

# AR13

**CODE: 13CE2005**

**SET-1**

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

**II B.Tech II Semester Regular & Supplementary Examinations, April- 2017**

## **CONSTRUCTION MATERIALS AND PRACTICE (CIVIL ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. Explain the following briefly:
  - a) Physical properties of materials
  - b) Applications of ceramic products
  - c) Difference between metals and alloys
  - d) What are the role of varnishes
  - e) What is stone masonry?
  - f) Types of partitions
  - g) What are the uses of windows?
  - h) List out the types of roof
  - i) Highlight the advantages of plastering
  - j) What is colour washing

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2.
  - a) Discuss the detailed process of burning bricks in intermittent kilns.
  - b) Give the detailed applications of rocks and stones.

**(OR)**

3.
  - a) What are the qualities of good building bricks? Discuss them.
  - b) Explain clearly about applications of timber and timber products in construction works.

#### **UNIT-II**

4.
  - a) What are the constituents of paints and varnishes and also write their usages?
  - b) Write a short note on the glass work.

**(OR)**

5.
  - a) Explain the specific uses of fiber reinforced plastics.
  - b) List the alternative materials for the glass reinforced plastics and explain their significance in connection with the building construction

**UNIT-III**

6. a) Where did the raft foundation is preferred to other shallow foundations. Explain with a neat sketch.
- b) Describe the role of water proofing in constriction of commercial buildings.

**(OR)**

7. a) What are the general principles in the brick masonry?
- b) Describe the role of damp proofing material.

**UNIT-IV**

8. Distinguish between the uses of Dog-legged stairs and Geometrical stairs.

**(OR)**

9. Differentiate between the Steel lintels & RCC lintels. Also write their applications.

**UNIT-V**

10. a) Explain the specific requirements of external and internal finishes in construction.
- b) Write a detailed notes on shoring and pinning

**(OR)**

11. a) How formwork is necessary? What are the requirements it formwork
- b) What are the Qualities expected from form work?

# AR13

**CODE: 13EE2009**

**SET-1**

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

**II B.Tech II Semester Regular & Supplementary Examinations, April- 2017**

## **CONTROL SYSTEMS (Electrical and Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) Define closed loop system?  
b) What is phase and gain crossover frequency?  
c) What are asymptotes?  
d) How you will find root locus on real axis?  
e) What is the principle of argument?  
f) Distinguish between type and order of a system?  
g) What are the characteristics of lag compensator?  
h) What is the minimum phase system?  
i) Mention few properties of state transition matrix?  
j) Mention two advantages of generalized error constants over static error constants?

### **PART-B**

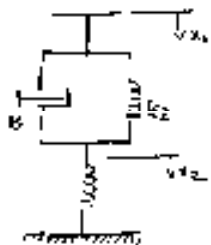
**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. a) What are the advantages and disadvantages of transfer function  
b) Derive their transfer function for the system shown in fig below

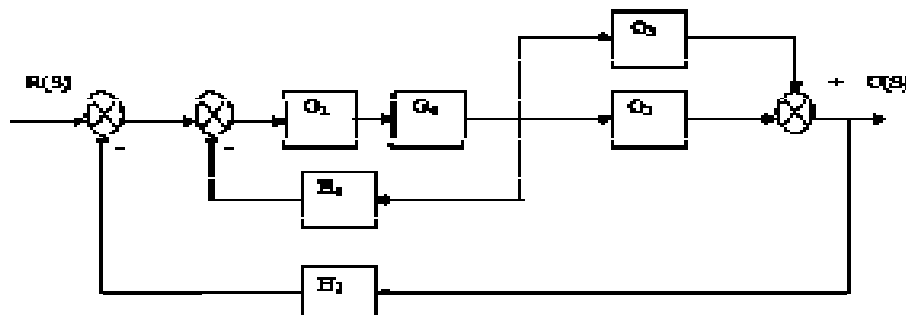
5  
7



**(OR)**

3. a) Write the differences between closed loop and open loop system  
b) Using block diagram reduction technique find the closed loop transfer function

4  
8



UNIT-II

4. a) Explain the operation of synchro as error detector? 6  
 b) The unity feedback system is characterized by an open loop transfer function  $G(S) = \frac{K}{s(s+10)}$  Determine the gain K so that the system will have a damping ratio of 0.5 for this value of K. Determine settling time, peak overshoot and time at peak overshoot for a unit step input. 6

(OR)

5. a) A unity feedback control system is characterized by the following open loop transfer function  $G(S) = \frac{(0.4S+1)}{s(s+0.6)}$  Determine its transient response for unit step input and sketch the response. Evaluate the maximum overshoot and the corresponding peak time. 6  
 b) Derive the transfer function of field controlled DC Servo motor? 6

UNIT-III

6. a) Determine the value of K such that the roots of the characteristics equation given below lie to the left of line  $S=-1$  4  
 $S^3 + 3(K+1)S^2 + (7K+5)S + (4S+7) = 0$   
 b) The open loop transfer function of a unity feedback system is given by 8  
 $G(S) = \frac{K}{s(s+4)(s+5)}$  sketch the root locus of the system

(OR)

7. a) Sketch the root locus for the unity feedback system whose open loop transfer function is  $G(S)H(S) = \frac{K}{s(s+4)(s^2+4s+20)}$  8  
 b) The characteristic polynomial of a system is  $S^7 + 5S^6 + 9S^5 + 9S^4 + 4S^3 + 20S^2 + 36S + 36 = 0$ . Determine the location of roots on the S-Plane and hence the stability of the system 4

UNIT-IV

8. Plot the Bode diagram for the following transfer function and obtain the gain and phase crossover frequencies 12  
 $G(S) = \frac{k}{s(1+s)(1+0.1s)}$

(OR)

9. a) Sketch the Bode plot for the open loop transfer function for the unity feedback system given below and assess stability 6  
 $G(S) = \frac{50}{(s+1)(s+2)}$   
 b) Sketch Nyquist plot whose open loop transfer function is given by 6  
 $G(S)H(S) = \frac{1}{s(1+2s)(1+s)}$  and examine closed loop stability in terms of parameter K

UNIT-V

10. a) The open loop transfer function of a unity feedback control system is given by 8  
 $G(s) = \frac{K}{s(s+2)(s+20)}$  design a suitable compensator such that the system will have  $K_v=20$  and P.M =  $35^\circ$   
 b) Derive the expression for state transition matrix? 4
- (OR)
11. Consider the following plant of a state space representation: 12  
 $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}; B = \begin{bmatrix} -2 \\ -2 \end{bmatrix}; C = [-2 \quad -2]; D = [0]$ , derive the transfer function for the given state model.

# AR13

**CODE: 13ME2008**

**SET-1**

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

**II B.Tech II Semester Regular & Supplementary Examinations, April- 2017**

## **FLUID MECHANICS AND HYDRAULIC MACHINERY (Mechanical Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) How does the viscosity of liquids vary with temperature?  
b) What are the applications of surface tension?  
c) What is flow net?  
d) Write any one application of momentum equation  
e) What is hydraulic gradient line.  
f) What is the use of Pitot tube  
g) What is impulse turbine?  
h) What is cavitation?  
i) Define pump.  
j) Define specific speed of a centrifugal pump.

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. a) Explain various fluid properties and pressure gauges. **6**  
b) Explain the terms stream line, streak line and path line. **6**
- (OR)
3. a) What is vacuum pressure? Explain the relationship between pressures with a schematic diagram. **6**  
b) The inlet to pump is 10.5 m above the bottom of sump from which it draws water through a suction pipe. If the pressure at the pump inlet is not to fall below 28 kN/m<sup>2</sup> absolute, work out the minimum depth of water in the tank. Assume atmospheric pressure as 100 kPa. **6**

#### **UNIT-II**

4. a) How is the continuity equation based on the principle of conservation of mass state? Differentiate between steady flow and uniform flow. **6**  
b) The velocity along a streamline passing through the origin is given by:  
 $V = 2 \times \text{Square root of } (x^2 + y^2).$  **6**
- (OR)
5. a) List the assumptions and derive Bernoulli's equation. **6**  
b) Water is flowing through a pipe having diameters 600 mm and 400 mm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 350 kN/m<sup>2</sup> and the pressure at the upper end is 100 kN/m<sup>2</sup>. Determine the difference in datum head if the rate of flow through the pipe is 60 litres/sec. **6**

**UNIT-III**

6. a) Derive Darcy-Weisbach formula for calculating loss of head due to friction in a pipe. **6**
- b) A horizontal Venturimeter with inlet diameter 200 mm and throat diameter 100 mm is used to measure the flow of water. The pressure at inlet is  $0.18 \text{ N/mm}^2$  and the vacuum pressure at the throat is 280 mm of mercury. Find the rate of flow. The value of  $C_d$  may be taken as 0.98. **6**
- (OR)**
7. a) A horizontal pipe line 40 m long is connected to a water tank at one end and discharges freely into the atmosphere at the other end. For the first 25 m of its length from the tank, the pipe is 150 mm diameter and its diameter is suddenly enlarged to 300 mm. The height of water level in the tank is 8 m above the centre of the pipe. Considering all losses of head which occur, determine the rate of flow. **6**
- b) What is Orifice meter? Derive an expression for the discharge through an Orifice meter. **6**

**UNIT-IV**

8. a) What type of turbine is Francis turbine? Explain how it works with a neat diagram. Discuss the importance of draft tube in reaction turbines. **7**
- b) A turbine is to operate under a head of 25 m at 200 r.p.m. The discharge is  $9 \text{ m}^3/\text{s}$ . If the efficiency is 90%, determine the performance of the turbine under a head of 200 metres. **5**
- (OR)**
9. a) A Pelton turbine develops 3000 kW under a head of 300 m. The overall efficiency of the turbine is 83%. If speed ratio = 0.46,  $C_v = 0.98$  and specific speed is 16.6, then find: (i) Diameter of the turbine and (ii) Diameter of the jet. **7**
- b) Explain the various unit quantities to study the performance of turbines. **5**

**UNIT-V**

10. a) What is a manometric head of a centrifugal pump? How do you define the specific speed of a centrifugal pump? **6**
- b) Define slip, percentage slip and negative slip of a reciprocating pump. **6**
- (OR)**
11. a) Explain briefly NPSH. **4**
- b) What is a reciprocating pump? Describe the principle and working of a reciprocating pump with a neat sketch. Why is a reciprocating pump not coupled directly to the motor? Discuss the reason in detail. **8**

# AR13

CODE: 13EC2009

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

II B.Tech II Semester Regular & Supplementary Examinations, April-2017

## ANALOG COMMUNICATIONS (Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Explain the need for modulation.  
b) What is the current relationship for AM wave?  
c) Define VSB.  
d) When phase error in the demodulation of DSB-SC wave using Synchronous detector Occurs.  
e) Explain the terms of Narrow band FM and wide band FM  
f) Write short notes on Pre-emphasis and de-emphasis.  
g) What is the difference between TDM and FDM?  
h) Explain about image frequency.  
i) Explain , how noise can be calculated in a communication system.  
j) Discuss the types of pulse Modulation.

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. a) Explain the square law detection of AM signals. **6M**  
b) An AM modulator consists of 500 kHz carrier with peak amplitude of 32V and a 12 kHz modulating signal whose amplitude is sufficient to provide a 14V peak change in the amplitude of the envelope. Determine Upper and lower side frequencies , Modulation coefficient, percent modulation and Maximum and minimum amplitudes of the envelope **6M**
- (OR)
3. a) Explain the generation of AM wave using square law modulator. **7M**  
b) What do you understand of modulation index? What is its significance? **5M**

#### UNIT-II

4. a) Write short notes on Costas Loop. **6M**  
b) Draw the circuit and explain the generation of SSB-SC wave using frequency discrimination method? **6M**
- (OR)
5. a) Prove that the balanced modulator produces an output consisting of sidebands only with the carrier removed. **6M**  
b) Compare different AM techniques. **6M**

# AR13

CODE: 13EC2009

SET-2

## UNIT-III

6. a) An angle modulated signal has the form  $v(t) = 100\cos[2\pi f_c t + 4 \sin 2000\pi t]$  where  $f_c = 5\text{MHz}$  **6M**  
i) Determine the average transmitted power ii) Determine the peak phase deviation  
iii) Determine the peak frequency deviation iv) Is this FM or a PM signal? Explain  
b) Explain the detection of FM wave using balanced frequency discrimination. **6M**  
(OR)
7. a) Discuss the merits and demerits of AM and FM modulation techniques. **6M**  
b) Explain how FM is generated using direct method. **6M**

## UNIT-IV

8. a) Mention the advantages of super heterodyne receiver over TRF receiver **4M**  
b) Draw the block Schematic for FM receiver and explain the function of each unit. **8M**  
(OR)
9. a) Distinguish between simple AGC and delayed AGC **6M**  
b) With the help of necessary block diagram describe the functioning of FM transmitters using frequency stabilization scheme for the FM oscillator centre frequency? **6M**

## UNIT-V

10. a) What is capture effect? Explain FM threshold effect. **6M**  
b) Explain about single polarity and double polarity in PAM. **6M**  
(OR)
11. a) Explain the equivalent model of a generalized communication system for noise calculation **6M**  
b) Explain with neat wave forms, how a PWM wave is converted into PPM wave. **6M**



# AR13

CODE: 13CS2006

SET-I

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

II B.Tech II Semester Regular & Supplementary Examinations, April- 2017

## OBJECT ORIENTED PROGRAMMING (Common to CSE & IT)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is polymorphism?  
b) Define casting.  
c) What is abstract class?  
d) What is call by value?  
e) How is a package created?  
f) What are extending interfaces?  
g) Define a sub class.  
h) What is life cycle of a thread?  
i) What is an event?  
j) What are Scroll Panes?

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. a) What is an object oriented paradigm? Explain two differences between the object oriented paradigm of programming languages and the structured paradigm of Programming languages. 6M  
b) Write about automatic type conversion and explain when casting is needed with an example program. 6M
- (OR)
3. a) Define an array? How it is defined in java? Explain with suitable example 6M  
b) Write a program to determine the sum of the following harmonic series for a given value of n:  $1 + 1/2 + 1/3 + \dots + 1/n$  The value of n should be given interactively through the keyboard. 6M

#### UNIT-II

4. a) Explain Overloading Methods and Overloading Constructors with examples? 6M  
b) Explain the parameter passing mechanism. 6M
- (OR)
5. a) Explain differences between constructor and method with one example.. 6M  
b) Write an example program to declare a method in a class. 6M

**UNIT-III**

6. a) Discuss about different types of inheritance with an example program 6M  
b) What are the various abstract classes used in Java? 6M

**(OR)**

7. a) What is interface? What are the possible contents of an interface? Explain. State the advantages of using interface . 6M  
b) How to access a package , explain with an example program 6M

**UNIT-IV**

8. a) What is multithreading and explain how to create a thread with an example program. 6M  
b) What is an Exception? Explain Exception handling mechanism. 6M

**(OR)**

9. a) What are the built-in-exceptions that exist in Java, explain with example. 6M  
b) How are throws and finally keywords used. 6M

**UNIT-V**

10. a) Explain any five AWT controls in detail with an example program. 6M  
b) Write a program that allows user to draw lines, rectangles and ovals. 6M

**(OR)**

11. a) What is an Applet, explain kinds of applet and explain its architecture 6M  
b) Explain about JTabbedPane and JTable classes in javax.swing package with a program 6M