AR13

CODE: 13CE3014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018
STRUCTURAL ANALYSIS -II
(Civil Engineering)

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

PART-A

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

1. a) Calculate the horizontal thrust of a two hinged arch having a point load at the centre of magnitude 75kN.
   b) What are the various approximation methods used for lateral load analysis?
   c) What are the applications of slope deflection equation?
   d) What are the limitations of slope deflection equations/
   e) Define stiffness factor?
   f) Define carry over factor?
   g) Define rotation factor?
   h) What is the relation between distribution factor and rotation factor?
   i) Define Flexibility of a member?
   j) Kinematic Indeterminacy of a fixed joint_____

PART-B

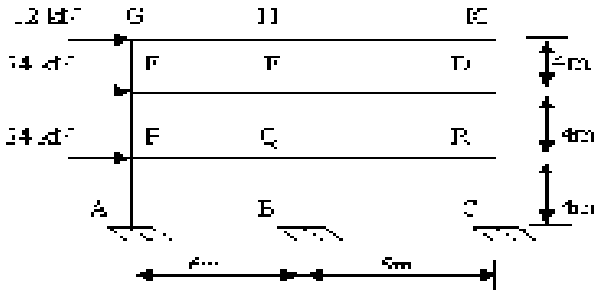
Answer one question from each unit **[5x12=60M]**

UNIT-I

2. A two-hinged parabolic arch of span 60 m and central rise 6 m is subjected to a crown load of 40 kN. Allowing for rib shortening, temperature rise of 20^0C and yield of each support of 0.006 cm/10 kN, determine H. Take I_c = 600,000 cm^4, A_c = 1000 cm^2, E=10 kN/mm^2, $\alpha = 11 \times 10^{-6}/\ ^0$C, $I = I_c \sec\theta$. 12M

(OR)

3. A multi-storied building frame is shown in figure is subjected to wind loads. Analyse the frame by Portal method. 12M



UNIT-II

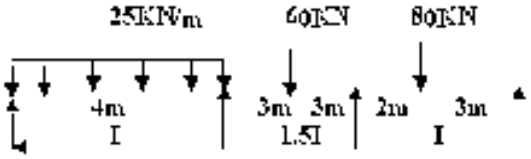
4. A continuous beam ABC consists of spans AB=4m, BC=3m, the ends A and C being fixed. AB and BC carry u.d.l of intensity 30KN/m and 50KN/m respectively. Using slope- deflection method, find the support moments and draw S.F and B.M diagrams. 12M

(OR)

5. A continuous beam ABC consists of spans AB=3m, BC=4m, the ends A and C being fixed. AB Carries an u.d.l of intensity 20KN/m and BC carries a central concentrated load of 60KN . Using slope- deflection method, find the support moments and draw S.F and B.M diagrams 12M

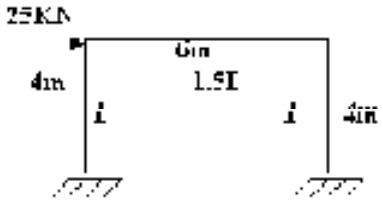
UNIT-III

6. Analyze the continuous beam shown in figure by Moment distribution method and Sketch the BMD. 12M



(OR)

7. Analyse the portal frame shown in figure and Sketch the BMD by using moment distribution method. 12M

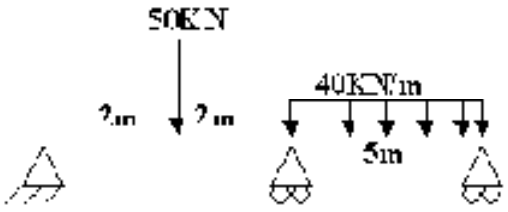


UNIT-IV

8. A simply supported beam ABC is continuous over two spans AB & BC of 5m and 6m respectively. The span AB is carrying a point load of 40KN at a distance of 3m from B and the span BC is carrying a u.d.l of 15 KN/m . Find the support moments using Kani's method and also draw BMD. 12M

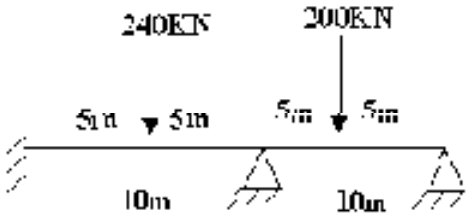
(OR)

9. Draw BMD for the beam shown in figure by using flexibility method. EI is constant. 12M



UNIT-V

10. Continuous beams shown in the figure has two equal spans of 10m each with the A as fixed and support C as hinged. Spans AB and BC carry central point loads of 240KN and 200KN respectively. Supports B and C settle by 2000/EI & 1000/EI respectively. Calculate the slopes at B and C in terms of EI and hence find the end moment at B using stiffness method. 12M



(OR)

11. . A Continuous beam ABC is continuous over two spans AB & BC of 6m and 6m respectively. The span AB is carrying a point load of 40KN at a distance of 4m from B and the span BC is carrying a u.d.l of 15 KN/m . Find the support moments using Stiffness method and also draw BMD. Support at A is fixed 12M

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AR13

CODE: 13EC3017 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018
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) What is the condition of RC circuit to work as differentiator
   b) Draw the frequency response of RC Low-pass circuit for sinusoidal input.
   c) Compare clippers and clampers
   d) Draw Shunt Diode clipper circuit
   e) Define storage time of a diode
   f) Mention different types of multivibrators
   g) How many number of stable states and quasi stable states exists in bistable, mono stable and astable multivibrators?
   h) Write the expression for the gate width of an astable multivibrator?
   i) Define displacement error in time-base generators
   j) What are the other names of sampling gates.

PART-B

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

UNIT-I

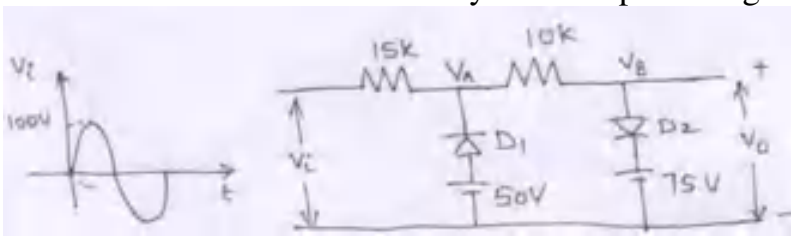
2. a) With neat sketches explain the output of High pass RC circuit excited by a square wave input for different time constants. 6M
   b) Derive an expression for percentage tilt of High pass RC circuit 6M

(OR)

3. a) For a low pass RC circuit, with a pulse input, prove that the area under the input pulse is same as the area under the output waveform across the capacitor. 7M
   b) Explain how a low pass RC circuit acts as integrator 5M

UNIT-II

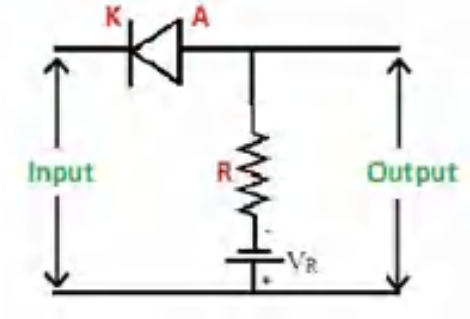
4. a) For the circuit shown in figure, V_i is a sinusoidal voltage of peak 100 volts. Assume ideal diodes. Sketch one cycle of output voltage. 6M



   b) Describe the operation of a simple clamper with the help of necessary diagrams. 6M

(OR)

5. a) Draw the transfer characteristics and explain the operation of the following clipper circuit shown in below figure. Assume diode an ideal diode. 5M



b) State and prove clamping circuit theorem. 7M

UNIT-III

6. a) Explain how a transistor acts as a switch? 6M
b) Write short notes on triggering methods of binary 6M

(OR)

7. Calculate steady state voltages and currents for a collector coupled bistable multivibrator with following circuit parameters: Vcc=10V, Rc=4KΩ, R1=30KΩ, R2=10KΩ, Re=0.4KΩ, hfe =25. 12M

UNIT-IV

8. a) With the help of a neat circuit diagram and wave forms explain the working of a monostable multivibrator? Give expression for pulse width? 8M
b) Show that astable multivibrator can be used as a voltage to frequency converter 4M

(OR)

9. Design a monostable multivibrator to generate an output pulse of 250μs duration. Assume $h_{FE(min)} = 25$, I_{CE} (sat) = 5 mA, V_{CC} = 10V and V_{BB} = - 4V 12M

UNIT-V

10. a) Draw the circuit diagram of UJT-time base generator and explain its operation with suitable wave forms. 6M
b) Explain the basic operating principles of sampling gates. List various types of sampling gates. 6M

(OR)

11. a) List out various methods of generating a time base wave forms and explain any one of them. 6M
b) Draw and explain the working of bidirectional Sampling gate using Transistors 6M

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AR13

CODE: 13ME3017 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

THERMAL ENGINEERING - II

(Mechanical Engineering)

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

PART-A

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

1. a) What is meant by 'Bleeding of Steam Turbines'?
   b) Define heating value of fuel.
   c) Name any two fire-tube boilers.
   d) What is the function of a boiler chimney?
   e) Name the types of steam condensers?
   f) Define the critical pressure ratio for the nozzle of a steam turbine.
   g) Write the expression for maximum efficiency of a Parson's reaction turbine.
   h) What is the main difference between impulse and reaction tubines?
   i) Name the methods used for improving thermal efficiency of an open cycle gas turbine?
   j) What are the types of jet propulsion systems?

PART-B

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

UNIT-I

2. a) Explain with the help of neat diagram a 'Regenerative cycle'. Derive also an expression for its thermal efficiency. [6 M]

   b) The following is the percentage analysis by mass of a fuel :
   Hydrogen (H_2) = 10 percent Oxygen (O_2) = 2 percent
   Sulphur (S) = 1 percent Nitrogen (N_2) = 3 percent
   Determine the following : [6 M]
   (i) The amount of air required to completely burn 1 kg of this fuel.
   (ii) The products of combustion as a percentage by mass.

(OR)

3. a) State and explain the methods of increasing thermal efficiency of a Rankine cycle. [4 M]

   b) A steam power plant operates on ideal Rankine cycle using reheater and regenerative feed water heaters. It has one open feed heater. Steam is supplied at 150 bar and 600^0C. The condenser pressure is 0.1 bar. Some steam is extracted from the turbine at 40 bar for closed feed water heater and remaining steam is reduced at 40 bar to 600^0C. Extracted steam is completely condensed in this closed feed water and is pumped to 150 bar before mixing with the feed water heater. Steam for the open feed water heater is bled from L.P. turbine at 5 bar. Determine : [8 M]
   (i) Fraction of steam extracted from the turbines at each bled heater
   (ii) Thermal efficiency of the system
   Draw the line diagram of the components and represent the cycle on T-s diagram.

UNIT-II

4. a) Explain with the help of neat diagrams the following fire-tube boilers :
(i) Simple vertical boiler. (ii) Cornish boiler. [6 M]

b) Write differences between induced draught and forced draught [6 M]

(OR)

5. a) Explain briefly about mountings and accessories. [6 M]

b) Derive condition for maximum discharge to chimney [6 M]

UNIT-III

6. a) Explain briefly the following types of jet condensers :
(i) Parallel-flow type (ii) Counter-flow type **[6 M]**

b) In a steam nozzle, the steam expands from 3 bar to 1 bar. The initial velocity is 90 m/s and initial temperature is 150^0C. The nozzle efficiency is 0.95. Determine the exit velocity. **[6 M]**

(OR)

7. a) What is the effect of friction on the flow through a steam nozzle? Explain with help of *h-s* diagram. **[6 M]**

b) In a surface condenser test the following observations were made : Vacuum 70 cm of Hg; barometer 76.5 cm of Hg; mean temperature of condensate 35.82^0C; hotwell temperature 30^0C; weight of cooling water 47500 kg/h; inlet temperature of cooling water 17^0C; outlet temperature of cooling water 32^0C; weight of condensate 1500 kg/h. Calculate: **[6M]**
(i) The mass of air present per m^3 of condenser volume ;
(ii) The state of steam entering the condenser, and
(iii) The vacuum efficiency.

UNIT-IV

8. a) Derive the expression for maximum blade efficiency in a single stage impulse turbine? **[5 M]**

b) A certain stage of a Parson's turbine consists of one row of fixed blades and one row of moving blades. The details of the turbine are below :

The mean diameter of the baldes	= 68 cm
R.P.M. of the turbine	= 3,000
The mass of steam passing per sec	= 13.5 kg
Steam velocity at exit from fixed blades	= 143.7 m/s
The blade outlet angle	= 20^0

[7 M]

Calculate the power developed in the stage and gross efficiency, Assuming carry over coefficient as 0.74 and the efficiency of conversion of heat energy into kinetic energy in the blade channel as 0.92.

(OR)

9. a) In an impulse turbine the nozzles are inclined at 24^0 to the plane of rotation of the blades. The steam speed is 1000 m/s and blade speed is 400 m/s. Assuming equiangular blades, determine : **[6 M]**
(i) Blade angles (ii) Forces on the blades in the direction of motion
(iii) Axial thrust (iv) Power developed for a flow rate of 1000 kg/h

b) A stage of a turbine with Parson's blading delivers dry saturated steam at 2.7 bar from the fixed blades at 90 m/s. The mean blade height is 40 mm, and the moving blade exit angle is 20^0. The axial velocity of steam is ¾ of the blade velocity at the mean radius. Steam is supplied to the stage at the rate of 9000 kg/h. The effect of the blade tip thickness on the annulus area can be neglected. Calculate : **[6 M]**
(i) The wheel speed in r.p.m. (ii) The diagram power
(iii) The diagram efficiency (iv) The enthalpy drop of the steam

UNIT-V

10. a) Describe with neat diagram a closed cycle gas turbine. State also its merits and demerits. **[6 M]**

b) In a jet propulsion unit, initial pressure and temperature to the compressor is 1.0 bar and 10^0 C. the speed of the unit is 200 m/s. The pressure and temperature of the gases before entering the turbine are 750^0 C and 3 bar. Isentropic efficiencies of compressor and turbine are 85% and 80%. The static back pressure of the nozzle is 0.5 bar and efficiency of the nozzle is 90%. Determine **[6 M]**
i) Power consumed by compressor per kg of air.
ii) Air-fuel ratio if calorific value of fuel is 35,000 kJ/kg.
iii) Pressure of gas leaving the turbine.
iv) Thrust per kg of air/sec.

C_p of gases = 1.12 kJ/kg K, C_p of air = 1.005 kJ/kg K, γ = 1.4 for air, γ = 1.32 for gases.

(OR)

11. a) Explain the working difference between propeller-jet, turbo-jet and turbo-prop? **[6M]**

b) In an open cycle gas turbine plant, air enters at 1.5 bar and 25^0 C and leaves the compressor at 5.5 bar. Maximum cycle temperature is 675^0 C, pressure loss in the combustion chamber is 0.2 bar. Efficiency of compressor is 0.85, turbine is 0.80, combustion chamber is c_p = 1.022 kJ/kg K for air and flue gases, neglecting mass of fuel, Determine: **[6M]**
i) Quantity of air circulation if power developed is 1050 kW.
ii) Heat supplied per kg of air.
iii) Thermal efficiency of the cycle.

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AR13

CODE: 13EC3047 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

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) What is the meaning of signal conditioning?
   b) What is the difference between accuracy and precision?
   c) What are the causes for Gross errors?
   d) What is the difference between transducer and sensor?
   e) Define Fidelity?
   f) Compare LVDT and RVDT?
   g) What is Galvanometer?
   h) Which bridge is suitable for low Q values?
   i) Draw the basic Wave Analyzer.
   j) Define the Resolution in Digital Voltmeter.

PART-B

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

UNIT-I

2.	a.	Define (i) Hysteresis (ii) Sensitivity (iii) Range	6M
	b.	Classify the systematic errors and list out their causes and give their remedies?	6M
		(OR)	
3.	a.	Explain in detail about series and shunt type ohmmeters.	6M
	b.	Explain the construction and working of a Digital Multimeter with a help of neat block diagram.	6M

UNIT-II

4.	a.	List out different application of Spectrum Analyzer.	6M
	b.	Describe the working of a function generator with the block diagram.	6M
		(OR)	
5.	a.	How a square wave is generated using Square Wave Generator.	6M
	b.	Elucidate the construction and working of a Harmonic Distortion Analyzer.	6M

UNIT-III

6.	a.	Explain about Cathode Ray Oscilloscope with a neat sketch.	6M
	b.	Explain the operation a dual trace oscilloscope.	6M
		(OR)	
7.	a.	How frequency is measured using Lissajous method?	6M
	b.	Explain the constructional features of Digital storage Oscilloscope.	6M

UNIT-IV

8.	a.	Explain how inductance is measured using Anderson bridge.	6M
	b.	Derive the equation for the measurement of capacitance using Schering bridge.	6M
		(OR)	
9.	a.	List out the precautions and related problems in Q – meter.	6M
	b.	Draw and explain the working of a Maxwell's bridge.	6M

UNIT-V

10.	a.	Explain the construction and working of an LVDT.	6M
	b.	Explain how strain is measured using electrical Strain Gauges.	6M
		(OR)	
11.	a.	Write briefly about data acquisition systems.	6M
	b.	Classify the Transducers.	6M

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AR13

CODE: 13CS3014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

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 a system call.
   b) Differentiate process and thread.
   c) What is a dead lock?
   d) What is PCB?
   e) What is compaction?
   f) Define paging.
   g) List out attributes of a file.
   h) What is a free-space management?
   i) Mention various character devices.
   j) What is a bad block?

PART-B

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

UNIT-I

2. a) List and explain the services offered by operating systems. **6M**
   b) Explain the following. **6M**
      i) Batch Processing ii) Multiprogramming iii)Time-sharing systems

(OR)

3. a) Explain in detail about context switching. **6M**
   b) What is a scheduler? List and describe different types of schedulers. **6M**

UNIT-II

4. a) Illustrate the usage of semaphores for process synchronization. **6M**
   b) Present the hardware instructions that can be used for solving the critical-section problem and show how to use them. **6M**

(OR)

5. a) Consider the following snapshot of a system: **6M**

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm:

i. What is the content of the matrix *Need?*
ii. Is the system in a safe state?
iii. If a request from process Pi arrives for (0,4,2,0), can the request be granted immediately?

b) Write about deadlock prevention methods. **6M**

UNIT-III

6. a) Compare and contrast paging and segmentation. **6M**
b) Describe contiguous allocation memory management technique. **6M**

(OR)

7. a) What is demand paging? Explain its concept. **6M**
b) Describe various page replacement algorithms with suitable examples. **6M**

UNIT-IV

8. a) What is a file? What are the different operations that can be performed on a file? **6M**
b) Explain the concept of file directory structures. **6M**

(OR)

9. a) How to provide protection to a file system? Explain. **6M**
b) Explain in detail about free space management. **6M**

UNIT-V

10. Explain in detail about disk scheduling algorithms with examples. **12M**

(OR)

11. Describe various block and character devices in detail. **12M**

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