Code No. 15290/AICTE

FACULTY OF ENGINEERING

B. E. II – Semester (AICTE) (Main) Examination, October 2021

Subject: Basic Electrical Engineering

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

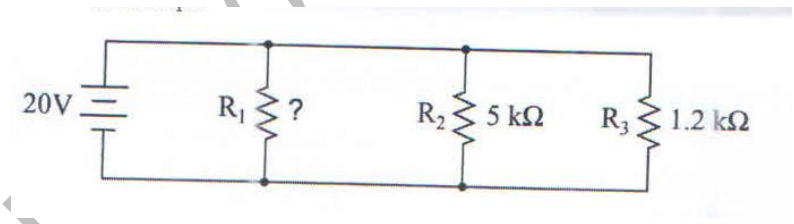
Note: i) First Question is compulsory and answer any three questions from the remaining six questions.
ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
iii) Missing data, if any may suitably be assumed.

Answer any four questions. **(4 x4= 16 Marks)**

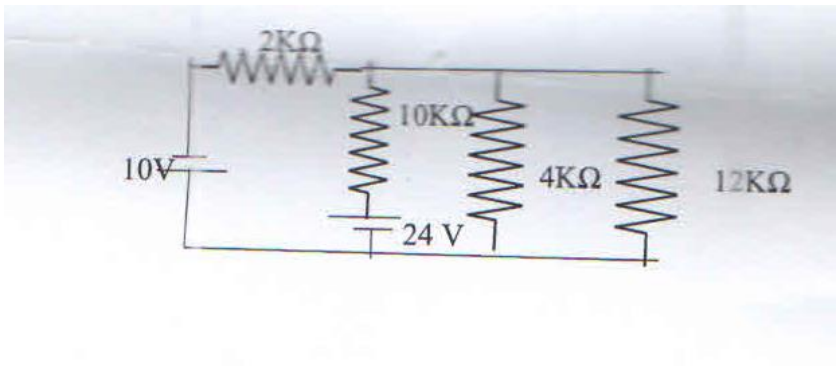
1 (a) Define (i) Charge (ii) Electric Current (iii) Power (iv) Network (v) Circuit
(b) The equation for an alternating current is given by I = 77 sin 314t. find the peak value, frequency, time period and instantaneous value at t = 2 ms.
(c) State the merits & demerits of auto transformer over two winding transformer
(d) Why is induction motors are called asynchronous motors
(e) List out the disadvantages of a single phase induction motor over 3 phase Induction motor.
(f) What is the function of commutator in DC machine?
(g) List out the different characteristics of batteries

(3x18=54 Marks)

2 (a) Calculate the necessary resistor size for R1 to make the total circuit current equal to 30 milliamps:



(b) Using the superposition find the current through 4KΩ for the circuit shown below



….2

3 (a) Explain the difference between a balanced polyphase system and an unbalanced polyphase system. What conditions typically cause a polyphase system to become unbalanced?

(b) A 10-Ω resistor, 10-mH inductor, and 10-μF capacitor are connected in series with a 10-kHz voltage source. The rms current through the circuit is 0.20A. Find the rms voltage drop across each of the 3 elements.

4 (a) Derive the relationship for torque developed by 3 phase Induction motor. Draw a typical torque slip characteristic & deduce the condition for maximum torque.

(b) A transformer is rated at 100KVA. At full load its copper loss is 1200W & its iron losses is 960W. Calculate.

(i) the efficiency at full load, UPF (ii) efficiency at half load, 0.8 p.f

(iii) the efficiency at 75% full load, 0.7 p.f lag (iv) load KVA at which maximum efficiency occurs.

5 (a) Describe the construction & working of capacitor start capacitor run induction motor & list out is applications.

(b) A 8 pole lap wound D.C. Generator has 120slots having 4 conductors perslot. If each conductor can carry 250A & if flux/pole is 0.05wb, Calculate the speed of generator for giving 240V on open circuit. If the voltage drops to 220V on Full load, find the rated output of the machine.

6 (a) A 50KW, 250V D generator runs at 1200rpm. If the machine is run as motor taking 30KW at 205V what will be its speed? The armature & shunt field resistances are 0.1Ω & 125Ω respectively. Brush drop is 2V.

(b) A 440V, 3 phase, 50Hz supply is fed to three coils, star connected each having a resistance of 25Ω & an inductive reactance of 20Ω. Calculate (a) line current (b) power factor (c) power supplied.

7 (a) What is earthing? Why earthing is required? With the help of neat sketch explain Plate earthing.

(b) Discuss the disadvantages of low p.f.

(c) What are the industrial & domestic application of single phase Induction motors? How can you reverse the direction single phase Induction motor?

* * *

Code No.15015/AICTE/BL

FACULTY OF ENGINEERING

B.E.II-Semester (AICTE) (Backlog) Examination, October 2021

Subject: Basic Electrical Engineering

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

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

PART – A

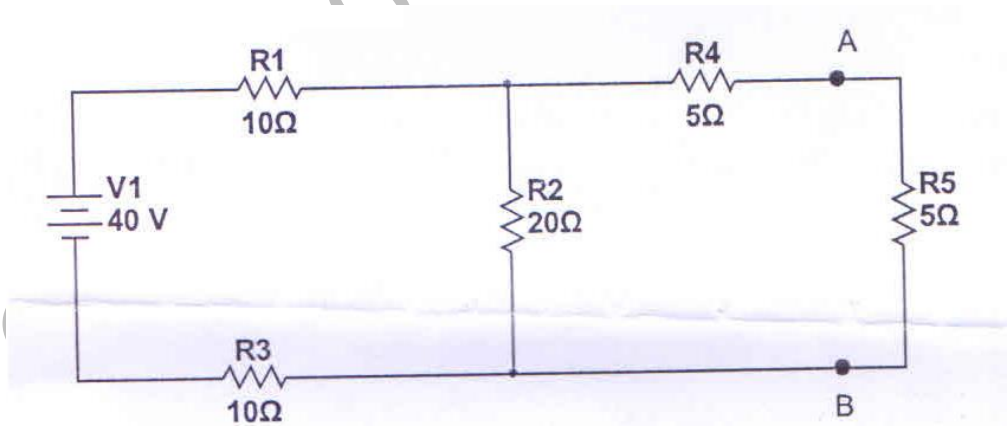
Answer any five questions. **(5 x 2 = 10 Marks)**

1 Define Norton's theorem.
2 Define super position theorem.
3 Define a) cycle b) frequency c) peak value d) time period
4 Define power factor.
5 List the various losses in a transformer.
6 Define synchronous speed and slip of an induction motor.
7 List the applications of capacitor start single phase induction motor.
8 What are the applications of DC shunt generator?
9 What is the function of fuse?
10 What are the causes of low power factor?

PART – B

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

11 a) Define Kirchhoff's current law (KCL) and voltage law (KVL).
b) Find the current flowing through the load resistance R5 connected across A-B using Thevenin's theorem.



12 a) Derive the relationship between line and phase quantities in a 3 phase delta connected system and express the power equation using line and phase quantities.
b) An R-L-C series circuit consisting of resistance of 20 ohms, inductance of 50 mH and a capacitance of 100 uF is connected across 230 V, 50Hz single phase supply. Find
a) impedance b) current c) power factor d) power consumed

Contd..2..

13 a) Derive the EMF equation of transformer.
   b) A 230/115 V, 5 KVA single phase transformer has full load copper loss of 200 watts and iron loss of 100 watts, find its efficiency when operating at
      a) Full load unity power factor b) half full load 0.8 power factor.

14 a) Classify the DC generators according to the method of excitation with neat circuit diagrams.
   b) A 4 pole dc generator has an armature with 600 conductors. If the flux per pole is 50m Wbs and the speed is 1500 rpm find the generated EMF when the armature is
      a) lap wound b) wave wound.

15 a) Describe the different components of switch gear.
   b) Describe various types of cables and wires.

16 a) State and explain Thevenins theorem.
   b) Derive the relation between RMS value and Maximum value for a sinusoidal voltage.

17 a) Explain the construction and principle of operation of 3-phase induction motor.
   b) Explain the construction and principle of operation of single phase capacitor start induction motor.

*

Code No. 14513/CBCS/BL

FACULTY OF ENGINEERING

B. E. (EEE/EIE) II – Semester (CBCS) (Backlog) Examination, October 2021

Subject: Electronic Engineering – I

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

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

PART – A

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

1 Draw Zener Diode Characteristics
2 Explain the PN-junction diode
3 Explain about half wave rectifier with neat diagram
4 What is Filter? List the different types of filter
5 Define α and β for a transistor and derive the relation between them
6 Compare CB, CE and CC configuration
7 What are the advantages of FET over BJT
8 What are the applications of a CCD?
9 What is pinch-off voltage
10 Explain why E-MOSFET is called sometimes normally – off MOSFET

PART – B

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

11 (a) Explain V-I characteristics of p-n junction diode. Discuss the temperature dependence of p n characteristics.
(b) List the application of P N junction diode.

12 (a) Explain working of BJT in CE configuration
(b) What is a heat sink? How does it contribute to increase in power dissipation?

13 Write short notes on any of two of the following:
(a) DIAC (b) CC amplifier (c) CRO.

14 (a) Explain in detail the working principle of SCR.
(b) Explain the characteristics of TRIAC with the help of neat circuit diagram.

15 (a) Discuss in detail JFET formation, operation and V-I characteristics with suitable diagrams.
(b) Describe the construction and working principle of depletion mode MOSFET and draw its characteristics.

16 (a) Draw the circuit of half wave PN junction diode rectifier and explain the operation with relevant sketches. Also obtain an expression for the ripple factor and efficiency of the same circuit.
(b) Explain the construction and working principle of Light Emitting Diode (LED).

17 (a) Explain different types of PN junction formation technique.
(b) Compare filters L. C. LC and CLC used in power supplies.

* * *

Code No. 14515/CBCS/BL

FACULTY OF ENGINEERING

B.E. (ECE) II-Semester (CBCS)(Backlog)Examination, October 2021

Subject: Electrical Technology

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

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 List the types of excitation with neat figures.
2 Reproduce the different methods of speed control of DC motor.
3 Distinguish between the balanced and unbalanced system of load.
4 What is relation between voltages in delta connected system?
5 Why rating of transformer is in KVA, not in KW?
6 What is difference between single phase and auto transformer?
7 Explain the construction details of AC generator.
8 What is armature reaction in alternator?
9 List the different parts of three phase induction motor.
10 A 12 pole 3 phase induction motor is operated on load, what is the synchronous speed?

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11 (a) A 4-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) Explain the measurement of three phase power using two wattmeter methods.
(b) The readings of two wattmeters of 3 phase power measurement are 50 W and 100 W. Calculate power and power factor.

13 (a) Explain the advantages and disadvantages of auto transformer.
(b) A 10kVA, 220/400V, 50Hz single phase transformer has the following test results. OC test : 200V, 1.3A, 120W – LV side; SC test : 22V, 30A, 200W-HV side; Calculate :
(i) magnetizing and core loss component at 50Hz and rated voltage
(ii) Magnetizing branch impedance (iii) regulation at full load 0.8 leading.

14 Explain the open circuit characteristics and short circuit characteristics of an alternator and determine the voltage regulation.

15 (a) Explain how the rotating magnetic field is developed in a 3 - ∅ induction motor.
(b) Calculate the synchronous speed, slip, and slip speed and rotor frequency of three-phase, 50Hz, 4-pole inductor motor running at 1440 rpm.

….2

16 (a) Explain the different characteristics DC shunt motor.
(b) Explain about 3 point starter for DC motor.

17 (a) Derive the EMF equation of Transformer.
(b) Explain the power stages in a three phase induction motor.

*****

Code No.14517/CBCS/BL

FACULTY OF ENGINEERING

B.E. II – Semester (CBCS) (CSE/IT) (Backlog) Examination, October 2021

Subject: Basic Electrical Engineering

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

Note: Missing data, if any, may be suitably assumed.

PART – A

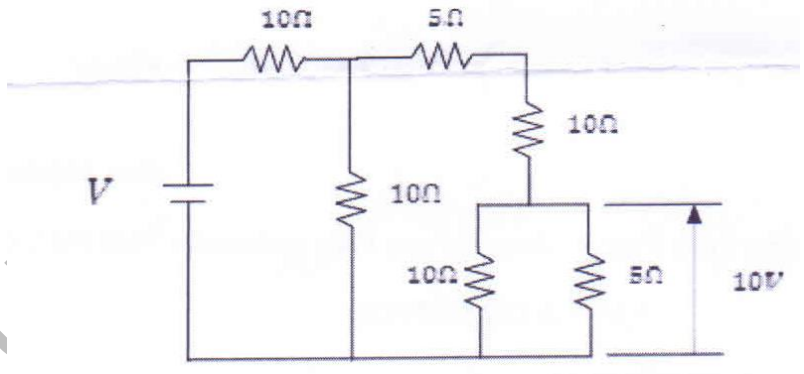
Answer any five questions. **(5x2 = 10 Marks)**

1. State and explain Kirchhoff's laws.
2. A current in a series circuit of R=5 ohm and L=30mH lags the applied voltage by 80°. Determine the source frequency and the impedance Z.
3. Explain the Faraday's. Law of electromagnetic induction.
4. What is the relation, between line voltage and phase voltage of star connected system.
5. Mention the various types of 3 phase induction motor.
6. Explain the various three phase transformer connection.
7. Explain Flemings' left and right hand rules.
8. Why single phase induction motors are not self-starting.
9. List the components of LT switchgears.
10. Define simple tariff and flat rate tariff.

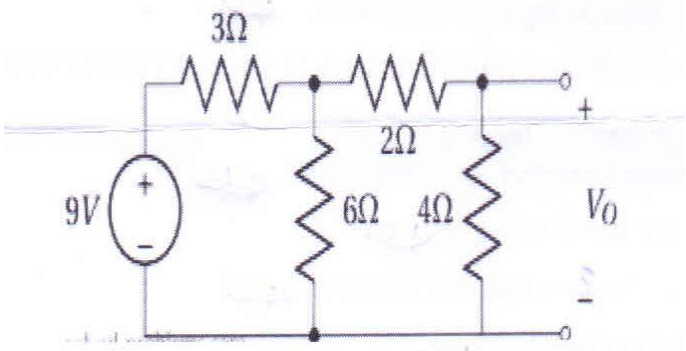
PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11. a) Calculate the supply voltage V in the circuit shown



b) Using the Thevenin's theorem determine Vo in circuit below



Contd..2..

12. a) Derive the voltage and current relations in a balanced 3 phase star connected load with suitable circuit and vector diagrams.

    b) A series RLC circuit with 100Ω, 25μF and 0.15H is connected across 415V, 50Hz AC supply. Calculate i) Impedance ii) Current iii) Power factor iv) Voltage drop across inductor and capacitor.

13. a) Explain the operating principle of transformer.

    b) Describe the constructional features of 3 phase induction motor with suitable diagrams.

14. A 400 V DC shunt generator gives a full load output of 50 KW. The armature and field resistance are 0.1 ohm and 250 ohm respectively. The core and frictional losses are together 2000W. Calculate the generated EMF, copper losses and efficiency.

15. a) What is earthling? Why earthling is required and what are the different methods of earthling.

    b) Write short notes on wire and cables.

16. a) Explain about capacitor start and capacitor run single phase induction motor.

    b) Draw and explain the DC generator? Characteristics.

17. a) Three arms of a 3 phase, delta connected load, each comprises of a coil having 25Ω resistance and 0.15 inductance in series with a capacitor of 120μF across 415V, 50Hz supply. Calculate i) Line current ii) Power factor iii) Power consumed.

    b) Write short notes on power factor improvement using static capacitor.

*