Printed Page:3 Roll No. | | | | | | |

End Term Examination, Odd Semester 2016-17

B.Tech I Year (I Semester)

Title of Paper: Electrical Engineering **Paper Code: EEE 1001**

Time: 2½ Hours **Max. Marks: 40**

Section-A

Note: Attempt All Questions. **1×16= 16**

I. Differentiate between Unilateral and Bilateral elements

II. Differentiate linear & non-linear elements with suitable example.

III. State maximum power transfer theorem for DC network.

IV. Determine the current in 10 ohm resistance shown in fig.1.

Fig.1

V. A sinusoidal voltage wave is represented by $e(t) = 144Sin(377t - 30^0)$. Find the frequency of the voltage.

VI. Define the term form factor and peak factor.

VII. What is meant by balanced three phase voltage system?

VIII. Write the relationship between line current and phase current for delta connected three-phase system.

IX. Enumerate two similarities between magnetic and electric circuit.

X. What is hysteresis loss and how can be minimized?

XI. Write any two applications of transformer in the electrical engineering.

XII. Enlist all the losses occurring in a transformer.

XIII. A DC generator has 4-poles, wave wound armature with 840 conductors and flux per pole is 0.018Wb. The generator runs at 1200 rpm. Calculate the emf generated.

XIV. What is the need of starter in DC motor?

XV. Define slip in three phase induction motor.

XVI. Write the different methods of house wiring.

Section-B

Note: Attempt Any Four Questions. **3×4=12**

I. Derive the emf equation for a DC machine. Why is induced emf in a DC motor called the back or counter emf?.

II. A 250V DC shunt motor having an armature resistance of 0.25Ω carries an armature current of 50A and runs at 750 rpm. If the flux is reduced by 10%, find the speed. Assume that the torque remains the same in both the conditions.

III. With the help of neat sketch describe the construction and principle of operation of the 3-phase induction motor.

IV. A 3-phase, 6-poles, 50 Hz induction motor has a slip of 1% at no load and 3% at full load. Find (a) the synchronous speed,(b) the no load speed,(c) the full-load speed.

V. Discuss the electro-mechanical energy conversion principle with the help of suitable equations & block diagram.

Section-C

Note: Attempt Any Three Questions. **4×3=12**

I. Draw and explain the torque-current, speed-current & speed-torque characteristics of DC series motor.

II. Draw a neat connection diagram of a fluorescent tube and explain its working.

III. Explain the principle of operation of synchronous motor. Why this motor is not self starting in nature. Enlist the methods of starting.

IV. Sketch & explain speed-torque characteristics of a 3-phase induction motor. Mark the stable region, unstable region and maximum torque.

Printed pages-4 University Roll No.....

B.Tech, I Year II semester, End Term Examination, 2016-17

EEE-1001: Electrical Engineering

Time: $2\frac{1}{2}$ Hours Total marks: 40

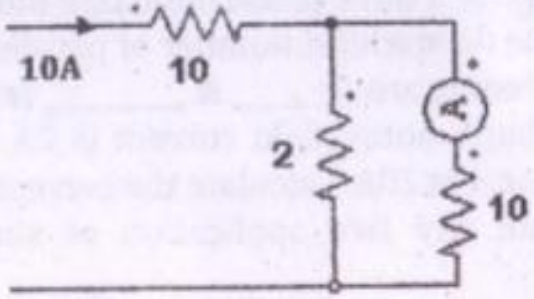
Notes:

1. Answer should be brief and to the point and be supplemented with neat sketches wherever necessary.
2. Any missing data may be assumed suitably with proper justification.
3. All symbols, abbreviation have their usual meaning.

SECTION A

Attempt all questions **(1x16=16)**

1. Define an ideal voltage source also draw its v-i characteristic graph.
2. Compute the reading of the ammeter shown in the given circuit?



3. State maximum power transfer theorem for a dc circuit?
4. Write example of linear and non-linear elements?

SECTION B

Attempt any four questions **(3x4=12)**

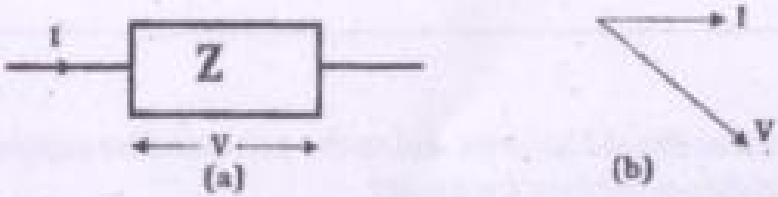
1. (a) Justify the need of starter in a dc motor.
   (b) What is the function of brush and commutator in a dc machine?
2. (a) Derive emf equation in case of a dc machine?
   (b) A 4-pole generator has a lap-wound armature with 50 slots with 16 conductors per slot. The useful flux per pole is 30mWb. Determine the speed at which the machine must be driven to generate an e.m.f. of 240 V.
3. Why a three phase synchronous motor is not self-started? Give a suitable method to start a three phase synchronous motor.
4. Explain the working of a fluorescent lamp with help of a neat sketch and suitable electrical circuit.
5. A 3-phase, 60 Hz induction motor has 2 poles. If the slip is 2% at a certain load, determine
   a) the synchronous speed,
   b) the speed of the rotor
   c) the frequency of the induced e.m.f. in the rotor.

SECTION C

Attempt any three questions **(4x3=12)**

1. A 250 V DC shunt motor having an armature resistance of 0.25Ω carries an armature current of 50A and runs at 750 rpm. If the flux is reduced by 10%, find the new speed. Assume that the torque remains the same.

5. Enumerate any two advantages of three phase system over single phase system.
6. How line and phase voltages are related in a star and delta connected system?
7. In the given figure impedance Z is composed of only two elements out of R, L, C. Phasor diagram for the impedance is given, Identify the elements present in Z.



8. How can eddy current losses be minimized in a transformer?
9. For a 100kVA, 400/1100V transformer, what will be the secondary rated current?
10. Complete the given table, where "A" is quantity used in magnetic circuit where as "B" is its analogous quantity used in electrical circuit.

	A	B
i	Reluctance	Resistance
ii	Magnetic flux	_____
iii	_____	emf

11. List any two motors which are not self-started?
12. Define slip for a three phase induction motor?
13. In a 4 pole dc machine, number of parallel paths in case of LAP and wave winding are _____ & _____ respectively?
14. In a dc shunt motor, field current is 2A whereas line current drawn by motor is 20A. Calculate the current drawn by armature?
15. Enumerate any two application of single phase induction motor?
16. In a three phase synchronous motor stator is excited with three phase ac supply whereas rotor is excited with _____?

2. **(a)** What is the need of auxiliary winding in a single phase induction motor?
   (b) Explain the working of a capacitor type single phase induction motor. Draw suitable phasor diagram and torque speed characteristics.
3. With suitable expression prove that when a three phase induction motor is excited with a three phase balanced supply a rotating magnetic field of magnitude $\frac{3}{2}\emptyset_m$ is produced.
4. Derive torque equation for a three phase induction motor and hence draw torque slip characteristics, also write expression for starting torque.

Printed Page: 04	University Roll No.

B. Tech. I Year, I Semester, End Term Examination, 2017-18

EEE 1001: ELECTRICAL ENGINEERING

Time: 3 Hours **Max. Marks: 50**

Section A

Attempt All Questions. **5x7=35 marks**

I. The circuit, having a resistance of 4Ω, an inductance of 0.50H and a variable capacitance in series, is connected across a 100 V, 50 Hz supply. Calculate:

a) Value of capacitance so that $X_L=X_C$ at 50 Hz.

b) Current I in the circuit under the condition given in part (a).

c) Voltage across L & C under the condition given in part (a).

II. What do you understand by Root mean square (rms) value of an AC quantity?

Find the rms value of the voltage waveform shown in Fig. 1. What will be the value of active power dissipated when the voltage is applied across a 2Ω resistance.

Given: v(t) is in volts and t in sec.

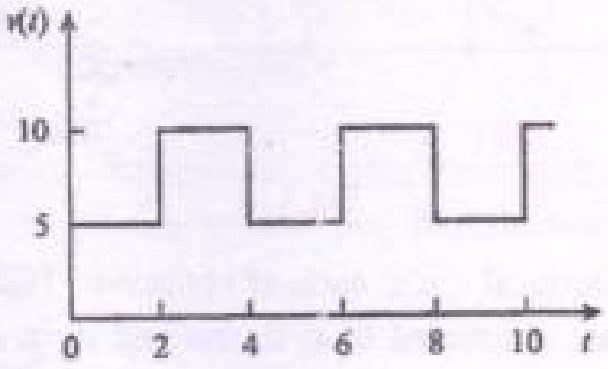


Fig.1

OR

II. What do you understand by Root mean square (rms) value of an AC quantity?
Find the rms value of the voltage waveform shown in Fig. 2. What will be the value of active power dissipated when the voltage is applied across a 2Ω resistance.
Given: v(t) is in volts and t in sec.

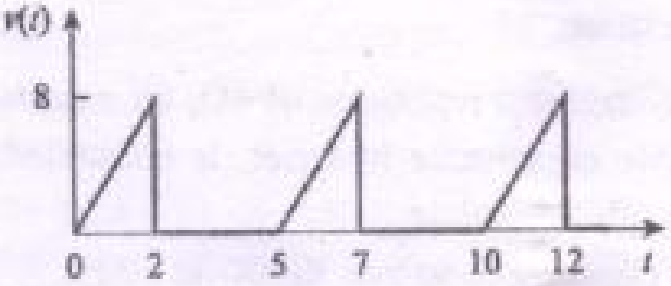


Fig.2

III. Find the Thevenin equivalent circuit across the A-B terminals for the circuit shown in Fig.3. Hence find the value of current through the load if load resistance is 50 Ω.

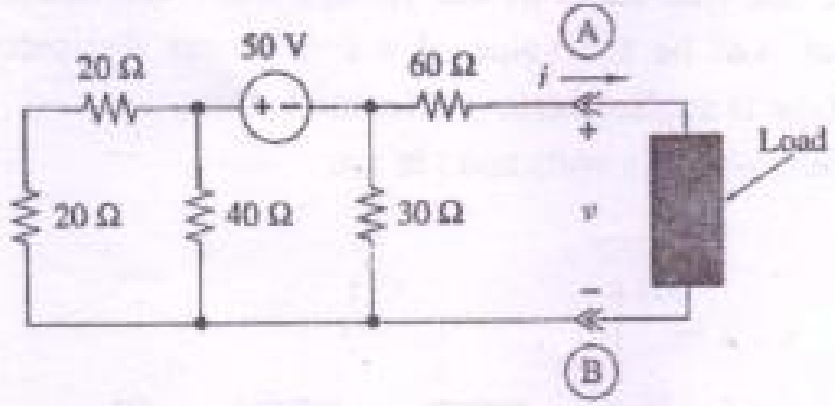


Fig.3

IV. Three identical coils, each of resistance 10Ω and inductance 42mH are connected in a) in star and b) in delta to a 415 V, 50 Hz, 3 phase supply. Determine the total power dissipated in each case.

V. With the help of suitable diagram(s) and equation(s), explain the following terms:
a) Self and Mutual inductance
b) Hysteresis and eddy current losses.

VI. Draw the phasor diagram of single phase ideal transformer under no load condition.
The efficiency of a 400 KVA, single phase transformer is 98.77% at full load 0.8 power factor and 99.13% at half full load unity power factor. Find:
a) Iron losses at full and half of full load
b) Copper losses at full and half of full load.

VII. Derive the expression for the torque developed by a three-phase induction motor. Draw and explain the torque-slip characteristics & show that the torque slip characteristics can be approximated as a straight line when the motor is running at speed close to synchronous speed.

Section B

Attempt all the questions

I. With the help of suitable diagrams, Explain the working of fluorescent sodium vapour lamp. (2)

II. A 6 pole, three phase induction motor is connected to a 50 Hz supply. If it is running at 970 rpm, find its synchronous speed and slip. (2)

III. With the help of necessary diagram(s)/equation(s). explain why starters are needed in DC motor operation. (2)

IV. Why single phase induction motor is not self-starting in nature?

Briefly discuss capacitor start capacitor run type induction motor along with necessary diagram(s). (3)

V. With the help of suitable diagram(s), explain the operation of Synchronous machine. Is this a singly excited or doubly excited machine? (3)

VI. A DC generator has an armature emf of 100 V when the useful flux per pole is 20 mWb, and the speed is 800 rpm. Calculate the generated emf:

a) With the same flux and a speed of 1000 rpm.

b) With a flux per pole of 24mWb and a speed of 900 rpm. (3)

Printed Pages 3 University Roll No.....

End Term Examination, Odd Semester 2018-19

B. Tech. I Year, I Semester

BEEG0001: Basic Electrical Engineering

Time: 03 Hours **Maximum Marks: 50**

Section-A

Note: Attempt all questions **[5x7=35 Marks]**

I State the maximum power transfer theorem. Derive the condition for which maximum power is transferred from source to load. Also find efficiency of power transfer under the condition of maximum power transfer. [5]

OR

A coil is joined in series with a pure resistor of resistance 800 Ω across a 100 V, 50 Hz supply. The reading of a voltmeter across the coil is 45 V and across the pure resistor is 80 V. Find (a) inductance and (b) resistance of the coil.[5]

II (a) Explain capacitor method for improving power factor of the circuit (use phasor-diagram). [3]

(b) In the following circuit [Fig. (1)], find the value of E (source voltage). [2]

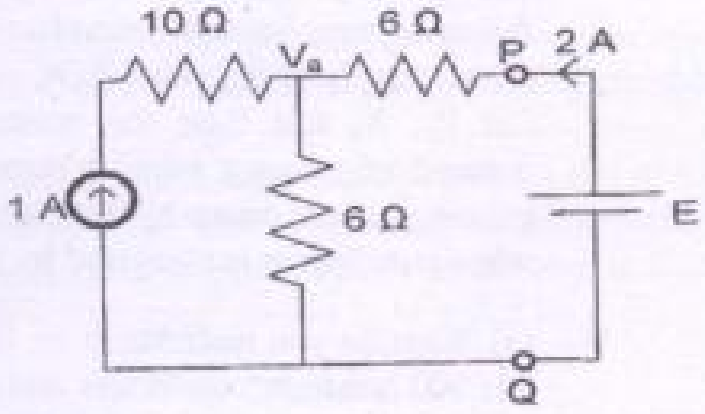


Fig.(1)

III Three identical resistors of 20 Ω each are connected to a 440 V, 3-phase, 50 Hz supply in the following manner:
(i) Star (ii) Delta
Find (a) the power consumed by resistors for each connection, (b) the power consumed by resistors for each connection, if one of the resistors is open circuited from star and delta connections. [5]

OR

Enumerate the advantages of 3-phase system over 1-phase system. Also derive an expression between line and phase parameters for 3-phase star connected system with the help of phasor diagram.[5]

IV (a) List any two similarities and two dissimilarities between electric & magnetic circuit. [2]

(b) A 1-phase transformer when supplied from 220 V, 50 Hz has an eddy current loss of 50W.If this transformer is connected to a voltage of 300 V, 50 Hz supply, find the eddy current loss. [2]

(c) Define root mean square (rms) value of an AC quantity.[1]

OR

The primary winding of a 1-phase transformer is energized by following supplies with secondary winding open:
(i) AC supply of V_{ac} volt (ii) DC supply of V_{dc} volt
Let R_1, X_1 and E_1be the resistance, leakage reactance and emf induced of primary winding respectively. Write the expression for primary current drawn by transformer in each case. What will happen when transformer is energized by DC supply? Discuss. [5]

V (a) What do you understand by back emf? An 8-poles DC machine has 500 armature conductors and useful flux of 0.05 Wb. What will be the emf induced, if it is lap connected and runs at 1200 rpm? [2]
(b) Draw a neat connection diagram of a fluorescent tube and explain its working. [3]

VI (a) Sketch and explain speed-torque characteristics of a 3-phase induction motor. Mark the stable region, unstable region and maximum torque. [3]
(b) Can a DC shunt motor be reconnected as a DC series motor by connecting shunt field winding in series? Explain. [2]

VII Show that when 3-phase AC supply is fed to the stator winding of a 3-phase induction motor, a rotating magnetic field that rotates in the air-gap at synchronous speed is produced.[5]

Section-B

Note: Attempt All Questions **[(2x3)+(3x3)=15 Marks]**

I A DC shunt motor runs at 1200 rpm when connected to a 220 V, DC supply. Neglecting losses and saturation, find the speed of this motor when connected to a 200 V, DC supply. [2]

II Why is 1-phase induction motor not self-starting? [2]

III Explain why a starter is needed for the starting of a DC motor. [2]

IV Discuss the principle of operation of a 3-phase synchronous motor with the help of neat circuit diagram. Write its applications (any two).[3]

V Draw a neat labeled diagram to show the essential constructional features of a DC machine. What is the function of commutator? [3]

VI A 3-phase, 6-pole, 50 Hz induction motor has a slip of 0.01 per unit at no load and 0.03 per unit at full load. Calculate (a) the speed of rotor at no load, (b) the speed of rotor at full load and (c) the speed of stator field with respect to rotor field at full load. [3]

Printed Pages 3 University Roll No.....

End Term Examination, Even Semester 2018-19
B. Tech. (common to all branches except EE) I Year, II Semester
BEEG0001: Basic Electrical Engineering

Time: 03 Hours **Maximum Marks: 50**

Section-A

Note: Attempt all questions **[5x7=35 Marks]**

I (a)Find the Thevenin equivalent circuit across terminals(1,2)as shown in Fig1.[2]

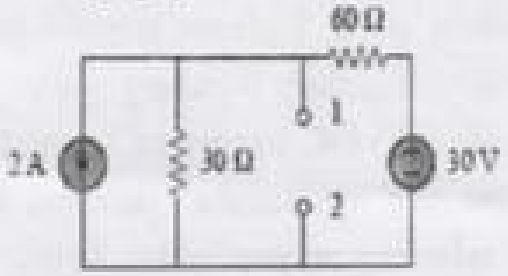


Fig 1

(b) A coil connected to 100 V DC supply draws 10 A and same coil when connected to 100 V AC voltage of frequency 50 Hz draws 5 A. Calculate the parameters (R, L) of the coil and power factor.[3]

OR

State the maximum power transfer theorem. Derive the condition for which maximum power is transferred from source to load. Also find efficiency of power transfer under the condition of maximum power transfer. [5]

II (a) Discuss the power triangle indicating different types of power.[2]
(b) Explain capacitor method for improving power factor of an R-L circuit (use phasor-diagram). [3]

III (a)Derive the relationship between line voltage and phase voltage for a 3-phase star connected system with the help of phasor diagram.[3]

(b) Enumerate any four advantages of 3-phase system over 1-phase system.[2]

IV (a)List any four similarities and two dissimilarities between electric & magnetic circuit. [3]

(b) Calculate the number of turns of primary and secondary windings of a 50 Hz, 240/120 V ideal transformer, if the flux in its magnetic core is to be limited to 5mWb. [2]

OR

(a) What is the value of internal resistance of an ideal current source and an ideal voltage source?[2]

(b)The primary winding of a 1-phase transformer is energized by following supplies with secondary winding open:

(i) AC supply of V_{ac} volt (ii) DC supply of V_{dc} volt

Let R_1, X_1 and E_1 be the resistance, leakage reactance and emf induced of primary winding respectively. Write the expression for primary current drawn by transformer for case (i) and (ii).What will happen when transformer is energized by DC supply? Discuss. [3]

V Sketch and explain speed-torque characteristics of a 3-phase induction motor. Mark the stable region, unstable region and maximum torque. [5]

VI (a)Explain the principle of operation of a 3-phase induction motor with the help of neat diagram.[3]

(b)A 3-phase, 6-pole, 50 Hz induction motor has slip of 1% at no load and 3% at full load. Calculate the speed of motor at no load and full load. [2]

VII Sketch & explain the torque-current, speed-current and speed-torque characteristics of DC shunt motor. Enumerate its applications.[5]

Section-B

Note: Attempt All Questions **[(2x3)+(3x3)=15 Marks]**

I Explain why a starter is needed for the starting of a DC motor. [2]

II Why is 1-phase induction motor not self-starting? [2]

III An 8-poles DC machine has 500 armature conductors and useful flux of 0.05 Wb. What will be the value of emf induced, if it is lap connected and runs at 1200 rpm? [2]

IV Derive emf equation for a DC machine. [3]

V Explain the principle of operation of a 3-phase synchronous motor with the help of neat diagram. Write its applications (any two).[3]

VI Draw neat connection diagram for a fluorescent tube and explain its working. [3]

Printed Pages: 3 University Roll No.....

End Term Examination, Odd Semester 2019-20
B. Tech. (CS, EE & EN) I Year, I Semester
BEEG1001: Basic Electrical Engineering

Time: 03 Hours Maximum Marks: 50

Section-A

Note: Attempt ANY FIVE Questions [5x4=20 Marks]

I State maximum power transfer theorem for a DC circuit. Derive the condition for which maximum power is transferred from source to load. Also find efficiency of power transfer under the condition of maximum power transfer.[1+2+1=4]

II Three inductive loads each of resistance 75 Ω and inductance 318.4 mH are connected in delta to 415 V, 50 Hz, 3-phase supply. Calculate:
(a)the phase-voltage
(b)the line voltage
(c)the phase current
(d)the line current.[1+1+1+1=4]

III Find the rms value of voltage for the following waveform (fig. 1).[4]

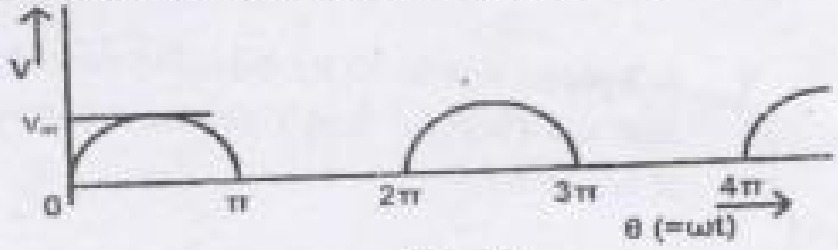


Fig.(1)

IV A rectangular shaped core is made of mild steel plate 15 mm x 20 mm cross-section. The mean length of the magnetic path is 18 cm. The exciting coil has 300 turns and current 0.7A. Calculate :
(a) Magnetic field intensity
(b) Flux density
(c) Reluctance
(d) Flux of magnetic circuit.
Assume relative permeability of mild steel as 940.[1+1+1+1=4]

V (a)What do you understand by back emf?
(b) An 8-pole DC machine has 500 armature conductors and useful flux of 0.05 Wb. What will be the emf induced, if it is lap connected and runs at 1200 rpm?[2+2=4]

VI Sketch and explain speed-torque characteristics of a 3-phase induction motor. Mark the stable region, unstable region and maximum torque.[4]

Section-B

[5x3=15 Marks]

Note: Attempt ALL Questions

I List any four similarities and two dissimilarities between electric & magnetic circuit.[2+1=3]

II Explain why a 1-Φ induction motor is not self starting. [3]

III Discuss why a starter is needed for the starting of a DC motor.[3]

IV Derive emf equation of a single-phase transformer. [3]

V A 3-phase, 6-pole, 50 Hz induction motor has a slip of 1% at no load and 4% at full load. Calculate the speed of motor at no load and at full load.[3]

Section-C

[3x5=15 Marks]

Note: Attempt ANY THREE Questions

I Show that when 3-phase AC supply is fed to the stator winding of a 3-phase induction motor, a rotating magnetic field at synchronous speed is produced in the air-gap.[5]

II (a) Derive emf equation for a DC machine.[3]
(b) Enumerate at least four applications of single-phase induction motor.[2]

III (a) Draw phasor diagram of an ideal transformer at no-load.[2]
(b) Draw a neat labeled diagram to show the essential constructional features of a DC machine. What is the function of commutator?[3]

IV A transformer takes a current of 0.8 A when its primary winding is connected to a 240 V, 50 Hz supply, the secondary winding being on open circuit. If the power absorbed is 72 W. Calculate:
(a) the power factor on no-load
(b) real component of no-load current
(c) the magnetizing current [1+2+2=5]

Basic Electrical Engineering

Course Outcome

CO1- *Define the basic concept of active and passive elements, Linear & non-linear elements, Unilateral and bilateral elements, Ideal & Practical voltage and current sources.*

CO2- *Illustrate the working principle of various machines like DC machine and Induction Motor.*

CO3- *Classify DC Motors and induction motor*

CO4- *Apply the concept of KVL/KCL, Thevenin's Theorem, Superposition Theorem and Maximum power transfer theorem to solve the electrical circuits.*

CO5- *Compute the parameters of single phase and three phase AC electrical circuits, magnetic circuit and transformer.*

Printed Pages: 3 **University Roll No. .....**

End Term Examination, Odd Semester 2022-23

B. Tech (All), 1st year, Ist semester

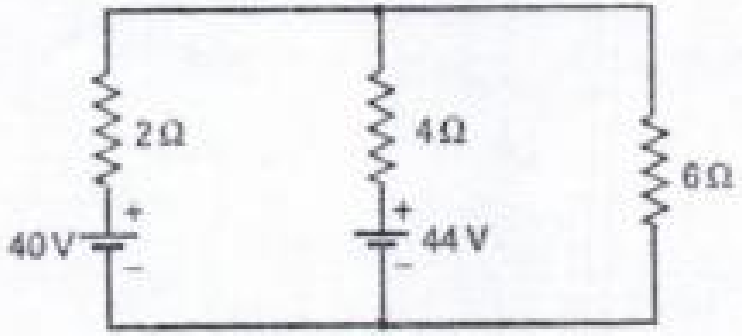
BEEG1001 – Basic Electrical Engineering

Time: 3 Hours **Maximum Marks: 50**

Instruction for students: *Read all the questions carefully.*

Section – A

Attempt All Questions 4 X 5 = 20 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	State any 4 advantages of three phase AC systems over single phase AC systems.	4	5	R	F
2	a. State and explain Superposition theorem for DC circuits, using a suitable example. (3) a. Why superposition theorem cannot be used for calculation of power? (1)	4	4	R	C
3	Using mesh analysis find the current in each branch of the circuit given in Fig. 1.  Figure 1	4	4	An	C
4	Define the following terms: (i) MMF (ii) Reluctance, S (iii) Flux Density, B (iv) Magnetic Field Intensity, H	4	5	R	C

5	Draw and explain the speed-current (N-I_a) characteristics of DC series motor. Why should a DC series motor not be started without load? (3+1) Or State four similarities between electric circuits and magnetic circuits. (2) A coil of 200 turns is wound uniformly over a wooden ring having a mean circumference of 60cm and a uniform cross-sectional area of 500mm^2 . If the current through the coil is 4A, calculate: (i) magnetic field strength; (ii) flux density. (2)	4	3	An	C

Section – B

Attempt All Questions 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
6	A 100 kVA, 4000 V/200 V, 50 Hz single-phase transformer has 100 secondary turns. Determine (a) the primary and secondary current, (b) the number of primary turns, and (c) the maximum value of the flux.	3	5	An	M
7	Define the term 'slip'. What is the value of slip at the instant of starting and at synchronous speed? Calculate the slip for an 8 pole induction motor that has a frequency of 50 Hz, running at 728 rpm.	3	2	R	C
8	What are the different core losses present in a transformer? Elaborate each one of them.	3	5	R	F
9	A 200 kVA rated transformer has a full load copper loss of 1.5kW and an iron loss of 1kW. Determine the transformer efficiency at full load and 0.85 power factor. Or Derive the EMF equation for a single phase transformer. What is transformation ratio?	3	5	E	C
10	A 250 V DC shunt motor takes 30 A current while running at full load. The resistance of armature and field windings are 0.1Ω and 200Ω, respectively. Determine the back emf produced in the motor, when it runs on full load.	3	3	E	C

Section – C

Attempt All Questions 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
11	Explain the principle of operation of a DC Machine. Derive the EMF equation for a DC machine. (2+3)	5	2	R	C
12	Discuss the properties of an ideal transformer. Also, draw and explain its phasor diagram. For a single phase transformer, show that for maximum efficiency iron loss is equal to copper loss. (3+2)	5	5	R	F
13	Explain the principle of three-phase Induction Motor. Draw and explain the torque-slip characteristics of a three-phase induction motor. Write the required expressions. (3+2) Or Explain the concept of Rotating Magnetic Field (RMF) for a three-phase induction machine. Show that the resultant flux of RMF is 3/2 Φ_m.	5	3	R	C

Course Name: BASIC ELECTRICAL ENGINEERING

Course Outcome

CO1-Define the basic concept of active & passive elements, Linear & non-linear elements, Unilateral and Bilateral Elements, Ideal & Practical voltage and current sources.

CO2-Illustrate the working principle of various machines like DC Machine, and Induction motor.

CO3-Classify DC motors and induction motors.

CO4- Apply the concept of KVL/KCL, Thevenin's theorem, Super position Theorem and Maximum power transfer theorem to solve the electrical circuits.

CO5-Compute the parameters of single phase and three phase AC electrical circuits, magnetic circuit and transformer.

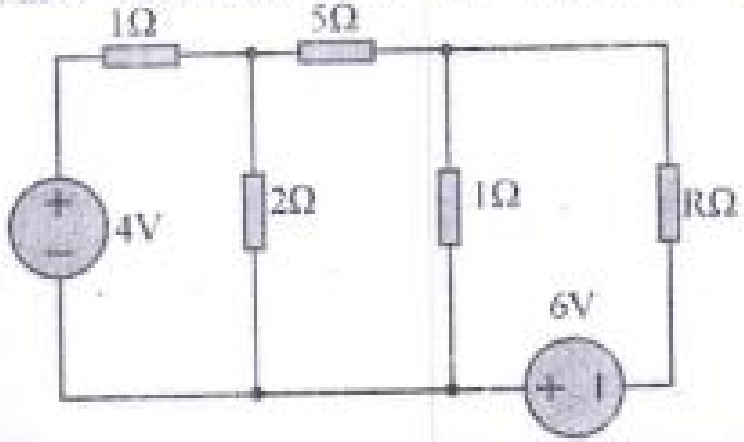
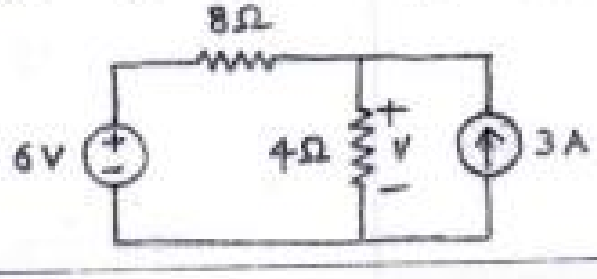
Printed Pages:03 **University Roll No. .....**

End Term Examination, Even Semester 2022-23
B.Tech (All Branch), Ist Year, IInd Semester
BEEG 1001: BASIC ELECTRICAL ENGINEERING

Time: 3 Hours **Maximum Marks: 50**

Section – A

Attempt All Questions 4 X 5 = 20 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	The equation for an AC voltage is given as V= 0.04sin(2000t) volts. Determine the frequency, angular frequency and instantaneous voltage when t=160μs.	4	1	A	C
2	Determine the value of 'R' in the circuit depicted below such that the maximum power is transferred. Also find the value of maximum power. 	4	4	E	F
3	Use the superposition theorem to determine the value of 'v' in the circuit. 	4	4	A	F

4	A coil of insulated wire of 500 turns and resistance of 4Ω is closely wound on an iron ring. The ring has a mean diameter of 0.25m and a uniform cross-sectional area of 700 mm^2. Calculate the total flux in the ring when a dc supply of 6V is applied at the ends of winding. Assume a relative permeability of 550.	4	5	A	F
5	Explain the following terms: - a) Magnetic Field Intensity b) Magnetic Flux Density c) Permeability d) Reluctance **Or** The transformer is devices that is used to either raise the voltage or decrease the voltage. In this context derive the expression for calculating the induced emf in a single phase transformer.	4	5	A	C

Section – B

Attempt All Questions 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
6	(a)Discuss various types of core losses in a transformer and method applied to minimize them. (b) An electrical circuit provides a path for the flow of electric current and a magnetic circuit is known to provide a path for the flow of magnetic flux. In this context enlist the analogy between Electric and Magnetic Circuits.	3	5	A	C
7	DC motors are widely used in industry due to their variable torque and speed characteristics. Using standard notation, derive the torque equation for DC motors.	3	2	A	P
8	A starter is required for starting a DC motor. Briefly explain the need for employing a starter in a DC motor circuit.	3	2	A	P
9	Enlist the various assumptions that are made to consider a transformer to be ideal. Also draw the phasor diagram depicting the operation of an ideal	3	5	U	C

	transformer under no-load condition.				
10	A 3-phase, 6-poles, 50 Hz induction motor is operating at a slip of 1% at no load and 3% at full load. Find: (a) the synchronous speed, (b) the no load speed, (c) the full-load speed, (d)the frequency of rotor current at standstill and (e) the frequency of rotor current at full load.	3	5	A	F

Section – C

Attempt All Questions 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
11.	A 4 pole, 1500 r.p.m. D.C. generator has a lap wound armature, having 32 slots and 8 conductors per slot. If the flux per pole is 0.04Wb, determine the E.M.F. induced in the armature. What would be the E.M.F induced, if the winding is wave connected.	5	5	A	F
12	A 250 KVA, 11000/415 volts, 50 Hz single phase transformer has 80 turns on the secondary. Calculate: (i) Rated primary and secondary currents (ii) Number of primary turns (iii) Maximum value of flux in the core (iv) Voltage induced/turn on secondary.	5	5	A	F
13	Discuss, with the help of neat diagram, the process of setting up rotating magnetic field is set up in a three phase induction motor?	5	2	A	C