AR13

CODE: 13BS2007 **SET1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Jan / Feb-2016

COMPLEX VARIABLES AND STATISTICAL METHODS
(CIVIL, MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1 X 10 = 10 M]**

1. a) State the Cauchy – Riemann equations in Cartesian co-ordinates?
   b) Show that $f(z) = z^3$ is analytic for all z?
   c) Define Removable Singularity?
   d) State the Cauchy's Residue Theorem?
   e) Explain conformal mapping?
   f) If P(A) = 3/5,P(B) = 2/5, P(C) = 3/4 ,then find $P(\overline{A} \cap \overline{B} \cap \overline{C})$?
   g) Three masses are measured as 62.34,20.48,35.97 kgs with S.D. 0.54,0.21,0.46 kgs, Find mean of sum of masses?
   h) Write any two applications of Normal distribution?
   i) If $\overline{x}$ = 157, μ = 155,σ = 15 and n = 36,then find z ?
   j) If 8 throws of a die, 5 or 6 is considered as success. Find the mean no. of success?

PART-B

Answer one question from each unit [5x12=60M]

UNIT-I

2. a) If f(z) is a regular function of z, prove that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)|f(z)|^2 = 4|f^1(z)|^2$?
   b) Show that $u = e^{-x}$ (x sin y – y cosy) is harmonic? [6M+6M]

(OR)

3. a) Using Milne - Thompson method, find the analytic function whose real part is $y + e^x$ cosy.
   b) Evaluate $\int[(y^2+z^2)dx+(z^2+x^2)dy+(x^2+y^2)dz]$ from (0,0,0) to (1,1,1) where c is the curve x = t, $y = t^2$, $z = t^3$ in the parametric form? [6M+6M]

UNIT-II

4. a) Find the Residue of $\frac{ze^z}{(z-1)^3}$ at its pole?
   b) Evaluate using Cauchy's Residue theorem $\int_c \frac{2z^2+3}{z(z+1)(z+2)}dz$ where c is circle $|z| = 1.6$.

[6M+6M]

(OR)

5. a) Evaluate $\int_c \frac{z-3}{z^2+2z+5}dz$ where c is the circle (i) |z+1-i| = 2 (ii) |z+1+i| = 2
   b) Using complex variable technique, evaluate $\int_0^{2\pi} \frac{\cos\theta}{3+\sin\theta}d\theta$ [6M+6M]

UNIT-III

6.a) Explain Bilinear Transformation?

b) Find the image of the circle |z|=2 under the transformation w = z + 3 + 2i. [6M+6M]

(OR)

7 . Find the bilinear transformation that maps the points $z_1 = \infty$, $z_2 = i$, $z_3 = 0$ into the points $w_1 = 0$, $w_2 = i$, $w_3 = \infty$ [12M]

UNIT-IV

8. a) Suppose 5 men out of 100 and 25 women out of 10000 are colour blind. A colour blind person is chosen at random. What is the probability of the person being a male(Assume male and female to be in equal number).

b) Number of monthly breakdowns of a computer is a random variable having Poisson distribution with mean equal to 1.8.Find the probability that the computer will function for a month (i) Without breakdown (ii) with only one breakdown. [6M+6M]

(OR)

9. a) In a Normal distribution ,7% of the items are under 35 and 89% are under 63.Determine the mean and variance of the distribution?

b) A population consist of 6 numbers 4,8,12,16,20,24. Consider all samples of size two which can be drawn without replacement from this population. Then find

(1) The sample distributions?

(2) The population mean

(3) The population standard deviation [6M+6M]

UNIT-V

10. a) In a random sample of 60 workers , the average time taken by them to get to work is 33.8min., with a standard deviation of 6.1min.,.Can we reject the null hypothesis $\mu = 32.6$min., in favour of alternative hypothesis $\mu > 32.6$ min., at $\alpha = 0.025$ level of significance.

b) Four methods are under development for making discs of a super conducting material Fifty discs are made by each method and they are checked for super conductivity when cooled with liquid.

	Ist method	IInd method	IIIrd method	IVth method
Super conductors	31	42	22	25
Failures	19	8	28	25

Test the significant difference between the proportions of super conductors at 0.05 level. [6M+6M]

11. A random sample from a company's very extensive files shows that the orders for a certain kind of machinery were filled respectively in, 10,12,19,14,15,18,11 and 13 days. Use the level of significance $\alpha = 0.01$ to test the claim that on the average such orders are filled with in 10.5 days. Choose the Alternative Hypothesis so that rejection of Null Hypothesis $\mu = 10.5$ days implies that it takes longer than indicated. [12M]

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CODE:13EE2004

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
ELECTRICAL CIRCUIT ANALYSIS - I
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time:-3 hours **Max.Marks:70**

PART-A

Answer all questions **[10X1=10M]**

1.a) Describe briefly the difference between an Ideal Source and practical Source.
b) List out the Dependent Sources.
c) Define tree and Co-tree of a graph.
d) Define Connected and Oriented graph.
e) State Norton's theorem
f) State Super position theorem
g) State milliman's theorem
h) State Tellegence Theorem.
i) If $Z_{11} = 2\Omega$, $Z_{12} = 4\Omega$, $Z_{21} = 1\Omega$ and $Z_{22} = 3\Omega$, Find Y_{12} .
j) The Impedance Parameters of a Two port network are $Z_{11} = 6\Omega$, $Z_{22}= 4\Omega$, $Z_{12}=Z_{21}= 3\Omega$. Compute A.

PART – B

Answer one question from each unit **[5x12 =60 M]**

UNIT-I

2.a) Explain the difference between independent and dependent source with suitable examples.
b) Calculate the mesh currents in the network shown in Figure1.

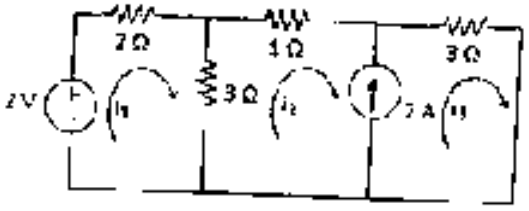


Figure.1

(OR)

3.a) In a series resonance circuit, the resistance is 5Ω,the resonant frequency is 4×10^5rad/sec and the bandwidth is 10^4 rad/sec. Compute L and C of the network, half-power frequencies and Q of the circuit.
b) Draw the admittance locus for the circuit shown in figure.2, and calculate C which results in resonance when ω=5000 rad/sec.

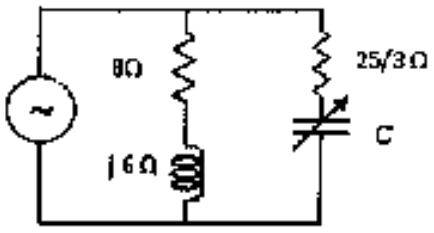


Figure.2

UNIT-II

4.a) Draw the graph of the network given in figure.3,find tie set matrix.

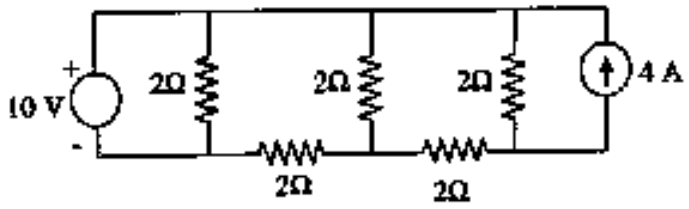


Figure.3

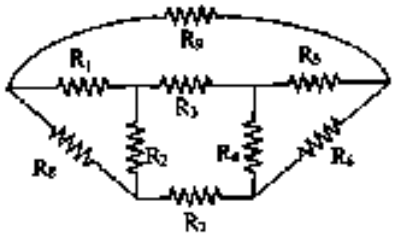


Figure.4

b) Draw a graph of the network shown in figure.4.Select a tree with branches R1, R2, R5, R3, and R4.Write fundamental loop matrix.

(OR)

5.a) Define the following.

i)Tree ii)co-tree iii)cut-set iv)Loop

b) Draw the graph of the network shown in figure.5.Find the tie set and cut set matrices.

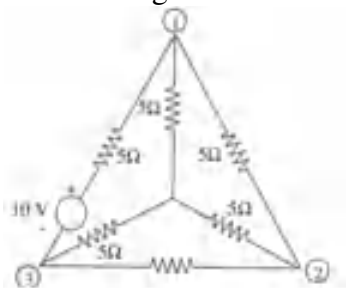


Figure. 5

UNIT-III

6.a) Find 'i' using super position theorem for the circuit given in figure .6

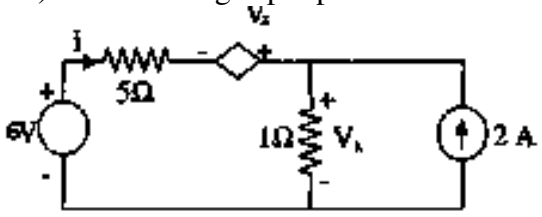


Figure.6

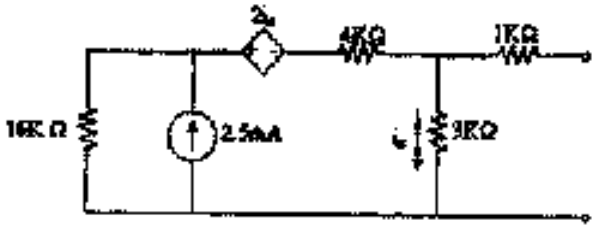


Figure.7

b) Find Norton's equivalent circuit for the circuit shown in figure .7

(OR)

7. Show the validity of reciprocity theorem for the circuits shown in figure.8 and figure.9

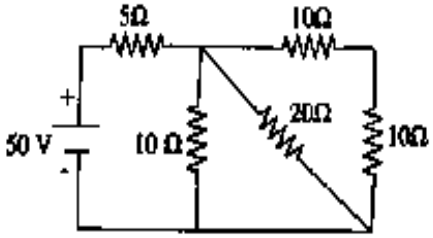


Figure.8

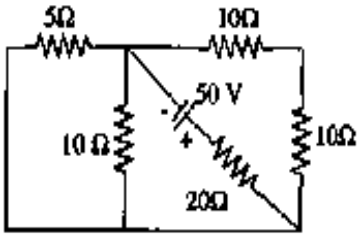


Figure.9

UNIT-IV

8. a) Find the value of Z_L to be connected between the terminals AB of the circuit shown in Figure 10,for maximum power transfer. Find maximum power.

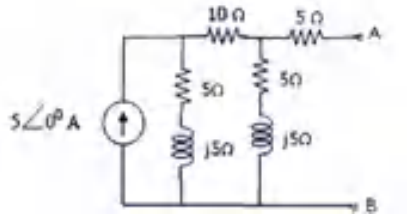


Figure.10

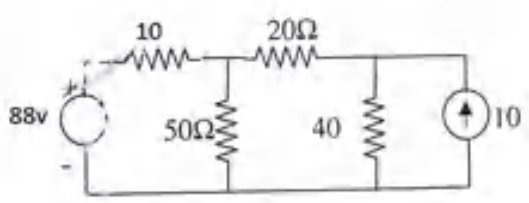


Figure.11

b) Verify Tellegen's theorem for the below circuit shown in figure 11.

(OR)

9. a) Verify Tellegen's theorem for the below circuit shown in figure.12

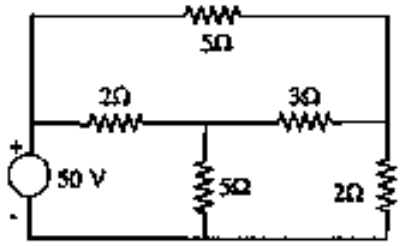


Figure.12

b) Find the current through 15Ω resistance using Milliman's theorem for the circuit shown in figure.13

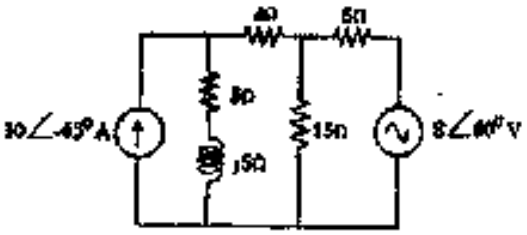


Figure.13

UNIT-V

10. In a T network shown in Fig.14, $Z_1 = 26\angle 0^o$, $Z_2 = 56\angle -90^o$, $Z_3 = 36\angle 90^o$, Find the Z-parameters.

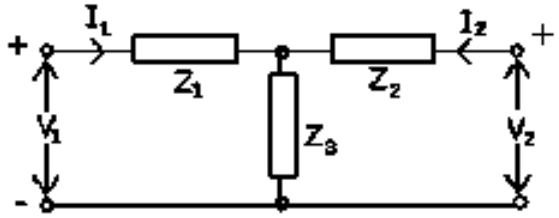


Figure.14

(OR)

11.a) Express *z*-parameters in terms of *h*-parameters and *ABCD*-parameters.

b) The *y*-parameters of a two port network are y_{11}=15 mho, y_{22}=24 mho, y_{12}=y_{21}=6 mho. Determine ABCD parameters.

AR13 **Set 02**

Code: 13EC2004

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
SIGNALS & SYSTEMS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 hours **Max. Marks: 70**

PART – A

Answer all Questions **[10X1=10M]**

1. a) Find the energy of the signal $x(n)=\left(\frac{1}{2}\right)^n u(n)$.

   b) What are orthogonal functions?
   c) Give the expression for exponential Fourier series coefficient C_n ?
   d) Write the limitations of Fourier series?
   e) What is the condition on magnitude and phase for distortionless transmission?
   f) Give the relation between impulse response and transfer function of a system?
   g) Explain the autocorrelation function?
   h) What is over sampling and under sampling?
   i) What is the relation between Laplace transform and Fourier transform?
   j) What is the necessary and sufficient condition for the stability of discrete-time systems?

PART – B

Answer one question from each unit **[5 X 12 = 60]**

UNIT – I

2. a) Determine the Power and RMS value of the signal $x(t)=A\,e^{j5t}$ [4M]

   b) Determine whether the system $\mathbf{y(t) = t^2 x(t)}$ is time invariant or not? [4M]

   c) Write the properties of the continuous-time unit impulse function? [4M]

(OR)

3. a) If x(t) and y(t) are orthogonal then show that the energy of the signal x(t)+y(t) is identical to the energy of the signal x(t) plus energy of the signal y(t) [8M]

   b) Define the terms (1) Basis function and (ii) Norm [4M]

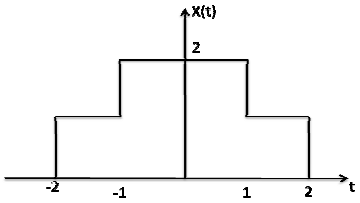
UNIT – II

4. a) Derive the relation between trigonometric Fourier series and exponential Fourier series [8M]

   b) What are Dirichlets conditions? State them? [4M]

(OR)

5. a) Obtain the Fourier transform of the signal shown in fig. [6M]



   b) Determine the Fourier transform of the following signals [6M]

   (1) $x(t)=e^{-a|t|}$ (ii) x(t) = u(t)

UNIT – III

6 a) The input voltage to an RC circuit is given as $x(t) = t.e^{\left(\frac{-t}{RC}\right)}u(t)$ and the impulse response to this circuit is given as $h(t) = \frac{1}{RC}e^{\left(\frac{-t}{RC}\right)}u(t)$. Determine y(t). [8M]

b) What is impulse response? State the importance of Impulse response of a system? [4M]

(OR)

7 a) Derive the relationship between rise time and bandwidth [8M]

b) State the Paley-Wiener criterion? [4M]

UNIT-IV

8 a) Determine the Autocorrelation and energy spectral density of $x(t) = e^{-at}u(t)$ [8M]

b) Write the properties of autocorrelation for periodic signals? [4M]

(OR)

9 a) A signal x(t) = 5 sin(150πt) is sampled at a rate of (i) 100 Hz (ii) 200Hz and (iii) 300Hz. For each of three cases, can you recover the signal x(T) from the sampled signal. [6M]

b) Given the band limited signal in frequency range of 22.6 kHz to 30.6 kHz, what is the minimum sampling rate required to completely specify the signal? [6M]

UNIT-V

10 a) Find the inverse Laplace transform of the signal $X(s) = \log\left[\frac{s(s+1)}{s^2+1}\right]$ [6M]

b) Find the Laplace transform of the signals (1) x(t)=tu(t) and (2) x(t)=u(t-3) [6M]

(OR)

11 a) Determine the inverse Z-transform of $X(z) = \frac{1}{1-\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}} \quad ROC: |z| > 1$

[8M]

b) Find the initial and final values of x(n) if the z-transform of x(n) is

$$X(z) = \frac{1}{z^2 + \frac{1}{6}z - \frac{1}{6}}$$ [4M]

AR-13

Code: 13CS2004 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
ADVANCED DATA STRUCTURES
(Common to CSE and IT)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[10 x 1=10M]**

1. a) Define tree
   b) What is meant by balanced tree
   c) Define graph
   d) What is 2-3 tree
   e) State warshall's algorithm
   f) Define hash function
   g) What is meant by directories
   h) What are the queue operations
   i) Define data structure
   j) Define red-black tree

PART-B

Answer one question from each unit **[5 x 12= 60M]**

UNIT - I

2. a) Explain the difficult of providing sequential access when a linear open addressed hash table is used.
   b) Explain about double hashing and rehashing

(OR)

3. a) Define Dictionaries ? what is dictionary with duplicate.
   b) Explain the process of designing chained hashed table with suitable example ?

UNIT-II

4. a) What are balanced trees? Explain about AVL trees in detail with an suitable example
   b) Give the representation of Red-Black tree? Explain with an example

(OR)

5. Perform deletion and insertion operations on Red-Black tree with suitable examples?

UNIT -III

6. a) Define Graph? Explain about bipartite graph , in degree and out degree of a graph with suitable examples?
   b) Explain about minimum cost spanning tree algorithm.

(OR)

7. Explain about Breadth first search and Depth first search algorithm

UNIT-IV

8. a) Write an algorithm for Heap sort with suitable example
   b) Illustrate about binomial queue?

(OR)

9. Illustrate Lazy binomial queue with suitable example

UNIT-V

10. Explain about Text processing algorithms in detail.

(OR)

11. Explain about Binary trie, Patricia and Multi-way trie.

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