SE-04

Total No. of Pages : 3

Seat No.	

S.Y. B.Tech. (Electronics & Telecommunication Engineering)
(Semester- III) (CBCS) Examination, March - 2023
ENGINEERING MATHEMATICS - III
Sub. Code : 73245

Day and Date : Thursday, 15 - 06 - 2023 **Total Marks : 70**

Time : 02.30 p.m. to 05.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of non-programmable calculator is allowed.**

Q1) Choose the correct alternative from the following. (2 marks each) **[14]**

a) The complete solution of $(D^3 - 3D^2 + 3D - 1)\, y = 0$ is_____

i) $y = (c_1 + c_2x + c_3x^2)e^x$ ii) $y = c_1e^x + (c_2 + c_3x)e^{-x}$

iii) $y = c_1e^{-x} + (c_2 + c_3x)e^x$ iv) $y = (c_1 + c_2x)e^x + c_3e^{-2x}$

b) Unit vector normal to the surface $xy^3z^2 = 4$ at $(-1, 1, 2)$ is_____

i) $\frac{1}{\sqrt{11}}(i + 3j - k)$ ii) $\frac{1}{\sqrt{11}}(i - 3j - k)$

iii) $\frac{1}{\sqrt{11}}(i - 3j + k)$ iv) $\frac{-1}{\sqrt{11}}(j + 3j - k)$

c) If $\left[\frac{0.1}{5} + \frac{0.7}{6} + \frac{0.9}{7}\right], B = \left[\frac{0.1}{5} + \frac{0.9}{6} + \frac{1}{7}\right]$ then

i) $\overline{A \cup B} = \left[\frac{0.1}{5} + \frac{0.7}{6} + \frac{0.9}{7}\right]$

ii) $\overline{A \cap B} = \left[\frac{0.9}{5} + \frac{0.3}{6} + \frac{0.1}{7}\right]$

iii) (i) & (ii) both true

iv) None of these

P.T.O.

d) $L\{t^n f(t)\} =$ _____

i) $\frac{d^n}{ds^n}\left[L\{f(t)\}\right]$ ii) $\frac{d^{n+1}}{ds^{n+1}}\left[L\{f(t)\}\right]$

iii) $(-1)^n \frac{d^n}{ds^n}\left[L\{f(t)\}\right]$ iv) None of these

e) The particular integral of $(D^3 + D)\, y = \cos x$ is_____

i) $y = \frac{-x\sin x}{2}$ ii) $y = \frac{x\cos x}{2}$

iii) $y = \frac{x\sin x}{2}$ iv) $y = \frac{-x}{2}\cos x$

f) The probability that a pen manufactured by a company will be defective is 0.1. If 12 such pens are manufactured, then the probability that exactly two will be defective.

i) 0.3412 ii) 0.2833

iii) 0.2301 iv) 0.3230

g) Value of a_0 in a fourier series for the function $f(x) = x^2$ in the interval $(0, 2\pi)$ is_____

i) $\frac{\pi^2}{3}$ ii) $\frac{2\pi^2}{3}$

iii) $\frac{4\pi^2}{3}$ iv) None of these

Q2) Attempt any two.

a) Solve $(D^2 - 4D + 4)\, y = 4(e^{2x} - \cos 2x)$ [7]

b) Find the directional derivative of $\phi = x^4 + y^4 + z^4$ at the point A(1, –2, 1) in the direction of AB where B is (2, 6, –1). In what direction from A is the directional derivative maximum? [7]

c) Find the fuzzy cardinality of the fuzzy set given by $A(x) = \frac{35-x}{15}$ on $X = \{20, 22, 24, 26, 28, 30\}$ [7]

Q3) Attempt any two.

a) Solve $(D^2 - 3D + 2)y = x^2e^{2x}$ [7]

b) Prove that $\overline{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + cy + 2z)k$ is solenoidal & determine the constants a, b, c if $\overline{F}$ is irrotational. [7]

c) Consider the fuzzy sets defined by $A(x) = \frac{x}{x+2}$ & $B(x) = \frac{x}{x+5}$; $X \in \{0, 1, 2, 3, 4, 5\}$. Find degree of subsethood S(A, B) and S(B, A). [7]

Q4) Attempt any two.

a) Find Fourier series expansion of $f(x) = x$ in $(0, 2\pi)$. [7]

b) Find Laplace transform of $e^t\ t\ sin4t$ [7]

c) A discrete random variable has the probability density function given below. [7]

X	–2	–1	0	1	2	3
P(X=x)	0.2	k	0.1	2k	0.1	2k

Find

i) K

ii) $P(X < 1)$

iii) $P(X \geq 1)$

iv) $P(-2 < X < 2)$

Q5) Attempt any two.

a) Find half range cosine series for $f(x) = (x - 1)^2\ \ 0 \leq x \leq 1$. [7]

b) Find inverse laplace transform of $\frac{1}{s^2(s+1)}$. [7]

c) In the probability that an individual suffers a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals [7]

i) exactly 3

ii) more than two

iii) atmost two will suffer a bad reaction.

SY. ETC.

SE-165

Total No. of Pages : 3

Seat No.	

S.Y. B.Tech. (E & TC) (Part - II) (CBCS) (Semester - IV) Examination, March - 2023

DIGITAL COMMUNICATION

Sub. Code : 79184

Day and Date : Saturday, 24 - 06 - 2023 **Total Marks : 70**

Time : 10.30 a.m. to 01.00 p.m.

Instructions : 1) **All Questions are compulsory.**
2) **Figures to the right indicate full marks.**

Q1) Attempt following multiple choice questions. **[14×1=14]**

a) Two unbiased coins are tossed. What is the probability of getting at most one head?
   i) 1/2 ii) 1/3
   iii) 1/6 iv) 3/4

b) $P(A \cap B)$ is equal to :
   i) P(A).P(B|A) ii) P(B).P(A|B)
   iii) Both (i) and (ii) iv) None of these

c) If P(E) = 0.37, then P(not E) will be
   i) 0.37 ii) 0.63
   iii) 0.57 iv) None of these

d) Information is in the form of
   i) Electrical signal ii) Music signal
   iii) Both (i) and (ii) iv) None of the above

e) The statement "MAN BITES DOG" has
   i) Zero information ii) Less information
   iii) More information iv) None of the above

f) _____ is the digital modulation technique in which the step size is varied according to the variation in the slope of the input.
   i) DM ii) PCM
   iii) ADM iv) PAM

P.T.O.

g) To avoid Alliasing error
   i) Sampling frequency must be greater than frequency of input signal
   ii) Sampling frequency must be greater than twice of frequency of input signal
   iii) Sampling frequency must be less than frequency of input signal
   iv) Sampling frequency must be less than twice of frequency of input signal

h) If sampling is not properly done then
   i) Positive error occurs ii) Negative error occurs
   iii) Alliasing error occurs iv) None of the above

i) The sub-processes involved in the PCM modulation in sequential order are :
   i) Sampling, quantizing, encoding
   ii) quantizing, encoding, sampling
   iii) Quantizing, sampling, encoding
   iv) None of the above

j) NRZ in communication means
   i) Non Release to Zero
   ii) Non Return to Zero
   iii) Non Real to Zero
   iv) Non Reluctive to Zero

k) Spread spectrum signals are used for
   i) Ranging
   ii) Determination of position
   iii) Ranging and Determination of position
   iv) None of the mentioned

l) The technique that may be used to reduce the side band power is
   i) MSK
   ii) BPSK
   iii) Gaussian minimum shift keying
   iv) BFSK

m) Matched filter is used to
   i) Provide Maximum SNR ii) Reduce amplitude
   iii) Reduce Height iv) None of the above

n) Eye Diagram will be corrupted by
   i) Noise ii) Interference
   iii) Both (i) and (ii) iv) None of the above

Q2) Solve any two : **[2×7=14]**
   a) Explain the functional description of digital communication system in detail.
   b) Explain Procedure of Shannon Fano Coding Technique.
   c) Describe Quantization process in detail.

Q3) Solve any two : **[2×7=14]**
   a) In a factory, four machines A_1, A_2, A_3 and A_4 produce 10%, 20%, 30% and 40% of the items, respectively. The percentage of defective items produced by them is 5%, 4%, 3% and 2% respectively. An item selected at random is found to be defective. What is the probability that it was produced by the machine A_2.
   b) Explain Entropy in detail.
   c) What are the drawbacks of delta modulation.

Q4) Solve any two : **[2×7=14]**
   a) Explain coding format of
      i) Bipolar RZ
      ii) Bipolar NRZ
      iii) Unipolar NRZ
      iv) Unipolar RZ
   b) Discuss the principle of operation of ASK Receiver.
   c) Draw the Eye pattern and indicate how ISI is measured from it.

Q5) Solve any two : **[2×7=14]**
   a) Explain the properties of line coding.
   b) Discuss QPSK in detail.
   c) Explain Matched Filter.

SE-10

Seat No.	

Total No. of Pages : 3

S.Y. (E&TC) (Semester-IV) (CBCS) Examination, March-2023
ELECTRONIC CIRCUIT DESIGN-II
Sub. Code : 79181

Day and Date : Thursday, 15 - 06 - 2023 **Total Marks : 70**
Time : 10.30 a.m. to 1.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**

Q1) Attempt following MCQs **[7×2=14]**

a) Gain of an amplifier usually expressed in db because_____.

i) It is a small unit

ii) Calculations become easy

iii) Human ear response is logarithmic

iv) Gain is reduced

b) What is meant by cascading?

i) Process of joining two amplifier stages using a coupling device.

ii) Process of extracting two amplifier stages using a coupling device.

iii) Both (i) and (ii)

iv) None of above

c) The lower and upper cut off frequencies are also called_____ frequencies

i) Sideband ii) Half-power

iii) Half-resonant iv) Resonant

P.T.O.

d) Types of negative voltage feedback_____
   i) Voltage-series & Shunt feedback
   ii) Current-series & Shunt feedback
   iii) Voltage-series & Current shunt feedback
   iv) Current-series & Voltage shunt feedback

e) Oscillators must use _____ feedback.
   i) Positive ii) Negative
   iii) Both (i) & (ii) iv) None of the above

f) In a wein bridge oscillator if C=0.047uF, Fo=1kHz, the value of R=_____.
   i) 1.38kΩ ii) 2.38 kΩ
   iii) 3.38kΩ iv) 4.38kΩ

g) What is the dropout voltage in a three terminal IC regulator?
   i) $|V_{in} \geq V_0| + 2V$ ii) $|V_{in}| < |V_0| - 2V$
   iii) $|V_{in}| = |V_0|$ iv) $|V_{in}| \leq |V_0|$

Q2) Attempt any two of the following. **[2×7=14]**

a) What is the need of cascading? Explain different types of coupling.

b) Write note on feedback topology.

c) Design class A Push-Pull Amplifier for following specifications: Po=500mW, loud speaker impedance=8Ω, Vcc=12V

Q3) Attempt any two of the following. **[2×7=14]**

a) Design a two stage RC coupled amplifier to meet the following specifications. RL=3Ω, RS=600Ω, VO=9V(p-p), VCC=15V, Lower 3dB frequency (f)=50Hz. Use transistor BC147A.

b) Design a two stage vtg series feedback amplifier with a overall gain of 100 and low 3dB frequency range is 20Hz to 20kHz. The output voltage swing should be 10V (p-p) with a load resistance of 5kΩ. Consider RS=200Ω. Use transistor data. IC(max)=100mA, PD(max)=300mV, VCE(max)=20 V, hfe=200.

c) Write short note on crossover distortion.

Q4) Attempt any two of the following. **[2×7=14]**

a) For Wein Bridge oscillator, show that oscillating frequency is fo=1/(2πRC) and minimum required gain is more than 3 to get sustained oscillations.

b) Derive expression for
   i) Time period (T)
   ii) Minimum hfe for astable multivibrator.

c) Write short note on Three terminal adjustable Positive voltage regulator (LM 317)

Q5) Attempt any two of the following. **[2×7=14]**

a) Design RC Phase shift oscillator for following specifications. VCC=12V, f_0=1 kHz, hfe=200/300, hie=4.5 k, IC (max)=200mA, PD(max)=250mw,s=10.

b) Draw a neat circuit diagram and explain the operation of Self Biased Bistable multivibrator.

c) Write short note on fixed positive and negative Voltage regulator (78XX & 79XX)

Q5) **Solve the following (15 marks) :**

a) Find Av, Ai, Ri, Ro, Avg, Aig for following parameter. Rg = 600Ω, R_L = 1KΩ, hie = 1000 Ω, hre = $3*10^4$, hoe = $3*10^6$ ʊ, hfe = 250. **[8]**

OR

a) Draw and explain hybrid equivalent circuit for CB configuration of transistor. **[8]**

b) Derive stability factor for collector to base bias circuit. **[7]**

⌘⌘⌘

Seat No.	

Total No. of Pages : 4

S.Y. B.Tech. (ETC) (Part - II) (Semester - III) (CBCS)
Examination, March - 2023
PCC-ETC-301 : ELECTRONIC CIRCUIT DESIGN - I
Sub. Code : 73247

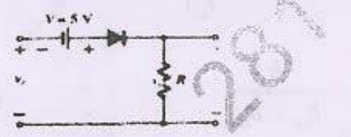
Day and Date : Saturday, 17 - 06 - 2023 **Total Marks : 70**

Time : 02.30 p.m. to 05.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Figures to the right indicates full marks.**
3) **Assume suitable data,if necessary.**
4) **Use of standard datasheet is allowed.**

Q1) **Choose one correct answer and rewrite the complete statement : [10]**

i) What is the circuit in the given diagram is called



a) Clipper b) Clamper
c) HWR d) FWR

ii) In a Low-pass filter, if Cutoff frequency is = 5.5 KHz. Its passband is _____.

a) 5.5KHz to ∞ b) 0Hz
c) 0Hz to 5.5KHz d) None of the above

iii) Output of Rectifier is _____.

a) AC b) DC
c) Pulsating DC d) None of the above

iv) Rectification Efficiency of HWR is _____ %.

a) 40 b) 100
c) 21 d) None of the above

P.T.O.

v) In short circuit protection circuit for Voltage regulator the additional transistor Q2 is connected to

a) Divert the base current of series pass transistor
b) Increase the base current of series pass transistor
c) Improve the Regulation
d) None of the above

vi) In order to determine hfe and hie parameters of a transistor _____ is a.c. short- circuited.

a) Input b) Output
c) Input as well as output d) None of the above

vii) Using standard transistor h parameter nomenclature, the voltage gain in CE arrangement is _____

a) $\frac{-h_{fe}}{Z_{in}\left(h_{oe}+\frac{1}{r_L}\right)}$ b) $\frac{-h_{fe}}{Z_{out}\left(h_{oe}+1\right)}$

c) $\frac{-h_{fe}}{h_{oe}+h_{re}}$ d) none of the above

viii) Choose the incorrect option according to self bias circuit.

a) Voltage gain increases
b) Stability factor is independent of collector resistance
c) BJT can be used in either of the three configurations
d) Excellent stability in collector current is achieved

ix) Which of the following relation is true about gate current?

a) IG = ID + IS b) ID = IG
c) IS = IG d) IG = 0

x) Consider a CE circuit, where trans-conductance is 50mΩ-1, diffusion capacitance is 100 pF, transition capacitance is 3pF,. I_B = 20μA. Given base emitter dynamic resistance, rbe = 1000 Ω, input V_1 is 20*sin(10_{π}). What is the short circuit Current gain?

a) 30 b) 35
c) 40 d) 100

Q2) **Solve the following (15 marks) :**

a) Design capacitor filter to supply V_{dc} = 12V, I_{dc} = 80mA and r = 0.05. **[7]**

b) Design series pass regulator V_o = 13.6V, I_o = 50mA and V_{in} = l8-25V (use hfel = 40 and hfe2 = 110). **[8]**

OR

b) Draw and explain positive and negative damper with waveforms. **[8]**

Q3) **Solve the following (15 marks) :**

a) Explain Full wave rectifier (Centre Tap) with neat diagram and waveform. Derive expression for dc output current, dc output voltage, rms current, rms voltage, ripple factor, Rectification efficiency and Transformer Utilization factor. **[8]**

b) Draw and explain positive clipper circuits. **[7]**

OR

b) Explain Pre-regulator and explain with suitable example. **[7]**

Q4) **Solve the following (15 marks) :**

a) Derive the expression for higher cut off frequency of R-C coupled amplifier considering square wave. **[7]**

OR

a) Derive the expression of stability factor for voltage divider biasing circuit. **[7]**

b) Derive expression for lower 3dB frequency of CE amplifier by considering coupling capacitor [Cc]. Calculate Cc for R_1 = 10KΩ, R_2 = 4.7KΩ, hie = 3.8KΩ, hfe = 100, Rs = 500Ω. **[8]**

SE-43

Seat No.	

Total No. of Pages : 3

S.Y. (ETC) (Semester - IV) Examination, March - 2023
LINEAR INTEGRATED CIRCUITS
Sub. Code : 79182

Day and Date : Saturday, 17 - 06 - 2023 **Total Marks : 70**

Time : 10.30 a.m. to 01.30 p.m.

Instructions : 1) **Attempt all questions.**
2) **Use of non-programmable calculator is allowed.**
3) **Assume necessary data if required and highlight.**

Q1) **Solve the following MCQs :** **[2 × 7 = 14]**

i) If 4V is applied to both the inputs of ideal op amp then the possible output will be

a) 4 V b) 2 V
c) 0 V d) 40 V

ii) Open loop configuration is not preferred in op-amps because its

a) Bandwidth is too large b) Bandwidth is very small
c) Gain is too large d) All of the mentioned

iii) A graph of the magnitude of the gain versus frequency is called

a) Break frequency b) Frequency response plot
c) Frequency stability plot d) Transient response plot

iv) For current mirror circuit

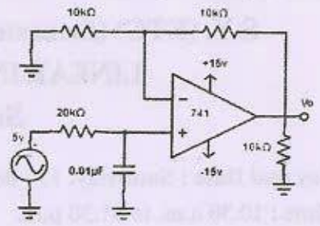
a) I source = I sink b) I source > I sink
c) I source < I sink d) None of these

v) Which among the following is a nonlinear application of op-amp?

a) V to I converter b) Comparator
c) Precision rectifier d) Instrumentation amplifier

P.T.O.

vi) Compute the pass band gain and high cut-off frequency for the first order high pass filter.



a) $A_F=11, f_H=796.18Hz$ b) $A_F=10, f_H=796.18Hz$

c) $A_F=2, f_H=796.18Hz$ d) $A_F=3, f_H=796.18Hz$

vii) For narrow band reject filter the quality factor Q will be always

a) Greater than 10 b) Less than 10

c) Infinite d) Zero

Q2) Answer any Two : **[2 × 7 = 14]**

a) Draw and explain DIBO (Dual input balanced output) differential amplifier with DC analysis.

b) Explain V to I convertor with floating and grounded load.

c) Explain frequency response of OP-AMP.

Q3) Answer any Two : **[2 × 7 = 14]**

a) Define the terms :

i) Input offset voltage

ii) Input bias current

iii) PSRR

iv) CMRR

b) Derive the expression for gain of non-inverting amplifier.

c) With neat sketch explain precision half wave rectifier.

Q4) Answer any Two : **[2 × 7 = 14]**

a) Design second order L.P.F. for cutoff frequency of 200 Hz. Draw circuit diagram. Assume C = 0.1 uF, Pass band Gain=2.

b) With neat diagram explain Timer IC 555 as Astable multivibrator.

c) Explain collpits oscillator using OP-AMP.

Q5) Answer any Two : **[2 × 7 = 14]**

a) Explain the application of IC AD620.

b) With the neat circuit diagram explain Band Reject filter with its frequency response.

c) Draw and explain transfer characteristics of PLL.

SE-89

Seat No.	

Total No. of Pages : 3

S.Y. B.Tech. (ETC) (Part - II) (CBCS) (Semester - IV) Examination, March - 2023

DATA STRUCTURES

Sub. Code : 79185

Day and Date : Monday, 19 - 06 - 2023 **Total Marks : 70**

Time : 10.30 a.m. to 01.00 p.m.

Instructions : 1) **All questions are compuslory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary.**

Q1) Solve the multiple-choice questions. **[1 each]**

i) A data structure in which linear sequence is maintained by pointers is known as
   a) Array b) Stack
   c) Linked list d) Pointer-based data structure

ii) A _____ is a linear collection of self referential structures, called nodes, connected by pointer links.
   a) Queue b) Linked list
   c) Tree d) Stack

iii) Which of the following is not a linear data structure?
   a) Stack b) Queue
   c) Linked list d) Binary tree

iv) Which of the following data structure permits insertion and deletion operations only on one end of the structure?
   a) Linked list b) Array
   c) Stack d) Queue

v) What is the time complexity of inserting at the end in dynamic arrays?
   a) O(1) b) O(n)
   c) O(log n) d) Either O(1) or O(n)

P.T.O.

vi) Pointer is a _____.
- a) variable that stores address of an instruction
- b) variable that stores address of other variable
- c) keyword used to create variables
- d) None of mentioned

vii) How can we initialize an array in C language?
- a) int arr[2]=(10, 20)
- b) int arr(2)={10, 20}
- c) int arr[2] = {10, 20}
- d) int arr(2) = (10,20)

viii) The number of edges from the node to the deepest leaf is called _____ of the tree
- a) Height
- b) Depth
- c) Length
- d) Width

ix) Pop Operation in stack is
- a) Adding Elements
- b) Removing Elements
- c) Traversing
- d) None of the above

x) Which data structure is suitable for Postfix to Infix evaluation?
- a) QUEUE
- b) Array
- c) STACK
- d) TREE

xi) What is a hash table?
- a) A structure that maps values to keys
- b) A structure that maps keys to values
- c) A structure used for storage
- d) A structure used to implement stack and queue

xii) The five items: A, B, C, D and E are pushed in stack, one after the other starting from A, The stack is popped four items and each element is inserted in a queue. Then two elements are deleted from the queue and pushed back on the stack. Now one item is popped from the stack. The popped item is
- a) B
- b) C
- c) D
- d) E

xiii) The number of elements in the adjacency matrix of a graph having 7 vertices is _____.
- a) 7
- b) 14
- c) 36
- d) 49

xiv) Heap can be used as _____.
- a) Priority queue
- b) Stack
- c) A decreasing order array
- d) Normal Array

Q2) Attempt any two questions. **[14]**
- a) What is time complexity and space complexity?
- b) Explain abstract data type with an example.
- c) Write in detail insertion & deletion of nodes of linked list.

Q3) Attempt any two questions. **[14]**
- a) Explain two-way lists.
- b) Explain Header linked list.
- c) Explain Binary Search with example.

Q4) Attempt any two questions. **[14]**
- a) Explain the different operations related to stack.
- b) Write an algorithm to evaluate postfix expression using stack.
- c) Write an algorithm to insert element into Queue.

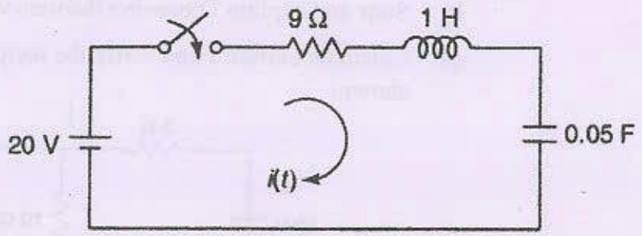
Q5) Attempt any two questions. **[14]**
- a) Explain quick sort with method with example.
- b) Explain AVL tree with example.
- c) Write Warshall's Algorithm.

Q5) Attempt any Two. **[14]**

a) Explain in detail DC or step voltage response of Series R-C circuit.

b) Design a prototype band pass filter having cutoff frequencies of 3KHz and 11 KHz and nominal characteristic impedance of 500Ω.

c) In the network of Fig., the switch is closed at t = 0 Obtain the expression for current $i(t)$ for t > 0.



Total No. of Pages : 4

Seat No.	

S.Y. B.Tech. (Electronics and Telecommunication Engineering)
(CBCS) (Semester - III) Examination, March - 2023
NETWORK ANALYSIS
Sub. Code : 73248

Day and Date : Monday, 19 - 06 - 2023 **Total Marks : 70**
Time : 02.30 p.m. to 5.00 p.m.

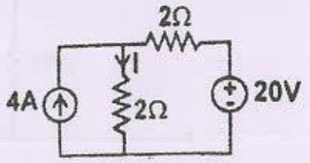
Instructions : **1)** **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data, if necessary**

Q1) Choose one correct answer and rewrite the complete statement. **[14]**

i) If no two branches of the graph cross each other, then the graph is called?

a) directed graph b) undirected graph
c) planar graph d) Non planar graph

ii) Find current I flowing through 2Ω resistor



a) 8A b) 6A
c) 7A d) 4A

iii) For ZL = ZS*, the relation between XL and XS is?

a) XL = XS b) XL = 0
c) XL = infinity d) XL = -XS

iv) The poles of driving point impedance are those frequencies corresponding to _____ conditions

a) short circuit b) open circuit
c) voltage source d) resonance

v) The relation between Z11 and Y parameters is?

a) Z11=Y21/Δy b) Z11=Y11/Δy
c) Zl1 = Y12/Δy d) Zl1 = Y22/Δy

vi) A network has 7 nodes and 5 independent loops. The number of branches in the network is

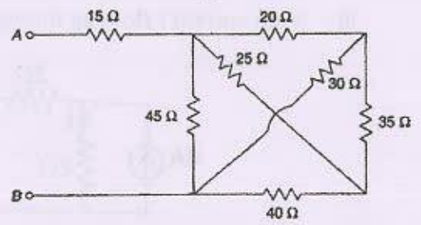
a) 13 b) 12
c) 11 d) 10

vii) A network contains only an independent current source and resistors. If value of all resistors are doubled, the value of the node voltages will

a) become half b) remain unchanged
c) become double d) none of the above

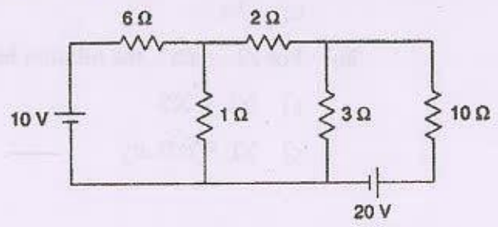
Q2) Attempt any two. **[14]**

a) Find an equivalent resistance between A and B in the network.



b) Derive the equation for delta to star transformation of resistive network.

c) Find current through 10Ω using Thevenin's theorem.



Q3) Attempt any two. **[14]**

a) Series RLC circuit having R=100Ω, L=100mH and C=10 nF. The applied voltage across circuit is 100V. Find

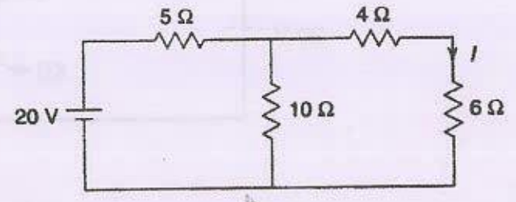
i) Resonant frequency (ω_0)

ii) Quality Factor at resonance Q_0

iii) Two half-power frequencies ω_1 and ω_2 and bandwidth ($\Delta\omega$).

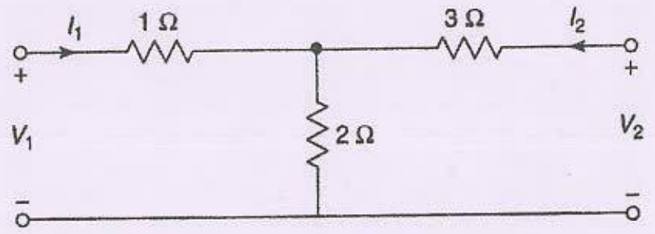
b) State and explain Thevenin's theorem with example.

c) Calculate current I and verify the reciprocity theorem for the network shown.



Q4) Attempt any Two. **[14]**

a) Find Y-Parameters of given network.



b) Determine ABCD parameters in terms of h-parameters.

c) Derive the relation between decibel and neper.