FE105

Total No. of Printed Pages:4

F.E. (Sem - I) (Revised Course 2016-17)
EXAMINATION MAY/JUNE 2019
Fundamental Of Electrical Engineering

[Duration : 3 Hours] **[Max. Marks : 100]**

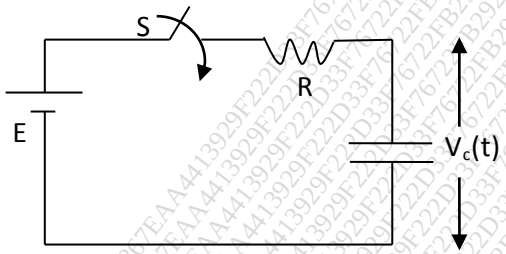
Please check whether you have got the right question paper.

Instructions: Answer any two from each of Part A & B and one from Part C.

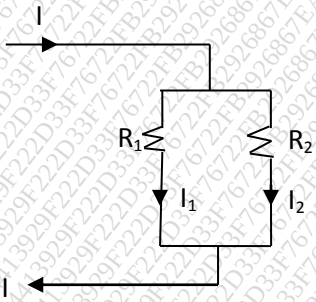
Part- A

Q.1 a) Explain construction and working of thermal power plant with block diagram. 08

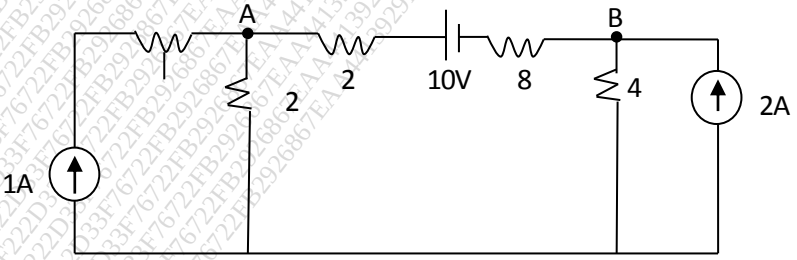
b) In the following capacitor charging circuit, show that, $V_c(t)$ is $V_c(t) = E(1 - e^{-t/RC})$ after switch S is closed at t=0 08



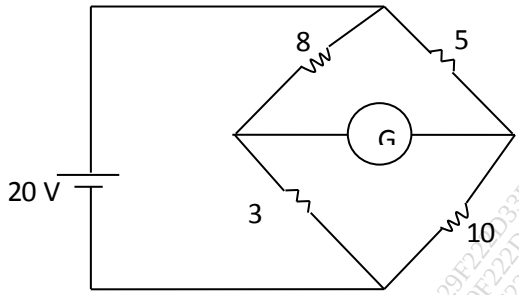
c) Find expression for currents I_1 & I_2. 04



Q.2 a) Find voltages of nodes A & B in the following circuit using nodal analysis. 08



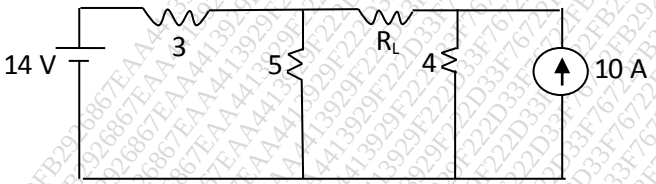
b) Use Norton's theorem to find current in galvanometer. Take rg = 2Ω. 08



c) Give the analogy between electrical and magnetic circuit. 04

Q.3 a) Use Amper's Raw to get magnetic field of a long solenoid having N turns, L as length and A as cross section area. Hence find its inductance. 06

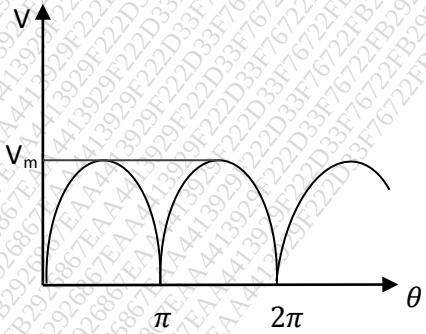
b) State and prove maximum power transfer theorem. Find the value of R_L and maximum power in the following circuit. 10



c) Explain what do you mean by coupling-coefficient. 04

Part- B

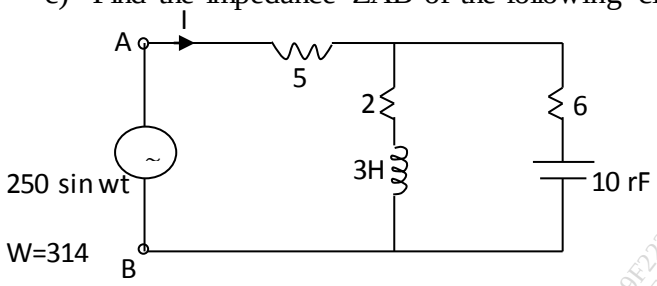
Q.4 a) Find the rms and average value of the following waveform. 08



b) Define what is power factor. What is p.f of following? 06
1) Pure resistor
2) Pure capacitor and pure inductor
3) Inductive circuit

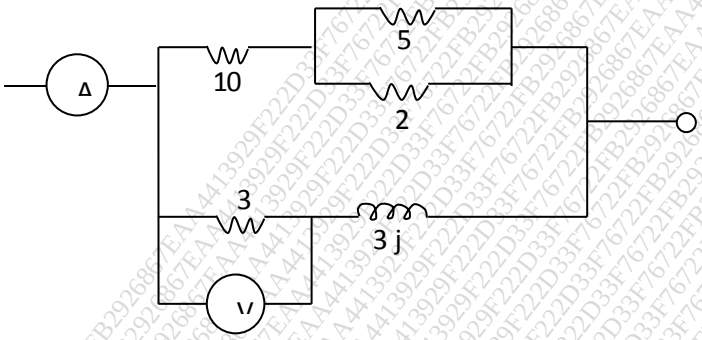
4) Capacitive circuit

c) Find the impedance ZAB of the following circuit. Hence find I 06



Q.5 a) Derive relation between line voltage and phase voltage in star connected 3ϕ system. Draw neat circuit and phasor diagram. 06

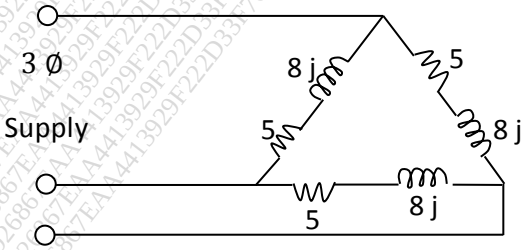
b) A voltmeter placed as shown reads 45V. What is the ammeter reading? 06



c) An circuit draws current of I = 3-4j when voltage V= 100 $\angle 30^0$ is applied to it. Find impedance of the circuit and active and reactive power drawn. What is the power factor of the circuit? 08

Q.6 a) What is the purpose of an transformer derive emf equation of the transformer. 06

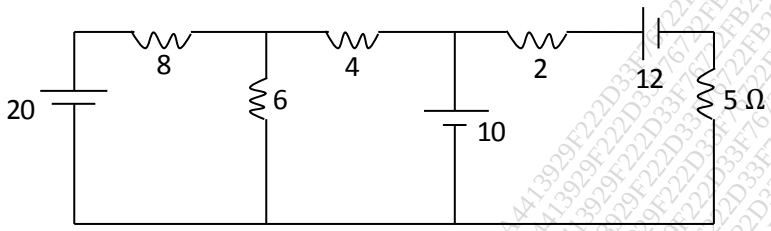
b) A delta connected load of 5 +8 j is connected to 440V, 50Hz, 3ϕ system find line and phase currents. 08



c) Show that 3ϕ power measurement is possible using 2 Wattmeter's. 06

Part- C

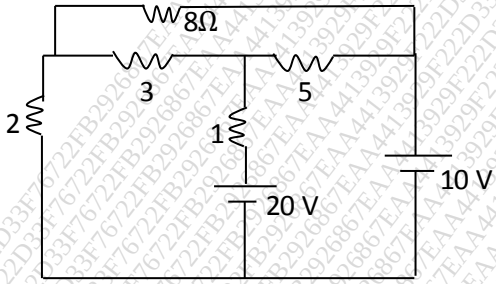
Q.7 a) Use superposition theorem to find current in 5Ω resistor below. 08



b) What is the purpose of no-load and SC test on transformer. Draw neat circuits to perform these tests. 08

c) What do you understand by phase sequence of 3ϕ supply? What is its significance? 04

Q.8 a) Using the venin's theorem find current in 8Ω below. 08



b) Explain different components of Solar-PV power plant. 06

c) Derive condition of maximum efficiency of transformer. 06