AR13 SET 2

CODE: 13CE2008

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

STRUCTURAL ANALYSIS-I
(CIVIL ENGINEERING)

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

PART-A

Answer all questions **[1 X 10 = 10 M]**

1. a) Which methods are used to find the forces in the members of the truss.
   b) For what types of beams Clapyron's three moment equation will be used.
   c) In what why statically indeterminate beam is different from statically determinate beam.
   d) How many reactions are developed at the fixed end.
   e) What are the forces acting at any point in a three hinged parabolic arch?
   f) Concept of UDL longer than span
   g) Types of loads
   h) What the is shear force at the mid span of the simply supported beam
   i) Write the types of the beams
   j) Propped cantilever beam is a determinate or indeterminate beam.

PART-B

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

UNIT-I

2. Find the forces in the members of the truss as shown (Fig. 1). The cross-sectional area and young's modulus of all the members are the same.

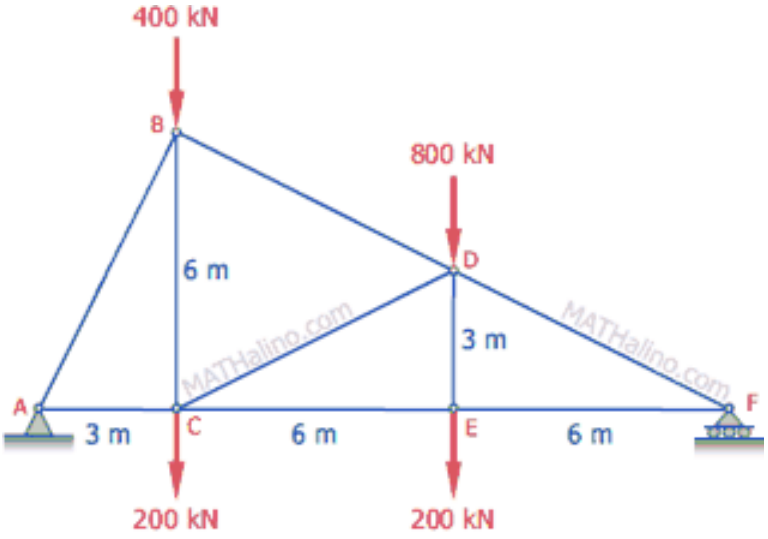

Fig. 1

CODE: 13CE2008

(OR)

3. Find the forces in the members of the truss as shown in Fig.2. The cross-sectional area and young's modulus of all the members are the same.

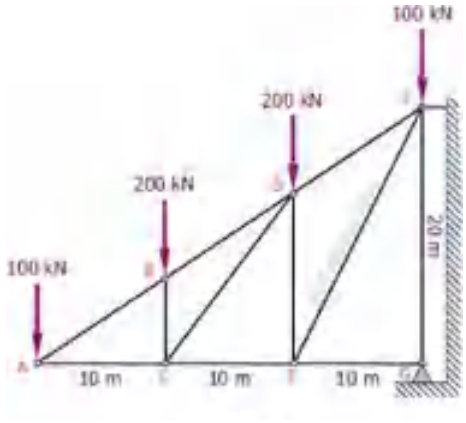

Fig.2.

UNIT-II

4. Discuss in detail about three hinged parabolic arch subjected uniformly distributed load and also Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section.

(OR)

5. A three hinged circular arch of span 20 m and rise 6 m carries uniformly distributed load of 30 kN/horizontal meter run over the left half of the span. Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section 8m from the right support.

UNIT-III

6. A cantilever beam of length 6m is carrying a point load of 60 kN at a distance of 3m from the fixed end. The cantilever is propped rigidly at free end. Determine the reaction at the rigid propped draw SF and BM diagrams.

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(OR)

7. A fixed beam of length 7 m carries a concentrated load of 30 kN at a distance of 3 metres from left hand end. Determine (i) support moments ii) position of the points of contraflexure from left hand end (iii) deflection under the load. (EI = 16000 kNm^2) and also draw the SF and BM Diagram for the fixed beam as shown in Fig. 3.

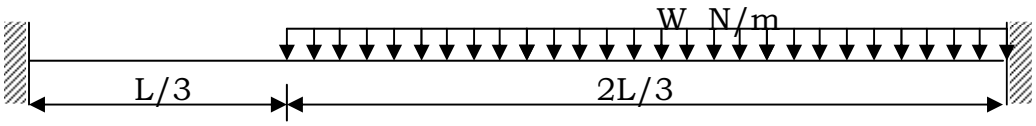

Fig. 3

UNIT-IV

8. A continuous beam ABC consists of two spans AB of length 6m, and BC of length 4m.The span AB carries a point load of 150 KN at its middle points. The span BC carries a point load of 200 KN at 1m from C. The end A is fixed and the end C is simply supported Find :
   i) The moments at the supports
   ii) The reactions at the supports and
   iii) Draw the B.M diagram
   Use Clapeyron's theorem of three moments

(OR)

9. Analyse the continuous beam shown in Fig. 4. Use three-moment equation. Draw S.F and B.M diagrams.

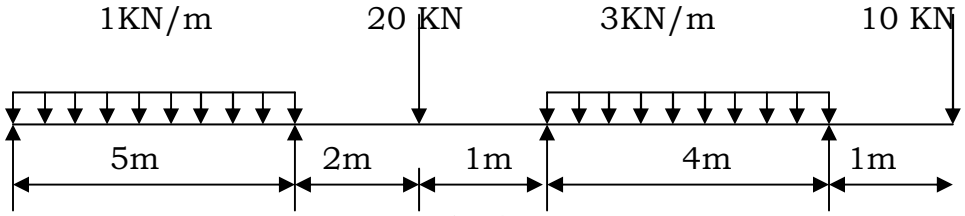

Fig. 4

UNIT-V

10. Write in detail about influence line for S.F., influence line for B.M. and Load position for maximum S.F. at any particular section.

(OR)

11. An overhanging beam DABC , 14m long is supported at A and B . DA=BC=2m; AB=10m. Draw the influence lines for the reactions at A and B, shear and bending moment at section 3m from A. Hence obtain their values for a uniformly distribute load of 10kN/m, 5m long acting from A.

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AR13

CODE: 13EE2010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

ELECTRICAL CIRCUIT ANALYSIS-II
(ELECTRICAL AND ELECTRONICS ENGINEERING)

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

PART-A

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

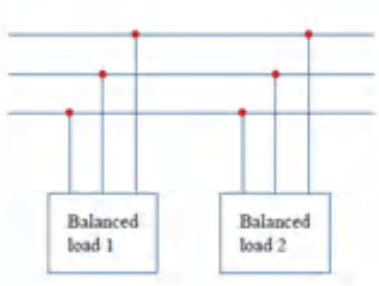
1. a) State Millmanns Theorem
   b) State Blondel's theorem
   c) What is the difference between the causal System and Non Causal system
   d) What is the time constant for RL Circuit
   e) What are the conditions for a system to be Positive Real
   f) Draw the Foster form –I and II
   g) Draw the Cauer form –I and II
   h) A series RLC circuit has R=100 ohms, L=0.8H and C=0.5μF. Find the natural frequency of the circuit?
   i) What is the condition in RLC series circuit to be Overdamped
   j) What is band Pass Filter

PART-B

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

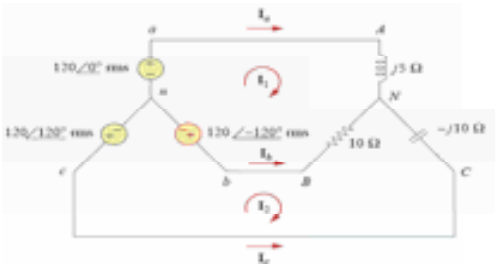
UNIT-I

2. a) A balanced Y-connected load with a phase impedance of is 40+j25Ω supplied by a balanced, positive sequence delta connected source with a line voltage of 210 V. Calculate the phase currents. Use as reference V_{ab} **4M**
   b) Two balanced loads are connected to a 240-KV rms 60-Hz line, as shown in Fig. Load 1 draws 30 kW at a power factor of 0.6 lagging, while load 2 draws 45 kVAR at a power factor of 0.8 lagging. Assuming the ABC sequence, Determine: **8M**
   (i) the complex, real, and reactive powers absorbed by the combined load,
   (ii) the line currents



(OR)

3. For the unbalanced circuit in Figure shown below, find: (i) the line currents, (ii) the total complex power absorbed by the load, and (iii) the total complex power absorbed by the source. **12M**



AR13

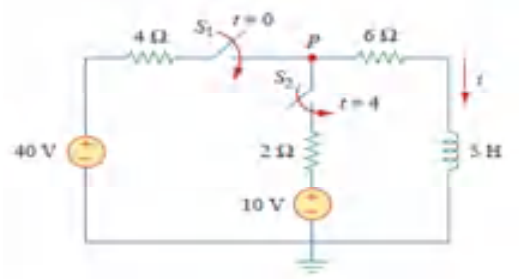
CODE: 13EE2010 **SET-1**

UNIT-II

4. Derive the DC transient current, voltage, power for a series RLC circuit **12M**

(OR)

5. At t=0 switch 1 in Fig. is closed, and switch 2 is closed 4 s later. Find i(t) for t > 0. Calculate i for t = 2 s and t =5 s. **12M**



UNIT-III

6. A series RLC Circuit with R= 100Ω ,L= 0.1H,and C= 50μF has a sinusoidal voltage source V=100sin(1000t +Φ) with if the switch is closed when $\Phi = 90^0$ find the current assuming no initial charge on the capacitor **12M**

(OR)

7. In the series RC circuit R=500Ω, and C=0.5μF applied with v(t) = 100sin(1000t+Φ)V at $\Phi = 45^0$ and the capacitor has an initial charge of 25μC find the current **12M**

UNIT-IV

8. a) Check whether the following function is Hurwitz or not $P(s)= S^7+3S^5+S^3+2S$ **6M**

   b) Find the positive realness of the function given below **6M**

$$\mathbf{Z(s)} = \frac{S^3+5S^2+9S+3}{S^3+4S^2+7S+9}$$

(OR)

9. An Impedance is given below find the Cauer form-I and II **12M**

$$Z(s) = \frac{8(S^2+1)(S^2+3)}{S(S^2+2)(S^2+4)}$$

UNIT-V

10. Design i) Appropriate m derived T section ii) an appropriate m derived π section for the following specifications design impedance =400Ω cutoff frequency of 5KHz and a frequency of attenuation(Resonant Frequency) =6KHz **12M**

(OR)

11. a) A series RC low pass filter requires a cuttoff frequency of 10KHz Use R= 10KΩ and compute C, mod H(jω) at 25KHz and angle H(jω) at 25KHz **6M**

    b) Derive expression for the transfer function of a K-type high pass filter. **6M**

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AR13 SET-2

Code: 13ME2011

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

THERMAL ENGINEERING - I
(MECHANICAL ENGINEERING)

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

PART-A

Answer all questions **[1 X 10 = 10 M]**

1. a) Define Engine?
   b) Write the expression for air standard efficiency of Otto cycle?
   c) Draw Theoretical valve timing diagram for 4-s petrol engine?
   d) Define volumetric efficiency?
   e) Define Squish?
   f) What are the desired properties of fuel to avoid knocking in SI engine?
   g) Draw the variation of Specific Fuel consumption (SFC) with B.P?
   h) What is the difference between positive displacement and Dynamic compressor?
   i) Write condition for minimum work done in reciprocating air compressor?
   j) What is the meaning of perfect inter cooling?

PART-B

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

UNIT-I

2. a) Explain the working principle of Air-standard Otto Cycle and obtain the expression for efficiency of it? [10M]
   b) Define loss due to Gas exchanging process? [2M]

(OR)

3. a) Explain the operation of magneto ignition system with neat sketch? [6M]
   b) Write the differences between battery and magneto ignition system? [6M]

UNIT-II

4. Explain the stages of combustion in SI engine? [12M]

(OR)

5. a) Draw theoretical pressure – crank angle (P-θ) diagram and actual pressure – crank angle (P- θ) diagram and explain the difference? [4M]
   b) What are different types of combustion chambers for SI engine and explain? [8M]

UNIT-III

6. a) Explain the stages of combustion in CI engine? [8M]
   b) Write the differences in the knocking of SI and CI engines? [4M]

(OR)

7. Write different types of air swirls? Explain suction induced swirl and write advantages and disadvantages of it? [12M]

Code: 13ME2011

UNIT-IV

8. The following observations have been made from the test of a 4-cylinder, 2-Stroke gasoline engine. Diameter = 10cm; stroke=15cm, speed=1600rpm. Area of the positive loop of indicator diagram =5.75cm^2. area of the negative loop of the indicator diagram =0.25cm^2 length of the indicator diagram =55mm. Spring constant =3.5bar/cm. Find the indicated power of the engine. [12M]

(OR)

9. The following observations were made during a trial of a single cylinder, four – stroke cycle gas engine having cylinder diameter of 18cm and stroke 24cm. Duration of trail = 30min, Total no.of revolutions = 9000, Total number of explosions = 4450, Mean effective Pressure = 5bar, Net load on the brake wheel = 40kg, Effective diameter of the Brake wheel = 1m, Total gas used at NTP = 2.4m^3,Calorific value of the gas at NTP = 19MJ/m^3, Total air used = 36m^3, Pressure of air = 720mm of Hg, Temperature of air = 17^{o}C, Specific heat of Exhaust gas = 1kJ/kgK, Cooling water circulated = 80kg, Rise in temperature of cooling water = 30^{o}C. [12M]

UNIT-V

10. Obtain the expression for minimum work done in a multi stage Reciprocating air compressor with perfect Inter cooling neglecting clearance. [12M]

(OR)

11. a) Explain with a simple sketch construction and working of an Axial flow compressor? [6M]

    b) A centrifugal air compressor delivers 18.2kg/s of air with a total head pressure ratio of 4 to 1. The speed of the compressor is 15000rpm. Inlet total head temperature is 15^{0}C, slip factor is 0.9, power input factor is 1.04 and 60% isentropic efficiency, calculate the overall diameter of the impeller and power input. [6M]

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AR13

CODE: 13EC2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-2016

PULSE AND DIGITAL CIRCUITS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

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

PART-A

Answer all Questions **[1 x 10 = 10 M]**

1. a) Define Rise time and give the expression for lowpass RC circuit.
   b) Condition for RC high pass circuit to perform good integration.
   c) Compare series and shunt diode clippers.
   d) What is the function of restorer.
   e) Give the conditions for transistor to work as a switch.
   f) Mention any two applications of Schmitt trigger.
   g) What is symmetrical triggering.
   h) Discuss Miller's principle.
   i) Define rise time and fall time.
   j) What are the applications of blocking oscillators.

PART-B

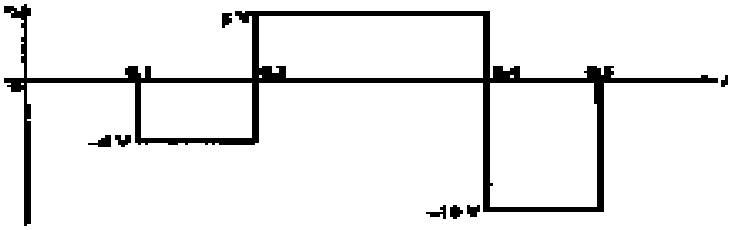
Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Explain the response of RC high pass circuit for exponential input. **7 M**
   b) Explain briefly about RLC series and parallel circuits. **5 M**

(OR)

3. a) Assuming that the capacitor is initially uncharged Determine the output response of low pass RC Circuit with time constant 0.05ms to the input waveform shown in below wave form. **5 M**



   b) Derive the condition for perfect compensation of an attenuator. **7 M**

UNIT-II

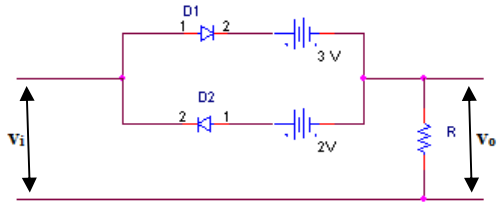
4. a) State and Prove Clamping circuit theorem. **6 M**
   b) Explain the working of negative peak clamping circuit with the help of circuit diagram and waveforms. **6 M**

(OR)

AR13

CODE: 13EC2010 SET-2

5. a) What is the need for clipping circuits. Give applications. **4 M**
   b) Find the output voltage and draw the transfer characteristics, input and output waveforms for the clipper circuit shown for a given sinusoidal input of 14Vp-p. **7 M**



UNIT-III

6. a) Explain the principle and operation of self bias Bistable multivibrator with neat waveforms. **6 M**
   b) Derive the expression for Lower Trigger Point in SCHMITT Trigger circuit. **6 M**

(OR)

7. a) Explain the transistor switching times with neat response and necessary definitions. **7 M**
   b) Explain in detail about p-n diode – switching times. **5 M**

UNIT-IV

8. a) Explain the operation of Astable multivibrator. **5 M**
   b) Design a collector coupled monostable multivibrator with a gate width of 2 ms, using n-p-n transistors. Assume h_{fe} = 20, V_{CC} = 6 V, $I_{C(sat)}$ = 2 mA, V_{BE} = -1 V for the OFF transistor **7 M**

(OR)

9. Discuss the three errors used to determine the deviation from linearity in time-base generators. Also determine the relation between them for an exponential input. **12 M**

UNIT-V

10. a) Explain the working of monostable blocking oscillator with base timing. **6 M**
    b) Explain the working of RC controlled Astable blocking oscillator. **6 M**

(OR)

11. a) With the help of neat circuit diagram explain the working of four diode sampling gate. **6 M**
    b) What is pedestal? Explain the reduction of pedestal in a Gate circuits. **6 M**

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AR13

CODE: 13CS2009 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2016

FORMAL LANGUAGES AND AUTOMATA THEORY
(COMMON TO CSE & IT)

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

PART-A

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

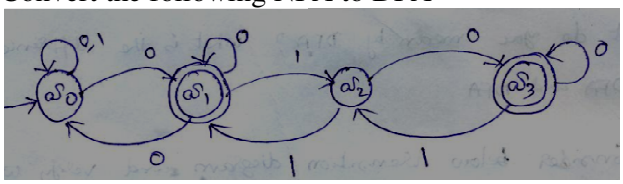
1. a) Define Alphabet on binary Values?
   b) What is the associative property for regular expression?
   c) State Arden's theorem?
   d) How to differentiate CFG and CSG ?
   e) List out any 2 conditions for converting LLG to RLG?
   f) Derive the grammar for R = 0110*
   g) Differentiate DPDA and NPDA?
   h) Differentiate acceptance of PDA with empty and final state method ?
   i) List out the problems comes under NP Complete ?
   j) Define churches hypothesis ?

PART-B

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

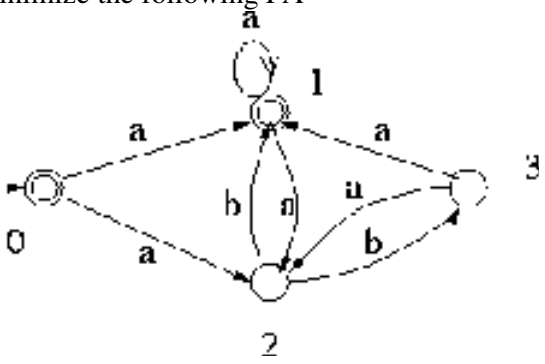
UNIT-I

2. a) Differentiate Moore and Melay Machine with examples? 6M
   b) Convert the following NFA to DFA 6M



(OR)

3. Minimize the following FA 12M



AR13

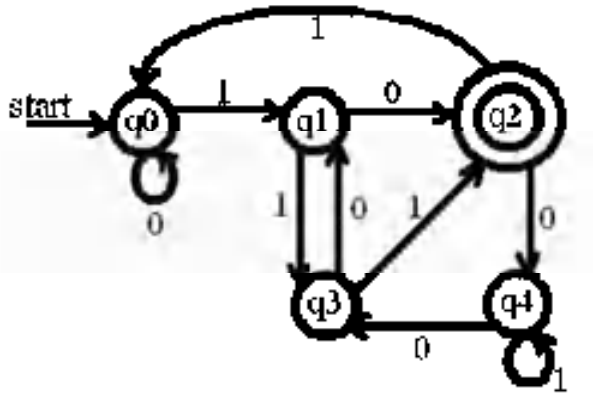
CODE: 13CS2009 SET-1

UNIT-II

4. a) Construct an NFA for the regular expression: (0 + 1)*(00 + 11) 6M
   110*110+11*00*+1111+000+1100+1100
   b) Minimize following regular expressions 6M
   1+10*0*+[(00+11)*+(00+11)*]*+11*+11*(00+1+1+10+0)*+1100+1100+1*.

(OR)

5. a) Check language L { Pow(a,n) / n >=1 } Regular or not ? 6M
   b) 6M



Construct Regular Expression for the above model ?

UNIT-III

6. Construct the left most, right most derivative for the string aaabbabbba for the following grammar and draw the derivation tree for both . 12M

   S → aB|bA
   A → aS |bAA| a
   B → bS |aBB| b

(OR)

7. Design PDA for L = { WCW^R / W is from (a+b)* } 12M

UNIT-IV

8. a) Construct the PDA for the following grammar. 6M
   S→AA/a A→SA/b
   b) Design a PDA for the following grammar. 6M
   S→0A A→0AB/1 B→1.

(OR)

9. a) Check the L={ ww / w is from (a,b)* } CFG or not ? 6M
   b) List out the Closure properties of CFL ? 6M

UNIT-V

10. Design Turing Machine for L = { pow(a,n) pow(b,n) pow(c,n) / n >=1 } 12M

(OR)

11. Explain Chomsky hierarchy of Model ? 12M

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