

Answer ONE Question from each Unit

All Questions Carry Equal Marks

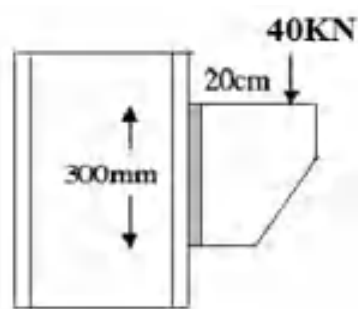
All parts of the Question must be answered at one place

**UNIT-I**

1. a) Write the advantages and disadvantages of steel as structural member. 5M
- b) A tie member of a roof truss consists of 2 ISA 100x75x8mm. 9M  
The angle are connected to either side of a 10mm gusset plates and the member is subjected to a working pull of 325kN. Design the welded connection. Assume connections are made in the workshop.

**(OR)**

2. a) With neat sketches explain different types of welds? 5M
- b) Determine the depth of the fillet weld required to join a plate bracket with flange of a stanchion as shown in figure. 9M  
(Load = 40 kN)

**UNIT-II**

3. Design a beam of effective span 6.0m and subjected to a bending moment of  $100.6 \times 10^6 \text{ Nmm}$ . The compression flange is laterally unsupported throughout. Check for deflections and shear. Assume  $f_y = 250 \text{ MPa}$  14M
4. Design a simply supported beam of span 5 m and it has to carry a factored UDL of 35kN/m (excluding the self-weight). The beam is laterally supported throughout. Use  $f_y = 250 \text{ MPa}$ . 14M

### **UNIT-III**

5. a) Explain the different modes of failure of tension members. 6M  
b) Design a tension member to carry a factored load of 340 kN. The two angles placed back to back with long legs out standing are desirable. The length of the member is 3.0m. 8M

**(OR)**

6. a) A column 3.9m long has to support a factored load of 6000 kN. The column is effectively held at both ends and restrained at one of the ends. Design the column using beam sections and plates. 10M  
b) Write the design considerations of columns. 4M

### **UNIT-IV**

7. A hand operated 60 kN overhead crane is provided in a workshop. The details are given below: Centre to centre between gantry girders = 15 m, Span of the gantry girder = 5.5 m, Weight of the crane = 45 kN, Wheel spacing = 3 m, Weight of the crab = 15 kN, Maximum edge distance = 1 m, Design a simply supported gantry girder, assuming the flange is laterally supported 14M

**(OR)**

8. Explain the design procedure of gantry girders. 14M

### **UNIT-V**

9. Design an 20m long simply supported welded plate girder carrying a uniformly distributed load of 50kN/m excluding self-weight and two concentrated loads of 250kN each at quarter points of the span. Assume that girder is laterally supported throughout. 14M

**(OR)**

10. Design steps for a a welded plate girder. 14M

# AR16

**CODE: 16EE3018**

**SET-2**

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

**III B.Tech II Semester Supplementary Examinations, July 2019**

**POWER SYSTEM ANALYSIS  
(Electrical and Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

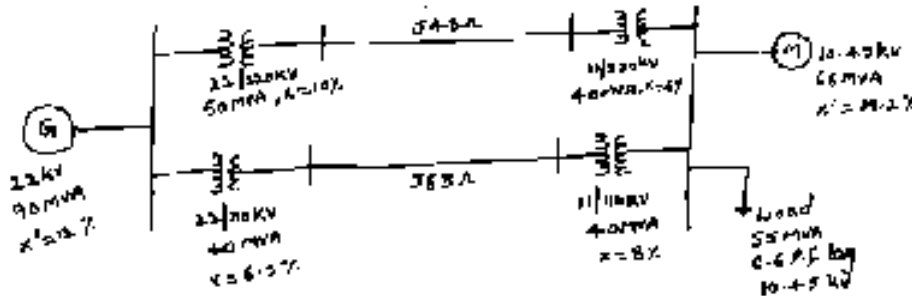
All parts of the Question must be answered at one place

## UNIT-I

1. Derive the expressions for obtaining the pu values of impedance, voltage, current and power from the fundamentals. 14M

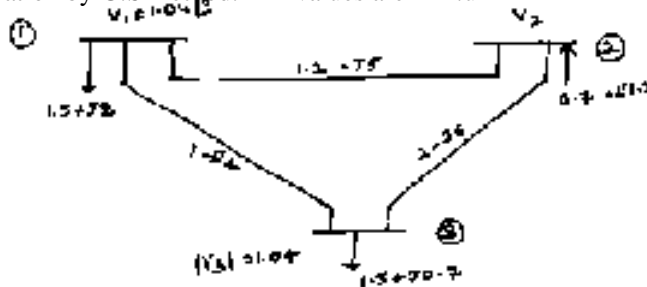
(OR)

2. Draw the P.u impedance diagram for the power system shown in the figure below 14M



## UNIT-II

3. A three bus system is shown in below figure. Calculate the bus 2 voltage at the end of first iteration by G.S method. All values are in P.u. 14M



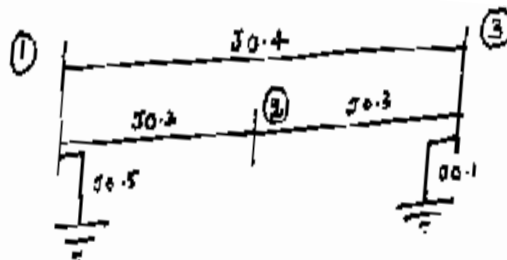
(OR)

4. Explain clearly the algorithmic steps for solving load flow equation using Newton – Raphson method (polar form) when the system contains all types of buses. Assume that the generators at the P-V buses have adequate Q Limits 14M

1 of 2

## UNIT-III

5. Form the bus impedance matrix of the system shown in below figure 14M



(OR)

6. The section bus-bars A and B are linked by a bus-bar reactor rated at 5000KVA with 10% reactance. On bus-bar A there are two generators each of 10000KVA with 10% reactance and on bus-bar B two generators each of 8000KVA with 12% reactance. Calculate the short circuit MVA fed into a dead short circuit between all phases on bus-bar section B with bus-bar reactor in the circuit 14M

**UNIT-IV**

7. a) Derive the an expression for the fault current for a Line-Ground fault on No-Loaded Alternator 7M  
b) Briefly discuss about significance of positive negative and zero sequence impedances of an alternator 7M

(OR)

8. a) In a power system it is observed that the magnitude of fault current for an L – G fault is 7.5 pu and for an L – L fault is 8.66 pu. If the pre – fault voltage at fault point is 1.0 pu, find the Z0 of the system 4M  
b) A 3 –  $\phi$  generator is rated 25 MVA, 13.2 kV and  $X_d'' = 0.2$  pu,  $X_2 = 0.03$  pu and  $X_0 = 0.10$  pu. The neutral is solidly grounded. A line – to – line fault occurs on phases B and C of the generator. Calculate 10M  
i)  $I_a$  in Amps      ii)  $I_b$  in Amps      iii)  $I_c$  in Amps

**UNIT-V**

9. Starting from first principle derive the swing equation of a synchronous machine 14M

(OR)

10. Describe the equal area criterion for transient stability analysis of a system 14M

# AR16

**CODE: 16ME3018**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, July 2019**

**DESIGN OF MACHINE MEMBERS – II**

**(Mechanical Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

1. a) Difference between the analysis of stresses in thin & thick cylinders 6M
- b) Derive a Clavarino's Equation for cylinders with closed end & made of ductile material 8M

**(OR)**

2. Design a piston for a single acting four-stroke engine for the following data. Fuel Consumption 0.15 kg/ brake power/hr, Indicated mean effective pressure of 0.75 N/mm<sup>2</sup>. The maximum gas pressure in the cylinder is 5 N/mm<sup>2</sup> at a speed of 2000 rpm. HCV of fuel = 42 x 10<sup>3</sup> KJ/kg, cylinder bore is 100 mm, stroke= 125mm. Assume any data required within limits. 14M

## UNIT-II

3. Design a connecting rod for the petrol engine from the following data  
Diameter = 110 mm; Mass of the reciprocating parts= 2 kg  
Length of the connecting rod=325mm; Stroke=150mm  
Speed=150 rpm with possible over speed upto 2500 rpm  
Compression ratio= 4:1 ; Maximum explosion pressure=205 MPa  
Assume any data missing 14M

**(OR)**

4. Design a plain carbon steel centre crankshaft for a single acting four stroke single cylinder engine for the following data: Bore = 400 mm ; Stroke = 600 mm ; Engine speed = 200 r.p.m. ; Mean effective pressure = 0.5 N/mm<sup>2</sup>; Maximum combustion pressure = 2.5 N/mm<sup>2</sup>; Weight of flywheel used as a pulley = 50 kN; Total belt pull = 6.5 kN. When the crank has turned through 35° from the top dead centre, the pressure on the piston is 1N/mm<sup>2</sup> and the torque on the crank is maximum. The ratio of the connecting rod length to the crank radius is 5. Assume any other data required for the design. 14M

### UNIT-III

5. a) Derive an expression for Length of Open belt drive. 6M  
b) A flat belt is required to transmit 30 kW from a pulley of 1.5 m effective diameter running at 300 r.p.m. The angle of contact is spread over  $\frac{11}{24}$  of the circumference. The coefficient of friction between the belt and pulley surface is 0.3. Determine, taking centrifugal tension into account, width of the belt required. It is given that the belt thickness is 9.5 mm, density of its material is 1100 kg / m<sup>3</sup> and the related permissible working stress is 2.5 MPa. 8M
- (OR)**
6. a) List out advantages of chain drives over the belt drives. 6M  
b) Design a chain drive to transmit power of 15KW from electric motor the speed of the motor shaft is 970r.p.m and compressor is to be run at 330r.p.m. compressor operates in 2 shafts the minimum Centre distance should be 550mm. design a suitable chain drive. 8M

### UNIT-IV

- 7 A gear drive required to transmit maximum power is 22.5KW. The velocity ratio is 1:2 and speed of pinion is 200r.p.m the applied Centre distance between the shafts is 600mm. the teeth has 20° step involute teeth profile. The static stresses for both the materials (gear & pinion) are 60Mpa. Face width is 10times the module. Find  
i. Module  
ii. Face width  
iii. No. of teeth on each gear and pinion  
Check the design for dynamic and wear load. The deformation or dynamic factor in Buckingham equation is 80 and material combination factor for the wear is 1.4. 14M
- (OR)**
8. a) Derive an expression for Strength of Helical Gear teeth. 6M  
b) With help of neat sketch, explain how an axial thrust is generated in a Helical gear. 8M

### UNIT-V

- 9 A single row deep groove ball bearing is subjected to a radial force of 8kN and a thrust force of 3KN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75mm and bearing No.6315 (C=112000N) is selected for this application. (i) Estimate the life of this bearing, with 90% reliability (ii) Estimate the reliability for 20000 hr life. 14M
- (OR)**
10. a) Differentiate sliding contact and roller contact bearings. 6M  
b) A ball bearing operates on the following work cycle:

Element No.	Radial load (N)	Speed (R.P.M.)	Element time (%)
1.	3000	720	30
2.	7000	1440	40
3.	5000	900	30

The dynamic load capacity of the bearing is 16,000 N. Determine expected life of the bearing 8M

# AR16

**CODE:** 16EC3019

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, July 2019**

**ANTENNA AND WAVE PROPAGATION  
(Electronics and Communication Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

1. A magnetic field strength of  $5\mu\text{A/m}$  is required at a point  $\theta = 14\pi/2$ , 2 km from an antenna in air. Neglecting ohmic loss, how much power must the antenna transmit if it is (i) A Hertzian dipole of  $\lambda/25$  (ii) A half-wave dipole (iii) A quarter-wave monopole

**(OR)**

2. a) What is Retarded vector Potential? 7M  
b) Prove the Reciprocity theorem for antennas. 7M

## UNIT-II

3. a) Obtain the expression for beam width of broadside and end fire arrays. 7M  
b) Explain the Principle of Pattern multiplication. 7M

**(OR)**

4. a) Find out null to null beam width of broadside array when array length  $10\lambda$  and number of elements=20 7M  
b) What are the various differences between binomial and linear arrays? 7M

## UNIT-III

5. a) What is meant by rhombic antenna? How it is constructed? How unidirectional pattern is obtained in properly terminated antenna? 7M  
b) For a 25 turn helix with  $\alpha = 12^\circ$  operating at 3GHz with circumference of 12 cm calculate the directivity and half power beam width. 7M

**(OR)**

6. With neat diagram explain yagi-uda antenna operation? What are the advantages and disadvantages of yagi-uda antenna. 14M

#### **UNIT-IV**

7. a) What is meant by corner reflector? give various forms of corner reflector? How passive corner reflectors differ from active corner reflector? 7M
- b) With the help of suitable diagram explain the measurement of radiation pattern of an antenna. 7M

**(OR)**

8. a) What is paraboloidal dish? Explain the principle of operation? 7M
- b) Explain the operation of Cassegrain feed. 7M

#### **UNIT-V**

9. a) What are the three modes of radio wave propagation and Derive the fundamental equation for free space propagation? 7M
- b) What are the different layers in Ionosphere and explain about ionosphere? 7M

**(OR)**

10. a) Obtain the relation between MUF and Skip distance. 7M
- b) Determine the minimum electron densities corresponding to critical frequencies of 2.5 MHz and 8.5MHz. 7M



# AR16

**CODE: 16CS3016**

**SET-2**

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

**III B.Tech II Semester Supplementary Examinations, July 2019**

**WEB TECHNOLOGIES**

**(Common to CSE & IT)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## **UNIT-I**

1. a) Create the following hybrid list using HTML List tags. 7M
- b) Define CSS. Explain in detail different types of CSS 7M with examples.

**(OR)**

2. a) Write the attributes of image <img> tag. How to 7M create an image hyperlink.
- b) What are the properties of CSS Link? Demonstrate 7M with necessary examples.

## **UNIT-II**

3. a) Write a JavaScript to read a number from the user and 7M prints all the even numbers between 1 to the given number.
- b) List the available objects in java script. Write the 7M properties and methods of the following JavaScript Objects.  
i) Document    ii) Form    iii) Window

**(OR)**

4. a) What is a function? Explain how parameters are 7M passed to a function in JavaScript
- b) What is AJAX? Explain the working process of AJAX 7M with a neat sketch.

### **UNIT-III**

5. a) What is Document Type Definition? What are the elements of DTD? Write a bookstore related XML file with a valid DTD. 7M
- b) Differentiate internal DTD and external DTd 7M
- (OR)**
6. a) Differentiate HTML and XML. 7M
- b) What is XML DOM? Explain in detail. 7M

### **UNIT-IV**

7. a) List different types of drivers available in JDBC. Explain any two drivers. 7M
- b) Explain the usage of init parameters in servlets using an example program. 7M
- (OR)**
8. a) Demonstrate how to read form data that reads user's name into servlet and greet with his/her name. 7M
- b) Explore the packages available in Servlet API. 7M

### **UNIT-V**

9. a) List any two advantages of JSP over Servlets. Explain the following with an example script.  
i) Scriptlet ii) Declaration iii) Expression 7M
- b) Write about implicit objects of JSP. 7M
- (OR)**
10. a) Explain the life cycle stages and methods of a jsp page with a neat sketch. 7M
- b) Write a jsp file to access a table data using JDBC Result Set interface. 7M

# AR13

**CODE: 13CE3016**

**SET-2**

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

**III B.Tech II Semester Supplementary Examinations, July 2019**

## **DESIGN OF STEEL STRUCTURES**

**(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) What is the permissible stress in butt weld?  
b) What is the equivalent stress when a fillet weld is subjected to direct shear and shear due to twisting moment?  
c) What is the difference between laterally supported beam and unsupported beam?  
d) What is the expression for slenderness ratio for web in case of web buckling?  
e) What are the failure modes of tension members?  
f) What is the radius of gyration?  
g) What are the surge loads in case of gantry girder?  
h) What is the deflection limit for gantry girders?  
i) Under what condition plate girder web will be subjected to shear buckling?  
j) What are two strength factors for web of a plate girder?

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. A tie member of a truss consists of double angle section, each 90X90X8mm welded on the opposite side of a 12 mm thick gusset plate. Design a fillet weld for making the connection in the workshop. The factored tensile force in the member is 300kN. a) when welding is done on two sides b) when welding is done on three sides.

**(OR)**

3. Design a column of effective length 5.90m. It is subjected to factored axial compressive load of 2000kN. Provide two channels back-to-back connected with battens by site welded connection. Use steel grade Fe 410.

#### **UNIT-II**

4. Design a steel beam section for supporting a big hall for the following data, factored  $BM_{max} = 348.25\text{kN-m}$ ;  $SF_{max} = 250\text{kN}$ ; Restriction on beam depth is 375mm; Serviceability criteria is ignored. The compression flange is restrained laterally throughout the span.

**(OR)**

5. a) Explain section classification with neat sketch.
- b) Find the plastic section  $Z_{px}$  and  $Z_{py}$  for ISMB 400 neglecting the fillets.

### **UNIT-III**

6. a) Explain the modes of failures of tension members with neat sketch when tension member (angle section) is connected to gusset plate.
- b) Find the net area of section shown in figure 2. Gusset is connected to ISA 200 X 150X 10 mm with M20 bolt and end distance, gauge and pitch 40mm is 50mm 60 mm respectively.

**(OR)**

7. Design a suitable column splice for column section ISHB300@577N/m. It is carrying a factored loads axial 560kN, moment of 40kN-m and shear 50kN. Assume ends are milled. Use welded splice.

### **UNIT-IV**

8. Find out the maximum bending moment and shear force in the gantry girder which carries an electric overhead traveling crane with following data.

Crane capacity = 180 kN, Weight of crane excluding crab = 100kN, Weight of Crab = 40 kN, Span of crane between rails = 12m, Wheel base = 3.0m, minimum hook approach = 1m,

Span of gantry girder = 8m, weight of rail section = 30 kg/m

Check whether ISMB 600 with ISMC 350 on compression flange is adequate to

(i) Fatigue strength (ii) deflection and (iii) In buckling resistance

**(OR)**

9. Explain the design procedure of gantry girders.

### **UNIT-V**

10. a) Design a welded plate girder for simply supported bridge deck beam with an effective span of 18 m. It carries a UDL of 50 kN/m, excluding self weight. Assume that the compressive flange of the beam is restrained against lateral bending, and prevented from rotating. Use mild steel with  $f_y = 250$  MPa.
- b) How the optimum girder depth of a plate girder is derived?

**(OR)**

11. Design steps for a a welded plate girder.

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

1. a) Define basic size, deviation, upper and lower limit of size
- b) Differentiate between shaft based and hole based systems
- c) Mention the various standards of linear measurement
- d) Define GO-gauge and NO GO-gauge
- e) What is the significance of optical projector
- f) List out the instruments used for flat surface measurement.
- g) Define flaws and roughness width
- h) Mention the geometrical characteristics of a surface.
- i) Enumerate various screw thread parameters for metrological measurement
- j) What are the uses of CMM.

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

2. a) Bring out the salient features of British standard and ISO systems of limits and fits 6M
  - b) Explain the need for providing tolerance on a dimension 6M
- (OR)**
3. a) Determine and sketch the limits of tolerance and allowance for a 42 mm shaft and hole pair designated as H 8 - g10. The basic size lies in the range of 30 – 50 mm. The multipliers for grades 8 and 10 are 25 and 64 respectively. The fundamental deviation for g shaft is  $(- 2.5 D^{0.34})$  microns. The standard tolerance unit is  $i = 0.45 (D)^{1/3} + 0.001D$  in microns 6M
  - b) Differentiate between unilateral and bilateral tolerance with examples 6M

**UNIT-II**

4. a) Explain angle measurement using sine bar with suitable sketch. 6M
- b) Explain the method of calibration of slip gauges 6M

**(OR)**

5. a) Explain with neat sketch, the construction and uses of Vernier bevel protractor 6M  
b) What are limit gauges? Sketch and explain any two types of limit gauges 6M

### **UNIT-III**

6. Explain advantages and disadvantages of optical flats in flat surface measurement. 12M

**(OR)**

7. Explain working principle of interferometer and state its advantages. 12M

### **UNIT-IV**

8. The heights of peaks and valleys of 20 successive points on a surface are 35, 25, 40, 22, 37, 19, 41, 21, 42, 18, 42, 24, 44, 25, 40, 18, 40, 18, 39, and 21 microns respectively, measured over a length 20mm. Determine CLA and RMS values of roughness surface 12M

**(OR)**

9. a) Explain the difference between electronic and pneumatic comparators. 6M  
b) Explain following methods of specifying roughness value: 6M  
i) Peak-to-valley height method ii) Centre-line-average method iii) Root mean square method

### **UNIT-V**

10. a) Describe with neat sketches two wire method of measuring the effective diameter of a screw threads 6M  
b) Discuss on angle of thread, thread pitch, and profile thread gauges 6M

**(OR)**

11. Explain with suitable sketches the various alignment tests performed on Milling machine 12M

# AR13

**CODE: 13CS3016**

**SET-2**

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

**III B.Tech II Semester Supplementary Examinations, July 2019**

## **WEB TECHNOLOGIES (Computer Science & Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) Differentiate between HTML and XHTML.  
b) What are the advantages of using CSS?  
c) Differentiate between DTD and Schema.  
d) What is DOM?  
e) Why use JSP?  
f) Differentiate HTTPServlet and GenericServlet.  
g) Define Cookie.  
h) How to read form data using JSP?  
i) Which type driver is a pure Java library that translates JDBC requests directly to database - specific protocol?  
j) Define sessions.

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. a) Create a simple HTML page which demonstrates the use of various types of lists and explain each with suitable example 6 M  
b) Explain the following tags in detail with example 6 M  
i) Tables ii) Frames
- (OR)**
3. a) Describe the different ways that CSS styles can be added to a page. 6 M  
b) What are the advantages javascript? And write javascript program to validate login page. 6 M

## **UNIT-II**

4. a) Discuss in detail about internal DTD and external DTD. 6 M  
b) Define an XML Schema. Show how an XML schema can be created. 6 M

**(OR)**

5. a) Explain in detail about DOM parser with example. 6 M  
b) Explain in detail about SAX parser with example. 6 M

## **UNIT-III**

6. a) What is a Servlet? Explain Servlet life cycle methods. 6 M  
b) How to design JSP application with MVC. 6 M

**(OR)**

7. a) Explain in detail about directive, action and scripting JSP elements. 6 M  
b) Write a Servlet application to validate user login details using HTTPServlet (name and password) 6 M

## **UNIT-IV**

8. a) What are the implicit JSP objects? 6 M  
b) Explain about scripting elements. 6 M

**(OR)**

9. a) Explain Error Handling and debugging with an example. 6 M  
b) Demonstrate users passing control between pages. 6 M

## **UNIT-V**

10. a) Explain about JDBC Driver types. 6 M  
b) Discuss in detail about JDBC architecture. 6 M

**(OR)**

11. a) Write the JDBC program to insert a record and retrieve multiple records from database. 6 M  
b) Explain in detail about javax.sql package. 6 M