AR13

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015
STRUCTURAL ANALYSIS -II
(CIVIL ENGINEERING)

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

PART-A
ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) What is the effect on horizontal thrust in two hinged arch due to rise in temperature
    b) How are arches classified based on shape and end conditions
    c) Explain the assumptions to be considered in cantilever method of approximate analysis.
    d) Define distribution factor .
    e) Write down joint displacement condition in the given continuous beam
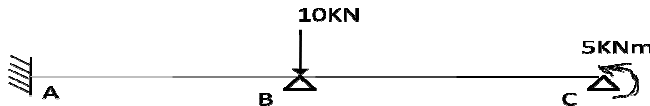
    f) Define rotation factors.
    g) Write the assumptions of slope deflection method?
    h) What are the equilibrium conditions to be satisfied in slope deflection equation
    i) Write general stiffness equation
    j) Write the relationship between stiffness matrix and flexibility matrix .

PART-B
**Answer one question from each unit**   **[5 x 12=60M]**
UNIT-I

2. (a) A symmetrical two hinged parabolic arch has a span of 20 m and central rise of 4 m. Find the horizontal thrust at the support if the central 10 m span carries a uniformly distributed load of 24 kN/m measured horizontally. Assume secant of flexural rigidity.
    (b) A two hinged parabolic carries a concentrated load 'W' at the crown. Derive the horizontal thrust at each support.
                                        (OR)
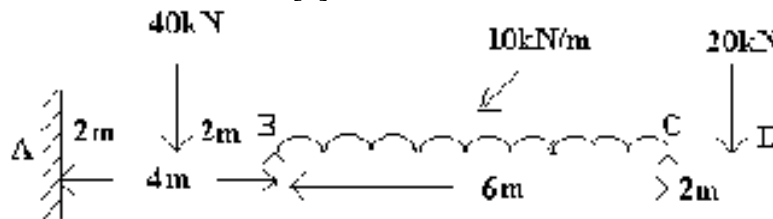3. (a) Analyze the building frame using portal method of approximate analysis.
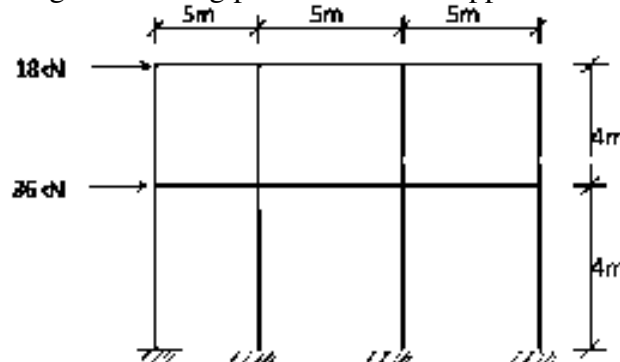
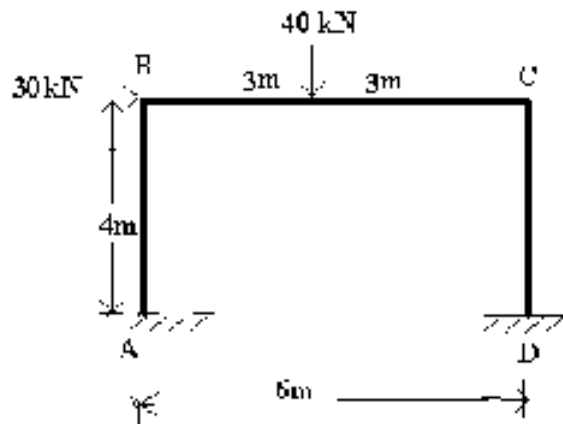(b) Write the assumptions of portal method

UNIT-II

4. Using slope deflection-method, analyze the continuous beam loaded as shown in figure. Sketch the B.M.D.
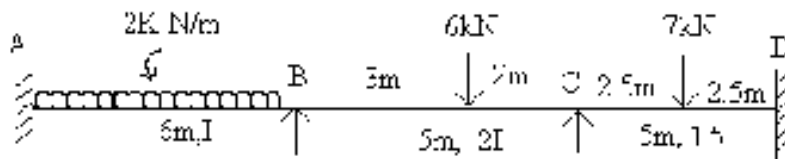[6]

(OR)

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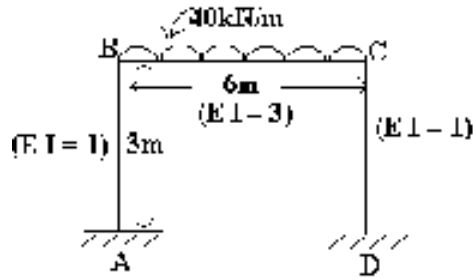

UNIT-III

6. Analyses the continuous beam as shown in figure using moment distribution method.

(OR)

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

UNIT-IV

8　　A two span continuous beam ABC has spans AB = 3m and BC = 4m and the end A and C are simply supported. On AB there is a load of 36 kN at 2m from A, while on BC there is a u.d.l. of 18 kN/m. If the moment of inertia of BC is 1.5times that of AB, analyse the beam using Kani's method. Sketch the B.M. and S.F.D

(OR)

9　　Analyse the continuous beam as shown in figure using flexibility method if the downward settlements of supports B and C are 200/E and 100/E I respectively (in kN-m units). Draw bending moment diagram.
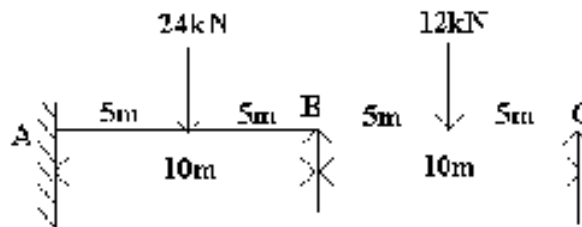
UNIT-V

10　　Using the displacement of the method of analysis find the support moments of the beam of shown in figure if the supports B and C are restrained from rotation. Sketch the B.M.D.

(OR)

11　　Analyze the continuous beam using displacement method. Assume flexure rigidity EI as constant

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

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) Why the clamping circuit is also called a dc inserter?
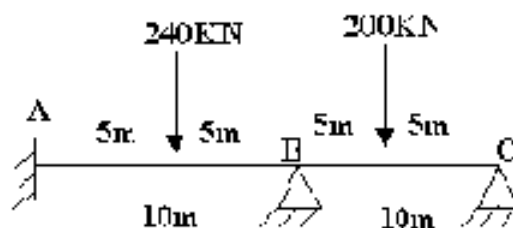   b).What factors contribute to delay time?
   c).Why is mono stable multi vibrator also called a delay circuit?
   d).Name the circuit whose output is a signal with a duty cycle of 50% for a input signal which is an output of oscillator?
   e). Why time base generators are called sweep-circuits?
   f). State the Principle of Miller Sweep circuit.
   g). Define comparator.
   h). What is meant by Phase Jitter.
   i). Define Percentage Tilt?
   j). Why compensation is needed in attenuator?

PART-B

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

UNIT-I

2.a) Prove that for any periodic input waveform the average level of the steady state output signal from the RC high pass circuit is always Zero.
  b) Draw the RC low pass circuit. With necessary waveforms and expressions explain its working for a step voltage input.

(OR)

3.a) Prove that an RC circuit behaves as a reasonably good integrator if RC > 15T, Where T is the period of an input 'Em sin ωt'.
  b) What is the ratio of the rise time of the three sections in cascade to the rise-time of Single section of low pass RC circuit?

UNIT-II

4.a) Draw the emitter coupled clipper circuit and explain its operation with its transfer characteristic and necessary expressions.
  b) Sketch the steady state output voltage for the clamper circuit shown in figure.1 and locate the output d.c level and the zero level. The diode used has Rf = 1KΩ, Rr = 600 KΩ, Vγ = 0. C = 0.1μF and   R = 20 KΩ. The input is a ± 20 Volts square wave with 50% duty cycle.
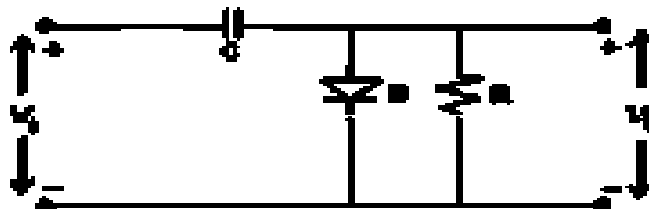
Figure.1

(OR)

5 a). Derive the relation between the tilts in the forward and reverse directions of the output of a clamping circuit excited by a square-wave input.

   b). State and prove clamping circuit theorem.

UNIT-III

6. a) What do you mean by collector catching diodes? Explain the need of these diodes in a bistable multivibrator.

   b) For the given circuit shown in figure. 2, find UTP & LTP. What is this circuit called? Data given hfe(min) = 40, VCE(sat) = 0.1 V, VBE(sat)=0.7 V, Vγ = 0.5V, VBE(active) = 0.6V.
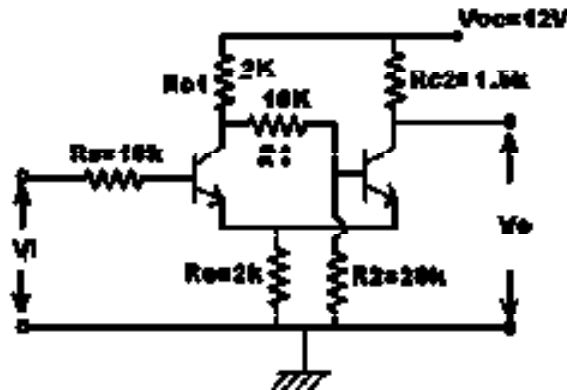
Figure. 2

(OR)

7.a) Prove that the total turn-on time of a transistor is the sum of the delay time and the rise time.

   b) For a CE transistor circuit with VCC = 15V, Rc=1.5K ohms, calculate the transistor power dissipation at open and closed positions.

UNIT-IV

8. What is a monostable multivibrator? Explain with the help of a neat circuit diagram the principle of operation of a monostable multivibrator, and derive an expression for pulse width. Draw the wave forms at collector and Bases of both transistors.

(OR)

9. a). Show that an astable multi vibrator can be used as a voltage to frequency converter.

   b). How can hysteresis be eliminated in a Schmitt trigger?

UNIT-V

10.a) Draw the circuit of a Boot strap sweep generator and explain its operation. Derive an expression for its sweep time.

   b) With the help of a neat circuit diagram, explain the working of a transistor Miller time base generator.

(OR)

11. a) With the help of a neat circuit diagram, explain the working of a transistor constant current sweep circuit.

    b). Prove that when the deviation linearly is small then the slop error is twice the transmission error

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CODE: 13ME3017

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER-2015
THERMAL ENGINEERING - II
(MECHANICAL ENGINEERING)

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

PART-A

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

1. a) List out the methods of improving thermal efficiency of Rankine Cycle.
   b) Define Calorific Value of a Liquid Fuel.
   c) What is the function of Damper in Boiler.
   d) What is the function of Economizer in Boiler.
   e) Define Condenser efficiency.
   f) Define Degree of Reaction in Steam Turbine.
   g) Write the relation between blade, stage and diagram efficiency in steam turbine.
   h) List out any two limitations of Gas Turbine.
   i) List out important components of open cycle Gas Turbine.
   j) What are the limitations of Ram Jet Engine.

PART-B

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

UNIT-I

2. (a) Explain Modified Rankine cycle and derive its efficiency equation.   **[6M]**
   (b) Draw the T-*s* and *h-s* diagrams of Modified Rankine Cycle.   **[6M]**

(OR)

3. (a) Explain the working of ORSAT apparatus with neat sketch.   **[6M]**
   (b) Explain any one method of determining the calorific value of gases fuels.   **[6M]**

UNIT-II

4. (a) What is a boiler. How do you classify boilers.   **[4M]**
   (b) Explain with a neat sketch working of Babcock and Wilcox boiler.   **[8M]**

(OR)

5. (a) State the advantages of artificial draft over natural draught.   **[4M]**
   (b) The chimney of 50 m height is used to discharge the flue gases at 350ºC to the atmosphere which is at 25ºC. The mass of air supplied per Kg of coal burnt is 19 Kg. Calculate i) The static draught in mm of water column and ii) The velocity of flue gases passing through the chimney if the friction losses are 30% of the theoretical draught.   **[8M]**

UNIT-III

6.   (a) Derive the maximum mass flow equation for a flow through steam Nozzle. Start
             from mass flow equation.   **[6M]**
         (b) An impulse turbine is to develop 1200kW with a steam consumption of 8.4 kg per
             kWH, Steam being initially at 20 bar and 300°C. If the throat diameter of each
             nozzle is 1.2cm,   the exhaust pressure is 0.8bar. Determine
             i) Number of nozzles   required   ii) exit diameter of the nozzle.   **[6M]**

(OR)

7.   (a) What are the sources of air leakage in condenser. How to avoid it.   **[3M]**
         (b) Differentiate between Jet and surface condenser.   **[3M]**
         (c) Explain the Principle of Surface condenser and derive the equation for   mass flow
             of water.   **[6M]**

UNIT-IV

8.   (a)   Derive the expression for maximum efficiency of impulse turbine.   **[6M]**
         (b) A De-Laval turbine is supplied with steam at 15 bar and 250°C. The back pressure is
             0.12 bar. Coefficient of nozzle is 0.9. Blade velocity coefficient is 0.8, mechanical
             efficiency is 90%, nozzle angle is 20°. Symmetric blade with an angle of 30°.
             Calculate blade efficiency and stage efficiency.   **[6M]**

(OR)

9.   (a) What is meant by compounding of steam Turbine. Explain Pressure compounding.
                                                                                      [4M]
         (b) In a De-Laval turbine the jet strikes the turbine blades at 20° with a velocity of 1000
             m/s. If the diameter of the blade is 2.5m and having a speed of 3000 rpm. If the blades
             are axi-symmetrical and the blade friction coefficient is 0.85. Find
         i) Diagram efficiency ii) Axial Trust force   iii) Blade speed ratio.   **[8M]**

UNIT-V

10.   (a) Derive the equation for finding thermal efficiency of a gas turbine.   **[6M]**
         (b) Explain in detail various methods of improving thermal efficiency of gas turbine.
                                                                                      [6M]

(OR)

11.   (a) Explain in detail about solid and liquid propellants.   **[6M]**
         (b) Explain with a neat sketch working of pulse jet engine.   **[6M]**

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER-2015

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) Distinguish between accuracy and precision.
   b) Compare Maxwell bridge with Kelvin's bridge.
   c) State the advantages of digital storage oscilloscope.
   d) What are the advantages of Digital voltmeter?
   e) Write the conditions for balance of Maxwell's bridge.
   f) Which bridge is used for capacitance measurement?
   g) What is the Piezo – electric effect?
   h) What is Transducer?
   i) List the applications Spectrum analyzer.
   j) What is the importance of sample and hold circuit in digital data acquisition system?

PART-B

Answer one question from each unit   **[5x12=60M]**
UNIT-I
2. (a) What are the different types of Digital Voltmeters?   [6M]
   (b) Explain the different types of errors that may occur in measurements. Describe their sources and precautions to minimize them.   [6M]

(OR)

3. (a) Draw and explain the circuit of shunt type Ohm meter.   [6M]
   (b) Give the specifications of a Digital Multimeter. Draw the general block schematic of a Digital Multimeter and explain.   [6M]

UNIT-II
4. (a) What is harmonic distortion? Draw the block diagram of a heterodyne type spectrum analyzer. Mention about the information provided by a spectrum analyzer.   [6M]
   (b) Discuss about an AF square wave generator with a neat block diagram.   [6M]

(OR)

5 (a) What are the various requirements of a signal generator? Discuss in detail about the working of a RF signal generator?   [6M]
   (b) Briefly explain about AF oscillator.   [6M]

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UNIT-III

6 (a) How frequency is measured using Lissajous figures?   [5M]
   (b) Discuss in detail about the various blocks of a general purpose CRO.   [7M]

(OR)

7 (a) Explain the operation of a sampling oscilloscope and explain its working   [8M]
   (b) Why is an attenuator probe used?   [4M]

UNIT-IV

8   (a) Explain with neat circuit diagram operation of Anderson bridge.   [6M]
    (b) Draw the circuit diagram of Wheatstone bridge and derive conditions of   [6M]
         balance.

(OR)

9   (a) With neat sketch explain how inductance is measured by means of   [6M]
         Maxwell's bridge.
    (b) Explain the principle and working of Q meter   [6M]

UNIT-V

10 (a) Describe the operation of strain Gauges and write its applications.   [6M]
    (b) What is Transducer? Write the classification of transducers.   [6M]

(OR)

11 (a) Draw and explain the block diagram of data acquisition system.   [6M]
    (b) Explain any two temperature measurement transducers.   [6M]

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PART-A

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

1. a) What is command interpreter?
    b) Define a process? How it is created?
    c) What are the different page replacement algorithms?
    d) What are the different types of free space management techniques
    e) What are the different types of edges present in a resource allocation graph?
    f) Differentiate between internal and external fragmentation.
    g) Define bad sector in disk.
    h) What are the different attributes in a file?
    i) Define NFS and WAFL.
    j) What is paging.

PART-B

Answer one question from each unit   **[5 x 12=60M]**

UNIT-I

2. (a) What is operating system? Briefly describe the two categories of services and   [6M]
         functions provided by an operating system.
    (b) Discuss the different types of operating systems.   [6M]

(OR)

3. (a) What do you mean by scheduler activation in multi-threaded programming?   [6M]
         Why it is important for the scheduler to distinguish I/O bound process from
         CPU bound process?
    (b) Consider the following set of process that arrive at time 0. The length of the   [6M]
         CPU burst times given   in milli seconds.

Process	Burst time (Milli seconds)
P1	14
P2	4
P3	3
P4	11
P5	2

Compute the average waiting time, average response time and average
turnaround time by SJF algorithm.

UNIT-II

4. (a) What is a counting semaphore? Explain reader-writer problem   [6M]
         using semaphore.
    (b) Define critical section problem. Explain the three requirements   [6M]
         that satisfy solution to critical section problem taking a suitable
         example.

(OR)

5 (a) What is a dead lock? Discuss the methods to recover from deadlock?   [5M]

   (b) Consider the following snapshot of a system   [7M]

	Allocation X Y Z	Max X Y Z	Available X Y Z
P_0	0 0 1	8 4 3	3 2 2
P_1	3 2 0	6 2 0	
P_2	2 1 1	3 3 3	

Is the system in a safe state? If yes, what is the safety sequence?
If a request from process P_0 arrives for (0,0,2) and form process p1 arrives for (2,3,0), can the requests be granted immediately ?

UNIT-III

6 (a) What is virtual memory? Define demand paging. How will you evaluate performance of demand paging?   [6M]

   (b) Explain segmentation with paging in Intel Pentium.   [6M]

(OR)

7 (a) Explain how LRU approximation page replacement works. Illustrate with an example   [4M]

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

UNIT-IV

8 (a) Explain NFS mount protocol and NFS protocol.   [6M]

   (b) Discuss the different file allocation methods in detail.   [6M]

(OR)

9 (a) What do you mean by mounting? Discuss the merits and demerits of supporting links to files that cross mount points.   [6M]

   (b) Explain various file accesses methods and discuss advantage and disadvantage of methods with each other.   [6M]

UNIT-V

10 (a) Describe character devices and block devices in details..   [6M]

    (b) Discuss about SCAN, C-SCAN and LOOK disk scheduling algorithm. How will you select a disk scheduling algorithm?   [6M]

(OR)

11 (a) Define DMA? Write down in detail the steps in a DMA transfer.   [6M]

    (b) Discuss the advantages and disadvantages of guaranteeing reliable transfer of data between modules in the STREAMS abstraction.   [6M]

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