

**CONSTRUCTION MATERIALS AND PRACTICE
(CIVIL ENGINEERING)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Define the term queen closer.
b) What is kiln?
c) What are the important raw materials used in manufacturing glass?
d) Give any two examples of sedimentary rocks.
e) Define the term nosing.
f) What are the specialties of machine moulded bricks?
g) What do you mean by scaffolding?
h) What are pozzolonic materials?
i) What is the nominal size of brick?
j) Mention two advantages of flat roofs.

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

2. a) Explain the process of burning bricks in clamps 6M
b) Write a note on tests on clay bricks. 6M
(OR)
3. a) Explain the defects in timber. 6M
b) What is meant by seasoning? Write about artificial seasoning of timber. 6M

UNIT-II

4. a) Explain manufacturing process of glass. 6M
b) What are the uses of plastics? 6M
(OR)
5. a) What are the considerations in choosing paints? 6M
b) Explain the procedure of production of concrete. 6M

UNIT-III

6. a) Give comparisons between English bond and Flemish bond. 6M
b) Explain the method of laying bricks 6M
(OR)
7. a) What are the methods of damp proofing the building? 6M
b) Explain with neat sketches about the types of rubble masonry. 6M

UNIT-IV

8. a) Explain types of stairs with neat sketches. 6M
b) What are the guidelines to be followed while planning a staircase for a residential building? 6M
(OR)

9. a) What are the merits and demerits of flat roofs? 6M
b) What are the factors that effect selection of flooring materials 6M

UNIT-V

10. a) Explain different types of scaffoldings? 6M
b) Write a short note on cement plaster. 6M
(OR)
11. a) What is underpinning? Explain methods of underpinning. 6M
b) Explain about formwork for column with neat sketch. 6M

AR13

CODE: 13EE2009

SET-2

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

II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

**CONTROL SYSTEMS
(ELECTRICAL AND ELECTRONICS ENGINEERING)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What are time domain specifications?
b) Why compensation is necessary in feedback control system?
c) What are the advantages of State space techniques?
d) Write the force balance equation of ideal dashpot?
e) What are the advantages of Bode plot?
f) Name the test signals used in control systems?
g) What is limitedly stable system?
h) What is root locus?
i) What are the characteristics of servomotors?
j) Define state and state space?

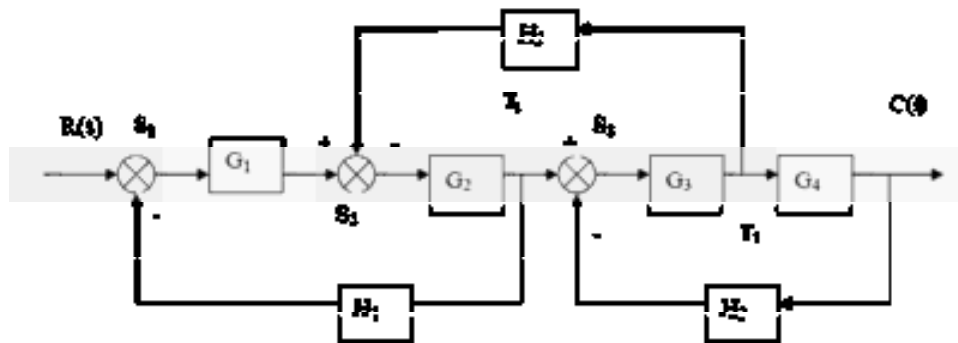
PART-B

Answer one question from each unit

[5x12=60M]

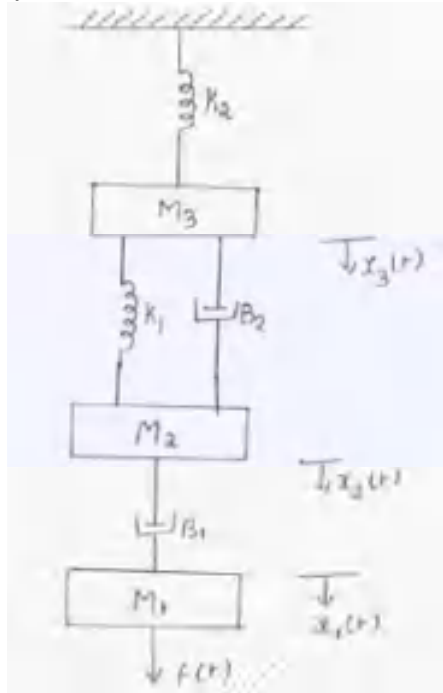
UNIT-I

2. a) Using block diagram reduction technique find the closed loop transfer function 8M

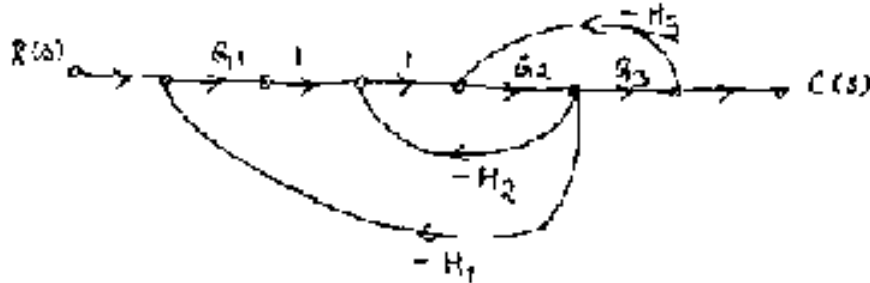


- b) Explain in detail the classification of control systems? 4M
- (OR)**

3. a) Obtain the equations relevant for the system shown in figure using translational system 8M



- b) Using Mason's gain formula obtain the closed loop transfer function for the signal flow graph 4M



UNIT-II

4. a) Derive the transfer function of armature controlled DC Servo motor 5M
 b) Find the dynamic error coefficients of the unity feedback system whose forward transfer function is $G(S) = \frac{200}{S(S+5)}$. Find the steady state error of the system for the input $4t^2$? 7M

(OR)

5. a) Obtain the unit step response of a unity feedback system whose open loop transfer function is $G(S) = \frac{4}{S(S+5)}$ 8M
 b) The open loop transfer function of a servo system with unity feedback is $G(S) = \frac{10}{S(0.1S+1)}$ Evaluate the static error constant of the system. Obtain the steady state error of the system when subjected to an input given by the polynomial $r(t) = a_0 + a_1 t + \frac{a_2}{2} t^2$. 4M

UNIT-III

6. a) sketch root locus for the unity feedback system whose open loop transfer function is $G(s)H(s) = \frac{K(s+1.5)}{s(s+1)(s+5)}$ 8M

- b) Using Routh criterion investigate the stability of a unity feedback control system whose open loop transfer function is given by $G(S) = \frac{K}{s(s^2+5s+9)}$ 4M

(OR)

7. a) Apply Routh Hurwitz criterion to the following equation and investigate the stability $S^5+2S^4+2S^3+4S^2+11S+10=0?$ 4M

- b) A unity feedback control system has an open loop transfer function $G(s) = \frac{K}{s(s^2+4s+13)}$ sketch the root locus of the system? 8M

UNIT-IV

8. a) Sketch the Bode plot for the transfer function $G(s) = \frac{1000}{s(1+0.001s)(1+0.1s)}$ determine gain margin and phase margin 8M

- b) Sketch the polar plot for $G(s) = \frac{20}{s(s+1)(s+2)}$ 4M

(OR)

9. a) Sketch the polar plot for $G(s) = \frac{10(s+1)}{s+10}$ 4M

- b) Sketch the Bode plot for the transfer function $G(s) = \frac{50}{s(1+0.25s)(1+0.1s)}$ determine gain margin and phase margin 8M

UNIT-V

10. a) For the system represented by following state model 6M

$$\dot{X} = \begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 1 \\ 0 \end{bmatrix} U \quad ; \quad Y = \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

Check for controllability and observability

- b) Obtain the time response of the system given below 6M

$$\dot{X} = AX \text{ where } A = \begin{bmatrix} 0 & 1 \\ -2 & 0 \end{bmatrix}; \text{ given } X(0) = \begin{bmatrix} 1 & 1 \end{bmatrix}^T \text{ and } y = \begin{bmatrix} 1 & -1 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

(OR)

11. a) Design a cascade lead compensation for a system whose transfer function is $G(s) = \frac{K}{s(1+0.001s)(1+0.1s)}$ it will fulfil the following specifications P.M $\geq 45^\circ$ 6M

Velocity constant $K_v = 1000 \text{ sec}^{-1}$

- b) A control system is described as below 6M

$$\dot{X} = AX + Bu \text{ and } y = CX \text{ where } A = \begin{bmatrix} 1 & 4 \\ -2 & -5 \end{bmatrix}, X(0) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}, B = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \text{ and } C = \begin{bmatrix} 1 \\ 0 \end{bmatrix}^T$$

Determine the time response. Use diagonalization process for matrix A

Code: 13ME2008**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****II B.Tech II Semester Regular / Supplementary Examinations, May, 2016****FLUID MECHANICS AND HYDRAULIC MACHINERY
(MECHANICAL ENGINEERING)****Time: 3 Hours****Max Marks: 70****PART-A****Answer all questions****[1X10 =10M]**

1.
 - a) A volume of 2.5m^3 of a certain liquid weighs 9.81kN. Determine its specific gravity
 - b) Carbon tetrachloride had a dynamic viscosity of 9.67×10^{-4} pa and a kinematic viscosity of $6.08 \times 10^{-7} \text{ m}^2/\text{sec}$. Calculate its mass density
 - c) Convert a pressure head of 18m of water into meters of oil of specific gravity 0.750
 - d) Differentiate Steady and Unsteady flow.
 - e) Mention the assumptions involved in deriving Bernoulli's Theorem.
 - f) Define path line
 - g) What is the Reynolds's number of a flow of $0.3 \text{ m}^3/\text{sec}$ of oil (specific gravity 0.86 and $\mu = 0.025 \text{Ns/m}^2$) through a 500 mm diameter pipe
 - h) Define specific speed of a turbine
 - i) Define slip in case of reciprocating pumps
 - j) What is meant by operating characteristics of a centrifugal pump and draw the operating characteristic curves

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

2. A cylinder of 0.30 m diameter rotates concentrically inside a fixed cylinder of 0.31 m diameter. Both the cylinders are 0.3 m long. Determine the viscosity of the liquid which fills the space between the cylinders if a torque of 0.98 N.m is required to maintain an angular velocity of 60 rpm.

(OR)

3. A U-tube differential manometer connects two pressure pipes A and B. Pipe A contains carbon tetrachloride having a specific gravity 1.594 under a pressure of 11.772 N/cm^2 and pipe B contains oil of specific gravity 0.8 under a pressure of 11.772 N/cm^2 . The pipe A lies 2.5 m above pipe B. Find the difference of pressure measured by mercury as fluid filling U-tube.

Code: 13ME2008**UNIT-II**

4. Derive the expression for continuity equation in Cartesian coordinates system.
(OR)
5. A bend in pipeline conveying water gradually reduces from 0.6 m to 0.3 m diameter and deflects the flow through angle of 60° . At the larger end the gage pressure is 171.675 kN/m^2 . Determine the magnitude and direction of the force exerted on the bend, when the flow is 876 litres/ s

UNIT-III

6. A 0.3 m diameter pipe 2340 m long is connected with a reservoir whose surface is 72 m above the discharging end of the pipe. If for the last 1170 m, a second pipe of the same diameter be laid beside the first and connected to it, what would be the increase in the discharge? Take $f = 0.002$.
(OR)
7. A venture meter has its axis vertical, the inlet and throat diameters being 150 mm and 75 mm respectively. The throat is 225 mm above inlet and $K = 0.96$. Petrol of specific gravity 0.78 flows up through the meter at a rate of $0.029 \text{ m}^3/\text{s}$. Find the pressure difference between the inlet and the throat.

UNIT-IV

8. A Pelton wheel has to be designed for the following data. Power to be developed = 6 000 kW. Net head available = 300 m; Speed = 550 r.p.m.; Ratio of jet diameter to wheel diameter = $1/10$; and overall efficiency = 85%. Find the number of jets; diameter of the jet; diameter of the wheel; and the quantity of water required.
(OR)
9. With a neat sketch explain the working of Francis turbine

UNIT-V

10. With a neat sketch explain a working of a centrifugal pump.
(OR)
11. A single acting reciprocating pump has a plunger of diameter 250 mm and stroke of 350 mm. if the speed of the pump is 60 r.p.m. and it delivers 16.5 litres per second of water against a suction head of 5m and a delivery head of 20 m, find the theoretical discharge, coefficient of discharge, the slip, the percentage slip of the pump and the power required to drive the pump.

AR13

CODE: 13EC2009

SET-I

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

ANALOG COMMUNICATIONS (Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Classify amplitude modulation based on modulation index.
b) Conventional amplitude modulation is wasteful of power. Why?
c) Phase reversal occurs in DSB SC signal at zero crossings of message signal. Why/
d) Compare conventional AM, DSB-SC, SSB SC and VSB in terms of bandwidth.
e) Single sideband is sometimes referred to as heterodyning. Why?
f) Give the significance of Carson's rule in FM signal generation.
g) Give any two disadvantages of TRF receiver over super heterodyne receiver.
h) Define Nyquist rate and Nyquist interval.
i) Define pre-emphasis.
j) Distinguish sensitivity and selectivity.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Discuss the need for modulation in communication systems. 6M
b) Describe the generation of an AM signal using square law modulator. 6M
- (OR)
3. a) An AM transmitter radiates 10kW of power when the carrier is unmodulated and 11.5 kW when it is sinusoidally modulated. Calculate the modulation index. If another sine wave resulting in 50% modulation is transmitted simultaneously. Find the total radiated power. 6M
b) Diode can be used as AM demodulator. How? Describe AM detection mechanism when the diode is operating in non linear region. 6M

UNIT-II

4. a) Explain the generation of DSB SC signal using balanced modulator. 6M
b) What is demodulator? And describe the coherent detection of SSB SC signal with necessary mathematical expressions. 6M
- (OR)
5. a) List out the carrier recovery methods and describe the carrier recovery mechanism using Costas receiver with neat block diagram. 6M
b) Illustrate the generation of SSB SC signal using frequency discrimination method. 6M

AR13

CODE: 13EC2009

SET-I

UNIT-III

6. a) Angle modulation is also called nonlinear modulation. Why? And give the relation between phase and frequency modulation. 6M
b) Maximum deviation allowed in an FM broadcast system is 75kHz. If the modulating signal is a single tone sinusoid of 8kHz, determine the bandwidth of FM signal. What will be the bandwidth when modulating signal amplitude is doubled? 6M

(OR)

7. a) Discuss FM demodulation using phase locked loop with necessary expressions. 6M
b) Describe the generation of FM signal using Armstrong method. 6M

UNIT-IV

8. a) Explain the operation of radio transmitter using high level modulation system. 6M
b) Super heterodyne receiver avoids the drawbacks of TRF receiver. How? 6M

(OR)

9. a) Draw the block diagram of TRF receiver and illustrate each block. 6M
b) Discuss the characteristics of super heterodyne receiver. 6M

UNIT-V

10. a) Describe the PPM signal generation from PWM signal. 6M
b) Derive the SNR of conventional AM system when the amount of noise is very small. 6M

(OR)

11. a) Discuss how pre-emphasis and de-emphasis improve quality of FM transmission. 7M
b) Prove that pulse duration modulation requires more average power over pulse amplitude modulation 5M

Time: 3 Hours**Max Marks: 70****ANSWER ALL QUESTIONS****PART-A****[1 x 10 = 10 M]**

1. a) What is a Class?
b) What is a Object?
c) What is a interface?
d) What is null reference?
e) What is a thread?
f) What is an abstract method?
g) What is casting?
h) What is an applet?
i) What is garbage Collection?
j) What is scope of a variable?

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

2. a) Explain about Object Oriented Principles? 6M
b) Explain about Scope and Life time of a variable? 6M
(OR)
3. Explain different control statements with examples? 12M

UNIT-II

4. a) Explain Method overloading with an example program? 6M
b) Explain Parameter passing techniques with an example program? 6M
(OR)
5. a) Explain constructor overloading with an example program? 6M
b) What is Recursion? Explain with an example program? 6M

UNIT-III

6. a) Explain multilevel Inheritance with an example program? 6M
b) Explain Package creation and importing packages with an example program? 6M
(OR)
7. a) Explain multiple Inheritance with an example program? 6M
b) Explain to implement Interfaces with an example program? 6M

UNIT-IV

8. What is Exception? Explain about Exception Handling Mechanism 12M
(OR)
9. What is a Thread? Explain about Thread Life Cycle with Suitable example 12M

UNIT-V

10. a) What is Applet? Explain about Applet Life Cycle. 6M
b) Explain how to pass parameters to the Applet. 6M
(OR)
11. a) Explain about Event Handling Mechanism 6M
b) Discuss JFrame and JComponent? 6M