

# AR13

**CODE: 13CE3016**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, July-2018**

## **DESIGN OF STEEL STRUCTURES (Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) Draw a neat sketch of single bevel butt joint and double bevel butt joint
- b) What do you mean by undercutting and edge melting in welding process
- c) What is meant by web buckling?
- d) What is meant by laterally unsupported beams?
- e) Define lacing and battening systems.
- f) Define net sectional area of plates?
- g) What are the loads acting on gantry girder?
- h) Name the components of gantry girder?
- i) What are bearing stiffeners?
- j) What do you mean by double shear?

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. Design a welded seat angle connection between a beam MB 400 and 12M column HB 200 for a reaction of beam 120 kN, assuming Fe 410 grade steel ( $f_y = 250$  MPa) and site welding.

**(OR)**

3. Determine the sizes of end fillets to connect two plates with cross sections of 125 x 8 mm and 125 x 12 mm which are subjected to a tension of 100 kN at working load. The ultimate strength of the plates,  $f_u = 410$  MPa.

#### **UNIT-II**

4. Design a laterally unsupported I beam with simply supported ends of effective span 6 m subjected to a working load of 35 kN/m. Assume that full torsional and warping restraints are provided at the supports and the load acts on the upper flange which will have destabilizing effect.

**(OR)**

5. Design a simply supported beam of effective span 1.5 m carrying a factored concentrated load of 360 kN at the mid span. Check deflection also.

### **UNIT-III**

6. Find the ultimate load carrying capacity in the following case: 12M  
Two angular plates of 75 x 75 x 10 connected to the same side of the gusset.

**(OR)**

7. Design a welded laced column of effective length 6 m to carry a load of 600 kN using four tubular sections. Also, use tubular sections as lacing bars. 12M

### **UNIT-IV**

8. Design a suitable section for a simply supported gantry girder for the following data: Spacing of columns = 4m. Crane capacity = 160 kN  
Weight of the crane excluding the crab = 250 kN  
Weight of the crab = 60 kN; Minimum clearance of cross travel = 0.8 m  
Wheel base = 5.3 m; Centre to centre distance between gantry girders = 20 m  
Height of the rail = 105 mm; Expected number of stress cycles =  $2 \times 10^5$   
Grade of steel = E250. 12M

**(OR)**

9. a) Explain the design steps involved in design of gantry girder. 6M  
b) Explain in detail the loads that are considered in design of gantry girder. 6M

### **UNIT-V**

10. Design a welded plate girder using Fe 410 grade steel for the codal specifications using the following data: the girder is simply supported over a span of 27 m and supports an uniformly distributed live load of 20 kN/m, together with two concentrated loads of 450 kN each located at 6 m from either supports. The top compression flange is restrained laterally. Design the cross section with a thinner web and suitable stiffeners conforming to the codal specifications. Sketch the details of the plate girder. 12M

**(OR)**

11. Design a welded plate girder of span 20 m to carry superimposed load of 40 kN/m. Avoid use of stiffeners. Draw the design details. 12M

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

1.
  - a) What is resistance switching?
  - b) Mention the disadvantages of oil circuit breakers.
  - c) Define pick-up value of a relay.
  - d) List any two advantages of Static relays over electromagnetic relays
  - e) Mention the most commonly used protection scheme for alternators.
  - f) Define incipient faults?
  - g) Mention the significance of bus-bar protection.
  - h) What are the advantages of distance protection over other types of protection
  - i) What are the factors causing arcing grounds?
  - j) What is the function of surge diverter?

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

2.
  - a) Explain the various methods of arc extinction in a circuit breaker. 6M
  - b) Briefly explain the following 6M
    - (i). Circuit Breaker Ratings
    - (ii). Circuit interruption problems
- (OR)
3.
  - a) Discuss the operation of SF<sub>6</sub> circuit breaker. 4M
  - b) In a power system the r.m.s voltage is 38.1kV, inductance is 10mH 8M  
and capacitance is 0.02μF. Determine (i) peak restriking voltage  
across the circuit breaker (ii) frequency of restriking voltage  
transient (iii) average RRRV (iv) maximum RRRV.

**UNIT-II**

4.
  - a) Explain the principal of operation of Differential relays with neat sketch. 6M
  - b) Distinguish between directional relays and differential relays. 6M

**(OR)**

5. a) A relay is connected to 400/5 ratio current transformer with current setting of 150%. Calculate the plug setting multiplier when circuit carries a fault current of 4000A. 4M
- b) Explain different types of electromagnetic relays and their field of applications 8M

### **UNIT-III**

6. a) Explain the differential protection of transformer with neat sketch. 7M
- b) Explain “Earth fault protection for transformer”. 5M

**(OR)**

7. a) Describe protection scheme of an alternator against inter-turn fault. 5M
- b) A star connected, 3 phase 10MVA, 6.6kV alternator is protected by Merz-price circulating current principle using 1000/5 amperes current transformers. The star point of the alternator is earthed through a resistance of  $7.5\Omega$ . If the minimum operating current for the relay is 0.5A, calculate the percentage of each phase of the stator winding which is unprotected against earth-faults when the machine is operating at normal voltage. 7M

### **UNIT-IV**

8. a) Explain the translay relay protection scheme with neat sketch. 7M
- b) Explain the ring main power system protection with directional relays. 5M

**(OR)**

9. a) What is the necessity of bus-bar protection? How bus-bar protection scheme is stabilized? 6M
- b) Explain the three zone distance relay protection. 6M

### **UNIT-V**

10. a) Explain the phenomenon of “arcing grounds” on overhead transmission lines. How does neutral earthing oppose arcing ground currents? 6M
- b) A 220kV, 3phase, 50Hz, 250Km transmission line has a capacitance to earth of  $0.04 \mu\text{F}/\text{phase}$ . Find the inductance and KVA rating of the Peterson coil used for earthing the above system. 6M

**(OR)**

11. a) What are the merits and demerits of reactance earthing compared to solid earthing? 4M
- b) Explain the following briefly 8M
  - (i) Causes of over voltages
  - (ii) Function of surge arresters
  - (iii) Requirements of a ground wire for efficient protection.
  - (iv) valve type arrester

# AR13

**CODE: 13EI3002**

**SET-I**

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

**III B.Tech II Semester Supplementary Examinations, July-2018**

**INSTRUMENTATION AND CONTROL SYSTEMS**

**(Mechanical Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 X 10=10M]**

1. a) Write different sources of errors.  
b) Which instrument is used for measurement of pressure?  
c) Write the applications of LVDT?  
d) Define stability of the system?  
e) Define gauge factor?  
f) Write any two techniques to measure acceleration?  
g) What do you mean by dominant pole?  
h) Define gain margin?  
i) What is the need of PI controller?  
j) Define Nyquist stability criterion?

**PARTB**

**Answer one question from each unit**

**[5 X 12=60M]**

**UNIT-I**

1. a) Explain the dynamic performance characteristics of the measurement system? 6M  
b) Explain the principle of operation of low pressure measurement? 6M  
(OR)
2. a) What are the general classes of errors in measurements? How do you minimize their effects in measurements? 6M  
b) Explain neatly with diagram the operation of Mcleod pressure gauge? 6M

**UNIT-II**

3. a) What do you mean by flow meters? List out different flow meters used for measurement of flow? 6M  
b) Derive an equation for gauge factor. What are the applications of strain gauge? 6M  
(OR)
4. a) Explain different laws involved in thermo couple? 6M  
b) Explain working principle of ultrasonic flow meter? 6M

**UNIT-III**

5. a) Explain the principle of operation of capacitive transducers? 6M  
b) Explain the principle of operation of accelerometer? 6M  
(OR)
6. a) Explain in principle of operation of dynamometer? 6M  
b) What are different types of transducers used measurement of displacement and explain operation briefly? 6M

# AR13

**CODE: 13EI3002**

**SET-I**

## UNIT-IV

7. a) Explain the effect of addition of poles and zeros to transfer function? 6M  
b) Access the stability of the system using RH criterion 6M

$$G(s) = \frac{K}{(s+2)(s+4)(s^2+6s+25)}$$

**(OR)**

8. a) List out the differences between open loop and closed loop systems? 6M  
b) A unity feedback control system is characterized by a open loop transfer function

$$G(S)H(S) = \frac{10}{S(S+2)}$$

.Find the rise time, percentage overshoot, peak time and settling time for a unit step input.

6M

## UNIT-V

9. a) Define frequency domain specifications of second order system and write their expressions? 6M  
b) What is the need of controllers in the system and explain their role briefly? 6M

**(OR)**

10. Access the stability of the system using Nyquist stability criterion of  $\frac{10}{[(s+2)(S+10)s]}$  12M

# AR13

**CODE: 13EC3019**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, July-2018**

**MICROPROCESSORS AND MICROCONTROLLERS  
(Electronics & Communication Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

## **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) What is assembler directive? Give Example.
- b) Write difference between macros and procedure
- c) Define addressing mode.
- d) Write advantages of segmentation.
- e) List interrupts of 8086 with its priority.
- f) List SFR's in 8051 Microcontroller (any two).
- g) Write features of 8051 Microcontroller.
- h) Write advantages of DMA.
- i) List Data transfer instructions. (Any two).
- j) Draw the 8086 Flag register.

## **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

## **UNIT-I**

2. a) Explain Addressing modes of 8086 Microprocessor with example. 6M
- b) Draw and explain architecture of 8086 microprocessor. 6M
- (OR)**
3. a) Explain register organization of 8086 microprocessor. 6M
- b) Draw and explain memory write cycle of 8086 microprocessor with timing diagram. 6M

## **UNIT-II**

4. a) Draw the timing diagram of memory read cycle in minimum mode operation of 8086 microprocessor. 6M  
b) Write an Assembly language program for 8086 to search a character in string stored in memory 6M  
(OR)
5. a) Draw and explain the interrupt vector table. 6M  
b) Explain the following instructions. 6M  
i) MOVS ii) CMPS iii) PUSH iv) ADD

## **UNIT-III**

6. a) Draw and discuss the internal architecture of 80386 in detail. 7M  
b) Write salient features of 80486. 5M  
(OR)
7. a) Draw and explain the Flag register of 80386 6M  
b) Explain the physical address formation in real address mode of 80386. 6M

## **UNIT-IV**

8. a) Explain the different modes of operation of 8255. 6M  
b) Draw and explain the architecture of 8259. 6M  
(OR)
9. Explain the following control words of 8251 12M  
i) mode instruction format  
ii) command instruction format

## **UNIT-V**

10. a) Explain the PIC microcontroller with neat diagram. 6M  
b) Illustrate the functions of TCON and TMOD registers. 6M  
(OR)
11. a) Explain the addressing modes of 8051 microcontroller with example. 5M  
b) Draw and explain the architecture of 8051 microcontroller. 7M



# AR13

**CODE: 13CS3016**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, July-2018**

**WEB TECHNOLOGIES  
(Common to CSE & IT)**

**Time: 3 Hours**

**Max Marks: 70**

## **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) How to declare an array variable in Java Script?  
b) Show syntax for output statement in Java Script.  
c) What is the syntax for defining an ordered list in HTML?  
d) Why Document Type Definition is needed for an XML file?  
e) Define a cookie.  
f) What are the different ways of session tracking?  
g) Name any two Web servers.  
h) What is the meaning of “implicit objects” in JSP?  
i) What is the use of a Prepared Statement class?  
j) What is the purpose of javax.sql.DataSource object

## **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

### **UNIT-I**

2. a) How web pages can be divided in to horizontal and vertical Frames? Explain the name and Target properties of a Frame Tag? **6M**  
b) Write a javascript to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Eg: If deposited amount is Rs.283, the output should be Hundreds=2, Fifties=1, Tens=3, Twos=1, ones=1) **6M**  
(OR)
3. a) Create a table using HTML tags with the following fields **6M**  
name, password, email-id, phone number, photo. Insert data in to the table such that the last field holds a picture.  
b) Define the purpose of a Cascading Style Sheet(CSS). List various categories of CSS and write the syntax for each of them. **6M**

### **UNIT-II**

4. a) How an XML file is internally stored in DOM. What are the DOM objects and methods used for XML file parsing? **6M**  
b) With an example explain the validation of an XML file using a Document Type Definition **6M**  
(OR)
5. a) How an XML file is internally stored in SAX model. What are the SAX objects and methods used for XML file parsing? **6M**  
b) With an example explain the validation of an XML file using an XML schema **6M**

# AR13

CODE: 13CS3016

SET-1

## UNIT-III

6. a) Write a short notes on JSP application design with MVC architecture **6M**  
b) Explain how JSPs are related to Servlets and write the advantages of JSPs over Servlets **6M**
- (OR)**
7. a) With a diagram explain the life cycle of a Servlet. **6M**  
b) What are the disadvantages of Servlets over JSPs **6M**

## UNIT-IV

8. a) How JSP allows sharing of data objects among the pages? **6M**  
b) What are the implicit objects used in JSP scripting? Explain them. **6M**
- (OR)**
9. a) Explain Error Handling and debugging in JSP with an example. **6M**  
b) List various types of JSP action elements and explain them in detail **6M**

## UNIT-V

10. a) Write a JSP program for the validation of user login details by accessing username and password from a database. **6M**  
b) Explain various categories of JDBC drivers. **6M**
- (OR)**
11. a) Write a JSP program to display the contents of a given table in a database. **6M**  
b) List and explain the classes related to javax.sql package **6M**