Answer any three of the following

1. a) Find the Even and Odd components of the following signals. [1.5 *2=3]
   i> $X(t) = e^{j2t}$, ii>X(n) = {5,4,3,2,1}
   ↑

   b) Examine the following signal is periodic or not. If Periodic, determine the fundamental period of the signal.
   $X(t) = 2 + \cos 2\pi t$ [2]

2. a) Determine the total energy of the signal. Shown in figure-1 below : [2.5 x2]
   b) Prove that odd . odd = Even signal

3. Find the values of Trigonometric Fourier series coefficients [a0,an,bn] for the following signal in figure-2. [5]

4. Using only Graphical method, find the circular convolution of the following signal.
   X1(n) = {1,2,-3,4,-5} and x2(n) = {-2,4,6} [5]

5. a) If x(t) is a signal shown in figure-3,then draw -3/5x (-3t+4) signal.
   b) Prove that, u(t) +u(-t) = 1 [3+2=5]

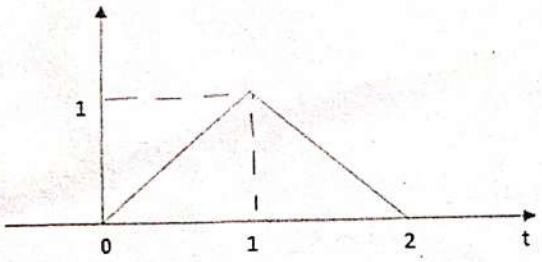


figure-1

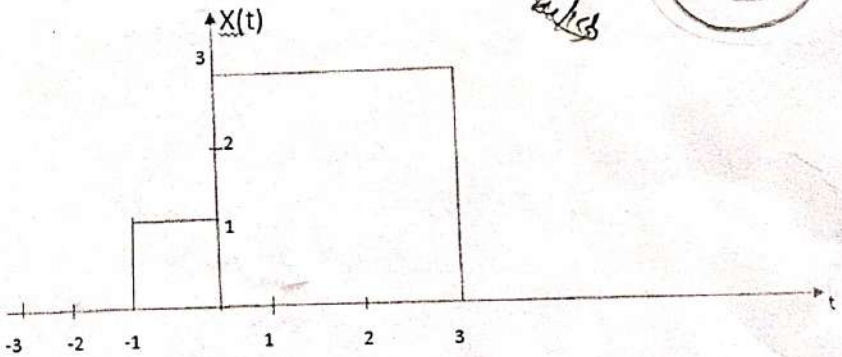


figure-3

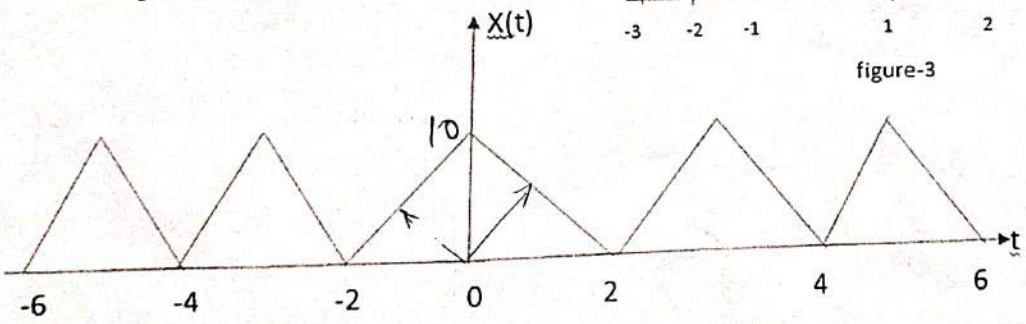


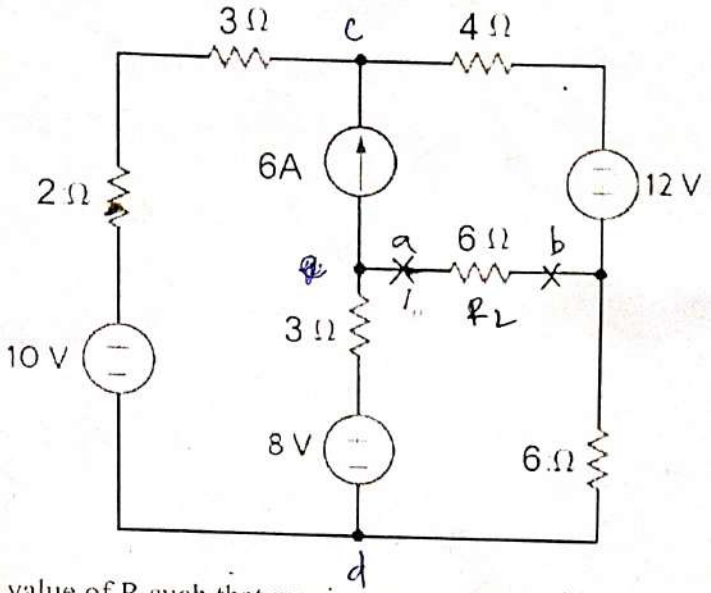
figure-2

Jalpaiguri Government Engineering College
Department of Electronics and Communication
Sub: Network Theory
First Internal Examination

Full Marks: 15

Time: 40 min

1. Find I_0 using Thevenin's theorem? 5



2. What should be the value of R such that maximum power transfer can take place from the rest of the network to R? Obtain the amount of this power. 4

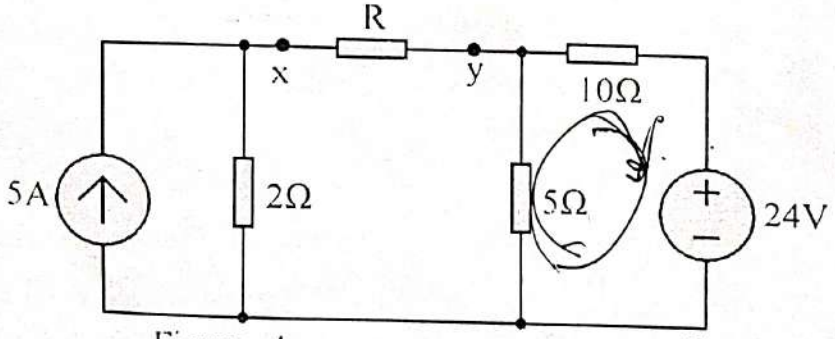


Figure: 4

3. Find the Fourier transform of the function , 6

$$f(x) = e^{-a|x|} \quad \text{for} \quad -\infty < x < \infty$$

Internal Examination 2023(JGEC)
Data structure & Algorithm

Dept: ECE
FM: 15

Semester: 3rd
Time: 45 mins

Answer all the questions:

1. Write an algorithm to delete a key element from a given one way linked list. 3
2. Write down the difference between array and linked list. 2
3. Write down the limitation and its solution of linear array representation of Queue. 2
4. What is LIFO data structure? Write an algorithm to insert an element into left side of Deque. 1+3
5. Evaluate the following expression using stack, 3
   ((4-2)*3)^(9-7)
6. Represent the following polynomial expression using linked list. 1
   $9x^6-10x^3+17x-6$

Internal Exam

Solid State and Opto-Electronic Devices [PC-EC303]

$\frac{D_n}{\mu_n} =$

F.M: 15

Time:

Answer all:

1. What do you mean by direct and indirect band gap semiconductors? What is mass action law? 2+2
2. establish Einstein relation. 5
3. A Si-sample is doped with $10^{16}cm^{-3}$ boron atoms and a certain number of shallow donors. The Fermi level is 0.36eV above E_i at 300K. What is the donor concentration N_d? 6

Subject: Basic Electronics Paper Code: ES-EC301

Answer any one of the following:

1. Draw and explain V-I characteristic of zener diode
2. Calculate stability factor of self-bias transistor.
3. Draw and explain drain characteristic and transfer characteristic of JFET