

**FACULTY OF ENGINEERING****B.E. (CSE) (CBCS) III-Semester (Backlog) Examination, October 2021****Subject : Logic and Switching theory****Time: 2 Hours****Max marks: 70****Missing data, if any, may be suitably assumed****PART - A****Note: Answers any Five questions.****(5x2=10 Marks)**

1. Simplify the following Boolean Expression to a minimum number of Literals.

$$i. \quad ABC + ABC + \overline{AB} \quad ii. \quad (\overline{A+B}) (\overline{A+B})$$

2. Simplify the Boolean function using  $(x' y' + z)' + z + xy + wz$  theorem.

3. Differentiate between Combinational and Sequential Circuits.

4. Implement F using  $F = (AB' + A'B)(E(C+D'))$ 

5. Distinguish between Decoder and Demultiplexer.

6. What is Demultiplexer? Give example.

7. Write about PAL and PLA.

8. Define the terms characteristic equation, characteristic table and excitation table.

9. What is a State Table, Give example?

10. Write the differences between synchronous and asynchronous counters.

**PART - B****Note: Answers any Four questions.****(4x15=60 Marks)**11. a) Simplify the Boolean Function to a minimum number of literals  $xy + \overline{x}z + YZ$   
 $ABC + \overline{A}B + AB\overline{C}$ b) Express the complement of the function given in sum of minterms and draw the logic diagram  $F(X, Y, Z) = \sum m(0, 3, 6, 7)$ 12. Realize the function with minimum number of literals using k-map method  $F(A, B, C, D, E) = \sum m(0, 2, 4, 6, 9, 11, 13, 15, 17, 21, 25, 27, 29, 31)$  and draw the logic circuit.

13. Design 4-bit carry look ahead Adder and draw the circuit.

14. a) Realize full subtractor circuit and draw the circuit using only NAND gates.

b) Explain about Carry save Adders.

15. a) Explain with suitable examples, Why NAND and NOR gates are called Universal gates.

b) Differentiate between Mealy and Moore Machines.

16. Design a synchronous decade counter using JK flip flop.

17. a) Design a mod – 12 Synchronous Counter using JK FF.

b) State De-Morgan's Law

\*\*\*\*\*

**FACULTY OF ENGINEERING**

**B.E. (I.T) III – Semester (CBCS) (Backlog) Examination, October 2021**

**Subject: Environmental Studies**

**Time: 2 Hours**

**Max. Marks: 70**

**(Missing data, if any, may be suitably assumed)**

**PART – A**

**Note: Answer any five questions.**

**(5x2 = 10 Marks)**

- 1 Write a note on Soil erosion.
- 2 Explain Drought.
- 3 What do you mean by water-logging?
- 4 What is a difference between *In situ* and *Ex-situ* conservation of biodiversity?
- 5 Define Climate change.
- 6 Write a note on Incineration.
- 7 What are the effects of Noise pollution on human health and environment?
- 8 Write a note on Estuary Ecosystem.
- 9 Why there is a need to develop awareness in public about Environment Safety?
- 10 Write about any four methods of water conservation.

**PART – B**

**Note: Answer any four questions.**

**(4x15 = 60 Marks)**

- 11 a) Define Floods and explain what are the causes, effects and control measures of them.  
b) Explain bio geographical zones of India.
- 12 a) What is Global Warming? What are its consequences?  
b) Why there are conflicts on water resources? Justify with examples.
- 13 a) Write about Air Pollution (Prevention & Control) Act.  
b) Define Thermal pollution. What are the causes, effects and control measures of it?
- 14 a) Explain Disaster Management cycle.  
b) Write a note on food chain. Explain energy flow in Pond ecosystem.
- 15 a) Define levels of biodiversity and why there is a need to conserve biodiversity.  
b) Discuss various impacts of industrial agriculture system.
- 16 a) Define water pollution. Explain causes effects and control measures of water pollution.  
b) Give a detail classification of Disasters. Write about mitigation measures of floods.
- 17 a) Write about any two case studies of watershed management. Briefly explain rain water harvesting.  
b) What are dams? Explain its merits and demerits.

\*\*\*\*

**FACULTY OF ENGINEERING****BE III-Semester (AICTE) (Civil) (Backlog) Examination, October 2021****Subject : Surveying and Geomatics****Time: 2 Hours****Max marks: 70****Missing data, if any may be suitably assumed****PART - A****Note: Answers any Five questions.****(5x2=10 Marks)**

1. Define Surveying
2. Convert the following whole circle bearing in to Reduced bearing ( $49^\circ$ ,  $209^\circ$ ,  $133^\circ$ ,  $278^\circ$ )
3. What type of errors are eliminated by changing face of the theodolite?
4. Define Latitude and Departure.
5. Write a short note on Transition curves
6. What is the radius of 5-degree curve from 30, chord?
7. Discuss the salient features of Space segment in GPS
8. State the principle of EDM
9. State the expression used to determine the scale of a vertical photograph?
10. Define Passive remote sensing

**PART - B****Note: Answers any Four questions.****(4x15=60 Marks)**

11. A road embankment is 8m wide and 200m in length, at the formation level, with a side slope of 1.5:1. The embankment has a rising gradient of 1 in 100m. The ground levels at every 50m along the center line are as follows:

Distance(m)	0	50	100	150	200
RL (m)	164.5	165.2	166.8	167	167.2

The formation level of zero chainage is 166m. Calculate the volume of earthwork using Trapezoidal rule and Prismoidal Rule

12. To find the elevation of the top of a chimney, the following observations were made from two stations P and Q, 50m apart.
- Horizontal angle at station P, between chimney and Q =  $60^\circ$
  - Horizontal angle at station Q, between chimney and P =  $50^\circ$
  - Angle of elevation from P to the top of Chimney =  $30^\circ$
  - Angle of elevation from Q to the top of Chimney =  $29^\circ$
  - RL of the line of collimation at P = 22.5m
  - RL of the line of collimation at Q = 20.5m
- Determine the elevation of the top of the chimney.

13. a) Explain the elements of simple circular curve using a neat sketch.  
b) A Circular curve has a 200m radius and 65° deflection angle. Determine the following components  
i) Tangent Length  
ii) Length of the curve  
iii) Length of the long chord  
iv) Degree of curve  
v) Apex distance  
vi) Mid-ordinate
14. a) Discuss the various applications of GPS  
b) Discuss the advantages and disadvantages of total station surveying
15. a) Derive the expression for Relief displacement with a neat sketch  
b) Explain the process of remote sensing
16. a) The following consecutive staff readings were taken with a level along a sloping ground line AB at a regular distance of 20m by using 4m leveling staff. 0.352, 0.787, 1.832, 2.956, 3.758, 0.953, 1.756, 2.738, 3.872, 0.812, 2.325, and 3.137. Rule out a page of level field book and enter the above readings. RL of point A is 320.288. Calculate RL of all points by rise and fall method and work out the gradient of line AB.  
b) Write a short note on Radiation method of plane table survey using neat sketch.
17. a) Discuss the principle of EDM instruments  
b) Write a short note on Scattering and absorption mechanism in remote sensing.

\*\*\*\*\*

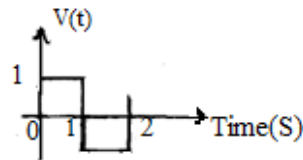
Note: Missing data, if any, may be suitably assumed.

**PART – A**

Answer any five questions.

(5x2 = 10 Marks)

- 1 Obtain the RMS and Average values of periodic waveform shown.



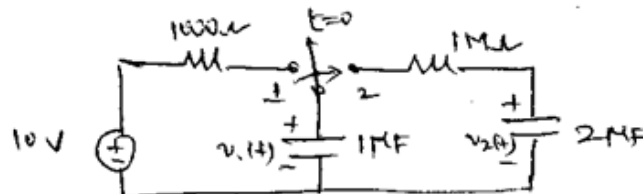
- 2 State final value theorem.  
 3 Obtain the Laplace transform of each of  $e^{-2t} \sin 4t u(t)$ .  
 4 What is integrodifferential equation? Write an example.  
 5 Write the behaviour of inductor and capacitor when suddenly connected to DC supply.  
 6 Write the governing equations of Z and Y parameters.  
 7 Define Transfer and Driving point functions.  
 8 State Maximum power transfer theorem.  
 9 Define Self and Mutual Inductance.  
 10 What is duality? Write equivalent dual quantities for R,L,C elements.

**PART – B**

Answer any four questions.

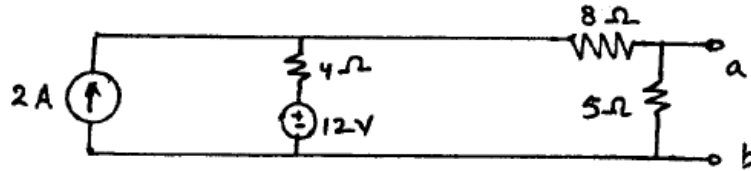
(4x15 = 60 Marks)

- 11 Find  $v_1(t)$  and  $v_2(t)$  for  $t > 0$  in the network shown below. The switch was in position 1 for a long time before it is thrown to position 2.



- 12 In a series-parallel circuit, the parallel branches Q and R are in series with P. The impedances are  $Z_P = (4+j2)\Omega$ ,  $Z_Q = (2-j8)\Omega$  and  $Z_R = (5+j2)\Omega$  and if the current in the series impedance  $Z_P$  is 20A. Determine the branch currents, branch voltages and the total voltage and also draw the phasor diagram.

- 13 (a) A 400V, 50Hz, 3- $\phi$  supply has  $50\Omega$  between R and Y,  $200\text{mH}$  between Y and B and  $36.4\mu\text{F}$  between B and R and are connected in delta. Find the line currents.  
 (b) Derive the expression for energy stored in Inductor.
- 14(a) State and explain Superposition theorem with an example.  
 (b) Find the Norton's equivalent at the terminals A and B of the circuit shown.



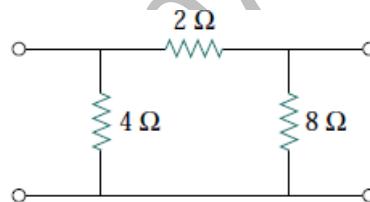
- 15(a) Determine the initial and final values of  $f(t)$ , if they exist  
 $F(s) = (s^2 + 3)/(s^3 + 6s^2 + 3)$   
 (b) Find the time functions that have the following Laplace transform:  
 $G(s) = (e^{-s} + 4e^{-2s})/(s^2 + 6s + 8)$

- 16 (a) Show that the transmission parameters of a two-port network may be obtained from the Y parameters as:

$$A = -\frac{y_{22}}{y_{21}}, \quad B = -\frac{1}{y_{21}}$$

$$C = -\frac{\Delta_y}{y_{21}}, \quad D = -\frac{y_{11}}{y_{21}}$$

- (b) Obtain the transmission parameters for the following  $\pi$  network shown.



- 17 Obtain the equivalent parameters when 2 two port networks are connected in

- (i) Series  
 (ii) Parallel

\*\*\*\*\*

## FACULTY OF ENGINEERING

B.E. (AICTE)(Inst) III – Semester (Backlog) Examination, October 2021

Subject : Network Theory

Time: 2 Hours

Max marks: 70

Missing data, if any, may be suitably assumed

## PART - A

Note: Answer any Five questions.

(5x2=10 Marks)

1. What do you understand by the term dependent source? Classify the different dependent sources.
2. Find the resistance R for the network shown in Fig.1.

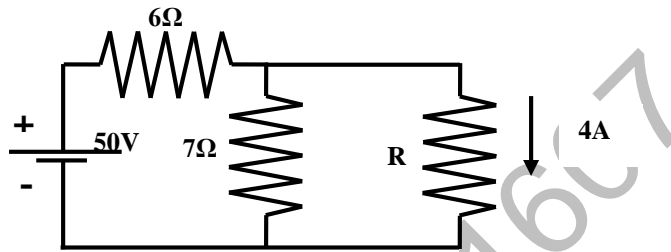


Fig.1

3. An exponential voltage  $V(t) = 16e^{-4t}$  volts is applied to series RL circuit with  $R = 1\Omega$  and  $L=0.2H$ . Find the response  $i(t)$  assuming initial charge to be zero.
4. Obtain the ramp response of a series RC circuit.
5. Show that in a reactive circuit the real power is zero.
6. An R-L series circuit draws a current of 5 A when connected across a 50V, 50Hz a.c supply. Assuming the resistance to be  $7.5\Omega$ , find the inductive reactance of the circuit. What is its power factor?
7. Write the expression for total inductance of the three series connected coupled coils connected between A and B as shown in circuit shown in Fig.2.

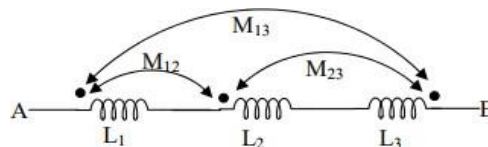


Fig.2

8. The line to line input voltage to the 3 phase, 50Hz, ac circuit shown in Fig.3 is 100V R.M.S. Assuming that the phase sequence is RYB, find the reading of each wattmeter.

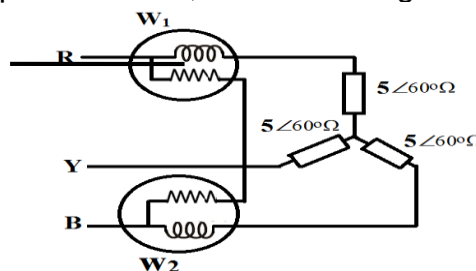


Fig.3

9. Express Z-parameters in terms of ABCD parameters.
10. What is reciprocity in a two-port network. Give the condition for reciprocity with respect to hybrid parameters and short circuit parameters.

## PART - B

Note: Answer any Four questions.

(4x15=60 Marks)

11. State Superposition Theorem. Obtain the value of current through the  $5\Omega$  resistor shown in Fig.4 by using super position theorem. Prove that Superposition theorem cannot be applied for nonlinear circuit.

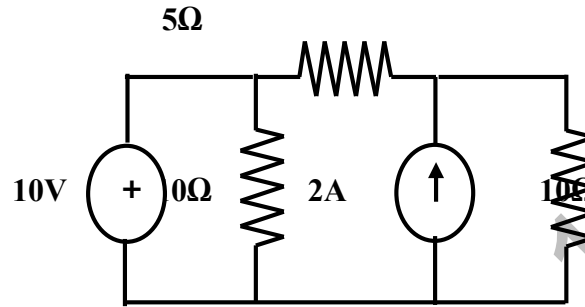


Fig.4

12. The network shown in the Fig.5 is in the steady state position when the switch k is opened. At  $t=0$ , the switch is closed. Determine the voltage across the capacitor  $v_c$  and  $\frac{dv_c}{dt}$  at  $t=0^+$ .

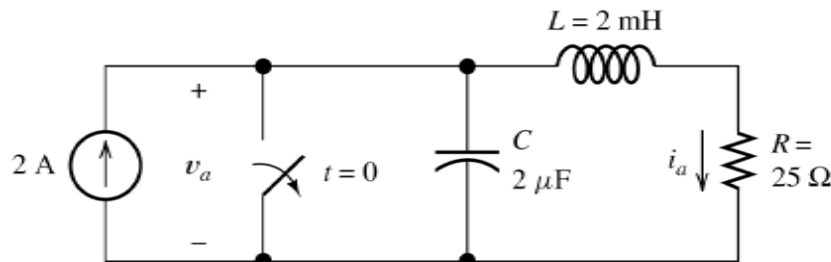


Fig.5

13. a) An unknown impedance of  $Z \Omega$  is connected in series with  $(5+j8) \Omega$  coil. If  $I=2.5\angle-15^\circ$  A, find the value of  $Z$  for the circuit shown in Fig.6.

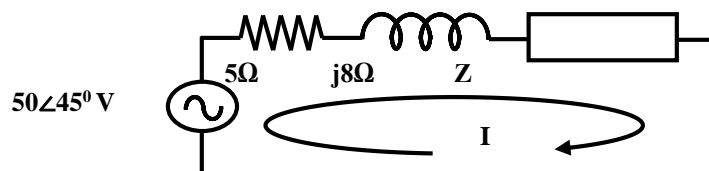


Fig.6

- b) A capacitor of capacitance  $100/\pi \mu\text{F}$  is connected across a 220 V, 50 Hz A.C. mains Calculate the capacitive reactance, RMS value of current and write down the equations of voltage and current.



-3-

14. a) A  $500 \mu\text{H}$  inductor,  $80/\pi^2 \mu\text{F}$  capacitor and a  $628 \Omega$  resistor are connected to form a series RLC circuit. Calculate the resonant frequency, band width and Q-factor of this circuit at resonance.
- b) Show that in an unbalanced 3-phase delta network three phase power can be measured by using two wattmeters only.
15. Determine the impedance, admittance parameters for the network shown in Fig. 7.

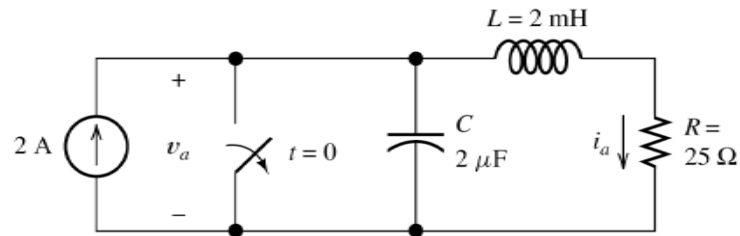


Fig. 7

16. a) What do you understand by the term Duality? Draw the dual network for the circuit shown in Fig.8.

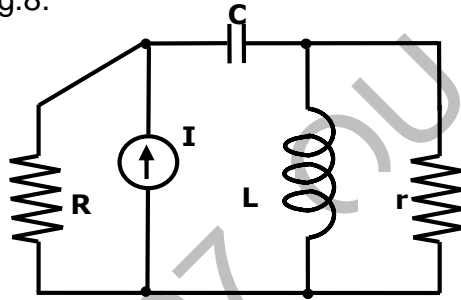


Fig.8

- b) Determine the value of  $R$  required to deliver maximum power and determine the maximum power delivered for the circuit shown in Fig. 9.

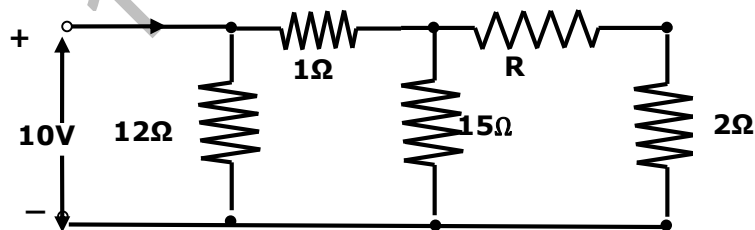


Fig. 9

17. a) Show that the power delivered in a mesh network is 3 times of the power delivered in Wye network.
- b) Find the form factor of half rectified sine wave.

\*\*\*\*\*