

MST-2

BEE

BEE

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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	CO4, L5	4
(Q6)	Find (i) synchronous speed (ii) Slip		
	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.

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  $\rightarrow$  no wire with supp.  
 principle  
 Operation generates Constr  
 transformer in which the of AT is as an  
 conventional trans is basically work on  
 magneto

$$\frac{I_{\text{av}}}{I_{\text{m}}} = \frac{\text{Incidence}}{\text{BER}}$$

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**Guru Nanak Dev Engineering College, Ludhiana**  
**Department of Applied Sciences**

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	16 <sup>th</sup> November, 2022	Roll Number	2214053	
<b>Note:</b> 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 principle and working of permanent magnet moving coil instruments.	CO6, L4	8	
Or				
What is Power factor and explain its significance? Classify various methods helps in improving the power factor				
Course Outcomes (CO)				

## **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	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

~~352015~~  
~~155~~  
~~225~~  
~~11 - 144~~  
~~70 72 Rms = 2m~~  
~~12~~  
~~AC's of different~~  
~~thevenin theory~~

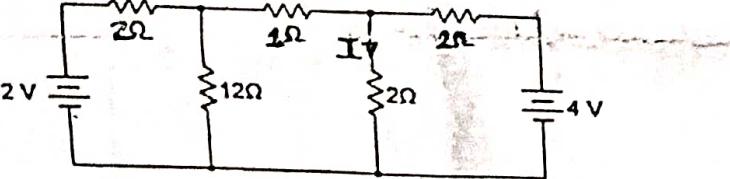
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## Guru Nanak Dev Engineering College, Ludhiana

### Department of Electrical Engineering

<b>Program</b>	B.Tech.	<b>Semester</b>	2
<b>Subject Code</b>	ESC-18101	<b>Subject Title</b>	Basic Electrical Engineering
<b>Mid Semester Test (MST) No.</b>	1	<b>Course Coordinator(s)</b>	Er. Amrinder Kaur Gill
<b>Max. Marks</b>	24	<b>Time Duration</b>	1 hour 30 minutes
<b>Date of MST</b>	13/12/2020	<b>Roll Number</b>	1914103

**Note:** Attempt all questions

<b>Q. No.</b>	<b>Questions</b>	<b>COs, RBT level</b>	<b>Marks</b>
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.	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)

Students will be able to

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

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

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**Guru Nanak Dev Engineering College, Ludhiana**

**Department of Electrical Engineering**

Program	B.Tech.(ME-C)	Semester	I
Subject Code	ESC-18101	Subject Title	BEE
Old Semester Test (MST)	1	Course	Karanbir Singh
Total Marks	24	Coordinator(s)	
Date of MST	18 <sup>th</sup> September, 2019	Time Duration	1 hour 30 minutes
Note: Attempt all questions			
Roll Number			

MID TERM EXAMINATION  
QUESTION PAPER

Q.No.	Question	COs, RBT level	Marks
Q2	Define power factor in relation with the voltage and current. A star connected network has 15 ohm resistance in each limb.what would be the resistance of each limb of delta connection?	CO2, L2 CO5, L5	2 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.	CO5, L3	4
P-VI	$10I_2 - 5I_1 = 10 \quad (1)$ $15I_1 - 5I_2 = 0 \quad (2)$	$\text{P} = I^2R$ $P = 0.16 \times 10$ $P = 1.6 \text{ Watt}$	
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 Superposition theorem.	CO5, L5	8
	$20I_1 - 4I_2 = 20 \quad (1)$		

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- Analyze the various electrical networks.
- Understand the components of low voltage electrical installations.

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

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**Guru Nanak Dev Engineering College, Ludhiana**

**Department of Applied Sciences**

<b>Program</b>	B.Tech	<b>Semester</b>	I
<b>Subject Code</b>	ESC-101	<b>Subject Title</b>	Basic Electrical Engineering Baljeet Singh Puneet Chandel Sukhpal Singh Ranjit Singh
<b>Mid Semester Test (MST) No.</b>	2	<b>Course Coordinator(s)</b>	
<b>Max. Marks</b>	24	<b>Time Duration</b>	1 hour 30 minutes
<b>Date of MST</b>	22 December, 2022	<b>Roll Number</b>	2216062

**Note:** Attempt all questions

<b>Q. No.</b>	<b>Question</b>	<b>COs, RBT level</b>	<b>Marks</b>
(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 50 Hz 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)**

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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.

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

**Guru Nanak Dev Engineering College, Ludhiana**  
**Department of Applied Sciences**

<b>Program</b>	B.Tech	<b>Semester</b>	I
<b>Subject Code</b>	ESC-101	<b>Subject Title</b>	Basic Electrical Engineering
<b>Mid Semester Test (MST) No.</b>	1	<b>Course Coordinator(s)</b>	Baljeet Singh Puneet Chandel Sukhpal Singh Ranjit Singh
<b>Max. Marks</b>	24	<b>Time Duration</b>	1 hour 30 minutes
<b>Date of MST</b>	16 <sup>th</sup> November, 2022	<b>Roll Number</b>	2216062
<b>Note:</b> Attempt all questions			
<b>Q. No.</b>	<b>Question</b>	<b>COs, RBT level</b>	<b>Marks</b>
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 principle and working of permanent magnet moving coil instruments.	CO6, L4	8
X	Or What is Power factor and explain its significance? Classify various methods helps in improving the power factor		

**Course Outcomes (CO)**

*Students will be able to*

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

- Q. 1) What are different types of electric measuring instruments?
- Q. 2) Give RMS and average values of sinusoidal voltage? RMS value of  $V_{rms} = \frac{V_m}{\sqrt{2}}$ ,  $V_{avg} = 0.637 \times V_m$
- Q. 3) Explain how rotating magnetic field is produced? Give expression for its magnitude?
- Q. 4) Derive an expression of EMF equation for DC machines
- Q. 5) Explain the working of transformer at an inductive load.
- Q. 6) 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	2 <sup>nd</sup>
Subject Code	ESC-101	Subject Title	Basic Electrical Engineering
Mid Semester Test (MST) No.	2 <sup>nd</sup>	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%. $N_s = 1800 \text{ rpm}$ , $N = 1499.40$	CO4, L5	2
Q3	A 200 kVA, 6600/400 V, 50 Hz single phase transformer has 80 turns on the secondary. Calculate 1. The approximate values of the primary and secondary currents 2. The approximate number of primary turns 3. The maximum value of flux.	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

1	Analyze the behavior of electrical and magnetic circuits.
2	Inculcate the understanding about the ac fundamentals.
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**Guru Nanak Dev Engineering College, Ludhiana**  
**Department of Electrical Engineering**

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

**Note:** Attempt all questions

<b>Q. No.</b>	<b>Question</b>	<b>COs, RBT level</b>	<b>Marks</b>
(Q1)	The equation of alternating current $i = 42.42 \sin 628t$ . Find average value $I_{avg}$ and RMS value $I_{rms}$ of current. $I_{avg} = 27.02$ , $I_{rms} = 30 A$	CO2, L3	2
(Q2)	Define power factor. What are the values of power factor for a) purely resistive circuit b) purely capacitive circuit? (Q2)	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. $\Rightarrow pf = \cos \theta = \frac{R}{\sqrt{R^2 + X^2}}$	CO2, L6	4
(Q6)	State Superposition theorem and Justify with suitable example.	CO6,L5	2+6=8

**Course Outcomes (CO)**

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1	Analyze the behavior of electrical and magnetic circuits.
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4	Select the type of generator /motor required for a particular application.
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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

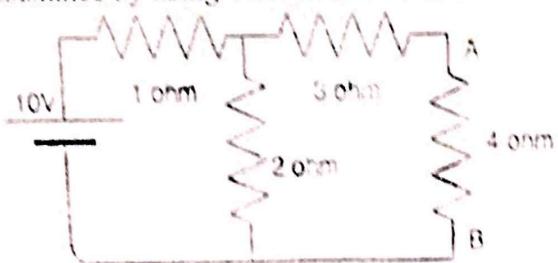
# Guru Nanak Dev Engineering College, Ludhiana

## Department of Electrical Engineering

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

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



### Course Outcomes (CO)

Students will be able to

- Analyze the behavior of electrical and magnetic circuits
- Indicate the understanding about the ac fundamentals
- Realize the requirement of transformer in transmission and distribution of electric power and other application
- Select the type of generator /motor required for a particular application
- Analyze the various electrical networks
- Recognize the various measuring instruments.

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

Fwd

Guru Nanak Dev Engineering College, Ludhiana Department of Electrical Engineering			
Program	B.Tech.	Semester	1 <sup>st</sup>
Subject Code	ESC-101	Subject Title	Basic Electrical Engineering
Mid Semester Test (MST) No.	2 <sup>nd</sup>	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)

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