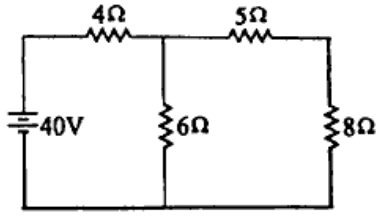
OSMANIA UNIVERSITY
FACULTY OF ENGINEERING
UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)
B.E. (ECE, BME, CSE, AI&ML) I-Semester (Main) Examinations April 2022

BASIC ELECTRICAL ENGINEERING

Time : 3 hours **Max. Marks : 70**

Note : *i) Each question carries **14** Marks.*
*ii) **First Question** is compulsory and answer all **sub** questions. Answer any **four** questions from remaining **six** questions **(Q.2 - Q.7).***
iii) Answers to each question must be written at one place only and in the same order as they occur in the Question Paper.
*iv) **Missing data, if any, may suitably be assumed.***

		Marks	BT	CO
1. a)	State Superposition Theorem.	2	1	1
b)	Define power factor.	2	1	2
c)	Differentiate between an ideal transformer and a practical transformer.	2	4	3
d)	A 6 pole lap-wound d.c. generator has 600 conductors on its armature. The flux per pole is 0.02 Wb. Calculate the speed at which the generator must be run to generate 300 V.	2	3	4
e)	Why is earthing required in an electrical system?	2	2	5
f)	Draw the phasor diagram of R-L series circuit.	2	3	2
g)	What is statically induced e.m.f?	2	2	3
2. a)	Using Norton's Theorem, find the current in 8Ω resistor for figure shown below.	8	5	1



b)	Discuss about KCL and KVL.	6	3	1
3. a)	Describe about the RLC series circuit. Mention all the possible cases.	7	4	2
b)	With a neat sketch, discuss the representation of sinusoidal waveform.	7	3	2

4. a)	Discuss how rotating magnetic field is produced in three phase induction motor.	7	4	3
b)	Derive e.m.f equation of a transformer.	7	6	3
5. a)	A 4-pole lap wound d.c. shunt generator has a useful flux per pole of 0.07 Wb. The armature winding consists of 220 turns, each of 0.004 Ω resistance. Calculate the terminal voltage when running at 900 r.p.m. if armature current is 50A.	8	5	4
b)	Explain about the principle of operation of a single phase induction motor.	6	3	4
6. a)	Discuss the different methods by which earthing is done.	7	4	5
b)	Describe the working of earth leakage circuit breaker.	7	4	5
7. a)	A 230V, 50Hz a.c. supply is applied to a coil of 0.06H inductance and 2.5Ω resistance connected in series with a 6.8μF capacitor. Calculate (i) impedance (ii) current (iii) phase angle between current and voltage (iv) power factor and (v) power consumed.	7	5	2
b)	Discuss the working of squirrel cage induction motor.	7	4	3

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Code No. E-5604/N/AICTE

FACULTY OF ENGINEERING

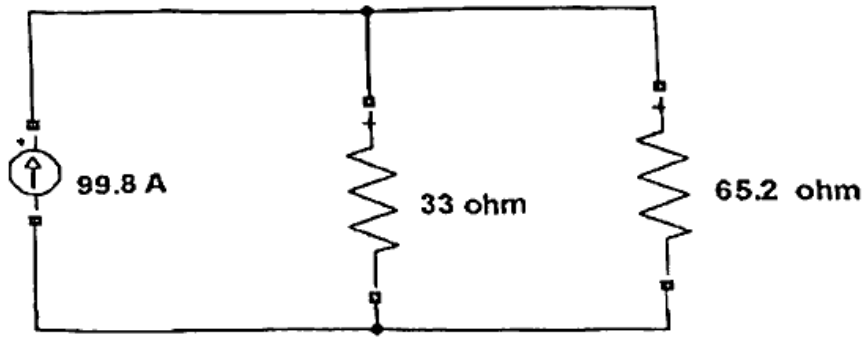
B.E.(ECE/M/P/AE/AI&DS/AI&ML/IoT/IT) I-Semester (AICTE)(Main & Backlog) (New) Examination, February / March 2023

Subject: Basic Electrical Engineering

Time: 3 Hours **Max. Marks: 70**

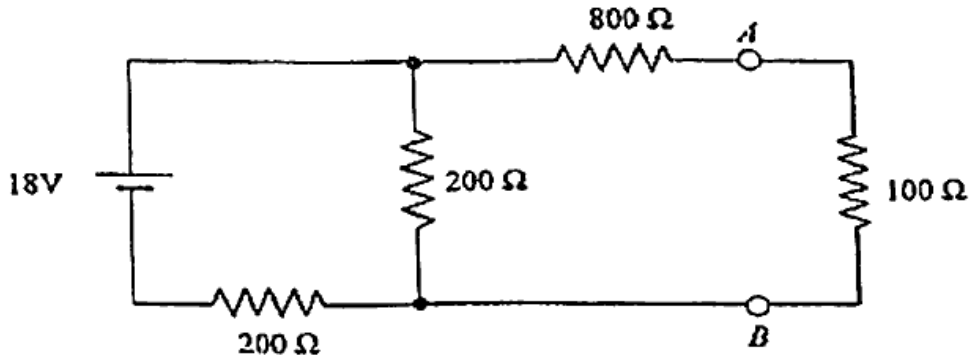
Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. (a) State Superposition Theorem
   (b) Find the Power dissipated in 65.2 Ohms resistor

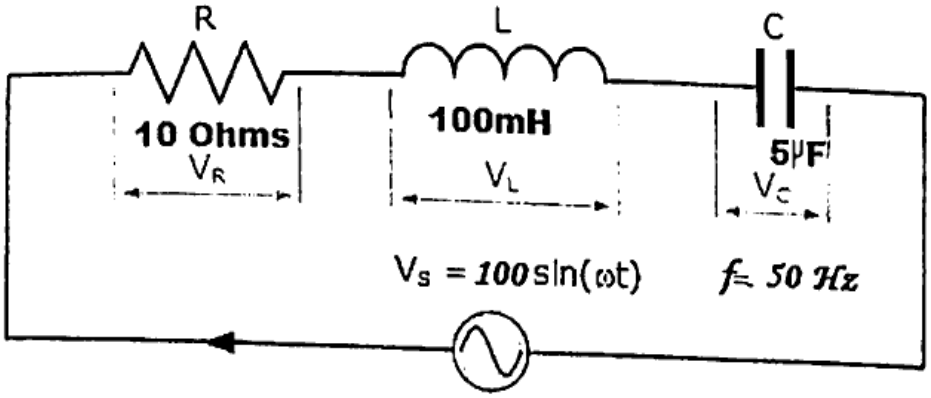


   (c) Define Instantaneous and Average value of an Alternating Quantity
   (d) Write about Auto Transformer advantages, disadvantages & applications
   (e) What are the parts of DC Machines?
   (f) What are the types of earthing?
   (g) Which losses are present in a Transformer?

2. (a) State Kirchhoff's Voltage Law & Kirchhoff's Current Law
   (b) Using Norton's theorem, find the voltage across 100 Ohm resistor in the circuit shown below:



3. (a) Derive the relation between Line and Phase Voltage in a 3-Ø Star connection.
   (b) For the given RLC Circuit find (1) Current (2) Impedance (3) Power Factor (4) Voltages across each element (5) Power dissipated (6) Draw the vector diagram



4. (a) Explain the Operation of a 3-Ø Induction motor.
   (b) A 20 kVA, 1-Ø, 50 Hz, 2200/200 V transformer gave the following test results:
   OC test: 2200 V, Wattmeter Reading is 220 W
   SC test: Wattmeter Reading is 240 W.
   Calculate the efficiency at full load and half full load at p.f. 0.8 lagging?

   52.17% 26.09%

5. (a) Explain the operation of capacitor start and run motor.
   (b) A 4 Pole,250 V DC Shunt generator has Iron & mechanical losses of 500 w. If a load of 20 A is connected then find the EMF and efficiency of the generator if R_a & R_{sh} are 0.1Ohm & 250 Ohm respectively. (Sketch relevant Figures)

6. (a) Explain the working of MCB with neat sketch.
   (b) What is the necessity of Earthing? Explain any one with neat sketch.

7. (a) In a house, 5 No of Tube light of 40 W each and 3 No of fans of 150 W each are used for 20 Hours/day. Find the Power consumption per (1) day (2) Month and (3) Calculate the power bill for a Month if unit rate is Rs.5/-
   (b) Draw and discuss the Power triangle

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Code No. 2960/AICTE/M

FACULTY OF ENGINEERING

B. E. II – Semester (CE/EE/Inst./ECE/CSE/CME) (AICTE) (Main & Backlog) Examination, December 2020

Subject: Basic Electrical Engineering

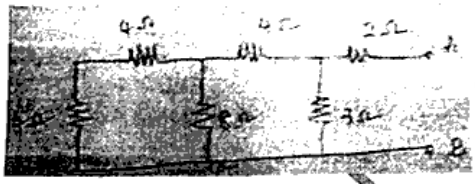
Time: 2 hours **Max. Marks: 70**

Note: (Missing data if, any can be assumed suitable)

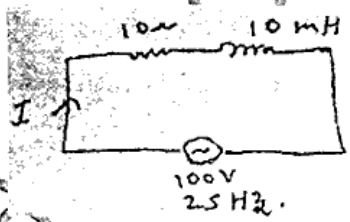
PART – A

Answer any five questions. **(5 x 2 = 10 Marks)**

1. State and explain Kirchhoff's current law.
2. Calculate the equivalent resistance between terminals A and B in the circuit.



3. *Define RMS value and peak value of alternating quantity.*
4. *For the circuit shown calculate current I.*



5. Draw no load phasor diagram of single phase transformer.
6. What is statically induced EMF.
7. Classify dc generators based on excitation.
8. List out the essential parts of DC machine.
9. What is Miniature Circuit Breaker (MBC)?
10. What is the importance of power factor?

PART – B

Answer any four questions. **(4 x 15 = 60 Marks)**

11. State and explain Thevenins's theorem and Norton's theorem with help of neat circuit diagrams and their related expressions.
12. (a) A resistance of 10Ω is connected in series with an inductance of 0.05H and a capacitance of 300μF to a 100V, 1-ϕ ac supply. Calculate the magnitude and phase angle of the current when the frequency of the supply is (a) 25Hz (b) 50Hz.

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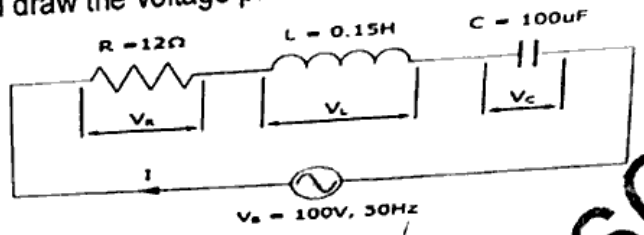
(b) A series RLC circuit containing a resistance of 12Ω, an inductance of 0.15H and a capacitor of 100uF are connected in series across a 100V, 50Hz supply. Calculate the total circuit impedance, the circuits current, power factor and draw the voltage phasor diagram.



13. (a) Derive the emf equation of 1-ϕ transformer.

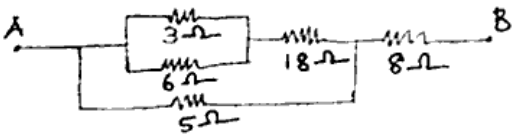
(b) In a 25 kVA, 2000/200V transformer, the iron and copper losses are 350W and 400W respectively. Calculate the efficiency on unity power factor at (a) full load (b) half full load.

14. Explain in detail constructional details and principle of operation D.C Generator.

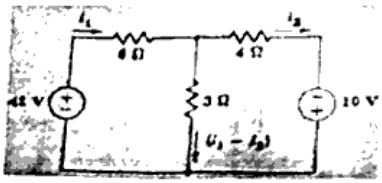
15. (a) Describe different types of cables used for domestic wiring.

(b) What do you understand by power factor? Explain the necessity of improving power factor?

16. (a) Calculate the effective resistance of the following combination of resistances and the voltage drop across each resistance when a potential difference of 60 volts is applied between points A and B.



(b) Solve for current in 3 ohm resistance in the circuit shown below using Thevenins theorem.



17. (a) The current in a series circuit of R=15Ω and L=30mH and C=20μF. Determine the source frequency and impedance Z.

(b) What do you mean by 3-Ø balanced load?

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