



**ACE**  
Engineering College  
(with a Difference in Excellence)

An AUTONOMOUS Institution

Question Paper Code

EE203ES

:

ACE-R20

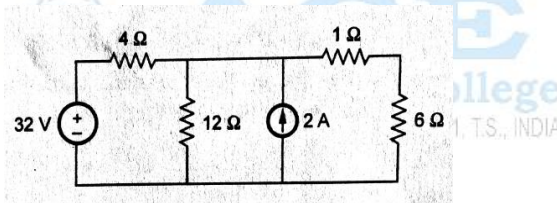
**Semester End Examination**  
**I B. Tech- II Semester- OCTOBER 2021**  
**BASIC ELECTRICAL ENGINEERING**  
(common to ECE,CSM, CSO)

Time: 3 Hours

Max. Marks: 70

H. T. No

*Answer any five full questions from the following. All Questions carry equal marks.*  
M=Marks; CO=Course Outcomes; PO= Program Outcomes

Q.No	Question	M	CO	PO
1. a)	State and Explain Thevenin's Theorem. Discuss its significance on the network theory.	7	1	1,2
b)	Find current Through $6\ \Omega$ Resistor using Thevenin's Theorem? 	7	1	1,4
2. a)	Compare series and Parallel circuits.	7	1	2
b)	Two resistors connected in parallel across 100 V DC supply, takes 10 A current from the supply. Power dissipated in one resistor is 600 W. Find i) What is the resistance of that resistor? ii) What is the current flowing through that resistor? iii) What is the current in the other resistor? iv) What is the resistance of the other resistor?	7	1	1,2
3. a)	Derive the expression for Root Mean Square value of an alternating sinusoidal current wave form $I = I_m \sin \omega t$ .	7	2	1,2
b)	A series circuit with a resistance of $R = 10\ \Omega$ and inductance of 20 mH has a current of $I = 2 \sin 500t$ . Obtain the total voltage across the series circuit and angle by which the current lags the voltage.	7	2	1,4
4. a)	(a) Sketch and Explain the phasor diagram of RLC series circuit for i) $X_C > X_L$ (ii) $X_C < X_L$ , (iii) $X_C = X_L$ .	7	2	1,2
b)	A coil of 20 Ohms resistance has an inductance of 0.2 H and is connected in series with a $100\ \mu\text{F}$ capacitor. Calculate the frequency at which the circuit will act as a non-inductive resistance. Also calculate the current at this frequency.	7	2	1,4
5. a)	Prove that the Efficiency of a Transformer is Maximum when	7	3	1,2

	Variable losses equal to constant losses.			
b)	Derive the approximate equivalent circuit of a single phase transformer.	7	3	1,2
6. a)	Explain, How will you classify DC generators in detail? and also explain the types of DC generators.	7	4	1,2
b)	Explain the construction of DC machine with neat diagram.	7	4	1,2
7. a)	Derive Torque Equation of a 3-Phase Induction Motor?	7	4	1,2
b)	Explain the principle of operation of an Alternator with a neat sketch.	7	4	
8. a)	Mention the Disadvantages of low power factor, and Explain how this can be Improved.	7	5	1,3
b)	What are the various components of LT switchgear? Explain the importance of these components.	7	5	1,3