MST-2

BEE

BEE

1

Guru Nanak Dev Engineering College, Ludhiana			
Department of Applied Sciences			
Program	B.Tech	**Semester**	1
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	2	**Course Coordinator(s)**	Baljeet Singh Puneet Chandel Sukhpal Singh Ranjit Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	22 December, 2022	**Roll Number**	221405

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	What do you understand by autotransformer?	CO3, L2	2
Q2	Differentiate wire and cable?	CO5, L4	2
Q3	Briefly discuss different methods of charging battery	CO5, L3	4
Q4	What is the working principle of 3 phase induction motor? Explain squirrel cage and wound rotor induction motor	CO4, L1	4
Q5	If a 4 pole induction motor running at 50Hz frequency and frequency of rotor current f_r is 2 Hz Find (i) synchronous speed (ii) Slip	CO4, L5	4
Q6	Explain construction and working of transformer? Derive the emf equation of single phase transformer	CO3, L5	8

Course Outcomes (CO)

Students will be able to

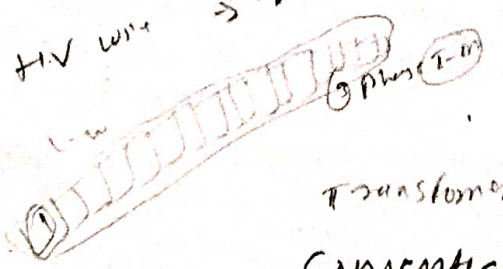
1	Analyze the behaviour of electrical and magnetic circuits.
2	Inculcate the understanding about the AC fundamentals.
3	Realize the requirement of transformers in transmission and distribution of electric power and other applications.
4	Select the type of generator / motor required for a particular application.
5	Analyze the various electrical networks.
6	Recognize the various measuring instrument.

release curr to the it to deliver current to an external load connect across it.

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

RBT

HV wire → the wire which supply



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Operation & genera Constr

Transformer in which the of AT is again

Convential trans is basically work on

magnetic

$\frac{I_m}{I_{av}}$ = Impedance BEE (8)

Guru Nanak Dev Engineering College, Ludhiana			
Department of Applied Sciences			
Program	B.Tech	**Semester**	1
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	1	**Course Coordinator(s)**	Baljeet Singh Puneet Chandel Sukhpal Singh Ranjit Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	16th November. 2022	**Roll Number**	2214053

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	State Ohm's law and its limitation?	CO5. L1	2
Q2	Differentiate mesh and loop in an electric circuit with example	CO5. L4	2
Q3	State and prove Thevenin's Theorem	CO5. L2	4
Q4	The current I = 35.36sin314t is flowing through R-L series circuit having R = 15Ω and X_L = 12Ω. Find (i) RMS Value of current (ii)Average Value of current (iii) Impedance (iv) Power Factor	CO2. L5	4
Q5	Evaluate the condition of resonance for series R-L-C circuit	CO2. L5	4
Q6	Explain the operating principal and working of permanent magnet moving coil instruments. Or What is Power factor and explain its significance? Classify various methods helps in improving the power factor	CO6. L4	8

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6	Understand the components of low voltage electrical installations

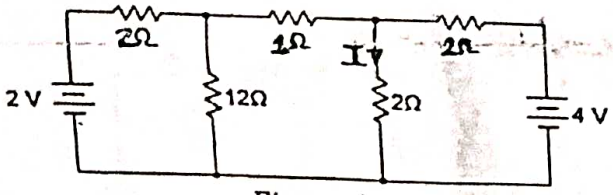
RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana

Department of Electrical Engineering

Program	B.Tech.	Semester	2
Subject Code	ESC-18101	Subject Title	Basic Electrical Engineering
Mid Semester Test (MST) No.	1	Course Coordinator(s)	Er. Amrinder Kaur Gill
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	12/2/2020	Roll Number	1914103

Note: Attempt all questions

Q. No.	Questions	COs, RBT level	Marks
Q1	What is active and reactive power.	CO2, L1	2
Q2	The equation of alternating voltage $v = 42.42 \sin 628\, t$. Determine: i. average value ii. r.m.s. value iii. form factor iv. peak factor	CO1, CO2, L5	2
Q3	Derive the necessary equations for converting delta to star network.	CO2, L2	4
Q4	Define the Kirchhoff's current law and Kirchhoff's voltage law.	CO1, L1	4
Q5	Calculate the current I in the circuit shown in Figure 1 by using superposition theorem.  Figure 1	CO5, L5	4
Q6	a. Discuss resonance in RLC series circuit. b. Reduce an expression for current, impedance and power factor for RLC series circuit when ac voltage is applied and draw the phasor diagram	CO2, L4	8

Course Outcomes (CO)

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1	Analyze the behavior of electrical and magnetic circuits.
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RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

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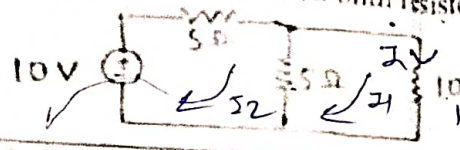
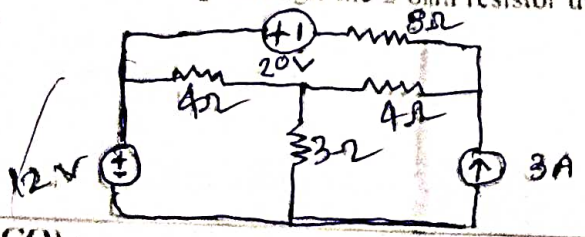
7

Guru Nanak Dev Engineering College, Ludhiana

Department of Electrical Engineering

Program	B.Tech.(ME-C)	Semester	I
Subject Code	ESC-18101	Subject Title	BEE
Mid Semester Test (MST)	I	Course Coordinator(s)	Karanbir Singh
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	18' September, 2019	Roll Number	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Define power factor in relation with the voltage and current.	CO2, L2	2
Q2	A star connected network has 15 ohm resistance in each limb.what would be the resistance of each limb of delta connection?	CO5, L5	2
Q3	Explain the difference between the phasor and time domain of sinusoidal function.	CO2, L2	4
Q4	Obtain the power dissipation in 10 ohm resistor using KVL.  $15I_1 - 5I_2 = 0$ — (1) $10I_2 - 5I_1 = 10$ — (2)	CO5, L3	4
Q5	Explain Norton's theorem, write the steps of solving circuit using Norton's theorem.	CO5, L6	4
Q6	Find the current flowing through the 3 ohm resistor using Superpostion theorem. 	CO5, L5	8

$P = VI$

$I_1 = 0.4$

$P = I^2R \quad P = 0.16 \times 10$

$P = 1.6$ watt

Course Outcomes (CO)

Students will be able to

1	Analyze the behavior of electrical and magnetic circuits.
2	Inculcate the understanding about the AC fundamentals.
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6	Understand the components of low voltage electrical installations.

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HO		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understandg	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana			
Department of Applied Sciences			
Program	B.Tech	**Semester**	I
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	2	**Course Coordinator(s)**	Baljeet Singh Puneet Chandel Sukhpal Singh Ranjit Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	22 December, 2022	**Roll Number**	2216062

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	What do you understand by autotransformer?	CO3, L2	2
Q2	Differentiate wire and cable?	CO5, L4	2
Q3	Briefly discuss different methods of charging battery	CO5, L3	4
Q4	What is the working principle of 3.phase induction motor? Explain squirrel cage and wound rotor induction motor	CO4, L1	4
Q5	If a 4 pole induction motor running at 50Hz frequency and frequency of rotor current f_r is 2 Hz Find (i) synchronous speed (ii) Slip	CO4, L5	4
Q6	Explain construction and working of transformer? Derive the emf equation of single phase transformer	CO3, L5	8

Course Outcomes (CO)

Students will be able to

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RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana

Department of Applied Sciences

Program	B.Tech	**Semester**	I
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	1	**Course Coordinator(s)**	Baljeet Singh Puneet Chandel Sukhpal Singh Ranjit Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	16th November, 2022	**Roll Number**	2216062

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	State Ohm's law and its limitation?	CO5, L1	2
Q2	Differentiate mesh and loop in an electric circuit with example	CO5, L4	2
Q3	State and prove Thevenin's Theorem	CO5, L2	4
Q4	The current $I = 35.36\sin 314t$ is flowing through R-L series circuit having $R = 15\Omega$ and $X_L = 12\Omega$. Find (i) RMS Value of current (ii)Average Value of current (iii) Impedance (iv) Power Factor	CO2, L5	4
Q5	Evaluate the condition of resonance for series R-L-C circuit	CO2, L5	4
Q6	Explain the operating principal and working of permanent magnet moving coil instruments. Or What is Power factor and explain its significance? Classify various methods helps in improving the power factor	CO6, L4	8

Course Outcomes (CO)

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RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Q1. What are different types of electric measuring instruments?

Q2. Give RMS and average values of sinusoidal voltage? RMS value of $V_{rms} = \frac{V_m}{\sqrt{2}}$, $V_{avg} = 0.637 \times V_m$

Q3. Explain how rotating magnetic field is produced? Give expression for its magnitude?

Q4. Derive an expression of EMF equation for DC machines

Q5. Explain the working of transformer at an inductive load.

Q6. Compare types of 3 phase induction motors? Give the applications of each type. What do you mean by SLIP?

Guru Nanak Dev Engineering College, Ludhiana			
Department of Electrical Engineering			
Program	B.Tech.	**Semester**	2nd
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	2nd	**Course Coordinator(s)**	Pf. Ranjeet Singh, Pf.Baljit Singh, Pf. Amrinder Kaur Gill, Pf. Arshdeep Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	29/5/2023	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Enlist different types of single-phase induction motor. Give applications.	CO4, L1	2
Q2	A Three phase induction motor has 2 poles and is connected to 400V,50 hz supply, determine synchronous speed and speed of motor when the slip is 4%. $N_S = 1800$ rpm, $N = 1499.40$	CO4, L5	2
Q3	A 200 kVA,6600/400 V, 50 Hz single phase transformer has 80 turns on the secondary. Calculate 30.30 / 499.95 1. The approximate values of the primary and secondary currents 2. The approximate number of primary turns 1320 3. The maximum value of flux. 0.0227 wb	CO1, L3	4
Q4	Explain the construction and working of three phase asynchronous motor.	CO1, L3	4
Q5	Define autotransformer. Compare auto transformer with conventional two winding transformer.	CO2,L6,L4	4
Q6	Explain the construction and principle of operation of PMMC instrument. Give merits and demerits of PMMC instruments.	CO6,L5	8

Course Outcomes (CO)

Students will be able to

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3	Realize the requirement of transformer in transmission and distribution of electric power and other application.
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Guru Nanak Dev Engineering College, Ludhiana
Department of Electrical Engineering

Program	B.Tech.	**Semester**	2nd
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	1st	**Course Coordinator(s)**	Pf. Ranjeet Singh, Pf Baljit Singh, Pf Amrinder Kaur Gill, Pf. Arshdeep Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST		**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	The equation of alternating current i= 42.42 Sin 628t. Find average value I_{avg} and RMS value I_{rms} of current. Iavg = 27.02, Iavg = 30 A	CO2, L3	2
Q2	Define power factor. What are the values of power factor for a) purely resistive circuit b) purely capacitive circuit? (0) (1)	CO2, L5	2
Q3	Define battery and explain its types.	CO6, L2	4
Q4	Derive the necessary equation for converting Delta network into an equivalent Star network.	CO1, L3	4
Q5	Deduce an expression for current, impedance and power factor for RLC series circuit when AC voltage is applied. → $pf = \cos(\tan^{-1}(\frac{X_L - X_C}{R}))$	CO2, L6	4
Q6	State Superposition theorem and Justify with suitable example.	CO6,L5	2+6=8

Course Outcomes (CO)
Students will be able to

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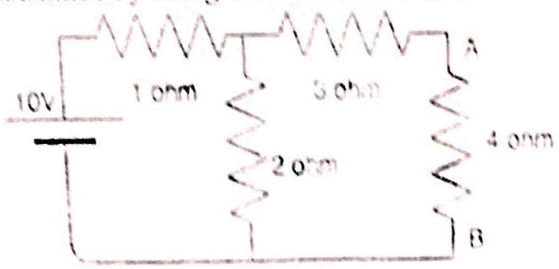
RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana
Department of Electrical Engineering

Program	B Tech	**Semester**	1st
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	1st	**Course Coordinator(s)**	PI Ranjeet Singh, PI Baljeet Singh, PI Karanbir Singh, PI Sukhpal Singh, PI Balwinder Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	28.09.2023	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Define Deflecting Torque	CO6, L1	2
Q2	An alternating current I is given by : $I = 141.4 \sin 314t$ Find R.M.S and average value of current	CO2, L5	2
Q3	Differentiate between PMMC and Moving iron instruments	CO6, L2	4
Q4	Derive the equation for converting Delta network into an equivalent Star network	CO1, L3	4
Q5	Deduce an expression for impedance and power factor for RLC series circuit when AC voltage is applied and also derive the expression for resonant frequency.	CO2, L6	4
Q6	State Thevenin's theorem and Find the current passing through 4Ω resistance by using Thevenin's Theorem. 	CO1,L5	8

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RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

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Guru Nanak Dev Engineering College, Ludhiana			
Department of Electrical Engineering			
Program	B.Tech.	**Semester**	1st
Subject Code	ESC-101	**Subject Title**	Basic Electrical Engineering
Mid Semester Test (MST) No.	2nd	**Course Coordinator(s)**	Pf. Ranjeet Singh, Pf.Baljeet Singh, Pf. Karanbir Singh, Pf.Sukhpal Singh, Pf. Balwinder Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	07.11.2023	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	A 2000/200V, 20KVA transformer has 66 turns in the secondary. Calculate Primary turns.	CO3, L5	2
Q2	What is the need of Earthing?	CO5, L2	2
Q3	Explain the working principle of Auto Transformer. What are its applications?	CO3, L1	4
Q4	Discuss about various components of LT switchgear?	CO5, L2	4
Q5	Draw and explain the torque slip characteristics of 3- phase induction motor?	CO4, L6	4
Q6	a) Explain the working principle and construction of DC motor. b) A three phase induction motor is wound for 4 poles and supplied from 50Hz system. Calculate a) Synchronous speed b) speed of motor when slip is 4% and c) the rotor frequency when the motor runs at 600 r.p.m.	CO4,L5	8 (4+4)

Course Outcomes (CO)

Students will be able to

1	Analyze the behavior of electrical and magnetic circuits.
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RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Please check that this question paper contains____9__ questions and __2____ printed pages within first ten

[Total No. of Questions: 09] [Total No. of Pages: 02]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)
Semester: 1st /2nd
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper ID: 15929
Scientific calculator is Allowed

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Define Kirchoff's voltage and current.

b) Define deflecting torque.

c) Give two limitations of Ohm's law.

d) What are the various types of three-phase transformer connections?

e) A consumer uses a 10 kW geezer, a 6 kW electric furnace, and five 100 W bulbs for 15 hours. How many units (kWh) of electrical energy have been used?

f) A coil of resistance of 30 Ω with an inductance of 0.25 H and capacitance of 250 μF are connected in series and is fed by 230V, 30 Hz supply. Find the impedance of the circuit

Part – B **[Marks: 04 each]**

Q2. Explain how the transformer operates and derive an EMF equation transformer.

Q3. Discuss the construction and working of permanent moving coil instruments.

Q4. Draw and explain the torque slip characteristics of a 3-phase induction motor.

P.T.O.

Q5. Analyze an AC circuit comprising of series RLC and also derive an expression for impedance, voltage, current, and power factor.

Q6. A three-phase 50 Hz induction motor has 8 poles and operates with a slip of 4 % at a certain load. Find the speed of the rotor and the frequency of the rotor current at 1000rpm.

Q7. State and prove Norton theorem with suitable example.

Part – C **[Marks: 12 each]**

Q8. With a clear, labelled diagram, describe the components and operation of a three-phase induction motor in detail.

OR

Write a short note on the following
a. Components of LT switchgear.
b. Earthing

Q9. Deduce the expression for star to delta and delta to star conversion.

OR

A 65 kVA transformer has an iron loss of 550 W and full load copper loss of 975 W. If the power factor of the load is 0.85 lagging. Calculate full load efficiency and kVA at which maximum efficiency occurs. Also, find the maximum efficiency.

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Final

BEE

(1)

Please check that this question paper contains 09 questions and 02 printed pages within first ten

[Total No. of Questions: 09] MORNING [Total No. of Pages: ..02....]

Uni. Roll No. ..... 02 JUL 2022

Program: B.Tech. (Batch 2018 onward)

Semester: 2nd

Name of Subject: Basic Electrical Engineering

Subject Code:ESC-101

Paper ID:15929

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Explain the concept of voltage and current source transformation with an example.

b) Name two ways of connecting three phase system. Write down the relationship between phase and line voltage and current for these systems.

c) Compare an auto transformer with a two-winding transformer. difference

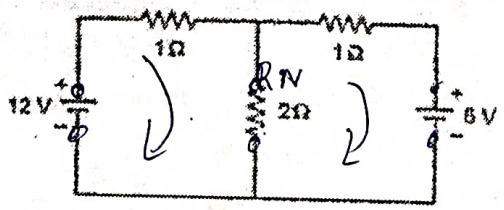
d) Define term phase splitting.

e) A lead acid cell maintains a constant current of 3A for 10 hours before its terminal voltage falls to 1.8 V. Calculate the capacity of the cell.

f) What are electrical measuring instruments? Give example.

Part – B **[Marks: 04 each]**

Q2. Using Norton theorem calculate the current through 2Ω resistance.



$\frac{1 \times 1}{1+1} = \frac{1}{2}$

Q3. Draw power triangle. Define apparent power, active power and reactive power of AC system.

Q4. Derive the condition for maximum efficiency of a transformer.

P.T.O.

MORNING

02 JUL 2022

Q5. A 3Φ, 6 pole 50 Hz induction motor has a fractional slip 0.01 at no load and 0.03 at full load. Calculate

a) Synchronous speed
b) No load speed of motor
c) Full load speed of motor
d) Frequency of rotor at full load.

Q6. With the help of neat diagram explain the construction and working of Miniature Circuit Breaker.

Q7. Explain the construction and working principle of Moving Iron Instrument. Give applications.

Part – C

[Marks: 12 each]

Q8. Derive all the necessary equations for converting delta network into an equivalent star network and vice versa.

OR

a. Draw neat phasor diagram and deduce an expression for current, impedance, phase angle, power factor and power of RL series circuit when an AC voltage is applied.

b. A voltage e =200 Sin (100Π t) is applied to a coil having R=200 Ω and L=0.38 H. Determine the expression of current and power taken by coil.

Q9. a. Draw an equivalent circuit and drive circuit parameters of conventional two winding transformer referred to secondary side.

b. A 400/200, 50 Hz ,10 KVA transformer has primary and secondary winding resistances of 2.5 Ω and 0.5Ω and winding leakage reactances of 5Ω and 1Ω respectively. Find the equivalent resistance and reactance referred to secondary side

OR

Explain the construction and working principle of 3 Φ Induction Motor. Why induction motor need starter?

BEE

3

[Total No. of Questions: 09] [Total No. of pages: 1]

Uni. Roll No. 2203347

Program/Course:B.Tech. (Sem.-1st/2nd)
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper I.D.: 15929

Time Allowed: 3 Hours **Max. Marks: 60**

Note:

1) **Part A and B is compulsory.**
2) Part-C has two Questions Q8 and Q9 both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately.

Part-A **[Marks: 02 each]**

Q1

(a) What do you mean by electric resistance? Mention the factors on which it depends?
(b) Distinguish between node and junction?
(c) Define peak factor and form factor of an alternating quantity?
(d) Define magnetic flux and give its unit?
(e) Which losses occur in a dc machine?
(f) Define damping torque?
(g) A 50 Hz, 4 pole, 3 phase induction motor has rotor current of frequency 2 Hz. Calculate slip and speed of motor?
(h) Give concept of work and energy.
(i) Explain the term Earthing.
(j) What is the difference between primary and secondary batteries?

Part-B **[Marks: 04 each]**

Q2. What are different component of LT Switchgear and Protection?
Q3. Explain the working of an auto transformer. How its different from conventional two winding transformer.
Q4. Explain the BH characteristics of magnetic material.
Q5. Discuss how do you analyse series RLC circuit? Draw its phasor diagram?
Q6. What do you understand by Power factor? Also explain the different methods to improve power factor.
Q7. Explain the classification of electrical instruments.

Part-C **[Marks: 12 each]**

Q8. (a) Derive the emf and torque equation of a dc machines.

or

(b) Explain the construction and operating principle of a Permanent magnet moving coil.

Q9. (a) Discuss construction and working of Transformer ?

or

(b) State and explain the Thevenin and Norton theorems with suitable example.

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Conductive
Conductive

Please check that this question paper contains __9____ questions and ___2___ printed pages within first ten

[Total No. of Questions: 09] [Total No. of Pages: ...2...]

Uni. Roll No. .....

Program: B.Tech
Semester: 2nd
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper ID: 15929

27-01-2022(E)

Time Allowed: 02 Hours **Max. Marks: 60**

NOTE:

1) Each question is of 10 marks.
2) Attempt any six questions out of nine
3) Any missing data may be assumed appropriately

Q1. How Thevenin and Norton theorems can be used to solve a linear circuit? Give the methodology with suitable example to apply Thevenin's theorem to any linear circuit.

Q2. Discuss the concept of resonance in parallel circuit. A series RC circuit takes power at 7000 W when connected to 200 V, 50 Hz supply. The voltage across the resistor is 130 V. Calculate (i) the resistance (R), Current (I), pf ($\cos\phi$), capacitance (C) and impedance (Z) and (ii) Also write equations for v(t) and i(t).

Q3. In a 50 kVA transformer, the iron loss is 500W and full load copper loss is 800W. Find the efficiency at full load an half load at 0.8 pf lagging.

Q4. Compare Permanent magnet moving coil and moving iron instruments with focus on the operating torques. Give the working of moving iron instruments in brief.

Q5. What information do we get from Power Flow diagram of three phase Induction Motor. A 440 V, 50 Hz, 6 pole , 3-ϕ induction motor draws an input power of 76 kW from the mains. The rotor emf makes 120 complete cycles per minute. Its stator losses are 1 kW

P.T.O.

and rotor current per phase is 62 A . Calculate (a) rotor copper losses per phase (b) rotor resistance per phase (c) torque developed.

Q6. (a) Discuss about various components of LT switchgear **(5 Marks)**

(b) Explain different types of batteries. **(5 Marks)**

Q7. Derive the EMF equation of transformer and with a suitable example, explain the approximation of equivalent circuit of transformer referred to secondary.

Q8. Why a starter is required in a 3-phase induction motor. Discuss about various type of starters with diagrams.

Q9. Explain Three phase balanced circuit with the necessary conditions and diagram of waveform (three phases). A delta connected balanced three phase load is supplied from a 3 phase, 400 V supply. The line current is 20 A and the power taken by the load is 10 kW. Find (i) impedance in each branch (ii) the line current, power factor and power consumed if the same load is connected in star.

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Please check that this question paper contains 09 questions and 02 printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: 02]

Uni. Roll No. .....

Program: B.Tech
Semester: 1st
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper ID: 15929

22-02-2022(M)

Time Allowed: 02 Hours **Max. Marks: 60**

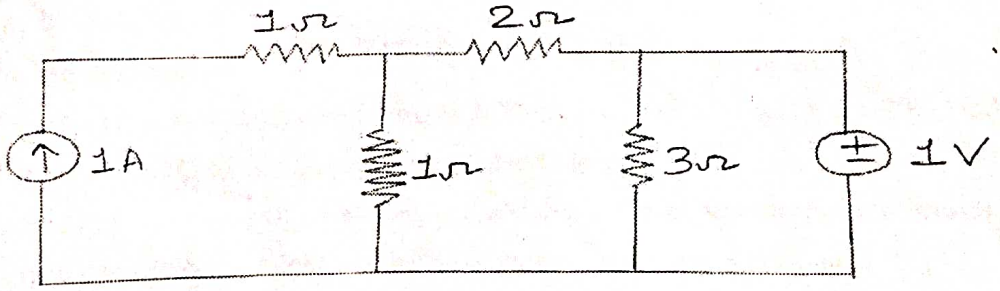
NOTE:

1) Each question is of 10 marks.
2) Attempt any six questions out of nine
3) Any missing data may be assumed appropriately

Q1. A) Define the term resonance for an AC circuit consisting of resistance, inductance and capacitance. Derive the condition of resonance in series R-L-C circuit.

B) Also determine i) resonant frequency ii) Q-factor iii) the half power frequencies iv) Bandwidth v) current at resonance in series R-L-C circuit having R=10 ohms, L=0.1Henry and C=8 microfarad. Assume the voltage to be V and write your answers in terms of V.

Q2. State and explain Superposition theorem. Find current through 2 ohms resistor in the circuit as shown in figure:



Q3. Enlist and explain the losses occurring in a transformer. Write an expression for calculating the efficiency of a transformer and develop the condition for maximum efficiency.

Q4. Describe the construction and working principle of the three phase induction motor. Draw the torque-slip characteristics and explain why this motor cannot operate on synchronous speed?

Q5. Draw and explain Power Triangle explaining active, reactive and apparent power. If load draws a current of 9 A at 0.8 pf lagging when connected to 100 V supply, Calculate the values of real, reactive and apparent powers. Also find out the resistance of the load.

Q6. Derive all the necessary equations for converting a star into an equivalent Delta network and a Delta into an equivalent Star network.

Q7. Describe the construction and working of permanent magnet moving coil instrument. What are its advantages and demerits.

Q8. Explain the construction and working principle of Synchronous generators.

Q9. Write short note on the following:

(A) Types of batteries

(B) Power factor correction methods

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Please check that this question paper contains __9____ questions and ___2___ printed pages within first ten

[Total No. of Questions: 09] [Total No. of Pages: ...2...]

Uni. Roll No. .....

Program: B.Tech
Semester: 2nd
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper ID: 15929

Time Allowed: 02 Hours **Max. Marks: 60**

NOTE:

1) Each question is of 10 marks.
2) Attempt any six questions out of nine
3) Any missing data may be assumed appropriately

12-07-21(M)

Q1. How Thevenin and Norton theorems can be used to solve a linear circuit? Give the methodology with suitable example to apply Norton theorem to any linear circuit.

Q2. A 230 V , 50 Hz AC supply is applied to a coil of 0.06 H(inductance) and 2.5 Ω (resistance) connected in series with a 6.8 μF capacitor. Calculate

(a) Impedance (Z)
(b) Current(I)
(c) Phase Angle(ϕ)
(d) Power factor
(e) Power consumed

Q3. In a 50 kVA transformer, the iron loss is 500W and full load copper loss is 800W. Find the efficiency at full load an half load at 0.8 pf lagging.

Q4. Compare Permanent magnet moving coil and moving iron instruments with focus on the operating torques. Give the working of moving iron instruments in brief.

Q5. A 3 phase , 6 pole , 50 Hz induction motor has a slip of 1% at no load and 3% at full load , Find:

(a) Synchronous Speed

(b) No-Load Speed

(c) Full-Load Speed

(d) Frequency of rotor current at standstill

(e) Frequency of rotor current at full-load

Q6. (a) Discuss about various components of LT switchgear (5 Marks)

(b) Explain different types of batteries. (5 Marks)

Q7. Derive the EMF equation of transformer and with a suitable example, explain the approximation of equivalent circuit of transformer referred to primary.

Q8. Why a starter is required in a 3-phase induction motor. Discuss about various type of starters with diagrams.

Q9. Explain Three phase balanced circuit with the necessary conditions and diagram of waveform(three phases). Give the voltage and current relations in star and delta connections.

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Please check that this question paper contains 09 questions and 02 printed pages within first ten

[Total No. of Questions:09] MORNING [Total No. of Pages:02]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)

Semester: 1st

Name of Subject: Basic Electrical Engineering

Subject Code: ESC-101

Paper ID:15929

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts Aand B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Explain Kirchhoff's Law.

b) Give comparison between Auto Transformer and Two winding Transformer.

c) What are Electrical Measuring Instruments?

d) A Voltage is represented by sine wave and has a maximum value of 100 V. Evaluate its R.M.S value and Average value of voltage.

e) Define Ampere Hour efficiency of a battery?

f) A 50Hz,Four pole,3 Φinduction motor has rotor current frequency of 2Hz. Determine a) Slip b) Speed of motor.

Part – B **[Marks: 04 each]**

Q2. Explain construction and working of permanent magnet moving coil instrument. Give its merits and demerits.

Q3. Define Switchgears.Explain the different component used in LT Switchgear.

Q4. With the help of power triangle explain various types of power in AC circuits.

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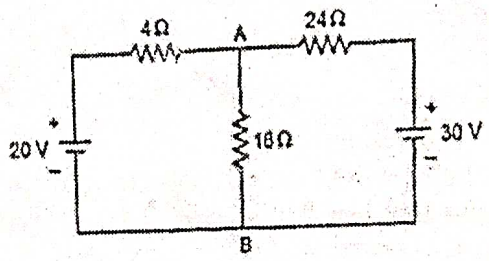
MORNING

15 MAR 2021

Q5. Describe the working principle of transformer and drive E.M.F equation of transformer.

Q6. Why induction motor need starter? Explain any one starting method of three phase induction motor in detail.

Q7. State Norton's Theorem and determine the current flowing through 16-ohm resistor of network shown in the figure.



Part – C **[Marks: 12 each]**

Q8. Derive all the necessary equations for converting a Delta into an equivalent Star network and also a star into an equivalent delta network.

OR

A) Derive an expression for Impedance, Current, Power and power factor for RLC series circuit when AC voltage is applied and draw the phasor diagram.

B) A circuit consists of a resistor of 9 Ω resistance, 6 Ω inductive reactance and 9 Ω capacitive reactance in series across a 240 V, 50 Hz supply. Calculate the circuit current and its phase angle.

Q9. What are the various losses in transformer? Derive the condition that efficiency at a given terminal voltage and load power factor is the maximum if full load losses are equal to the iron losses in the transformer.

OR

Explain the construction and working principle of three phase induction motor. Discuss the various speed control method of three phase induction motor.

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[Total No of Questions: 09] MORNING [Total No pages: 02]

Uni. Roll No. ..... 25 MAY 2019

Program/Course: B.Tech. (Sem. 1st and 2nd)

Basic Electric Engineering

Subject Code: ESC-101

Paper ID: 15929

Time Allowed: 3 Hours **Max.Marks: 60**

Note:

1) Part –A and B are compulsory.
2) Part-C has two question Q8 and Q9.Both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately.

Part-A **[Marks: 02 each]**

Q1.

a) State ohms law. Give its limitations.

b) Classify various measuring instruments.

c) Define power factor of an ac circuit.

d) What is earthing? Why it is provided?

e) A battery has taken a charging current of 5.2 A for 24hours at a voltage of 2.25 V, while discharging it gave a current of 4.5 A for 24 hours at an average voltage of 1.85V. Calculate the quantity efficiency and the energy efficiency of the battery.

f) A 50 Hz, 4 pole, 3 phase induction motor has rotor current of frequency 2 Hz. Calculate slip and speed of motor.

Part-B **[Marks: 04 each]**

Q2. For a single phase sinusoidal waveform, find average and rms values in terms of maximum value. Hence determine form factor of the sine wave.

Q3. Give Analogy between Electric and Magnetic circuits.

Q4. Define primary and secondary batteries. Explain any two types of batteries in details.

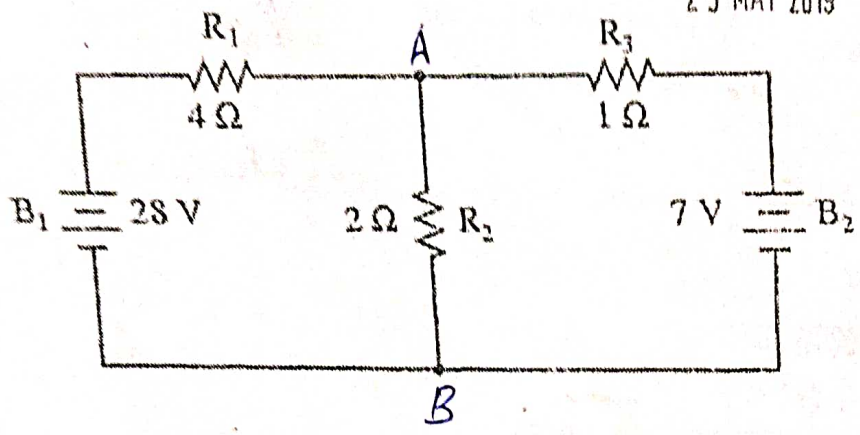
Q5. When a star connected network is transformed to delta connected network, shows that Resistance of an arm of delta = Sum of star resistances connected across that arm plus product of the arm two resistances divided by the third. Also calculate the equivalent delta arm resistance if all star arm resistance is 9 ohms.

Q6. Draw and explain torque speed characteristics of separately excited Dc motor.

Q7. State Thevenin's theorem. Determine Thevenin's equivalent circuit between terminals A and B for the shown network

MORNING

25 MAY 2019



Part-C [Marks: 12 each]

Q8. (a) Describe the constructional details of transformer. Explain different types of losses in a transformer and also derive condition for maximum efficiency of the transformer.

Or

(b) What is resonance? Discuss the condition of resonance for series circuit.

Q9. (a) Explain the operating principle and working of a Permanent magnet moving coil.

Or

(b) Why starters are necessary for starting of 3 phase induction motor? What are the various types of starters? Explain any two starters in detail.

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MORNING

[Total No. of Questions: 09] 11 DEC 2019 [Total No. of Pages: 02]

Uni. Roll No. .....

Program/ Course: B.Tech.batch 2018 onwards (Sem. 1st/2nd)
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper ID: 15929

Time Allowed: 3 Hours Max. Marks: 60

NOTE:

1) Parts A and B are compulsory
2) Part-C has two questions Q8 and Q9. Both are compulsory but with internal choice
3) Any missing data may be assumed appropriately

Part–A [Marks: 02 each]

Q1.

a) State Norton's Theorem.

b) Define Apparent Power.

c) State principle of operation of three phase induction motor.

d) What is operating principle of permanent magnet moving coil instrument.

e) What can you infer regarding magnetic properties of a material from area under BH curve?

f) Enlist two methods for power factor improvement.

Part – B [Marks: 04 each]

Q2. Define Kirchoff's current and voltage laws.

Q3. What are the various losses in transformer? What is condition for maximum efficiency of transformer?

Q4. What are the constructional features for a separately excited DC motor? Explain with a diagram.

Q5. What is use for following:

i) SFU ii) ELCB iii) MCCB iv)MCB

Q6. Derive condition for parallel resonance for a parallel RLC circuit.

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MORNING

11 DEC 2019

Q7. Which type of instruments are used for measuring DC quantities only? Describe with construction.

Part– C [Marks: 12 each]

Q8. What is a balanced system? Convert a given Star connected system to a delta connected system. Also derive voltage and current relations in a given star connected system.

OR

Draw equivalent circuit of a transformer. Define efficiency and regulation of a transformer.

Q9. A three phase induction motor runs at almost 1000rpm at no load and 950 rpm at full load when supplied with power from a 50Hz 3 phase line.

i) What is number of poles of motor?

ii) What is percentage slip at full load?

iii) What is corresponding frequency of rotor voltages?

iv) What is corresponding speed of rotor field with respect to motor?

v) What is corresponding speed of rotor with respect to Stator?

vi) What is rotor frequency at slip of 10%?

OR

a) Why is earthing necessary for an electrical installation? 6

b) What are important characteristics for a battery? 6

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[Total No. of Questions: 09] [Total No. of Pages: 02]

Uni. Roll No. .....

MORNING

10 DEC 2018

B.Tech. (Sem. 1st)

Basic Electrical Engineering

Subject Code: ESC-18101

Paper ID: 15929

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are **compulsory**
2) Part C has two questions Q8 and Q9 and both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Define Kirchhoff's law.

b) Give the classification of instruments.

c) Define RMS and Average Value of an alternating current.

d) What is difference between Wire and cable?

e) The synchronous speed of induction motor is 1500 rpm and rotor speed is 1440 rpm. Find slip.

f) Draw the complete phasor diagram of the transformer under no load conditions

Part – B **[Marks: 04 each]**

Q2. Explain the working of synchronous generator.

Q3. Describe the methods of power factor improvements.

Q4. Explain why PMMC instruments are most widely used instruments. Discuss their advantages and disadvantages.

Q5. Determine the current in 4 Ω resistance using superposition theorem in the network shown in fig no. 1

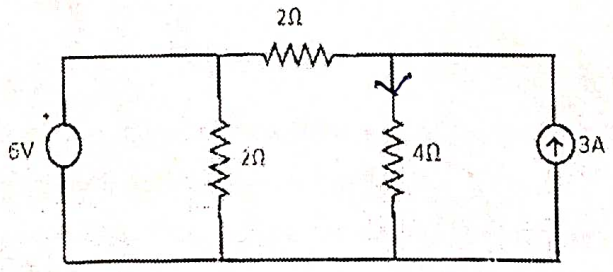

Fig 1

Q6. A coil of resistance 12 Ω and inductive reactance of 25 Ω is connected in series with a capacitive reactance of 41 Ω. The combination is connected to a supply of 230 V, 50 Hz. Using phasor algebra, find i) circuit impedance ii) current iii) power factor iv) power consumed.

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MORNING

10 DEC 2018

Q7. Derive the necessary equations for converting a delta network into an equivalent star network.

Part – C **[Marks: 12 each]**

Q8. Discuss the working of two winding transformer and its emf equation. Draw the equivalent circuit of a single phase transformer and drive the expression for all its parameters.

OR

Discuss the phase relation between emf and current when AC flows through RLC series circuit. Derive the condition of resonance in RLC series circuit.

Q9 1 List the factors that determine torque in running conditions and derive the condition for maximum running torque. Also draw the torque slip characteristics.

OR

2 Name and discuss different components of Low tension switchgear. Also discuss different types of batteries and their characteristics.

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Please check that this question paper contains __9____ questions and ___2___ printed pages within first ten

[Total No. of Questions: 09] [Total No. of Pages: ...2...]

Uni. Roll No. .....

Program: B.Tech
Semester: 2nd
Name of Subject: Basic Electrical Engineering
Subject Code: ESC-101
Paper ID: 15929

Time Allowed: 02 Hours **Max. Marks: 60**

NOTE:

1) Each question is of 10 marks.
2) Attempt any six questions out of nine
3) Any missing data may be assumed appropriately

Q1. How Thevenin and Norton theorems can be used to solve a linear circuit? Give the methodology with suitable example to apply Norton theorem to any linear circuit.

Q2. A 230 V , 50 Hz AC supply is applied to a coil of 0.06 H(inductance) and 2.5 Ω (resistance) connected in series with a 6.8 μF capacitor. Calculate

(a) Impedance (Z)
(b) Current(I)
(c) Phase Angle(ϕ)
(d) Power factor
(e) Power consumed

Q3. In a 50 kVA transformer, the iron loss is 500W and full load copper loss is 800W. Find the efficiency at full load an half load at 0.8 pf lagging.

Q4. Compare Permanent magnet moving coil and moving iron instruments with focus on the operating torques. Give the working of moving iron instruments in brief.

Q5. A 3 phase , 6 pole , 50 Hz induction motor has a slip of 1% at no load and 3% at full load , Find:

(a) Synchronous Speed

(b) No-Load Speed

(c) Full-Load Speed

(d) Frequency of rotor current at standstill

(e) Frequency of rotor current at full-load

Q6. (a) Discuss about various components of LT switchgear (5 Marks)

(b) Explain. different types of batteries. (5 Marks)

Q7. Derive the EMF equation of transformer and with a suitable example, explain the approximation of equivalent circuit of transformer referred to primary.

Q8. Why a starter is required in a 3-phase induction motor. Discuss about various type of starters with diagrams.

Q9. Explain Three phase balanced circuit with the necessary conditions and diagram of waveform(three phases). Give the voltage and current relations in star and delta connections.

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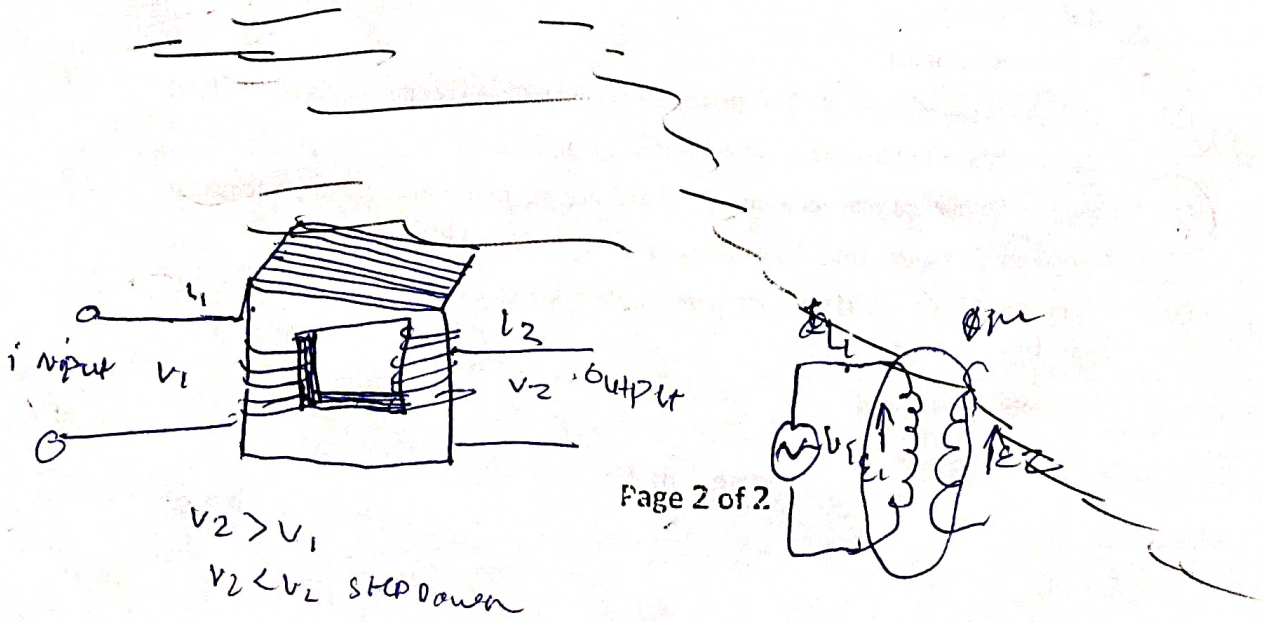

[Total No. of Questions: 09]

[Total No. of Pages: .02]

Uni. Roll No. 2203751

Program: B.Tech. (Batch 2018 onward)
Semester:....1st, 2nd
Name of Subject: Basic Electrical Engineering
Subject Code:ESC-101
Paper ID: 15929
Scientific calculator is Allowed

Max. Marks: 60

Time Allowed: 03 Hours

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

[Marks: 02 each]

Part – A

Q1.

a) Define rms and average value of a sinusoidal voltage.

b) State and explain Kirchoff's laws.

c). What is the purpose of OCT & SCT in transformers?

d). What is Earthing? Enlist different types of Earthing?

e). A three phase, 50 Hz, induction motor has a full load speed of 1460 rpm. calculate slip ,number of poles and the frequency of rotor induced EMF?

f). What are the electrical characteristics of a battery?

[Marks: 04 each]

Part – B

Q2. Describe the construction and working of permanent magnet moving coil instruments.

Q3. A separately excited DC motor draws and armature current of 12 ampere from 220 volt dc supply when developing a gross torque of 20 Nm in the armature running at 1200 RPM what will be the induced back EMF in the armature? 209.

Q4 A 20 KVA loss-less Transformer has 500 turns on the primary and 40 turns on the secondary winding the primary is connected to 3000 volt ,50 hertz mains determine :
i. Number of primary and secondary currents at full load
ii.The secondary EMF and
iii. The maximum flux in the core. The no load current may be ignored.

Q5 Explain in brief the Thevenin and the Norton theorems.

Q6 Name different types of switches, fuses and circuit breaker. Explain briefly the working of MCB.

Q7. Compare electric circuits with magnetic circuits.

P.T.O.

Part – C

[Marks: 12 each]

Q8. What are the different types of transformers based on the construction of core? What is the significance core in a transformer? Explain the working of transformer at an inductive load.. What are the losses in the transformer? How we can find the losses in laboratory without putting on the actual load?

OR

Drive an expression for EMF equation and Torque equation for DC machines. Explain the working and construction of DC motor with help of suitable diagrams what are the types of DC Motor? what is the need of Starter is a DC motor? How the starter help reducing the starting current?(LOTS)

Q9. Explain the construction and working of three phase induction motors. What are the different types of three phase induction motors? Give some applications of each type.

OR

Explain phasor diagram impendence triangle, voltage triangle and power triangle. Explain power factor from above terms. Prove that power, $P=1.732\ V_L\ I_L \cos \emptyset$ in 3 phase star and delta connection; also show the relationship between line and phase quantities.

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