

AR13

CODE: 13CE3014 SET-1
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Regular & Supplementary Examinations, October-2017
STRUCTURAL ANALYSIS -II
(CIVIL ENGINEERING)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Explain rib-shortening in the case of arches.
b) What are the approximate methods for the lateral load analysis of frames.
c) Define relative stiffness of a member.
d) Define displacement factor.
e) Define: Carry over moment and Carry over factor.
f) When does joint equilibrium condition satisfies?
g) Define rotation contribution moment.
h) Define degrees of freedom
i) Develop stiffness and flexibility matrices for single coordinate system
j) What is meant by sinking of support?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. Analyze the given two hinged arch as shown in below

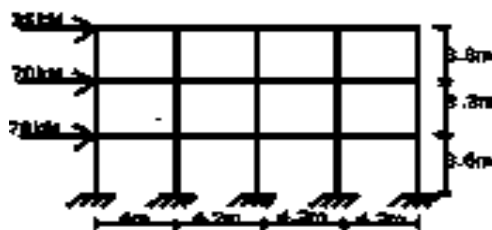
12M



(OR)

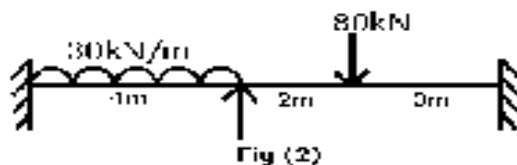
3. Analyse the frame using Portal method.

12M



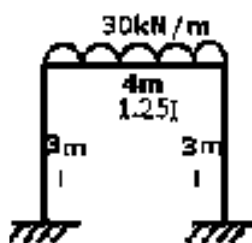
UNIT-II

4. Analyze the continuous beam by slope deflection method. **12M**



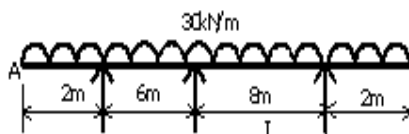
(OR)

5. Analyse the portal frame using slope deflection method. Also draw Bending Moment diagram. **12M**



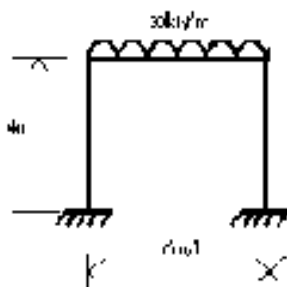
UNIT-III

6. Find the support moments and draw bending moment diagram by moment distribution method **12M**



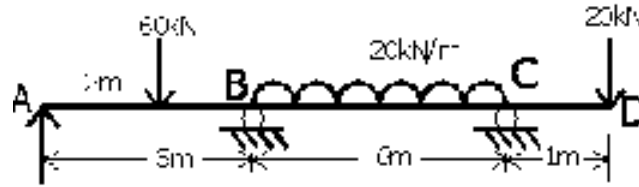
(OR)

7. Analyse the Portal frame as shown in figure using moment distribution method Draw B.M.D. **12M**



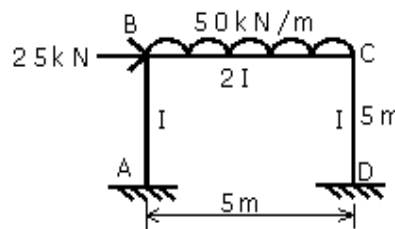
UNIT-IV

8. Analyse the beam ABCD loaded as shown in Fig. by Kani's method. If support B yields by 9mm, $EI=1 \times 10^{12}$ N-mm² throughout. **12M**



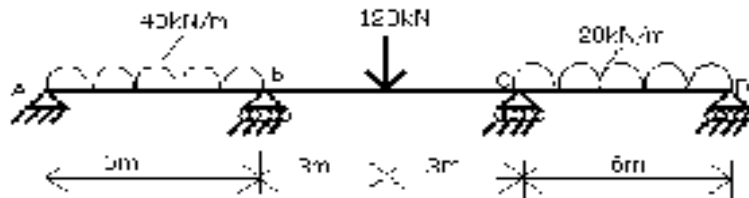
(OR)

9. Analyse the portal frame as shown in below using Kani's method. Draw bending moment diagram. **12M**



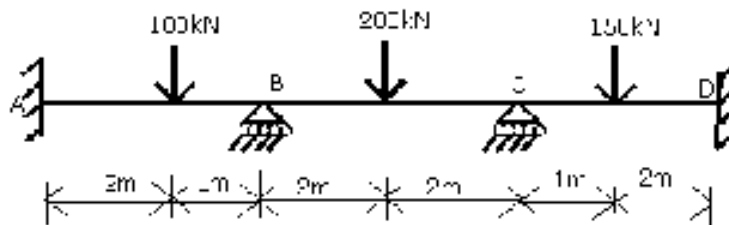
UNIT-V

10. Analyse the continuous beam shown in below fig., using flexibility matrix method **12M**



(OR)

11. Analyse the given continuous beam by stiffness matrix method **12M**

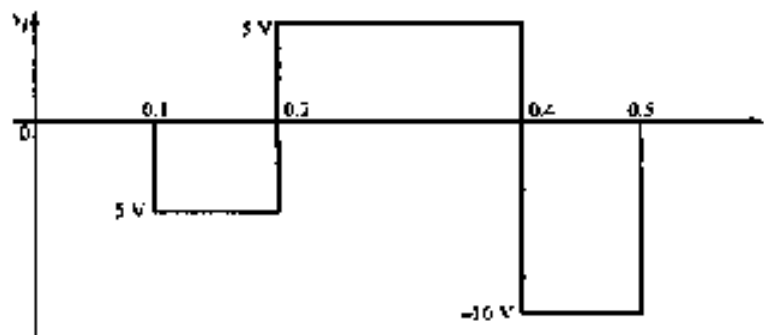


**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****III B.Tech I Semester Regular & Supplementary Examinations, October-2017****PULSE AND DIGITAL CIRCUITS
(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Write the relation between Rise Time and Time Constant
- b) What do you mean by Ringing Circuit
- c) What are the other names of Clampers
- d) The value of Resistance in the Clipping Circuit be chosen as the _____ of Diode Forward Resistance (R_F) and Diode Reverse Resistance (R_R)
- e) Mention any one Application of Bistable Multivibrator
- f) What do you mean by BV_{CBO}
- g) What do you mean by Quasi Stable State
- h) Why Monostable Multivibrator is Known as Delay Circuit
- i) Define Sweep Time
- j) The value of Sweep Error should be small Why?

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

2. a) Assuming that the capacitor is initially uncharged determine the output response of low pass RC Circuit with time constant 0.04ms to the input waveform shown in figure 1 (V_i in Volts t is in ms) **6 M**

**Figure-1**

- b) Draw and Explain Output Waveforms of high Pass RC circuit when excited by Ramp Wave **6 M**
- (OR)**
3. a) Draw and Explain the response of RC low pass circuit to the step input. **8 M**
 - b) Explain about an Attenuator and derive the condition for Perfect Compensation of an Attenuator **4 M**

UNIT-II

4. a) State and Prove Clamping Circuit Theorem with relevant circuits and waveforms **8 M**
 b) Draw the transfer characteristics for the circuit shown in figure-2 and also draw the output waveform for a sinusoidal input of amplitude 30 V **4 M**

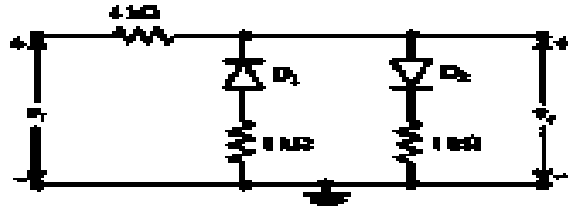


Figure-2

(OR)

5. a) Explain the operation of Negative Clamper Circuit **6M**
 b) Draw and explain the working of Emitter Coupled Clipper with the help of transfer characteristics. **6 M**

UNIT-III

6. A collector coupled Fixed bias binary uses NPN transistors with $h_{FE} = 90$. The circuit parameters are $V_{CC} = 10V$, $V_{BB} = 3V$, $R_C = 2K\Omega$, $R_1 = 5K\Omega$ and $R_2 = 10K\Omega$. Assume for transistors $V_{CE(sat)} = 0.3V$ and $V_{BE(sat)} = 0.7V$. **12 M**
 i. Find the stable state currents and voltages for the circuit.
 ii. What is the maximum load that the multivibrator can drive, still maintaining one transistor in Saturation and the other in cut off.

(OR)

7. a) Explain in detail about transistor switching times. **8 M**
 b) Explain how Transistor acts as a Switch **4 M**

UNIT-IV

8. a) With necessary Circuit diagrams and wave forms explain the working of Collector Coupled Monostable Multivibrator **8 M**
 b) Derive an Expression for the Gate width of a Monostable Multivibrator **4 M**

(OR)

9. a) Design an Astable Multivibrator to Generate a Square wave at 2 KHz Frequency. $V_{CC}=10V$, $I_C(SAT)=10\text{ mA}$ $h_{fe}= 50$ and assume Si transistors. **7 M**
 b) Derive an Expression for Upper Triggering Point of a Schmitt Trigger **5 M**

UNIT-V

10. a) Explain the basic principles of Miller and Bootstrap time base generators. **8 M**
 b) Explain with circuit diagram the operation of a sampling gate whose response is not Sensitive to the Upper level of the Control Voltage **4 M**
(OR)
 11. a) Explain with circuit diagram the operation of Bidirectional Sampling gate using Transistors **8 M**
 b) Why Sampling Gate is Known as Selection Circuit and Explain with an Example **4 M**

AR13

CODE: 13ME3017

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech I Semester Regular & Supplementary Examinations, October-2017

**THERMAL ENGINEERING - II
(Mechanical Engineering)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) Why Carnot cycle is not possible to implement practically?
 - b) What do you mean by stoichiometric air-fuel (A/F) ratio?
 - c) What is the typical pressure employed in high-pressure boilers?
 - d) What are the limitations of chimney draught?
 - e) Define the term 'steam nozzle'.
 - f) What are the sources of air in the condensers?
 - g) Name different type of compounding methods used for impulse turbines?
 - h) Define stage efficiency of a turbine.
 - i) Draw the $T-s$ diagrams of a Brayton cycle.
 - j) What is the main difference between pulse jet and ramjet propulsion?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2.
 - a) Explain the various operations of a Rankine cycle. Also represent it on a $T-s$ and $p-V$ diagrams. [8 M]
 - b) Write the chemical analysis of a fuel by weight and find the stoichiometric amount of air required for complete combustion of fuel. [4 M]

(OR)

3.
 - a) A steam power plant of 110 MW capacity is equipped with regenerative as well as reheat arrangement. The steam is supplied at 80 bar and 550°C of superheat. The steam is extracted at 7 bar for feed heating and remaining steam is reheated to 350°C , and then expanded to 0.4 bar in the L.P. stage. Assume indirect type of feed heaters. Determine :
 - (i) The ratio of steam bled to steam generated,
 - (ii) The boiler generating capacity in tones of steam/ hour, and
 - (iii) Thermal efficiency of the cycleAssume no losses and ideal processes of expansion.

- b) An Orsat analysis of the products of combustion of hydrocarbon fuel of unknown composition is as follows:
 Carbon dioxide (CO₂) = 9% Carbon monoxide (CO) = 0.6% [6 M]
 Oxygen (O₂) = 7.3% Nitrogen (N₂) = 83.1%
 Determine the following:
 (i) Air-fuel ratio (ii) Per cent theoretical air required for combustion

UNIT-II

4. a) Give the construction and working of the following water tube boilers : [6 M]
 (i) Babcock and Wilcox boiler (ii) Stirling boiler
 b) Estimate the mass of flue gases flowing through the chimney as per data given below :
 Draught produced = 20 mm of water column
 Temperature of the flue gases = 573 K
 Ambient temperature = 303 K [6 M]
 The mass of air used = 19 kg per kg of fuel burnt
 Diameter of the chimney = 2 m
 Neglect the losses.
- (OR)**
5. a) Explain the unique features of high pressure boilers and list their advantages. [6 M]
 b) Explain induced draught fan and forced draught fan also find the power of a motor required to drive a forced fan [6 M]

UNIT-III

6. a) The inlet conditions of steam to a convergent-divergent nozzle is 22 bar and 260°C. The exit pressure is 4 bar. Assuming frictionless flow upto the throat and a nozzle efficiency of 85%, determine : [6 M]
 (i) The flow rate for a throat area of 32.2 cm².
 (ii) The exit area.
 b) Classify the surface condensers and explain with neat sketches any two of the following :
 (i) Down-flow type (ii) Regenerative type [6 M]
 (iii) Evaporative type
- (OR)**
7. a) What do you mean by supersaturated flow? Explain with the help of *h-s* diagram. [5 M]
 b) A surface condenser deals with 2724 kg of steam per hour and the air leakage amounts to 2.27 kg per hour. The temperature of the air pump suction is 30°C and vacuum 67 cm of Hg when the barometer reads 74.7 cm of Hg. The volumetric efficiency of the air pump is 70%. Determine the discharging capacity of the air pump in m³/min, taking the volumetric efficiency of the pump as 80%. If the air pump is single-acting and runs at 55 rpm and piston stroke is 1.25 times the diameter of the pump, find the dimensions of the wet air pump. [7 M]

UNIT-IV

8. a) Explain differences between an Impulse and Reaction turbines? [6 M]
b) In a 50 per cent reaction turbine stage running at 3000 r.p.m., the exit angles are 30° and the inlet angles are 50° . The mean diameter is 1 m. The steam flow rate is 10000 kg/min and the stage efficiency is 85%. Determine :
(i) Power output of the stage. [6 M]
(ii) The specific enthalpy drop in the stage.
(iii) The percentage increase in the relative velocity of steam when it flows over the moving blades.
- (OR)**
9. a) The following data relate to a single stage impulse turbine :
Steam velocity = 600 m/s; Blade speed = 250 m/s;
Nozzle angle = 20° ; Blade outlet angle = 25° . [6 M]
Neglecting the effect of friction, calculate the work developed by the turbine for the steam flow rate of 20 kg/s. Also calculate the axial thrust on the bearings.
b) In a stage of impulse reaction turbine operating with 50% degree of reaction, the blades are identical in shape. The outlet angle of the moving blades is 19° and the absolute discharge velocity of steam is 100 m/s in the direction at 100° to the motion of the blades. If the rate of flow of steam through the turbine is 15000 kg/h, calculate the power developed by the turbine in kW. [6 M]

UNIT-V

10. a) State the merits of the gas turbines over I.C Engines and steam turbines? Discuss also the demerits of gas turbines? [5 M]
b) In a gas turbine plant, air is drawn at 1 bar, 15°C and the pressure ratio is 6. The expansion takes place in two turbines. The efficiency of compressor is 0.82, high pressure turbine is 0.85 and low pressure turbine is 0.84. The maximum cycle temperature is 625°C . Calculate [7 M]
(a) Pressure and temperature of gases entering the low pressure turbine.
(b) Net power developed
(c) Work ratio
- (OR)**
11. a) Enumerate the various uses of a gas turbine? [6 M]
b) Explain turbo jet, turbo prop with neat sketch and calculate the thrust for turbo jet. [6 M]

AR13

CODE: 13EC3047

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Sem Ester Regular & Supplementary Examinations, October-2017

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) Define sensitivity and error.
 - b) What is loading effect?
 - c) What is a Standard Signal generator?
 - d) Where are spectrum analyzers commonly used?
 - e) What are the Basic components of a CRT?
 - f) What are the Advantages of using active probe?
 - g) What is the drawback of Dual Trace Oscilloscope?
 - h) Give the applications of Kelvin Bridge.
 - i) Which bridge is used to measure the Dissipation factor ?
 - j) Name different types of a piezo – electric transducers?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2.
 - (a) Explain the construction and working of a thermocouple measuring instrument [6M]
 - (b) What are the advantages of digital instruments over analog instruments? [6M]
- (OR)
3.
 - (a) Discuss thermocouple type RF ammeter in detail [6M]
 - (b) Explain Digital Multi meter with the Block Diagram. [6M]

UNIT-II

4.
 - (a) Draw the block diagram of a function generator and explain the method of producing the sign wave. [6M]
 - (b) With a neat block diagram discuss about an AF sine wave generator [6M]
- (OR)
5.
 - (a) What is a difference between a wave analyzer and a harmonic distortion analyzer. [6M]
 - (b) Discuss with the help of neat diagram the elements of standard sweep generator and draw the output wave form [6M]

UNIT-III

- 6 (a) Draw the block diagram of a basic Oscilloscope and explain the functions of each block. [6M]
- (b) The lissajous pattern on an CRO is stationary and have five horizontal and two vertical tangencies. The frequency of the horizontal input is 1000 Hz. Determine the frequency of vertical input. [6M]

(OR)

- 7 (a) With a block diagram explain the operation of a sampling oscilloscope [6M]
- (b) With a block diagram explain the operation of a Digital storage Oscilloscope [6M]

UNIT-IV

- 8 (a) Describe the operation of Maxwell's bridge and derive conditions of balance. [6M]
- (b) Explain the principle and working of Q meter [6M]

(OR)

- 9 (a) Describe the operation of the wheat stone's bridge. [6M]
- (b) Describe the operation of shearing bridge and derive conditions of balance [6M]

UNIT-V

- 10 (a) Define transducers. What is the difference between active and passive transducers [6M]
- (b) What is an LVDT? Where is it used? Explain the operating principle of LVDT? [6M]

(OR)

- 11 (a) Draw the block diagram of a standard DAS and explain function of each block. [6M]
- (b) Describe the construction of thermocouples and state its limitations [6M]

AR13

CODE: 13CS3014

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech I Semester Regular & Supplementary Examinations, October-2017

OPERATING SYSTEMS

(Common to CSE & IT)

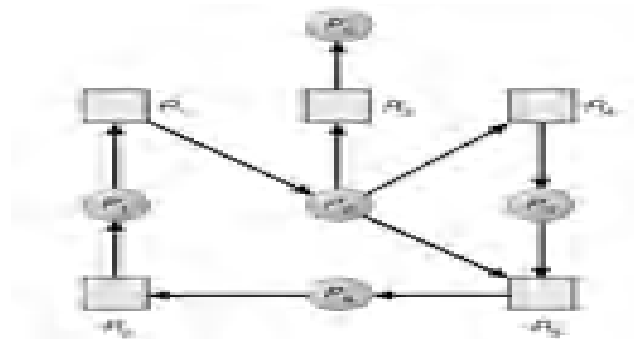
Time: 3 Hours**Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) Define Operating System.
 - b) List different CPU Scheduling algorithms.
 - c) What is Semaphore?
 - d) Identify different methods used for handling deadlocks.
 - e) Draw the wait-for graph for the corresponding resource allocation graph



- f) Abbreviate MVT in OS?
- g) Define a File.
- h) How to manage free space in memory management system.
- i) Which algorithm of disk scheduling selects the request with the least seek time from the current head positions?
- j) What is the other name for SCAN algorithm?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Explain Process concept. Draw a process transition diagram and explain the various states of process. 6M
- b) What is multi threading? Discuss the benefits of multithreaded programming and write a short note on various multithreading models 6M

(OR)

3. a) Suppose that the following processes arrive for execution at the times indicated 6M

Process	Arrival Time	Burst Time
P_1	0.0	7
P_2	2.0	4
P_3	4.0	1
P_4	5.0	4

What is the average waiting for these processes using

1. SJF Non Preemptive scheduling algorithm
 2. SJF Preemptive scheduling algorithm.
- b) Explain round robin scheduling algorithm with an example. 6M

UNIT-II

4. a) What are the requirements for solving critical-section problem? 6M
b) Describe in detail about the data structures used in BANKER'S algorithm. 6M

(OR)

5. Four resources ABCD. A has 6 instances, B has 3 instances, C has 4 instances and D has 2 instances. 12M

Process	Allocation	Max
	ABCD	ABCD
P1	3011	4111
P2	0100	0212
P3	1110	4210
P4	1101	1101
P5	0000	2110

- i) Is the current state safe?
ii) If P5 requests for (1,0,1,0), can this be granted?

UNIT-III

6. a) Outline the concepts of demand paging? Why it is called as lazy swappers? 6M
b) Explain the following page replacement algorithms with example. 6M
a) FIFO b) LRU

(OR)

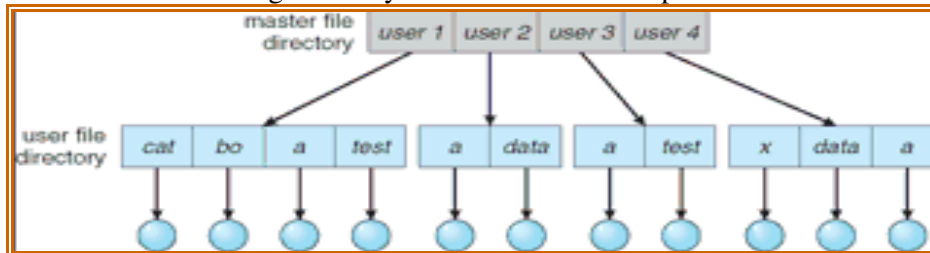
7. a) What is segmentation? Address this concept with different strategies with an example. 6M
b) A process has been allocated 3 page frames. Assume that none of the pages of the process are available in the memory initially. The process makes the following sequence of page references (reference string): 6M
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1
If optimal page replacement policy is used, how many page faults occur for the above reference string?

UNIT-IV

8. a) List and explain files attributes and operations. 6M
b) Explain about file system mounting? 6M

(OR)

9. a) Identify the issues in file system sharing. 6M
b) Consider the following directory structure and list out pros and cons. 6M



UNIT-V

10. a) List and explain about at least two device drivers. 4M
b) Distinguish between character devices and block devices in I/O System. 8M

(OR)

11. Schedule the given requests 98, 183, 37, 122, 14, 124, 65, 67 with the following disk scheduling algorithms and calculate seek time? 12M
1. FCFS disk scheduling
2. SSTF disk scheduling
3. SCAN disk scheduling
4. C-SCAN disk scheduling