

NOTE : The submission time of the Question Paper Answer Sheet is 24 Hrs from the scheduled time (exceptional provision due to extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas).

No Submission will be entertained after 24 Hrs

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Assignment based End Semester Examination, July 2020

Programme Name: B.Tech –APE Spz GS, APE Spz US, ME, CHEMICAL

Semester : II

Course Name : Basic Electrical Engineering

Time :

Course Code : EPEG 1001

Max. Marks : 40

Instructions:

1. Attempt all the questions (Theory, Numerical, Case study etc.) on A4 size blank sheets.
2. Attempt all questions serially as per question paper.
3. Answer should be neat and clean. Draw a free hand sketch for circuits/tables/schematics wherever required.
4. Scan the whole answer script and check the resolution carefully before upload on the blackboard. Note that answer scripts will be considered for evaluation only through Blackboard. No other mode of submission is acceptable.
5. You are expected to be honest about each attempt which you make to progress in life

SECTION A [5]

S. No.		Marks	CO
Q1	Draw the circuit symbol and terminal V-I characteristics of : (a) Ideal and practical Voltage source (b) Ideal and practical Current source	2	CO1
Q2	Define in reference to alternating quantity the following terms (a) Active power (b) Reactive power.	1	CO1
Q3	Enlist the ratings of the battery which defines its characteristics and the quality. Describe any two ratings.	2	CO2

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SECTION B [15]

Q4 Find the value of V_{TH} and R_{th} across terminal A-B for the network shown below in Fig 2

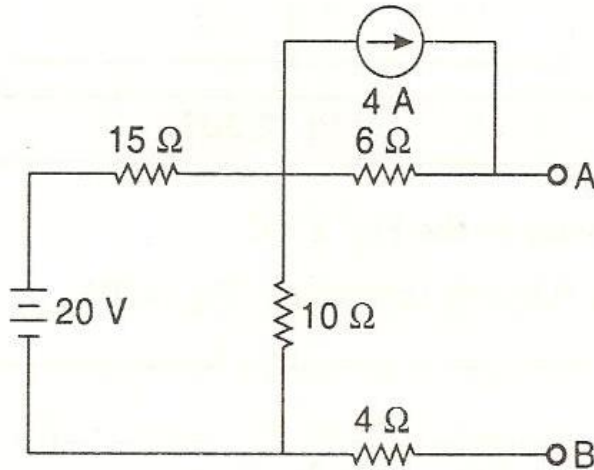


Fig 2

5

CO2

Q5 Two circuits P and Q are connected in parallel across a 240 V , 50 Hz supply . The total current drawn by the combination is 13.75 A at 0.96 leading power factor . The circuit P consists of a resistance of 10 Ω and capacitance of 150 μF connected in series .Circuit Q has a resistance R in series with an inductive reactance X .

Calculate the following data for the Q circuit (i) the current (ii) power factor (iii) impedance (iv) resistance and (v) reactance .

5

CO2

Q6 Find the value of R_L for maximum power transfer . Also find the current and voltage under the condition of maximum power transfer for the circuit shown below in Fig .3

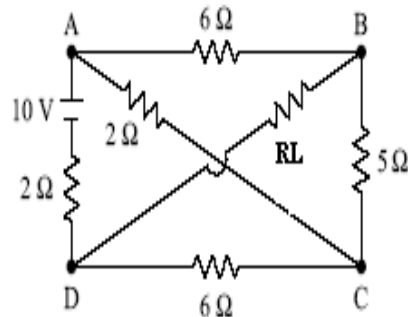


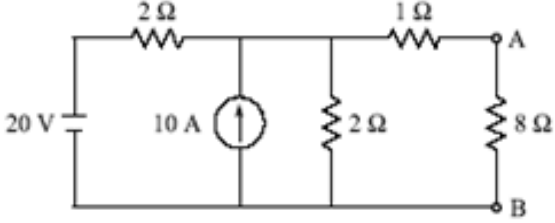
Fig 3

5

CO3

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	<p style="text-align: center;">OR</p> <p>Find the value of current through $8\ \Omega$ resistance shown in Fig.4 below using Superposition theorem</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Fig 4</p>		
SECTION-C [20]			
<p>Q7</p>	<p>(a) Explain the principle of working of a dc generator .Explain why a commutator and brush arrangement is necessary for the operation of a dc machine.</p> <p>(b) A shunt generator gives full-load output of 30 kW at a terminal voltage of 200 V . The armature and shunt – field resistances are $0.5\ \Omega$ and $50\ \Omega$ respectively . The iron and friction losses are 1000 W . Calculate (i) the emf generated , (b) the copper losses , and (iii) the efficiency.</p> <p style="text-align: center;">OR</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 $0.02\ \Omega$. Find the emf produced and the resistance of armature winding if the flux per pole is 0.05 Wb.</p> <p>(b) A 4 – pole dc shunt motor working on 250 V takes a current of 2 A when running light (i.e. at no load) at 1000 rpm . Armature resistance and shunt field resistances are $0.2\ \Omega$ and $250\ \Omega$ respectively.</p> <p>(i) How much back emf is generated ?</p> <p>(ii) What will be its back emf , speed and percentage speed drop if the motor takes 51 A at a certain load ?</p>	<p style="text-align: center;">5</p> <p style="text-align: center;">5</p> <p style="text-align: center;">5</p> <p style="text-align: center;">5</p>	<p style="text-align: center;">CO3</p> <p style="text-align: center;">CO4</p> <p style="text-align: center;">CO3</p> <p style="text-align: center;">CO4</p>
<p>Q8</p>	<p>(a) Discuss the various losses occurring in a transformer. What information can be obtained by performing open-circuit test on Transformer? Also draw phasor diagram of transformer when it is operating on No-Load.</p>	<p style="text-align: center;">5</p> <p style="text-align: center;">5</p>	<p style="text-align: center;">CO3</p> <p style="text-align: center;">CO4</p>

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	<p>(b) A single phase, 50 Hz, 220/3000 V, transformer has a net –sectional area of core 400 cm^2. If the peak value of flux density in the core is 1.239 tesla. Calculate the suitable values for the number of turns on the primary and secondary windings.</p>		
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