

**AR13**

**Set 02**

**Code: 13CE2002**

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

**II B.Tech I Semester Regular Examinations, January, 2015**

**SURVEYING  
(CIVIL ENGINEERING)**

**Time: 3 hours**

**Max. Marks: 70**

**PART – A**

**Answer all Questions**

**[10X1=10M]**

1. a) What is the basic principle of surveying?
- b) What are the different types of errors?
- c) Define reduced level?
- d) Define profile levelling?
- e) What are various parts of a theodolite ?
- f) Define the changing face in a theodolite?
- g) State Simpson's rule?
- h) The prismoidal formula for determination of volume is given as-----
- i) Define normal chord?
- j) Define reverse curve?

**PART – B**

**Answer one question from each unit**

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

**UNIT-I**

2. A steel tape of nominal length 30m long between end graduations at a temperature of 27°C under a pull of 45N when lying on the flat. The tape is stretched over two supports between which it records 30000m and is supported at two intermediate supports equally spaced. If the temperature in the field is 32°C and the pull of tape is 75N calculate the actual length between the end graduations and the equivalent length at mean sea level if the measurement was made at an elevation of 1000.00m [12M]

**(OR)**

3. Explain any two obstacles in chaining? [12M]

**UNIT-II**

4. The following readings were observed successively with a levelling instrument. The instrument was shifted after fifth and eleventh readings.

0.585, 1.010, 1.735, 3.295, 3.775, 0.350, 1.300, 1.795, 2.575, 3.375, 3.895, 1.735, 0.635, 1.605

Determine the R.L. of various points if the R.L. of the point on which the first reading was taken as 136.440. Use Rise and fall method. [12M]

**(OR)**

5. What are the characteristics of contours? [12M]

**UNIT-III**

6. Explain various temporary adjustments of a theodolite? [12M]

**(OR)**

7. The following observations were made on a vertically held staff with a tacheometer set up at an intermediate point on a straight line CD

Staff Station	Vertical Angle	Staff intercept(m)	Axial Hair Reading(m)
C	$+8^{\circ}36'$	2.880	2.505
D	$-8^{\circ}36'$	1.655	2.850

The instrument was fitted with an anallatic lens and had a constant 100. Complete the length and the R.L. of D1 given that C has a reduced level of 527.63m [12M]

**UNIT-IV**

8. A series of offsets was taken from a baseline to a curved boundary line at intervals of 10m in the following order: 0, 2.68, 3.64, 3.70, 4.60, 3.62, 4.84, 5.74

Compute the area of the area by Simpson's and trapezoidal rules? [12M]

**(OR)**

9. Explain the procedure for estimation of capacity of reservoir? [12M]

**UNIT-V**

10. Explain the obstacle for location of a curve when the point of intersection is inaccessible? [12M]

**(OR)**

11. Two straight lines AB and BC intersect at chainage 2060m. The intersection angle being  $140^{\circ}$ . Calculate the radius and chainage of the tangent points of a circular curve connecting the two lines if  $D=6^{\circ}$  [12M]

CODE:13EE2004

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI  
(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, January, 2015

ELECTRICAL CIRCUIT ANALYSIS - I

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time:-3 hours

Max.Marks:70

PART-A

Answer all questions

[10X1=10M]

1. a) Define Kirchhoff's Voltage Law.
- b) Draw the VI Characteristics Of a Practical Voltage Source.
- c) Define twig and link
- d) Define Planar and non planar graph
- e) State Norton's Theorem
- f) State Thevenin's theorem
- g) State Super position theorem
- h) State Tellegen Theorem.
- i) For a given  $Z_{11}=3$  ,  $Z_{12}=1$  ,  $Z_{21}=2$  and  $Z_{22}=1$  . Find  $Y_{11}$  .
- j)  $Z_{11}=5$  ,  $Z_{22}=7$  ,  $Z_{12}=Z_{21}=3$  .Find ABCD parameters.

PART - B

Answer one question from each unit

[5 x 12 = 60 M]

UNIT-I

2. a) Define Ohm's law. Explain about ideal and non-ideal voltage and current sources.
- b) For the circuit shown in figure 1, use nodal analysis to determine voltage across 3 and 12 Resistance. Compute power absorbed by 6 resistor.

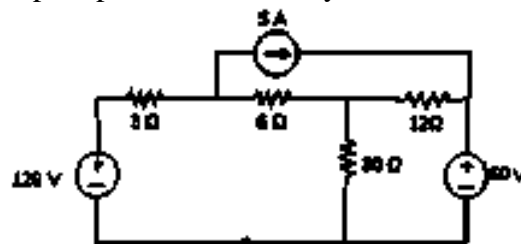


Figure 1

(OR)

- 3.a) A series RLC circuit with  $R=100$  ,  $L=0.5$  H and  $C=40$   $\mu$ F has applied voltage of 100V with variable frequency. Calculate the resonant frequency, current at resonance, voltage across R,L and C. Also calculate the Q-factor, upper and lower half power frequencies and bandwidth.
- b) Construct an admittance locus and determine the variable inductance values, so that the phase angle between the supply voltage and supply current is zero for the circuit shown in Fig.2. Assume  $\omega=5000$  rad/sec.

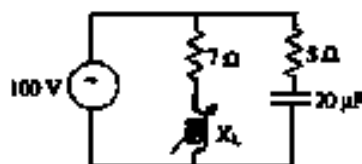


Figure.2

UNIT-II

- 4.a) Define the following.  
 )Tree )co-tree ) Loop  
 b) Draw the graph of the network shown in figure 3. Find the tie set schedule, obtain equilibrium equation on loop current basis and find the branch currents.

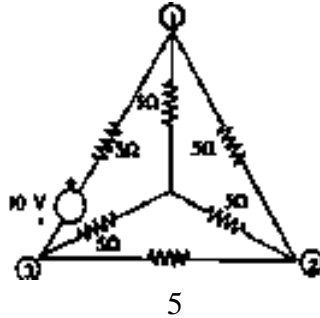


Figure.3

(OR)

5. For the network given in below figure 4, Draw the connected graph and calculate the Branch voltages and branch currents using node-basis method.

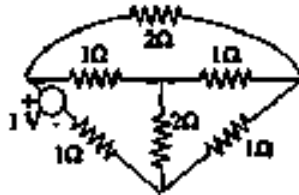


Figure.4

UNIT-III

- 6.a) Find Norton's equivalent circuit for the circuit shown in Figure 5.

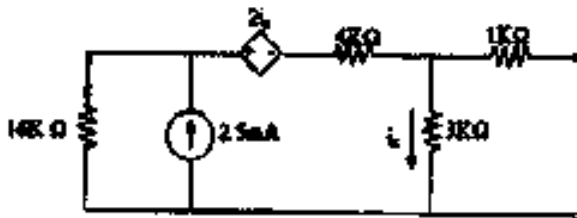


Figure.5

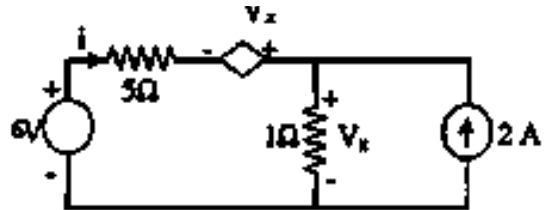


Figure.6

- b) Find ' ' using super position theorem for the circuit given in figure.6

(OR)

7. Show the validity of reciprocity theorem for the circuits shown in figure .7 and figure.8

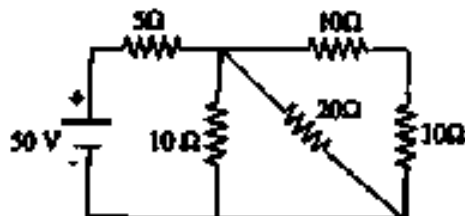


Figure.7

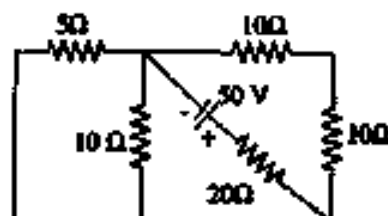


Figure.8

UNIT-IV

- 8.a) Verify the Tellegen's theorem for the circuit shown in Figure .9

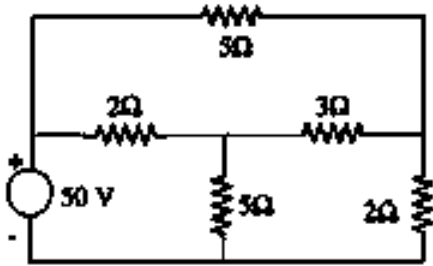


Figure.9

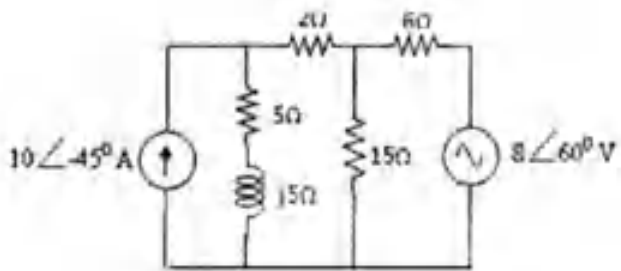


Figure.10

- b) Find the current through 15 resistance using Millman's theorem for the circuit shown in Figure.10

(OR)

- 9.a) Find the value of  $Z_L$  to be connected between the terminals AB of the circuit shown in figure.11, for the maximum power transfer. Find maximum power.

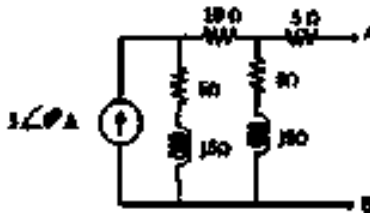


Figure.11

- b) State Millman's theorem and derive expression for that.

UNIT-V

10. Determine Y-parameters of the network shown in below figure 12.

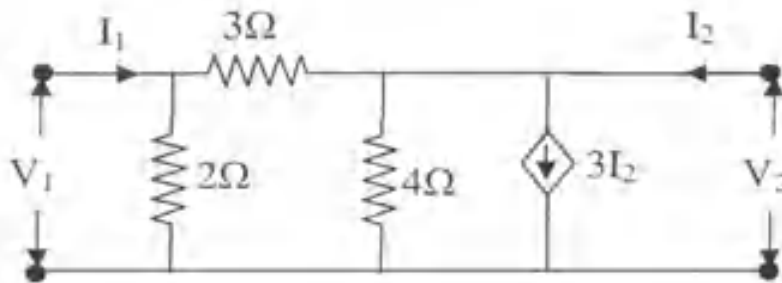


Figure.12

(OR)

- 11.a). Deduce the expression for ABCD parameters in terms of Z parameters .  
 b). Z-parameters for a two port network are given as  $Z_{11}=25$ ,  $Z_{12}=Z_{21}=20$ ,  $Z_{22}=50$ . Find the equivalent T-network.

**ELECTRICAL CIRCUIT ANALYSIS - I**  
**(ELECTRICAL AND ELECTRONICS ENGINEERING)**

**Note: Question Number: 6. (a) current source strength is 2.5 mA**

**Question Number: 8. (b) Figure 10. one of the resistor resistance is 2 ohm**

**CODE:13ME2005****ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI  
(AUTONOMOUS)****II B.Tech I Semester Regular Examinations, January, 2015****PRODUCTION TECHNOLOGY  
(MECHANICAL ENGINEERING)****Time:-3 hours****Max.Marks:70****PART-A****Answer all questions****[10X1=10M]**

- 1 a) List different types patterns?
- b) What is the purpose of electric arc furnace?
- c) What is the role of flux in Arc welding process?
- d) What is soldering?
- e) What is spot welding and how it differs from seam welding?
- f) Name any four welding defects.
- g) Write any two applications of extrusion processes.
- h) Differentiate between direct extrusion and indirect extrusion.
- i) List any two applications of drawing processes.
- j) Define the term 'plastic'.

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

2. With a neat sketch explain shell molding processes. List out various advantages, disadvantages and applications.

**(OR)**

3. Explain with a neat diagram the construction, operation and various zones in Cupola furnace

**UNIT-II**

4. With a neat sketch explain the working principle of Shielded metal arc welding. What are the advantages, Limitations and applications of that process?

**(OR)**

5. With a neat sketch explain the working principle of Laser beam welding. What are the advantages, Limitations and applications of that process?

**UNIT-III**

6. Explain the principle of Rolling process with a neat sketch and discuss about differences between Hot Rolling and Cold Rolling Processes.

**(OR)**

7. (a) Represent the angle of bite in rolling process with a suitable sketch.  
(b) What is the significance of Recrystallization temperature in metal working? How does extrusion compare with rolling?

**UNIT-IV**

8. What is extrusion? How are collapsible tubes of aluminium manufactured? Explain with a neat sketch.

**(OR)**

9. What is forging? Distinguish between closed die forging and impression die forging with a neat sketch.

**UNIT-V**

10. (a) What are thermo plastic materials? How do they differ from thermosetting materials?  
(b) With a neat sketch write short notes on injection moulding

**(OR)**

11. With a neat sketches explain Magnetic pulse forming and high velocity forming.

Code: 13EC2004

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

**II B.Tech I Semester Regular Examinations, January, 2015**

**SIGNALS & SYSTEMS**

**(ELECTRONICS AND COMMUNICATION ENGINEERING)**

Time: 3 hours

Max. Marks: 70

**PART – A**

Answer all Questions

[10X1=10M]

- 1 (a) When a signal is said to be an Energy signal?
- (b) Define Orthogonal Signal space.
- (c) State the Dirichlet's conditions of Fouries series.
- (d) State the Time reversal property of Fourier transform.
- (e) Draw the Ideal characteristics of an Ideal BPF.
- (f) Define an LTI system.
- (g) Define Auto correlation and Cross correlation of signals.
- (h) Draw the Sampled frequency spectrum that effected by Aliasing.
- (i) Define Poles and Zeros of a system function  $H(S)$ .
- (j) Evaluate the final value for the Z transform  $X(Z) = \frac{z+2}{4(z-1)(z+0.7)}$

**PART – B**

Answer one question from each unit

[5 X 12 = 60]

**UNIT – I**

2. A rectangular function  $f(t)$  is defined by  $f(t) = \begin{cases} 1 & (0 < t < \Pi) \\ -1 & (\Pi < t < 2\Pi) \end{cases}$

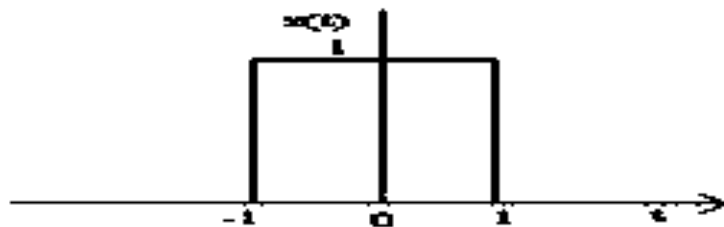
Approximate the above function by a finite series of Sinusoidal functions.

[12M]

**(OR)**

3. (a) Consider the rectangular pulse  $x(t)$  of unit amplitude and a duration of 2 time units as depicted in figure. Sketch (i)  $y(t) = x(3t)$  (i)  $y(t) = x(2t+3)$

[6M]



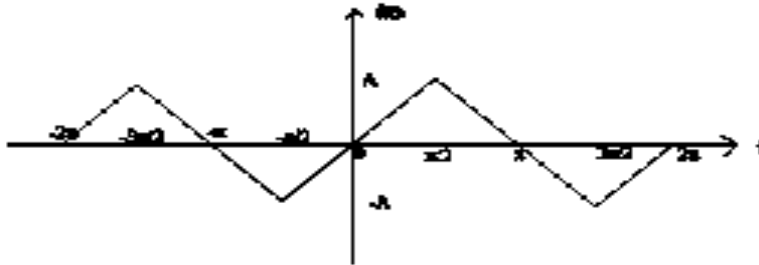
- (b) Prove that the sinusoidal functions  $\sin(n\check{S}_0 t)$  and  $\cos(m\check{S}_0 t)$  for  $n \neq m$  are orthogonal functions.

[6M]



UNIT-II

4. Consider a periodic function  $f(t)$  is shown in figure. Obtain Trigonometric Fourier series representation for it. Also plot it's frequency spectrum. [12M]



(OR)

5. (a) Find the Fourier Transform of  $\text{sgn}(t)$  function. [6M]  
 (b) From the above result and from the fact that  $1 \leftrightarrow 2\pi \delta(\omega)$ , derive the Fourier Transform of a Unit step function. [6M]

UNIT-III

6. (a) Obtain the conditions for Distortionless transmission through a system. [6M]  
 (b) Explain (i) Impulse Response and (ii) Transfer Function, related to Linear systems. [6M]
- (OR)
7. (a) Explain causality and physical reliability of a system and hence give paley-wiener criterion. [6M]  
 (b) Explain the representation of Continuous time signals in terms of Impulses, i.e. Convolution Integral. [6M]

UNIT-IV

8. a) State and prove Sampling theorem. [10M]  
 b) What is aliasing effect? [2M]
- (OR)
9. Find the Convolution of the following signals

$$\begin{aligned} \text{i) } x_1(t) &= 1 & 0 \leq t \leq 2 \\ &= 0 & \text{other wise} \\ \text{ii) } x_2(t) &= 1 & 1 \leq t \leq 5 \\ &= 0 & \text{other wise} \end{aligned}$$

[12M]

UNIT-V

10. (a) Determine the Laplace Transform and it's ROC of the following signal. [8M]  
 $x(t) = 3e^{-2t}u(t) - 2e^{-t}u(t)$  [4M]  
 (b) Bring out the relations between LT and ZT. [4M]
- (OR)
11. (a) State and prove Time shifting and Convolution properties of Laplace Transform. [8M]  
 (b) Find the Laplace Transform of  $x(t) = te^{-at}u(t)$ , using properties of LT. [4M]

Code: 13CS2004

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

**II B.Tech I Semester Regular Examinations, January, 2015**

**ADVANCED DATA STRUCTURES**

**(Common to CSE and IT)**

Time: 3 hours

Max. Marks: 70

**PART – A**

Answer all Questions

[10X1=10M]

1.    a) Define Skip List.
- b) What is division hash function?
- c) What is AVL Tree?
- d) Define Splay Tree.
- e) What are different graph traversal techniques?
- f) Define min heap.
- g) What is Binary trie.
- h) Define Rehashing.
- i) What is Binomial Queue?
- j) Define digital search tree.

**PART -B**

Answer one question from each unit

[5X12 = 60M]

**UNIT – I**

2.    a) Define Hashing. Explain various hash functions. [6M]
- b) Explain open addressing techniques in hashing. [6M]

**(OR)**

3.    Explain various operations performed on skip lists. [12M]

**UNIT – II**

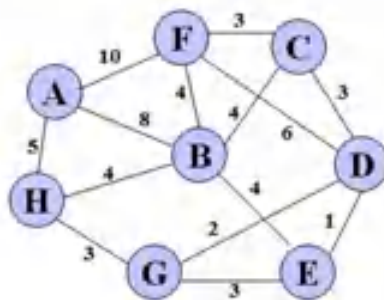
4.    Explain various operations performed on 2- 3 search Trees. [12M]

**(OR)**

5.    Explain various operations performed on AVL trees. [12M]

**UNIT – III**

6.    Explain Kruskal's Algorithm for finding minimum cost spanning tree. 12M



**(OR)**

7.    a) Write Warshals algorithm. [6M]
- b) Explain various representations of graphs with suitable examples. [6M]

**UNIT – IV**

8.    a) What is binary heap? Implement insertion and deletion performed on it. [6M]
- b) What is priority queue? How can you represent it in heap? [6M]

**(OR)**

9.    a) Explain binomial queue operations. [8M]
- b) Discuss Lazy binomial queue. [4M]

**UNIT – V**

10. Discuss Knuth – Morris –Pratt algorithm with an example. [12M]

**(OR)**

11. a) Explain tries in detail. [6M]
- b) Discuss Boyer Moore pattern matching algorithm. [6M]