Code No: D-2338/N/AICTE

FACULTY OF ENGINEEERING

B.E (EEE/EIE/CSE/CME/DS) II - Semester (AICTE) (New)(Backlog) Examination, March / April 2022

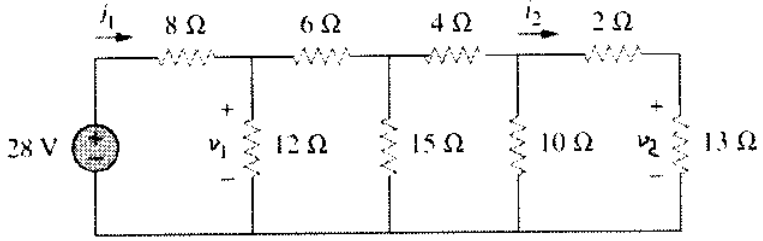
Subject: Basic Electrical Engineering

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

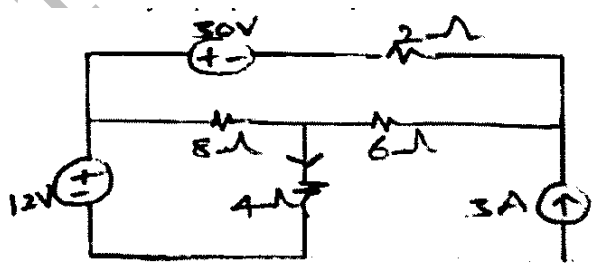
Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each Questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably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

1 a) State thevenins theorem.
b) Distinguish between Active and Passive elements and give examples.
c) Define Form factor and Peak factor
d) Give the relationship between line and phase quantities in a 3-phase Star Connection.
e) Draw the phasor diagram of single phase transformer on no-load.
f) What is the principle of operation of a D.C. motor?
g) State the types of carthing

2 a) Determine i_1, i_2, V_1 & V_2 in the ladder network in below using Nodal Analysis.



b) Write procedure for solving circuit using superposition theorem and calculate current through 4 resistor in the circuit shown below by superposition equivalent.



3 a) Derive the relationship between line and phase quantities in a 3-phase balanced delta connection.
b) Explain the operation of a series RLC circuit, when excited by AC Supply with neat diagram

4 a) Explain the principle of operation of single phase transformer with neat diagram.
b) Explain how the rotating magnetic field is developed in a 3-phase induction motor.

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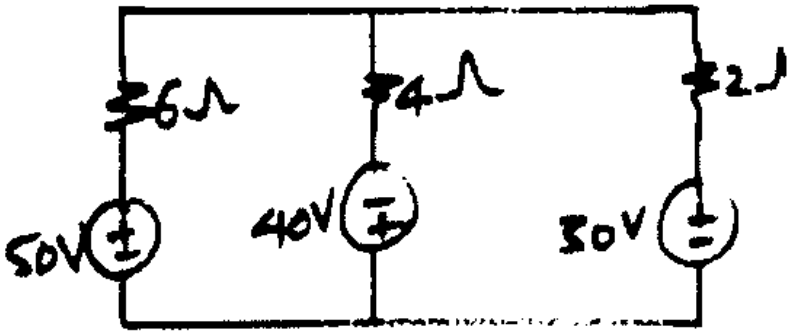
5 a) Explain the construction features and principle of operation of single phase induction motor.
   b) Explain the classification of DC generator.

6. a) What are batteries? How are they classified?
   b) Discuss about improvement of power factor and disadvantages of Power factor.

7 a) Use Mesh analysis to find the power delivered by 50V voltage source for the circuit shown below.



   b) A voltage is applied in a circuit containing only resistance of 10Ω. If the voltage wave be represented by $V_{(t)}$ = 10 Sin (314t) volts. Find (i) Peak current (ii) RMS Current (iii) Average current (iv) Time period (v) frequency (vi) Instantaneous voltage at t=10ms.

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Code No. D-2015/O/AICTE

FACULTY OF ENGINEERING

B.E.(Civil/EEE/EIE/ECE/CSE/CME) II – Semester (AICTE) (OLD)(Backlog)
Examination, March / April 2022
Subject: Basic Electrical Engineering

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

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

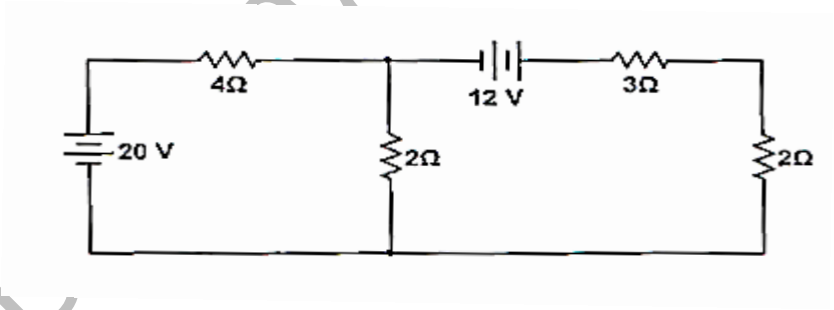
1. Define KCL and KVL.
2. Define Theremins theorem.
3. Define RMS value of an alternating quantity.
4. An alternating voltage is represented by v=282.8 sin 314t. Find i) RMS value frequency.
5. List the features of an ideal transformer.
6. Define slip.
7. Explain why single phase induction motor is not self-starting?
8. What are the applications of DC series motor?
9. What is the necessity of earthing?
10. What are the disadvantages of low power factor?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. (a) Define super position theorem.

(b) Find the current flowing through each branch in the following circuit.



12. (a) Derive the relationship between line and phase quantities in a 3 phase star connected system and express the power equation using line and phase quantities.

(b) A 3 phase load consisting of load impedance of 15+j20 ohms in each phase is connected across 400 V, 50 Hz 3-phase supply. If the impedances are connected in star, find a) phase current b) line current c) power factor d) total power consumed.

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13. (a) Explain the construction and principle of operation of transformer.

    (b) A single phase transformer connected to 50 Hz, AC supply has 500 primary turns and 200 secondary turns. If the cross sectional area of the core is 100 cm^2 and core flux density is 1.2 Wb/m^2 find the primary and secondary induced emfs.

14. (a) Derive the EMF equation of DC generator.

    (b) A 200 V DC shunt generator supplies 50 lamps each rated at 60 Watts, 200 V. If the armature and shunt field resistances are 0.2 ohm and 50 ohms respectively, find the generated DMF. Consider a brush contact drop of 1 Volt per brush.

15. (a) Describe the method of power factor improvement using static capacitors.

    (b) List the advantages, disadvantages and applications of MCBs.

16. (a) State and explain Norton's theorem.

    (b) Explain the terms real power, reactive power and apparent power and write their expressions.

17. (a) Describe various types of 3-phase transformers.

    (b) Compare squirrel cage and slip ring rotors of 3-phase induction motor and list their applications.

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Code No: D-3515/CBCS

FACULTY OF ENGINEERING

B.E. (EE/EIE) II - Semester (CBCS) (Backlog) Examination, March / April 2022

SUBJECT: Electronic Engineering – I

Time: 3 Hours **Max marks: 70**

(Missing data, if any may be suitably assumed)

PART – A

Note: **Answer all questions**. **(10 x 2 = 20 Marks)**

1. Draw the V-I characteristics of ideal diode.
2. Distinguish between Zener and Avalanche breakdown
3. Define ripple factor.
4. Draw the circuit of bridge rectifier and explain its advantages over other rectifiers.
5. With a neat circuit diagram, define early effect?
6. What is stability factor?
7. Compare UJT and SCR.
8. How does TRIAC differs from an SCR?
9. Draw the V-I characteristics of N-channel enhancement MOSFET.
10. In a JFET, ID changes from 1.2mA to 1.5mA when VGS is varied from-4.2 Vto – 4, 10V keeping VDS constant. Determine gm for a given JFET.

PART - B

Note: Answers any five questions. **(5 x 10 = 50 Marks)**

11. a) Explain the formation of depletion region in a PN junction diode with a neat diagram.
    b) For a Ge diode, the 10=2μA and the voltage of 0.26V is applied. Calculate the forward and reverse dynamic resistance values at room temperature.

12. a) A diode with a forward voltage 0.7 volts is connected as half wave rectifier. The load resistance is 500 ohms and rms ac input is 22 volts. Determine the peak output voltage, peak load current and diode peak inverse voltage.
    b) Draw a neat block diagram of a general purpose CRT and explain function of each block.

13. a) Explain with suitable diagrams operation of NPN transistor.
    b) Explain the operator of CE configuration with neat circuit diagram.

14. a) Explain in detail about BJT amplifier with approximate model.
    b) Describe the working of a SCR with suitable waveforms.

15. a) Draw the structure of a JFET and explain its principle of operation with neat diagrams along the V-I characteristics. Define pinch-off voltage and mark it on the characteristics.
    b) Describe the construction and working principles of MOSFET in Enhancement Mode and Depletion mode.

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16. a) Explain the formation of depletion region in an open circuit PN junction with neat sketches.
    b) What is Zener breakdown?

17. a) Explain input and output characteristics of a transistor in CE configuration.
    b) The reverse leakage current of the transistor when in CB configuration is 0.3 μA while it is 16μA when the same transistor is connected in CE configuration. Determine α, β and γ.

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Code No. D-3516/CBCS

FACULTY OF ENGINEERING

B.E. (ECE) II - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Electrical Technology

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

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 What is the significance of Back emf?
2 Differentiate between lap winding and wave winding.
3 Express the relationship between voltage and currents in star connected system.
4 List the different losses in DC motor.
5 Draw the phasor diagram of transformer on no load?
6 Give the definition of efficiency and regulation of single phase transformer.
7 Define the synchronous impedance of an Alternator.
8 What are the two different types of synchronous machines?
9 Why single phase induction motor is not self starting?
10 What are the different starting methods of squirrel cage induction motor?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) A4-pole lap wound DC shunt generator has a useful flux / pole 0.07 Wb. The armature winding consists of 220 turns, each turn having a resistance of 0.004 ohms. Calculate the terminal voltage when running at 900 rpm. If the armature current is 50A.
(b) Derive the expression for torque in DC motors.

12 (a) If in the unbalanced Y-connected load of Za = (10 + j0), Zb = (3 + 4) and Zc = (0 – j10) and the load is put across a 3-phase, 200 V circuit with balanced voltages, find the three line currents and voltages across each branch impedance. Assume phase sequence of Vab, Vbc, Vca.
(b) Determine the power measurement using two wattmeter methods.

13 Explain the OC and SC test on single phase transformer and explain the term regulation and efficiency.

14 (a) Derive EMF equation of an alternator.
(b) Explain method to find regulation of Alternator using synchronous impedance method.

15 (a) Explain the principle of rotating magnetic field.
(b) Explain the operation of single phase capacitor start and run induction motor.

16 (a) Explain about speed control of DC shunt motor.
(b) What is auto transformer? Explain.

17 (a) The input power to a 6-pole, 3-phase, 50 Hz induction motor is 42kW; the speed is 970 rpm. The stator losses are 1.2kW and the friction and windage losses 1.8 kW. Find (i) The rotor Cu losses and (ii) The efficiency of the motor.
(b) Draw and explain the Torque-Slip characteristics of a 3-induction motor.

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Code No. D-3517/CBCS

FACULTY OF ENGINEERING

B.E. (CSE/IT) II - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Basic Electrical Engineering

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

(Missing data, if any, may be suitably assumed)

PART – A

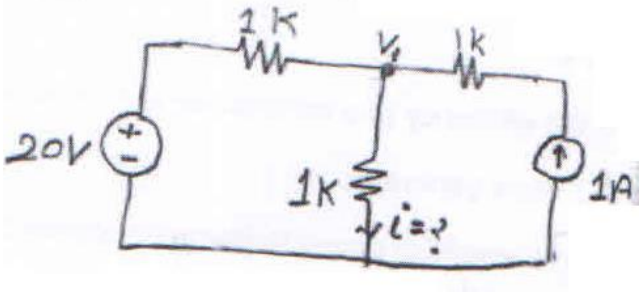
Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 State and explain Superposition theorem.
2 What do you understand by the term RMS?
3 Define active power and reactive power.
4 A 6 pole lap connected 1200 rpm, DC generator has 486 conductor on its armature. Calculate the flux per pole required to generate an emf of 292V.
5 State the Lenz law.
6 Mention the application of three phase induction motor.
7 Mention the different types of DC motors.
8 Give the application of single phase induction motor.
9 Explain the causes of low power factor.
10 What is the purpose of relay?

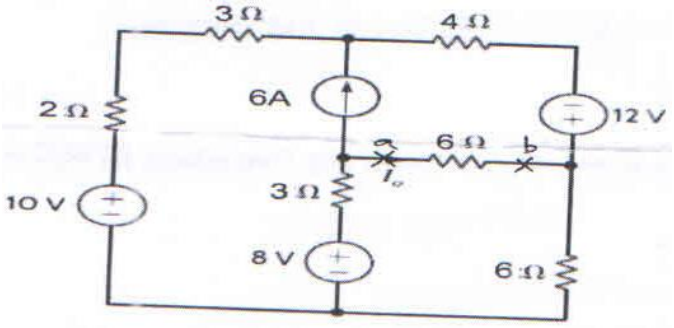
PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) Find the current 'i' through the resister 1K ohm.



(b) Find I_a using Norton's theorem.



12 (a) Define the following with respect to sinusoidal alternating quantity
(i) Average Value (ii) RMS value (iii) Form factor and (iv) Peak factor.
(b) Show that in a pure inductor the current lags behind the voltage by 90^o. Also draw thevoltage and current waveforms.

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13 (a) Derive an EMF equation of transformer.
(b) Describe the constructional features of 3 phase induction motor with suitable diagrams.

14 A 4 pole, DC shunt motor takes 22.5A from a 250 V supply. The armature resistance is 0.5 Ohms and field resistance is 125 Ohms. The armature is wave wound with 300 conductors. If the flux per pole is 0.02 Wb. Calculate (i) Speed (ii) Torque developed
(iii) Power developed.

15 (a) Derive the condition for which the efficiency of a transformer is maximum.
(b) Explain the characteristics of DC shunt generator.

16 (a) What are various types of Tariff in electrical power systems and explain the advantages and disadvantages?
(b) What are different types of DC motors and draw their speed-torque characteristics?

17 (a) Explain about capacitor start and capacitor run single phase induction motor.
(b) Draw and explain the DC generator characteristics.

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