under steady state if RC = 1msec. [5M]

(OR)

3 .a) The output of a high pass RC circuit for a symmetrical square wave input is shown in Figure.1. Derive the expression for percentage tilt in the output. Figure.1

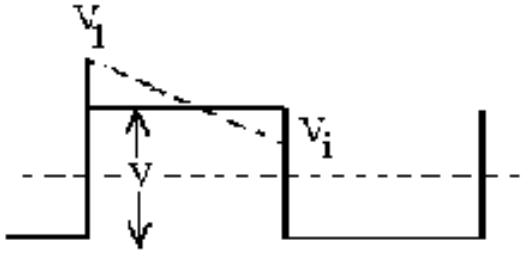

Figure.1

b) Explain RC low pass circuit acts as an integrator.

AR13

CODE: 13EC3017 **SET-2**

UNIT-II

4.a). Draw the basic circuit diagram of negative peak clamper(positive clamper) and explain its operation.

b) For the circuit shown in figure.2, an input voltage Vi linearly varies from 0 to 150V is applied. Sketch the output voltage VO and transfer characteristics. Assume ideal diodes.

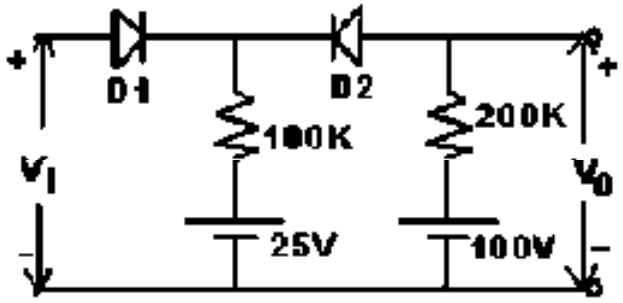

Figure.2

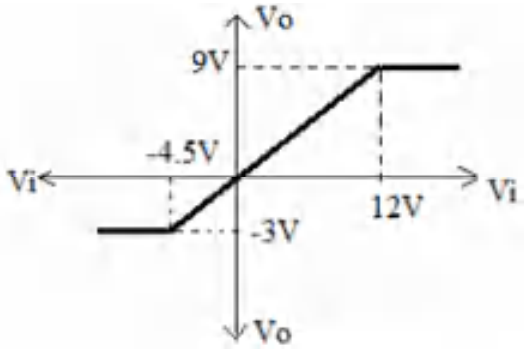

Figure.3

(OR)

5 a). The ideal transfer characteristic of particular clipper circuit is shown in Figure.3. Design the circuit using ideal diodes and draw the input-output waveforms with proper explanation, if Vi = 15 Sin ωt.

b) With neat diagrams, explain the use of clamper circuit in television receivers as DC restorer?

UNIT-III

6.a)Explain the terms pertaining to transistor switching characteristics. i) Rise time. ii) Delay time. iii) Turn-ON time. iv) Storage time. v) Fall time. vi) Turn-OFF time.

b) Calculate the maximum operating frequency of a diode with storage time of 1ns and transition time of 8ns.

(OR)

7 a). A common emitter circuit has Vcc=20V and a collector resistor which can be either 20KΩ to 2KΩ. Calculate the minimum level of base current to achieve saturation in each case.

b). Derive the expression for fall time, rise time of transistor switch.

UNIT-IV

8. Draw and explain the circuit of Astable Multi-vibrator with necessary waveforms and also derive the expression for its frequency of oscillations.

(OR)

9.a). Define the terms UTP and LTP of a Schmitt trigger and explain how these are varied?

b). With the help of neat circuit diagram explain the working of a collector coupled Mono-stable multi-vibrator.

UNIT-V

10. a) Explain the basic principles of Miller and Bootstrap time-base generators.

b). Prove that when the deviation from linearity is small then the slope error is eight times than the displacement error.

(OR)

11.a) With the help of a neat circuit diagram and waveforms , explain the working of a transistor bootstrap time base generator.

b) With the help of a neat circuit diagram, explain the working of a bidirectional sampling gate.

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AR-13 SET-2

CODE: 13CS3014

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular / Supplementary Examinations, November-2016
OPERATING SYSTEMS
(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What is the function of bootstrap loader?
   b) Define are cooperating processes?
   c) What is a thread? Write its advantage.
   d) What is the advantage of monitor?
   e) What deadlock will be prevented?
   f) Differentiate between paging and segmentation.
   g) What do you mean by formatting a disk?
   h) Write the system calls for opening a file and reading data from a file.
   i) Write down the structure of FAT.
   j) Define interrupt. Differentiate between hardware and software interrupt.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. (a) Define the essential properties of the following types of operating systems: [6M]
   a) Time sharing b) Batch c) Network d) Clustered e) Parallel f) Handheld
   (b) What is system call? What is its use? Explain how system calls are used briefly. [6M]

(OR)

3. (a) Write down functions of different types of schedulers? [4M]
   (b) Consider the following set of process that arrive at time 0. The length of the CPU burst times given in milli seconds. [8M]

Process	Burst time (Milli seconds)
P1	23
P2	12
P3	13
P4	5
P5	14

Compute the average waiting time, average response time and average turnaround time by FCFS, SJF and RR algorithm with time slice=4 milliseconds.

UNIT-II

4. (a) What is a binary semaphore? Explain producer-consumer problem using semaphore. [6M]
   (b) Define Monitor with condition variables by taking a suitable example. Is there any advantage of monitor over semaphore? [6M]

(OR)

CODE: 13CS3014

5 (a) What is a dead lock? Explain different conditions for deadlock. [4M]

(b) Explain deadlock detection algorithm. Consider the following snapshot of a system : [8M]

	Allocation	Request	Available
	X Y Z	X Y Z	X Y Z
P_0	0 1 0	0 0 0	0 0 0
P_1	2 0 0	2 0 2	
P_2	3 0 0	0 0 1	
P3	2 1 1	1 0 0	
P4	0 0 2	0 0 2	

Apply the deadlock detection algorithm and determine whether deadlock exists in the system or not? If exist, write down the processes which are deadlocked.

UNIT-III

6 (a) Write down the solutions to solve dynamically storage allocation problem. Explain first fit, best fit and worst fit schemes with an example. [6M]

(b) What is the use of TLB in memory management? Draw paging hardware with TLB and explain it. [6M]

(OR)

7 (a) What thrashing? Why it occurs? What is its effect on multiprogramming? [4M]

(b) Calculate the number of page faults for the following reference string using [8M]
i) FIFO ii) Optimal page replacement iii) LRU algorithms
5 3 2 0 1 3 2 5 3 6 7 4 5 7 3 4 1 1 2 4 3 7 6 5 6 7 4 3 3 2 3 1 2 3 1

UNIT-IV

8 (a) Explain about deferent types of file allocation methods. [6M]

(b) Discuss the different methods for free space management. [6M]

(OR)

9 (a) Explain the functions of different layers in the layered file structure. [6M]

(b) Discuss schematic view of the NFS architecture. [6M]

UNIT-V

10 (a) Write short notes on protection and security. [4M]

(b) Discuss about all the disk scheduling algorithms with an example. [8M]

(OR)

11 (a) Define interrupt. Draw and discuss interrupt-driven I/O cycle. [6M]

(b) Explain life cycle of an I/O request. [6M]

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