

AR13

CODE: 13CE2008

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-2017

STRUCTURAL ANALYSIS –I

(Civil engineering)

Time: 3 Hours

Max Marks: 70

PART -A

ANSWER ALL QUESTIONS

[1 X 10 = 10M]

- 1 (a) What are the methods are used to find the forces in the members of the truss?
(b) What is degree of static indeterminacy of a fixed beam?
(c) What is the imperfect frame?
(d) How many reactions are developed at the hinged end?
(e) In a continuous beam the moment at the external hinge is
(f) Which method is used to find the reaction at the propped end?
(g) What is the bending moment at a point where shear force changes its sign?
(h) What is the shear force at the mid span of the simply supported beam when subjected to UDL on total span?
(i) What is the bending moment at supports in a simply support beam with UDL?
(j) Define influence line.

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 .The cross – sectional area and young's modulus of all the members are the same.

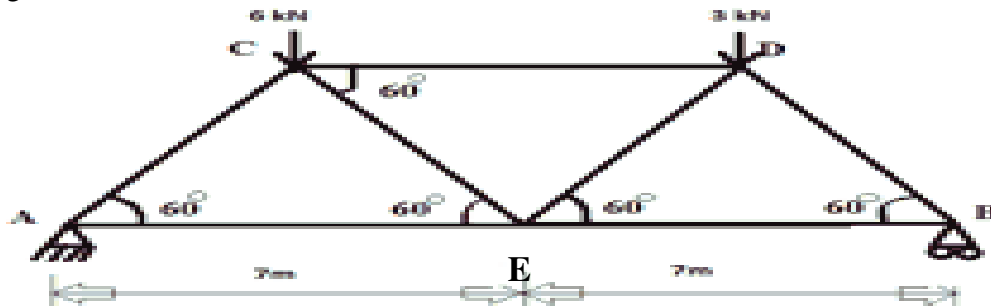


FIGURE - 1B

(OR)

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

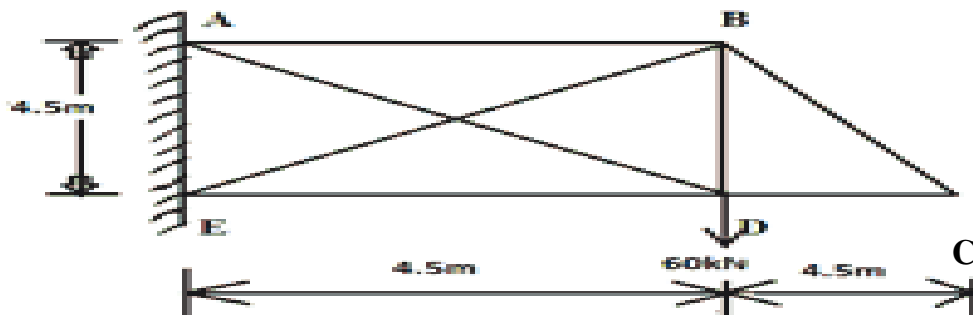


FIGURE - 1A

UNIT – II

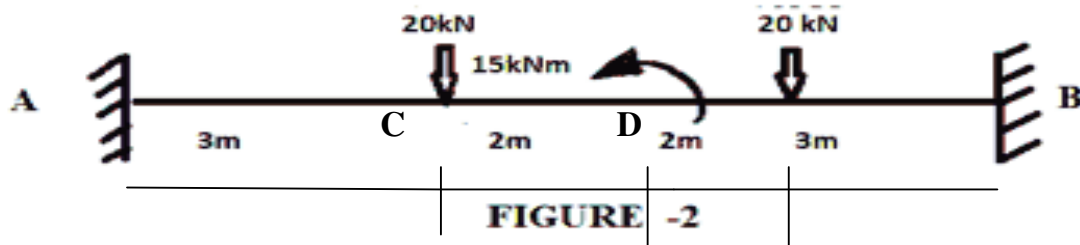
4. A three hinged circular arch of span 20m and rise 6m carries uniformly distributed load of 60kN/ horizontal meter run over the left half of the span. Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section 8m from the right support

(OR)

5. A three hinged parabolic arch of span 25.0m and rise 5.0m carries uniformly distributed load of 70kN/ horizontal meter run over the right half of the span. Calculate the support reactions and also find bending moment radial shear and normal thrust at a section 10m from the right support.

UNIT – III

6. A fixed beam is shown in Fig 2. Solve the beam and also draw the B.M and S.F Diagrams.

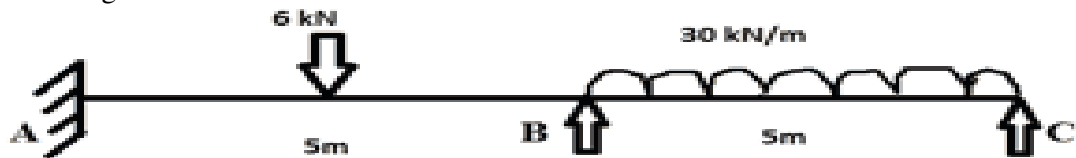


(OR)

7. A cantilever beam of length 6m is carrying a point load of 80kN at a distance of 5m from the fixed end. The cantilever is propped rigidly at free end. Determine the reaction at the rigid propped draw SF and BM diagrams.

UNIT – IV

8. Analyse the continuous beam shown in Fig 3. Use three moment equation Draw S.F & B.M diagram



(OR)

9. A continuous beam ABC consists of two spans AB of length 4m, and BC of length 3m. The span AB carries a point load of 150kN at its middle points. The span BC carries a point load of 170kN 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.

UNIT – V

10. An overhanging beam DABC, 14m long is supported at A & 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

(OR)

11. A system of wheel loads crosses a grider of 21.60m span, which is simply support at its ends. The loads and their distances are as follows.
Wheel load (kN) ; 140 240 240 190; Distance between centre (metres) : 1.80 2.70 2.40 2.10 Determine (i) The maximum B.M at quarter span.
(ii) The maximum B.M in the grider

AR13

CODE: 13EE2012

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-2017

POWER SYSTEMS-I (Electrical and Electronics Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) What are the advantages of thermal power stations?
 - b) What is meant by mass curve?
 - c) What is solar power generation and what are its advantages?
 - d) What is the function of super heater in case of thermal power station?
 - e) List the merits of ring main distribution system.
 - f) What is bus bar and mention the different arrangements of bus bars?
 - g) Define plant use factor.
 - h) A generating station has a connected load of 43 MW and a maximum demand of 20MW; the units generated being 61.5×10^6 per annum calculate the demand factor and load factor.
 - i) Write the properties of insulating materials used for underground cables.
 - j) List the demerits of gas insulated substations.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. Draw and explain the schematic diagram of Thermal power station. 12M
- (OR)
3.
 - a) Explain the general arrangement of and operation of hydroelectric plant. 6M
 - b) Write about the functions of different components in storage reservoir plants. 6M

UNIT-II

4.
 - a) Draw the schematic diagram of gas power station and list their components. 6M
 - b) Draw the line diagram of solar energy storage and explain it 6M
- (OR)
5.
 - a) Write importance of nuclear reactor in nuclear power stations. 6M
 - b) Write the difference between PWR and BWR 6M

UNIT-III

6.
 - a) Write about the classification of distribution systems. 6M
 - b) . Explain the design features of distribution system. 6M
- (OR)
7.
 - a) Briefly explain about the main components of the air insulated substations 6M
 - b) Draw the layout diagram of 11kv substation 6M

AR13

CODE: 13EE2012

SET-1

UNIT-IV

8. a) Explain briefly the following, i) Load curve ii) Load duration curve and give its significance 4M
- b) A residential consumer has a connected load of 10 lamps each of 100 W at his premises. The demand from midnight to 5am is 100 W from 5 am to 6 pm no load, from 6pm to 7pm 800W, from 7pm to 9pm 900W, from 9pm to mid night 400W. 8M
- i) Plot the load curve, ii)find the energy consumption during 24 hours and iii) calculate the demand factor, average load, maximum demand and load factor
- (OR)
9. a) Write a short note on two part tariff, three part tariff and power factor tariff. 6M
- b) Write about the desirable characteristics of tariff. 6M

UNIT-V

10. a) Explain about the construction of underground cable with neat sketch 6M
- b) What is meant by grading of cables and explain about capacitance grading. 6M
- (OR)
11. a) Draw the single line diagram of GIS and explain 6M
- b) List the merits and demerits of gas insulated sub stations. 6M

AR13

CODE: 13ME2011

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-2017

THERMAL ENGINEERING-1

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 × 10=10 M]

1. a) Write the formula for air standard efficiency of Otto cycle?
- b) Why thermal efficiency of CI engine is higher than SI engines?
- c) What is meant by abnormal combustion?
- d) What is the function of carburetor?
- e) List the stages of combustion in CI engines.
- f) What is delay period in IC engines?
- g) Define Break Mean Effective Pressure?
- h) Define specific fuel consumption?
- i) Define Isothermal Efficiency of reciprocating compressor?
- j) What do you mean by positive displacement compressors?

PART-B

Answer one question from each unit

[5 × 12=60 M]

UNIT-1

2. a) Describe briefly about loss due to time required for fuel -air mixture and combustion. [6 M]
- b) Discuss briefly the loss due to gas exchange process? [6 M]

(OR)

3. a) With a neat sketch explain the working principle of a simple carburettor. [6 M]
- b) What are the functional requirements of an injection system? [6 M]

UNIT-II

4. a) Explain the effect of various engine variables on SI engine knock. [6 M]
- b) Explain various factors that influence the flame speed. [6 M]

(OR)

5. a) Discuss about the basic requirements of SI engine combustion chamber. [6 M]
- b) What are the desirable qualities of SI engine fuels to inhibit detonation? [6 M]

UNIT-III

6. a) Explain with figures various types of combustion chambers used in CI engines. [6 M]
- b) Explain the phenomenon of knock in CI engine. [6 M]

(OR)

7. a) Explain the turbulence in CI engines. [6 M]
- b) Briefly explain the process of combustion in CI engine and explain various stages. [6 M]

UNIT-IV

8. A four stroke, six cylinder gasoline engine has a bore of 80 mm and a stroke of 100 mm running at 4000 rpm. If the clearance volume in each cylinder is 70 cc, specific fuel consumption is 20kg/h and torque developed is 150 Nm. Calculate 1) break power 2) break mean effective pressure 3) break thermal efficiency if the calorific value is 4300 kJ/kg 4) the relative efficiency on the break power basis assuming the engine works on constant volume cycle. γ of air 1.4 for air. [12 M]

(OR)

9. During the trial of a single cylinder four stroke oil engine the following results were obtained cylinder diameter 20 cm, stroke 40 cm, mean effective pressure 6 bar, torque 400 Nm, speed 250 rpm, oil consumption 4 kg/h, calorific value of fuel 43 MJ/kg, cooling water flow rate 4.5 kg/min, air used per kg of fuel 30 kg, temperature of exhaust gases 450 °C, room temperature 20 °C, mean specific heat of exhaust gases is 1 kJ/kg K and specific heat of water 4.18 kJ/kg K. Find the indicated power, break power and draw up a heat balance sheet for the test in kJ/h. [12 M]

UNIT-V

10. a) Describe with a neat sketch the construction and working of a single-stage single acting reciprocating compressor. [6 M]
b) Write classification of rotary compressors and explain working principle of roots blower with a neat sketch? [6 M]

(OR)

11. a) What is a centrifugal compressor? How does it differ from an axial flow compressor? [6 M]
b) Explain briefly i) Surging ii) Chocking iii) Stalling [6 M]

LINEAR CONTROL SYSTEMS
(Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Why negative feedback is preferred in control systems?
- b) What do you mean by characteristic equation?
- c) What is electrical zero position of a synchro transmitter?
- d) What do you mean by damped frequency of oscillation?
- e) What do you mean by zero-input response?
- f) What are dominant poles?
- g) Define the cut off rate?
- h) What do you mean by region being enclosed?
- i) What is the disadvantage of frequency-domain method of compensation?
- j) How many state variables are required to completely define the dynamics of a system?

PART-B

Answer one question from each unit

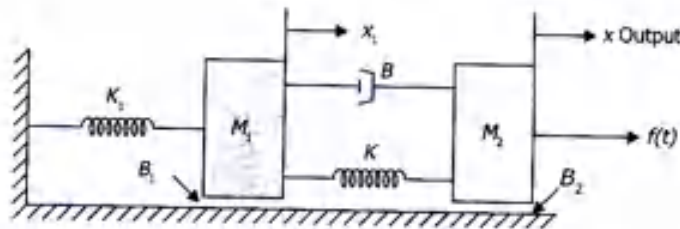
[5x12=60M]

UNIT-I

2. a) Explain the effect of feedback on (i) Overall gain
(ii) Stability
(iii) External disturbance
(iv) Sensitivity
- b) Find the transfer function of the following system show below

6M

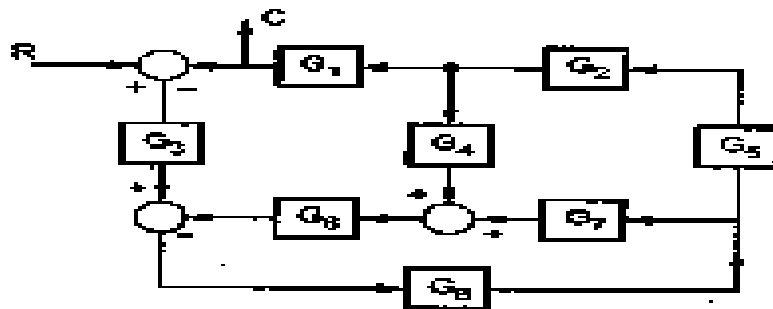
6M



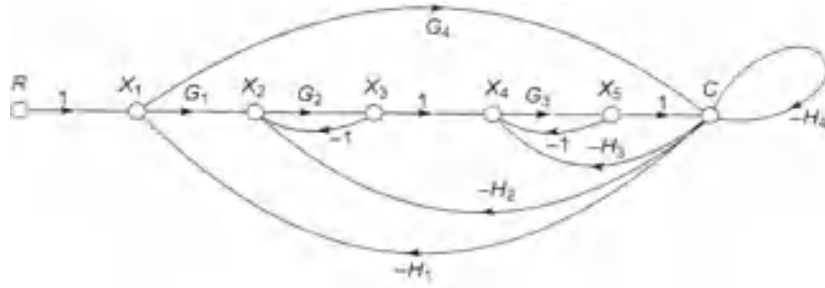
(OR)

3. a) Reduce the given block diagram and hence obtain the transfer function $\frac{C(s)}{R(s)}$

6M



- b) For the signal flow graph shown below using mason's gain formula, find $\frac{C(S)}{R(S)}$ 6M



UNIT-II

4. a) Compare the armature and field controlled D.C servo motors? 5M
 b) Derive an expression for the time response of second order system excited by unit step i/p? (any case) 7M

(OR)

5. a) Derive the T.F of armature controlled D.C servo motor? 6M
 b) The open loop transfer function of a unity feedback system is given by $G(s) = K/s(Ts+1)$, where K and T are positive constants. By what factor should the amplifier gain be reduced so that the peak overshoot of unit-step response of the system is reduced from 75% to 25%? 6M

UNIT-III

6. a) The characteristics equation of a control system is given by $S^4 + 20S^3 + 15S^2 + 2S + K = 0$. Use Routh-Hurwitz method to find the value of K for which the system will be marginally stable and the frequency of the corresponding sustained oscillations. 6M
 b) Determine the break away points of the system which have the open loop transfer function $G(s)H(s) = \frac{K(s+4)}{s^2 + 2s + 4}$ 6M

(OR)

7. For a unity feedback system, the open-loop transfer function is given by 12M

$$G(S) = k / \{s(s+2)(s+6)\}$$

- (a) Sketch the root locus for $0 < K < \infty$
 (b) At what value of K, the system becomes unstable.
 (c) At this point of instability, determine the frequency of oscillation of the system.

UNIT-IV

8. Sketch the Bode plot for the following transfer function $G(s) = K / \{s(s+1)(s+5)\}$.

12M

(OR)

9. Sketch the Nyquist plot for system with 12M

$$G(s)H(s) = \frac{(1+0.5s)}{s^2(1+0.1s)(1+0.02s)}$$

comment on the stability.

UNIT-V

10. a) Sketch the Bode-plot and Pole zero plot for lag compensation? 6M
 b) A feedback system has a closed loop transfer function. 6M

$$\frac{Y(s)}{U(s)} = \frac{10(s+4)}{s(s+1)(s+3)}$$

construct canonical state models for this system?

(OR)

11. a) Explain the computation of S.T.M and also list their properties of S.T.M? 6M
 b) Consider the system represented by, 6M

$$\dot{X} = \begin{bmatrix} -0.2 & 0.4 \\ 0.1 & -0.1 \end{bmatrix} X(t) + \begin{bmatrix} 1 \\ 1 \end{bmatrix} U(t)$$

$$Y(t) = [1 \ 0] X(t)$$

Find the state transition matrix.

Code: 13CS2009**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****II B.Tech II Semester Supplementary Examinations, July-2017****FORMAL LANGUAGES AND AUTOMATA THEORY****(Common to CSE & IT)****Time: 3 Hours****Max Marks: 70****PART-A****Answer all questions****[1X10 =10M]**

1. a) Give the Formal definition of Finite Automata
- b) Specify an example for infinite set
- c) Define Useless symbol
- d) What is NP – Hard Problem?
- e) Define Turing machine
- f) What are context sensitive languages
- g) What is NFA?
- h) Differentiate Moore machine with Mealy Machine
- i) How do you say a string is accepted by the Finite Automata?
- j) Give an application of PDA.

PART- B**Answer one question from each unit****[5X12=60M]****UNIT-I**

2. a) What are the applications of Finite automata.
- b) Construct finite automata for accepting the strings ending with 01.

(OR)

3. a) Write about DFA.
- b) Construct DFA equivalent to the NFA
 $(\{p,q,r,s\}, \{0,1\}, \delta, p, \{s\})$ and the transition table is

PS\NS	0	1
P	p,q	p
Q	r	r
R	s	-
S	s	s

UNIT - II

4. Construct Finite Automata equivalent to the following Regular Expressions

- i) $10+(0+11) 0^*1$
- ii) $01(0)^*1$
- iii) $((0+1)(0+1))^* + ((0+1)(0+1)(0+1))^*$

(OR)

5. a) Explain about Closure properties of Regular set
- b) What are identity rules for regular expressions?

Code: 13CS2009**UNIT - III**

6. a) Construct a CFG generating the set
 $\{w\#w\#lw \mid w \in (0+1)^+\}$
b) Define Derivation Tree. Give the difference between Left most derivation tree and Right most derivation tree.

(OR)

7. a) Consider the following grammar $(\{S,A,B\}, \{c,d\}, P,S)$ that has the following Productions:

 $S \rightarrow bAaB$ $A \rightarrow bAAaSa$ $B \rightarrow aBBlbSb$

Find the equivalent grammar in CNF

- b) Give context free grammar for Arithmetic expressions with +, *, and id and Generate Unambiguous grammar.

UNIT - IV

8. a) What is Pushdown Automata with example
b) Give the differences between PDA and FA

(OR)

9. Design Push Down automata for accepting the Language $\{WCW^R \mid W \in \{0+1\}^*\}$

UNIT - V

10. a) Differentiate Turing Machine with FA and PDA
b) What are Undecidable problems? Explain with an example.

(OR)

11. Explain about Chomsky Hierarchy