

Name:

Enrolment No:



### UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2019

Programme Name: B.Tech – ASE , ASE-AVE , FSE , Civil , GIE , Mechatronics Engg. , ADE , Electrical Engg. , Electronics Engg. Semester : I

Course Name : Basic Electrical Engineering Time : 03 hrs

Course Code : EPEG 1001 Max. Marks : 100

Nos. of page(s) : 03

#### SECTION A

S. No.		Marks	CO
Q 1	What is a battery . List the main characteristics of a battery .	4	CO1
Q2	(a) Why the p.f. of ac circuit is always positive ? (b) Discuss when the reactive power is positive or negative .	4	CO2
Q3	Compare magnetic and electric circuits	4	CO2
Q4	Distinguish between core type and shell type transformer ? Why is the core of a transformer laminated ?	4	CO3
Q5	What is an electrical circuit breaker . What is difference between MCB and ELCB .	4	CO4

#### SECTION B

Q6 In fig.1 the galvanometer G has a resistance of  $0.1 \Omega$  . Determine the current through the galvanometer using Thevenin's Theorem .

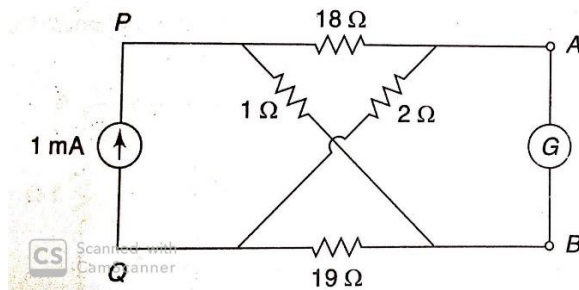


Fig 1

10 CO1

Q7 Determine the current drawn by the series parallel circuit shown in Fig 2. And find the overall p.f.

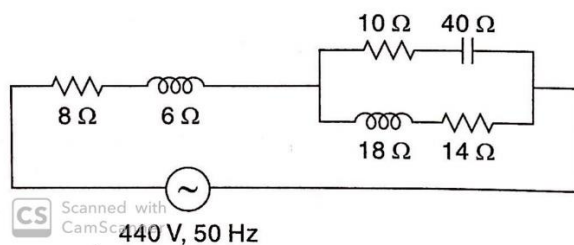
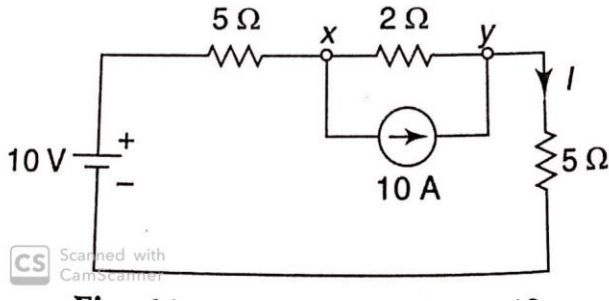
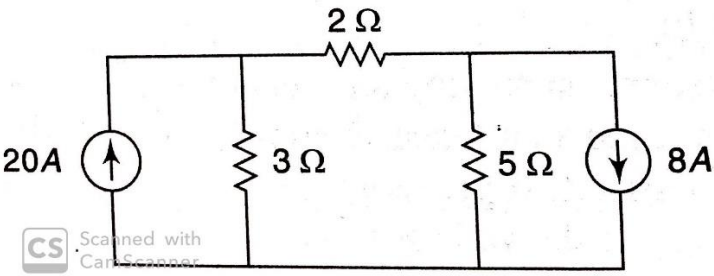


Fig2

10 CO2

Q8	A series connected RLC circuit has $R = 15 \Omega$ , $L = 40 \text{ mH}$ and $C = 40 \mu\text{F}$ . Find the resonant frequency and under resonant condition calculate current , power , voltage drops across various elements if the applied voltage is $75 \text{ V}$ .	10	CO2
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Q9	<p>Using Source conversion technique , find current <math>I</math> for the Fig 3.</p>  <p style="text-align: center;"><b>Fig 3</b></p> <p><b>OR</b></p> <p>Using Superposition theorem find the current through the <math>2 \Omega</math> resistor in Fig 4</p>  <p style="text-align: center;"><b>Fig 4</b></p>	10	CO1
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**SECTION-C**

Q10	<p>(a) Enumerate the different types of dc generators according to the ways in which the fields are excited . Show the connection diagram of each type .</p> <p>(b) A dc shunt motor runs at 1000 rpm and takes an input of 700 W at 220 V under no load conditions . The shunt field current is 1 A and armature resistance is <math>0.2 \Omega</math> . Find the speed when the machine is used as generator if the line current is same in both the cases .</p> <p><b>OR</b> ----- X -----</p> <p>(a) A 4 – pole wave connected dc generator has 220 coils of 10 turns each . The speed is 400 rpm and resistance of each turn is <math>0.02 \Omega</math> . Find the emf produced and the resistance of armature winding if the flux per pole is <math>0.05 \text{ Wb}</math></p>	10	CO3
		10	CO4
		10	CO3

	(b) Describe using the diagram , how the speed of a dc motor motor can be controlled	<b>10</b>	<b>CO4</b>
Q11	(a) Explain the working of Transformer on No – Load . (b) A 125 kVA transformer having a primary voltage of 2200 V at 50 Hz has 182 primary turns and 40 secondary turns . Neglecting losses calculate (i) full load primary and secondary currents and (ii) no load secondary induced emf .	<b>10</b>  <b>10</b>	<b>CO3</b>  <b>CO4</b>