

## (CIVIL ENGINEERING)

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	Design a fillet welded joint to join two plates each of thickness 10 mm and 250 mm width for 100% efficiency. (Take $f_y = 250$ MPa)	10	1	3
<b>(OR)</b>				
2.	Two plates of thickness 12 mm and 10 mm are to be jointed by a groove weld. The joint is subjected to a factored tensile force of 275kN. Assuming an effective length of 150 mm, check the safety of the joint for (i) Single V groove weld joint and (ii) Double V groove weld joint. Assume Fe 410 grade steel plates and that the welds are shop welded.	10	1	2
<b><u>UNIT-II</u></b>				
3.	The rolled steel beams are provided in a hall at 3.5 m c/c on an effective span of 5m. The beam support a RCC slab of 100 mm thick, the live load on the slab is $2 \text{ kN/m}^2$ and floor finish is $1 \text{ kN/m}^2$ , if the compression flange of beam is laterally restrained $f_y=250 \text{ N/mm}^2$ .	10	2	4
<b>(OR)</b>				
4.	Design a simply supported beam of 6 m effective span, carrying a uniformly distributed load of $25 \text{ kN/m}$ over entire length, if compression flange is laterally unsupported.	10	2	4
<b><u>UNIT-III</u></b>				
5.	Design a suitable double angle section to carry a factored tensile load of 450 kN. The length of the member is 2.9m. Use M20 bolts of 4.6 grade. The grade of steel is Fe410.	10	3	4
<b>(OR)</b>				
6.	A channel section is required to be welded to a 10 mm thick gusset plate. The channel is required to carry a factored tensile load of 750 kN. Compute the tensile strength of the section.	10	3	4
<b><u>UNIT-IV</u></b>				
7.	A column in building is 3.35 m long with both ends restrained in position and direction both along z-z and y-y axis. The column is required to carry a load of 2080 kN. Design the column section.	10	4	4
<b>(OR)</b>				
8.	Design a built up column 9 m long to carry a factored axial compressive load of 1200 kN. The column is restrained in position but not in direction at both the ends. Design the column with connecting system as battens with bolted connections. Use two channel sections back to back. Use steel of grade Fe410. Assume any missing data. Draw to scale the cross section and longitudinal section.	10	4	4

### **UNIT-V**

9. Design a simply supported crane girder to carry an electric overhead travelling crane for the following data: Crane capacity is 250 kN. Weight of the crane and crab is 300 kN. Weight of the crane is 200 kN. Minimum hook approach is 1.3m. centre to centre distance between wheels is 3.2m. span of the girder is 5m. Centre to centre distance between gantries is 15m. Weight of rail is 300 N/m. Height of rails is 75mm. Yield stress of steel is 250 MPa. Assume any missing data. Draw to scale the cross section and longitudinal section.

**(OR)**

10. Design an I-section purlin for an industrial building to support a galvanized corrugated iron sheet given spacing of the trusses=6 m, Inclination of the main rafter= 30°, Spacing of purlins=1.5 m, Weight of corrugated sheeting = 120 N/m<sup>2</sup>, Live load = 0.4 kN/m<sup>2</sup>, Wind load = 1.5 kN/m<sup>2</sup>, suction, Yield stress in steel = 250 MPa.

### **UNIT-VI**

11. Design a welded plate girder of span 24m to carry on superimposed load of 35 kN/m. Avoid use of bearing and intermediate stiffeners. Use Fe 415 steel. Draw the cross section and longitudinal section of the plate girder.

**(OR)**

12. Design a welded plate girder subjected to a maximum factored moment of 3500 kNm and a factored shear force of 600 kN. Find the plate girder with intermediate stiffener only. Draw the cross section and longitudinal section of the plate girder.

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		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	a) What is the need of scripting languages in web Technologies.	5M	CO1	L1
	b) Explain the structure of the HTML webpage with an example	5M	CO1	L2
<b>(OR)</b>				
2.	a) Discuss different types of CSS with examples?	5M	CO1	L2
	b) Explain the Box Model and Conflict Resolution in CSS?	5M	CO1	L1
<b><u>UNIT-II</u></b>				
3.	a) Explain about Function definition, Function calling, Function parameter, return type with a suitable example in JavaScript.	5M	CO2	L1
	b) Design A JavaScript to display whether a given number is prime or not.	5M	CO2	L5
<b>(OR)</b>				
4.	a) Discuss the importance of Expression in AngularJS	5M	CO2	L2
	b) Illustrate Conditional statements in JAVA script with example programs?	5M	CO2	L2
<b><u>UNIT-III</u></b>				
5.	a) What is XML Element? Explain various rules while writing XML	5M	CO3	L1
	b) Illustrate the concept of XML Schemas	5M	CO3	L2
<b>(OR)</b>				
6.	a) Define DTD and Discuss Different types of DTD?	5M	CO3	L1
	b) Explain the Parsers DOM and SAX in detail?	5M	CO3	L2
<b><u>UNIT-IV</u></b>				
7.	a) Illustrate Architecture of JDBC Drivers?	5M	CO4	L2
	b) Demonstrate about javax.sql package in detail	5M	CO4	L3
<b>(OR)</b>				
8.	a) Discuss Steps to connect java to database management systems?	5M	CO4	L2
	b) Demonstrate types of JDBC Drivers?	5M	CO4	L3
<b><u>UNIT-V</u></b>				
9.	a) write servlet program to illustrate Http Session	5M	CO5	L5
	b) How to Read Parameters in servlet with proper syntax and example?	5M	CO5	L3
<b>(OR)</b>				
10.	a) Write Servlet application to print current date & time	5M	CO5	L5
	b) Explain about the Lifecycle of a Servlet?	5M	CO5	L2
<b><u>UNIT-VI</u></b>				
11.	a) Explain about the JSP directive Elements. Explain each of them in detail.	5M	CO6	L2
	b) Write a JSP program to perform addition and subtraction.	5M	CO6	L5
<b>(OR)</b>				
12.	a) Discuss about Implicit Objects in JSP?	5M	CO6	L2
	b) Explain about JSP Actions, JSTL?	5M	CO6	L2

**Time: 3 Hours****Max Marks: 60**

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		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	a) Determine the impulse response $h(n)$ for the system described by second order difference equation $y(n)-(1/6)y(n-1)-(1/6)y(n-2)=x(n)$	6	CO1	L3
	b) Check whether the given systems are Linear or not. i) $y(n)=x^2(n)$ ii) $y(n)=n x(n)$	4	CO1	L3
<b>(OR)</b>				
2.	a) Find the frequency response and sketch the magnitude and phase response of $y(n)=\frac{1}{2}[x(n)+x(n-2)]$	6	CO1	L3
	b) Explain different types of discrete time signals with example	4	CO1	L2
<b><u>UNIT-II</u></b>				
3.	a) Find DFT of sequence of $x(n) = \{1,0,1,0,1,1,0,0\}$	6	CO2	L3
	b) Write the differences between Linear and circular convolution	4	CO2	L2
<b>(OR)</b>				
4.	a) State and prove the Linearity and Time reversal properties of DFT.	6	CO2	L2
	b) Find the circular convolution of two sequences $x_1(n) = \{1,2,1\}$ and $x_2(n) = \{-1,1,0\}$ .	4	CO2	L3
<b><u>UNIT-III</u></b>				
5.	a) Compute the 8-point DFT for the sequence $x(n)=\{1,2,3,4,4,3,2,1\}$ using Radix-2 DIT FFT algorithm	6	CO3	L3
	b) Write the summary steps of radix-2 DIF-FFT algorithm.	4	CO3	L2
<b>(OR)</b>				
6.	a) Write the differences between DIT and DIF algorithms	4	CO3	L2
	b) Compute the 8-point IDFT for the sequence $X(k)=\{7,-0.707-j0.707,-j,0.707-j0.707,1,0.707+j0.707,j,-0.707+j0.707\}$ using Radix-2 DIF FFT algorithm	6	CO3	L3
<b><u>UNIT-IV</u></b>				
7.	a) Design an analog Chebyshev filter that has $\alpha_p = 2.5\text{dB}$ , $\alpha_s = 30\text{dB}$ , $\Omega_p = 20\text{ rad/sec}$ ; $\Omega_s = 50\text{ rad/sec}$ .	6	CO4	L4
	b) For the given specification $\alpha_p=-2\text{dB}$ , $\alpha_s=-10\text{dB}$ , $\Omega_p=20\text{ rad/sec}$ ; $\Omega_s=30\text{ rad/sec}$ Find the cut off frequency of Butter worth filter.	4	CO4	L3
<b>(OR)</b>				
8.	a) Design a Digital Butterworth filter using impulse variance method for the given specification, $0.8 \leq  H(e^{j\omega})  \leq 1$ for $0 \leq \Omega \leq 0.2\pi$ and $ H(e^{j\omega})  \leq 0.2$ for $0.6\pi \leq \Omega \leq \pi$ .	6	CO4	L4
	b) Determine the direct form-II realization for the following system $y(n)=-0.1y(n-1)+0.72y(n-2)+0.7x(n)-0.252x(n-2)$	4	CO4	L3

### UNIT-V

9. a) Obtain an ideal low pass filter with a frequency response  $H_d(w) = 1$  for  $-\pi/2 \leq w \leq \pi/2$  and 0 for  $\pi/2 \leq |w| \leq \pi$ . Find the values of  $h(n)$  for  $N=5$  find  $H(z)$  using rectangular window. 6 CO5 L3
- b) Prove that FIR filter will have constant group and phase delay when the impulse response is symmetrical about  $\alpha=(N-1)/2$ . 4 CO5 L3
- (OR)
10. a) Realize the system function  $H(z) = \frac{1}{2} + \frac{1}{3}z^{-1} + z^{-2} + \frac{1}{4}z^{-3} + z^{-4} + \frac{1}{3}z^{-5} + \frac{1}{2}z^{-6}$  using direct form. 4 CO5 L3
- b) Obtain an ideal High pass filter with a frequency response  $H_d(w) = 1$  for  $\pi/4 \leq |w| \leq \pi$  and 0 for  $|w| < \pi/4$ , Find the values of  $h(n)$  for  $N=5$ , find  $H(z)$  using Hamming window. 6 CO5 L3

### UNIT-VI

11. a) What is function of on-chip peripherals? Briefly explain any three on-chip peripherals. 6 CO6 L2
- b) Explain function of different registers used in TMS320C54XX DSP Processor. 4 CO6 L2
- (OR)
12. a) Explain the special addressing modes in TMS320C54XX DSP Processor. 5 CO6 L2
- b) Explain techniques to improve speed of DSP processor. 5 CO6 L2

**Power System Analysis**  
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

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**UNIT-I**Marks CO Blooms  
Level

1. Find out the Y matrix of the sample power system as shown in fig.

10 CO1 L3

Data for this system is given in table.

Bus Code Impedance Line Charging admittance

1-2 0.02+j0.06 j0.03

1-3 0.08+j0.24 j0.025

2-3 0.06+j0.18 j0.02

(OR)

2. Draw the reactance diagram for the power system shown in figure.

10 CO1 L3

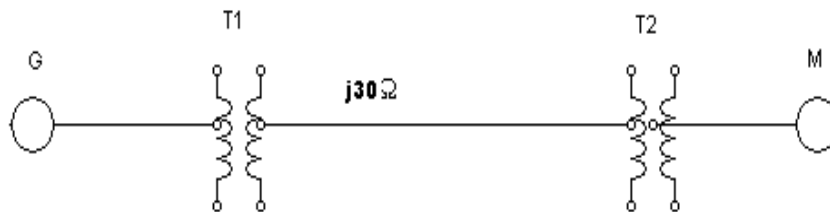
Use a base of 50MVA 230 kV in 30  $\Omega$  line. The ratings of the

generator, motor and transformers are

Generator = 20 MVA, 20 kV, X=20%

Motor = 35 MVA, 13.2 kV, X=25%

T1 = 25 MVA, 18/230 kV (Y/Y), X=10%

T2 = 45 MVA, 230/13.8 kV (Y/ $\Delta$ ), X=15%**UNIT-II**

3. Explain the need for load flow study? Derive the static load flow equations of n-Bus system.

10 CO2 L2

(OR)

4. Explain bus incidence matrix? What is bus admittance matrix? Mention the advantages of bus admittance matrix, Ybus

10 CO2 L2

**UNIT-III**

5. With a neat flow chart, explain the computational procedure for load flow solution using Newton Raphson method when the system contains all types of buses

10 CO3 L2

(OR)

6. Write the equations to calculate Slack bus power, Transmission losses and Line flows.

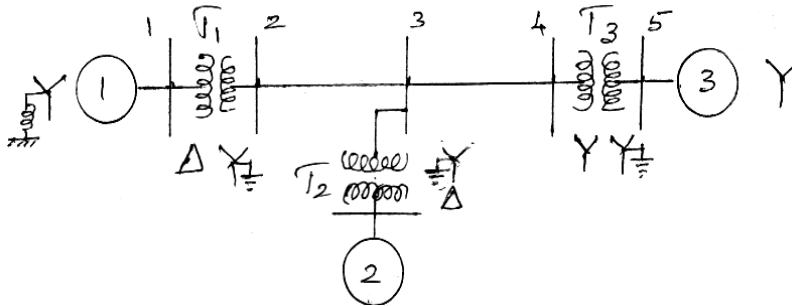
10 CO3 L2

## UNIT-IV

7. Explain the step by step procedure for systematic fault analysis using bus impedance matrix. 10 CO4 L2

(OR)

8. 10 CO4 L3



The following are the p.u. reactances of different elements on a common base

Generator 1:  $X_{g0} = 0.075$ ;  $X_n = 0.075$ ;  $X_1 = X_2 = 0.25$

Generator 2:  $X_{g0} = 0.15$ ;  $X_n = 0.15$ ;  $X_1 = X_2 = 0.2$

Generator 3:  $X_{g0} = 0.072$ ;  $X_1 = X_2 = 0.15$

Transformer 1:  $X_0 = X_1 = X_2 = 0.12$

Transformer 2:  $X_0 = X_1 = X_2 = 0.24$

Transformer 3:  $X_0 = X_1 = X_2 = 0.1276$

Transmission line 2—3:  $X_0 = 0.5671$ ;  $X_1 = X_2 = 0.18$

Transmission line 3—5:  $X_0 = 0.4764$ ;  $X_1 = X_2 = 0.12$

Prepare the three sequence networks and determine reactances  $Z_{bus0}$ ,  $Z_{bus1}$  and  $Z_{bus2}$ .

## UNIT-V

9. Derive the expression for fault current in line to line fault on unloaded generator. Draw an equivalent network showing the inter connection of networks to simulate double line to line fault. 10 CO5 L2

(OR)

10. A 30 MVA, 11 Kv generator has  $Z_1 = Z_2 = j0.05$ . A line to Ground fault occurs at generator terminals. Find the fault current and line voltages during fault conditions. Assume that the generator neutral is solidly grounded and the generator is operating at no load and at rated voltage during occurrence of fault 10 CO5 L3

## UNIT-VI

11. A 50 Hz, 500 MVA, 400 KV generators (with transformer) is connected to a 400 KV infinite bus bar through an interconnector. The generator has  $H = 2.5$  MJ/MVA, Voltage behind transient reactance of 450 KV and is loaded 460 MW. The transfer reactance between generator and bus bar under various conditions are:  
Prefault 0.5 Pu ; During Fault 1.0 Pu ; Post fault 0.75 Pu  
Calculate the swing curve using intervals of 0.05 sec and assuming that the fault is cleared at 0.15 sec. 10 CO6 L3

(OR)

12. Discuss the method by which transient stability can be improved. What are the numerical integration methods of power system stability 10 CO6 L2

Time: 3 Hours

Max Marks: 60

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- |   | <u>UNIT-I</u>   | Marks | CO | Blooms Level  |
|---|-----------------|-------|----|---------------|
| 1. Explain the factors determining demand for a product<br>(OR)   |                 | 10    | 1  | Understanding |
| 2. Define Elasticity of Demand and explain the Types of Elasticity of demand  |                 | 10    | 1  | Understanding |
|   | <u>UNIT-II</u>  |       |    |               |
| 3. Describe the various factors involved in Demand forecasting of a product<br>(OR)   |                 | 10    | 2  | Understanding |
| 4. a What is test marketing? Why is it preferred by marketing managers?   |                 | 5     | 2  | Understanding |
| b Discuss Survey methods  |                 | 5     | 2  | Understanding |
|   | <u>UNIT-III</u> |       |    |               |
| 5. State and explain the theory of law of variable proportions.<br>(OR)   |                 | 10    | 3  | Applying      |
| 6. Discuss the Breakeven point with graphical representation  |                 | 10    | 3  | Understanding |
|   | <u>UNIT-IV</u>  |       |    |               |
| 7. Define perfect competition. Explain the price and output determination under perfect competition market.<br>(OR)   |                 | 10    | 4  | Understanding |
| 8. a What is Monopolistic competition? State its features.  |                 | 5     | 4  | Understanding |
| b Distinguish monopoly and perfect competition  |                 | 5     | 4  | Understanding |
|   | <u>UNIT-V</u>   |       |    |               |
| 9. Define Capital. How is it classified? What factors influence the volume of working capital needed by an organization?<br>(OR)  |                 | 10    | 5  | Understanding |
| 10. A company is considering purchase of a new machine. Two alternatives (Machine A and machine B) have been suggested, each having an initial cost of Rs.4,00,000. The annual cash flow at the end of each year for the next 5 years are as follows: |                 | 10    | 5  | Applying      |

year	Machine A	Machine B
	Rs.	Rs.
1	40,000	1,20,000
2	1,20,000	1,60,000
3	1,60,000	2,00,000
4	2,40,000	1,20,000
5	1,60,000	80,000

The company has a target return of 10% on its investment. Compare the two projects and suggest which project one should opt for with using NPV.

- |   | <u>UNIT-VI</u> | Marks | CO | Blooms Level  |
|---|----------------|-------|----|---------------|
| 11. Explain various Accounting concepts and Conventions which are widely accepted.<br>(OR)                        |                | 10    | 6  | Understanding |
| 12. a What do you understand by Double Entry System of book-keeping?  |                | 5     | 6  | Understanding |
| b Identify the Ratios that are used to find the soundness and strength of long-term financial position of a firm. |                | 5     | 6  | Understanding |



# AR18

**CODE: 18MET313**

**SET-2**

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

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**CAD/CAM  
(MECHANICAL ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

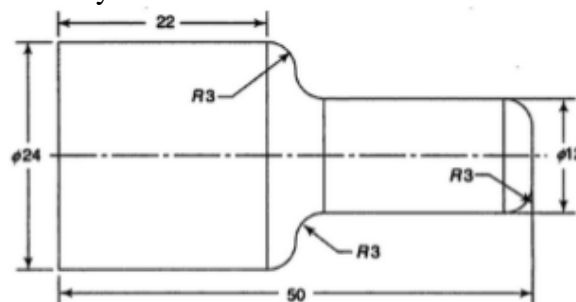
1. a) State the functions of an interactive computer graphics in CAD/CAM? 6M  
b) Explain about the following 3D transformations: 6M  
(i) Translation (ii) Rotation (iii) Scaling  
(OR)
2. a) Discuss the benefit of CAD/CAM. 4M  
b) Explain CAD/CAM product life cycle? 8M

## UNIT-II

3. a) Define the cubic spline and Bezier curves? 6M  
b) Explain the Constructive Solid Geometry (CSG) method to create models? 6M  
(OR)
4. a) Explain Bezier curve with a neat sketch. Explain its advantages and limitations. 6M  
b) Find the degree of Bezier curve controlled by three points (4, 2), (0, 0) and (2, 8). Also find the equation of the Bezier curve in parametric format with parameter "u"? 6M

## UNIT-III

5. a) Explain the difference between CNC and DNC along with neat sketches. 6M  
b) Write NC part program for the part shown in the below shown in figure. All the dimensions are in mm only. 6M



(OR)

6. a) List out and Explain about basic components of an NC system and CNC system? 6M  
b) Differentiate Manual part programming and Computer assisted part programming? 6M

#### **UNIT-IV**

7. a) What is group technology? When is it suitable in manufacturing? What are its benefits? 6M
- b) What is CAPP? Explain the any one type of Capp with neat sketches. 6M

**(OR)**

8. a) What is a part family? Explain various methods of part formation? 6M
- b) Explain the Retrieval type system with neat sketch and explain the Benefits of CAPP? 6M

#### **UNIT-V**

9. a) Define FMS and state applications of FMS? 6M
- b) Discuss the following types of layouts in the design of FMS:  
(i) Circular layer (ii) Linear layers (iii) Loop layers 6M

**(OR)**

10. a) Draw the FMS layout and explain the function of each component of FMS. 6M
- b) Describe the Scheduling and Dispatching issues related to FMS (Flexible Manufacturing System). 6M

# AR18

**CODE: 18EET315**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**POWER SYSTEM ANALYSIS  
(ELECTRICAL AND ELECTRONICS ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 60**

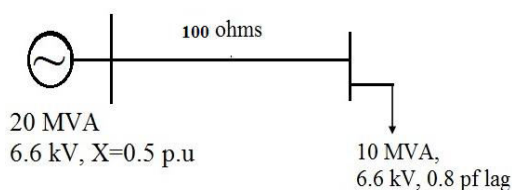
Answer ONE Question from each Unit

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**UNIT-I**

1. a) Discuss in detail about impedance diagram. 4M  
b) Develop p.u reactance diagram for the network shown in the following figure.



**(OR)**

2. a) Write the step by step method for obtaining Y-bus matrix using direct inspection method. 6M  
b) The primary and secondary reactances of a 3-phase  $\Delta$ -Y transformer with 20 kVA, 11kV/440V are  $20\Omega$ /phase and  $1\Omega$ /phase respectively. Determine the p.u reactance of the transformer from secondary side of the transformer. 6M

**UNIT-II**

3. For the following three bus power system Find the voltage values upto one iteration of Load flow solution by Gauss Seidel method.

Bus 1 : Slack Bus,  $V_1 = 1.05 \angle 0^\circ$  p.u

Bus 2 : PV bus,  $1.02 + j 0.0$ ,  $P_g = 2$  p.u

Bus 3 : PQ bus,  $P_L = 4$  p.u,  $Q_L = 1.5$  p.u

Bus code	Impedance
1-2	$j 0.4$
1-3	$j 0.25$
2-3	$j 0.35$

**(OR)**

4. a) Explain Gauss-Seidel algorithm with neat flow diagram. 6M  
b) List the assumptions for Decoupled-Loadflow and Fast Decoupled-Loadflow methods. 6M

**UNIT-III**

5. a) Write the four types of modifications required in building Z-bus matrix with necessary expressions. 8M  
b) Discuss about symmetrical fault analysis using Z-bus 4M

**(OR)**

6. An alternator and synchronous motor each rated for 50 MVA, 13.2 kV having subtransient reactance of 20% are connected through a transmission link of reactance 10% on the base of machine ratings. The motor acts as a load of 30MW at 0.8 pf lead and terminal voltage 12.5 kV when a 3-ph fault takes place at the motor terminals. Determine the sub transient current in the alternator the motor and the fault. 12M

#### **UNIT-IV**

7. a) Derive the expressions for symmetrical components in terms of unbalanced phase voltages. 6M  
 b) The line currents in amperes in phases in A,B and C respectively are  $50+j20$ ,  $10-j50$  and  $-20+j60$ . Find the symmetrical component of currents. 6M
- (OR)**
8. a) Derive the expression for fault current for the line to line fault at the terminals of an unloaded alternator when the neutral is grounded. 6M  
 b) A 3-Ph 13.2 kV, 30 MVA generator with  $X_0=0.1$  p.u,  $X_1=X_2=0.2$  p.u is solidly grounded. Determine the fault current for a LG fault. 6M

#### **UNIT-V**

9. Derive the expression for swing equation from the fundamentals 12M
- (OR)**
10. Explain the traditional and modern methods of improving transient stability 12M

# AR18

**CODE: 18ECT316**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**DIGITAL SIGNAL PROCESSING  
(ELECTRONICS AND COMMUNICATION ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

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## UNIT-I

1. a) Consider a discrete – time system with input  $x(n)$  and output  $y(n)$  related by 6M  
$$y(n) = \sum_{k=n-n_0}^{n+n_0} x(k).$$
 Where  $n_0$  is a finite positive integer.  
(i) Is this system linear?  
(ii) Is this system time-invariant?
- b) State and prove the final value theorem of Z-Transform 6M  
**(OR)**
2. a) State and prove the conditions for causality & stability of an LTI system. 6M  
b) Write the properties of Z transform. 6M

## UNIT-II

3. a) Derive the expression for Discrete Fourier Series Coefficients of a periodic signal  $x(n)$ . 6M  
b) Evaluate the Discrete Time Fourier Transform (DTFT) of a sequence 6M  
$$x(n) = 1; 0 \leq n \leq 5$$
  
$$= 0; \text{ elsewhere}$$
  
**(OR)**
4. a) Find DFT of (1,1,1,1) properties solve the following. 6M  
b) Develop an 8-point FFT algorithm. Draw the signal flow graph. Determine the DFT of the following sequence,  $x(n) = \{1, 1, 1, 0, 0, 1, 1, 1\}$  6M

## UNIT-III

5. a) Compare IIR and FIR filters 4M  
b) Realize system with following difference equation 8M  
$$y(n) = (3/4) y(n-1) - (1/8) y(n-2) + x(n) + (1/3)x(n-1).$$
  
(a) cascade form (b) Parallel form  
**(OR)**
6. a) Using a rectangular window, design as LPF with a pass-band gain of unity, cut-off frequency of 1000Hz, and working at a sampling frequency of 5KHz. Take the length of the impulse response as 7. 8M  
b) Write the transfer function representation of Digital Filters 4M

#### **UNIT-IV**

7. Explain about Wiener smoothing and prediction filters 12M

**(OR)**

8. a) Write the Normal equations for linear prediction filtering. 6M  
b) What is LMS adaptive filter? Why we use Why LMS adaptive algorithm compared to other algorithms? Write the different applications of LMS adaptive algorithm? 6M

#### **UNIT-V**

9. a) Explain the various addressing modes of TMS320C54XX DSP processor. 8M  
b) Explain the MAC unit and Pipelining concepts in detail. 4M

**(OR)**

10. a) Explain special addressing modes and advantages of DSP processors. 6M  
b) Explain about Memory access schemes in DSP processor. 6M

2 of 2

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# AR18

**CODE: 18CSE324**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**Cryptography and Network Security  
(Professional Elective – II)  
(Common to CSE & IT Branches)**

**Time: 3 Hours**

**Max Marks: 60**

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) Explain the following terminologies, 6M  
(i) Authentication, (ii) Digital signature, (iii) non-repudiation,  
(iv) Access control, and (v) Confidentiality and (vi) Private  
key.
- b) What will be the ciphered text if the string “SANFOUNDRY” 6M  
is given as input to the code of playfair cipher with keyword  
as “SANTOSH” (assuming j is combined with i)? Explain the  
steps involved.

**(OR)**

2. a) Create the playfair matrix using the keyword “monarchy” 6M  
and find the ciphertext for the plaintext “balloon”. Explain  
the steps involved
- b) For hill cipher the key is  $\begin{pmatrix} 5 & 8 \\ 17 & 3 \end{pmatrix}$ , encrypt the plaintext 6M  
“he”. Furthermore, decrypt the obtained ciphertext to plain  
text.

## **UNIT-II**

3. a) Compare between DES and AES algorithms. 6M
- b) Explain the encryption operation of DES algorithm with a 6M  
neat diagram. Analyse the avalanche effect it.

**(OR)**

4. a) Explain the block cipher design principles. 6M
- b) Explain Encrypt-Decrypt-Encrypt operation in the triple DES. 6M  
How it is more secure than DES. If we use Encrypt-Encrypt-  
Encrypt what is the difference.

### **UNIT-III**

5. a) Explain public key cryptography. Compare it with Distinguish between symmetric key cryptography. 6M  
b) Explain with a single diagram how public key cryptography can be used for both confidentiality and authentication 6M  
(OR)
6. a) Write the steps in Diffie-Hellman key exchange algorithm. 6M  
b) Compare Kerberos version '4' with version '5'. 6M

### **UNIT-IV**

7. a) Describe PGP cryptographic functions. 6M  
b) Write the limitations of SMTP. 6M  
(OR)
8. a) Explain Cryptographic Keys of PGP. 6M  
b) Describe MIME Content Types in detail. 6M

### **UNIT-V**

9. a) Explain the parameters used in Session State and Connection State. 6M  
b) What are the counter measures for Viruses? 6M  
(OR)
10. a) Explain the services provided by SSL Record Protocol in detail. 6M  
b) What are the design principles of Firewalls? 6M



# AR18

**CODE: 18CET317**

**SET-1**

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

**III B.Tech II Semester Supplementary Examinations, August, 2023**

**Basic Design of Steel Structures  
(CIVIL ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 60**

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. Explain failures in bolted connections with neat sketches. (12M)  
(OR)
2. A tie member of a roof truss consists of 2 ISA 10075, 8mm. The angles are connected to either side of a 10mm gusset plates and the member is subjected to a working pull of 300kN. Design the welded connection. Assume connections are made in the workshop. (12M)

## UNIT-II

3. Design a beam of effective span 6.0m and subjected to a bending moment of  $105.3 \times 10^6$  Nmm. The compression flange is laterally supported throughout. Check for deflections and shear. Assume  $f_y = 250$  MPa. (12M)  
(OR)
4. Determine the design bending strength of ISLB 350 @ 486 N/m considering the beam to be (a) laterally supported (b) laterally unsupported  
The design shear force  $V$  is less than the design shear strength. The unsupported length of the beam is 3.0 m. Assume steel of grade Fe 410 (12M)

## UNIT-III

5. A column section ISHB 350 @ 0.674 kN/m is carrying an axial load of 1000 kN. It is to be supported over a column section ISHB 450 @ 0.872 kN/m. Design the column splicing. (12M)  
(OR)
6. Design a compression member of two channels placed toe-to-toe. The length of the compression member is 12m and carries a load of 1500 kN. The width over the backs of channels is 450mm. The channels are connected by lacing. Sketch the cross-section of the column. (12M)

## UNIT-IV

7. A hand operated 50 kN overhead crane is provided in a workshop. The details are given below: Centre to centre between gantry girders = 16 m, Span of the gantry girder = 6 m, Weight of the crane = 40 kN, Wheel spacing = 3 m, Weight of the crab = 10 kN, Maximum edge distance = 1 m, Design a simply supported gantry girder, assuming the flange is laterally supported (12M)  
(OR)
8. a) Draw a neat sketch of Gantry girder and mention its parts? (6M)  
b) Write down the Design Steps involved while designing a gantry girder? (6M)

## UNIT-V

9. Design a welded plate girder for a simply supported bridge deck beam with a clear span of 18 m. Dead Load including self weight = 20 kNm and imposed load = 10 kNm. Two moving loads of 100 kN each spaced 2 m apart. Assume the top compression flange of the plate girder is restrained laterally and prevented from rotating. (12M)  
(OR)
10. Design an 18m long simply supported welded plate girder carrying a uniformly distributed load of 50 kN/m excluding self-weight and two concentrated loads of 350 kN each at quarter points of the span. Assume that girder is laterally supported throughout. (12M)

**DESIGN AND DRAWING OF STEEL STRUCTURES  
(CIVIL ENGINEERING)****Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

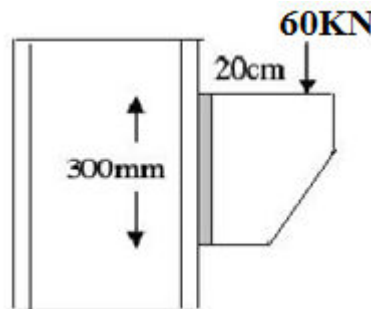
All parts of the Question must be answered at one place

**UNIT-I**

1. a) With neat sketches explain different types of welds 6M
- b) What are the advantages of welded connections? Explain the following for fillet weld considering I.S specification; i) size of weld, ii) Throat thickness and iii) Length of weld 8M

**(OR)**

2. Determine the depth of the fillet weld required to join a plate bracket with flange of a stanchion as shown in figure (Load = 60 kN) 14M

**UNIT-II**

3. Design a beam of effective span 8.0m and subjected to a bending moment of  $110.8 \times 10^6 \text{ Nmm}$ . The compression flange is laterally unsupported throughout. Check for deflections and shear. Assume  $f_y = 250 \text{ MPa}$  14M
- (OR)**
4. Design a simply supported beam of span 8 m carrying a RCC slab of lateral support at compression flange. The total UDL 100kN dead load and 150kN imposed load. The beam carries additional load 100kN at mid span. Assume stiff bearing length of support 100mm. 14M

### **UNIT-III**

5. a) Write about different types of tension members. 5M  
b) Design a tension member to carry a load of 300 kN. 9M  
The two angles placed back to back with long legs out standing are desirable. The length of the member is 3.5m.

**(OR)**

6. a) Write the different types of compression members 5M  
b) A column section ISHB 300@ 0.630kN/m is carrying an axial load of 1000kN. It is to be supported over a column section ISHB 400 @ 0.822kN/m. Design the column with lacing system. 9M

### **UNIT-IV**

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

**(OR)**

8. A hand operated 50kN overhead crane is provided in a workshop. The details are given below: Centre to centre between gantry girders = 16 m, Span of the gantry girder = 5 m, Weight of the crane = 40kN, Wheel spacing = 3 m, Weight of the crab = 10 kN, Maximum edge distance = 1 m, Design a simply supported gantry girder, assuming the flange is laterally supported. 14M

### **UNIT-V**

9. Design a welded plate girder to carry a superimposed load of 15 tonnes per metre on an effective span of 28 metres. 14M  
Assume necessary data.

**(OR)**

10. Design an 14m long simply supported welded plate girder carrying a uniformly distributed load of 40kN/m excluding self-weight and two concentrated loads of 325kN each at quarter points of the span. Assume that girder is laterally supported throughout. 14M