15/6/24 (FN)

Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E.(FT) END SEMESTER EXAMINATIONS – APRIL/MAY 2024

COMPUTER SCIENCE AND ENGINEERING

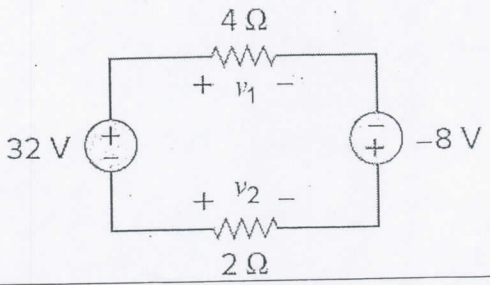
EE6351 – Basics of Electrical and Electronics Engineering
(Regulation 2018 -RUSA)

Time:3 Hours

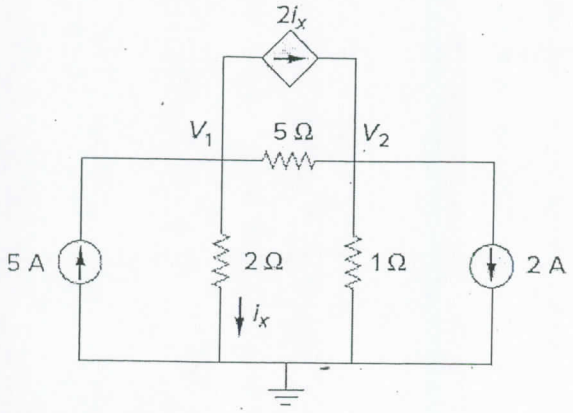
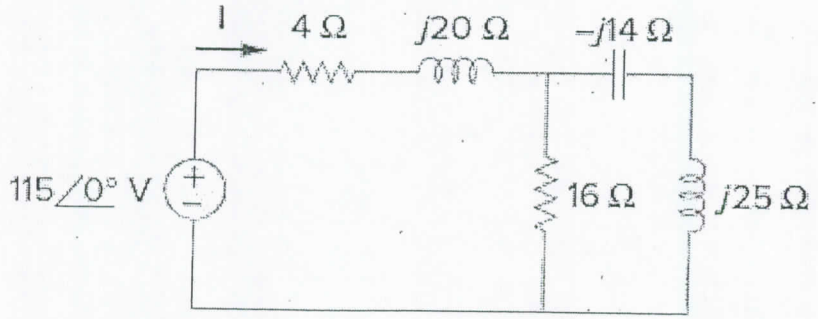
Max.Marks100

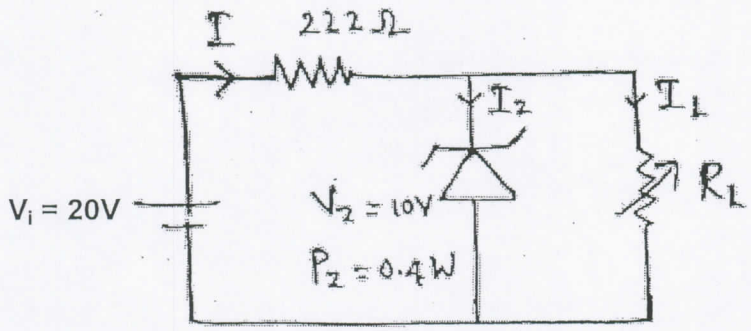
PART-A (10x2=20 Marks)

(Answer ALL Questions)

S.No	Questions	Marks
1.	Find v_1 and v_2 	2
2.	The delta network consists of balanced resistors of values $R_a=R_b=R_c=R_\Delta=24\ \Omega$. Calculate the resistance R_Y for balanced star network.	2
3.	The turn ratio of transformers is given as 1:2. If the applied voltage in the primary coil is 100 V, then calculate the secondary voltage across the load.	2
4.	What is step angle in stepper motor?	2
5.	In which region, the BJT is operated as amplifier.	2
6.	What is voltage divider biasing?	2
7.	Design an inverting op-amp for a voltage gain of -2.	2
8.	How an op-amp is operated as integrator and draw the corresponding circuit.	2
9.	Draw the circuit of 3-bit flash type ADC.	2
10.	Draw the output characteristics of n-channel MOSFET in depletion type.	2

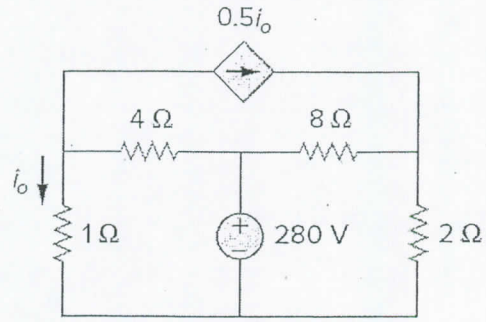
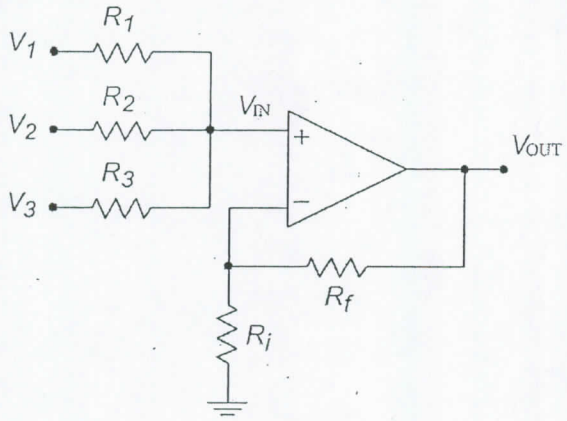
PART –B (8x8=64 marks)
(Answer any 8 questions)

S.No	Questions	Marks
11.	Explain the operation of Permanent Magnet Moving Coil (PMMC) instrument with appropriate diagram and derive the torque equation.	8
12.	Calculate the node voltages i_x, V_1 and V_2. 	8
13.	Calculate the following parameters for the given circuit a. Equivalent impedance Z_{eq} (2 marks) b. Supply current I in polar form (2 marks) c. Real power (P) (1 mark) d. Reactive power (Q) (1 mark) e. Apparent power (S) (1 mark) f. Power factor (1 mark) 	8
14.	a) Derive the EMF equation of DC machine. (4 marks) b) A 200 V DC shunt motor takes 20 A current while it runs at 800 rpm under full load. The resistance of armature and field windings are 0.25 Ω and 200 Ω respectively. Determine the back EMF. (4 marks)	8

15.	A single phase transformer has 400 and 800 turns in primary and secondary windings respectively. The net cross-sectional area of the core is $50cm^2$ and the flux density is 2 Wb/m^2. The primary winding is connected to 50Hz supply at 200 V. Calculate (a) flux in the core (b) transformation ratio (c) emf induced in the secondary winding.	8
16.	Why single phase induction machine is not self starting and explain in detail with double field revolving theory. Mention the types of single phase induction motors.	8
17.	a) Explain the characteristics and the operation of PN junction diode under (i) unbiased (ii) forward biased (iii) reverse biased condition with suitable diagrams. (6 marks) b) What is avalanche breakdown and Zener breakdown? (2 marks)	8
18.	Find the minimum and maximum value of R_L to maintain a constant load voltage in the given circuit. The input voltage is Vi=20V, Rs=222 Ω, maximum power allowed in Zener diode is $Pz_{(max)}$=0.4 W. 	8
19.	Explain the characteristics of any two types of negative feedback amplifier with neat sketch	8
20.	Derive the expression for summing operational amplifier circuit in inverting and non-inverting configuration.	8
21.	Briefly explain the operation of binary weighed Digital to Analog converter (DAC) with necessary diagram.	8
22.	Explain in detail the construction and working of n-channel MOSFET in depletion and enhancement mode of operation	8

PART–C (2x8=16 marks)

ANSWER ALL THE QUESTIONS

S.No	Questions	Marks
23.	**Find the mesh currents and i_o in the given circuit.** 	8
24.	**Calculate output voltage V_{out} for the given circuit where R_1=1Ω, R_2=2Ω, R_3=4Ω, R_f=4Ω, R_i=1Ω, V_1=1V, V_2=3V, V_3=5V.** 	8