

Hall Ticket No:

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Question Paper Code :

**ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)**

B. Tech II Semester Regular Examinations May - 2016

(Regulations: R15)

**FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING
(EEE)**

Date:

Time: 3 hours

Max Marks: 60

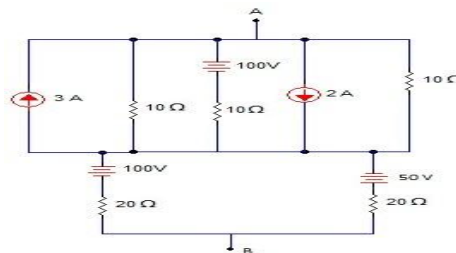
Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

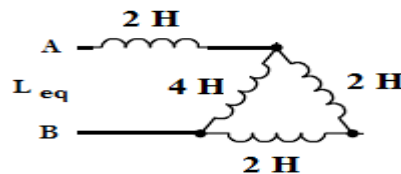
UNIT-I

- 1.(a) State and explain the Kirchhoff's laws in brief. **4M**
(b) Find out the equivalent Voltage between the terminals A and B **8M**

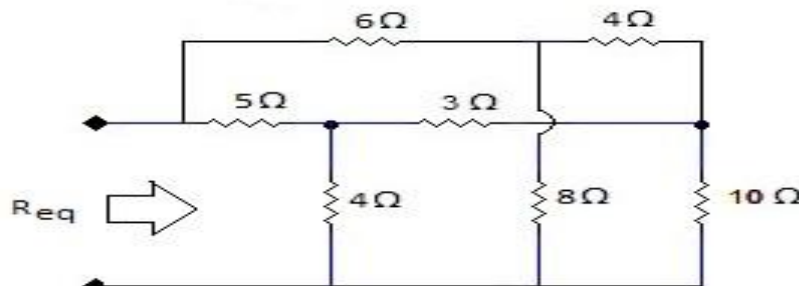


(OR)

2. (a) Calculate the equivalent inductance between the terminals A & B for the circuit shown below. **2M**

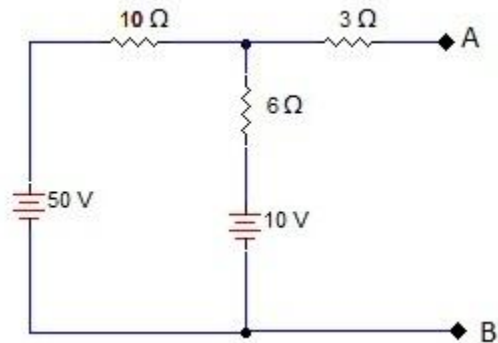


- (b) State and explain the Faraday's laws of electromagnetic induction. **4M**
(c) Find the equivalent resistance between terminals. **6M**



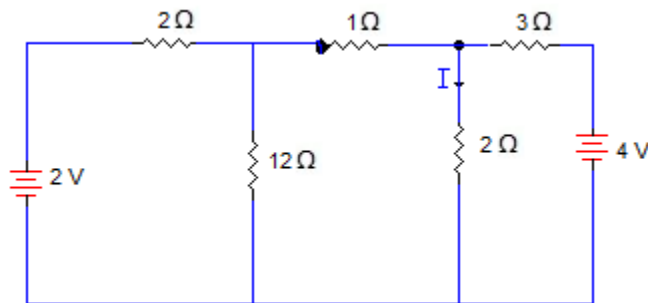
UNIT-II

- 3.(a) Derive the condition for Maximum power to be transferred from source to load **4M**
for a given DC circuit.
- (b) Find the Thevenin's equivalent circuit between terminals A and B. **8M**



(OR)

- 4.(a) Define and derive the average and effective values for the sinusoidal periodic **4M**
function.
- (b) Find the current 'I' in the circuit by using superposition theorem. **8M**



UNIT-III

- 5.(a) Compare Magnetic and Electrical Circuits. **4M**
- (b) A coil of 600 turns is wound uniformly on a ring on a non magnetic material. **8M**
The ring has a cross sectional area of 200 mm^2 and mean circumference of 500 mm. If the current in the coil is 4A, determine magnetic field strength, flux density and total magnetic flux.

(OR)

- 6.(a) Briefly explain the hysteresis and eddy currents. **4M**
- (b) A straight conductor of length 40 cm moves perpendicularly to it's axis at a **8M**
velocity of 50 m/s in uniform Magnetic field of flux density 1.2 Tesla. Evaluate the emf induced in the conductor if the direction of motion (i) normal to the field (ii) parallel to the field (iii) at a angle 60° to the orientation of the field.

UNIT-IV

7. (a) (i) What is semi conductor diode? **2M**
(ii) What is avalanche breakdown? **2M**
(b) Define hall effect. Obtain the expression for it. **8M**

(OR)

8. (a) (i) State different operating regions of a transistor. **2M**
(ii) Distiguinish between JFET and MOSFET. **2M**
(b) A circular iron ring has a mean circumference of 1.5 m and a cross sectional area of 0.01m^2 a saw cut off 4mm wide is made in the ring. Calculate magnetizing current required to produce a flux of 0.8 mwb in an air gap of ring is wound with a coil of 175 turns. Assume relative permeability of iron as 400 and leakage factor is 1.25. **8M**

UNIT-V

9. (a) (i) What is the drawback of electrical field as medium for electro mechanical energy conversion? **2M**
(ii) Why do we neglect magnetic non linearity and core losses in electromagnetic energy conversation system? **2M**
(b) Derive the EMF equation of DC machine and also explain the parts of a DC Machine. **8M**

(OR)

10. (a) (i) What are the losses that occur during electro mechanical energy conversion? **2M**
(ii) What are the advantages of DC machines? **2M**
(b) Derive and explain electromagnetic torque of a DC machine? **8M**

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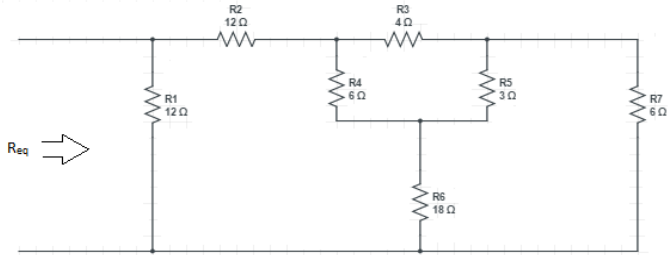
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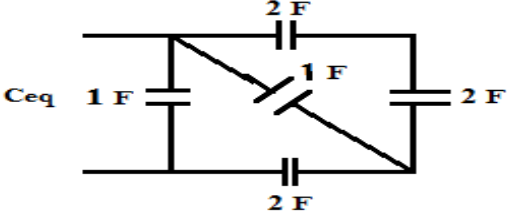
UNIT-I

1. (a) State and explain Coulomb’s law. 4M
 (b) Find out the equivalent resistance between the terminals. 8M

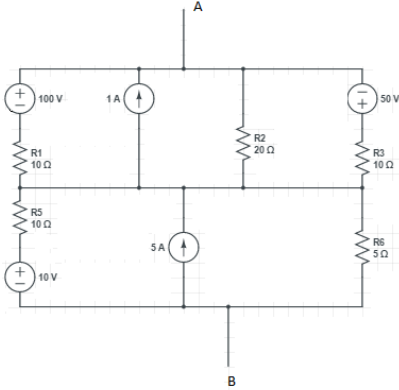


(OR)

2. (a) Find equivalent capacitance between terminals A & B. 2M

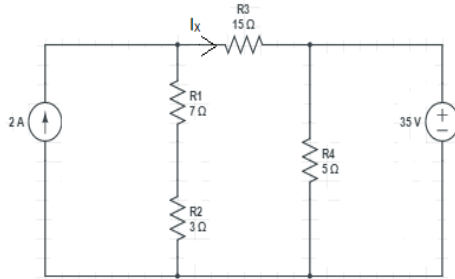


- (b) Explain about R,L,C elements of electrical networks. 4M
 (c) Find out the equivalent voltage between the terminals of A and B. 6M



UNIT-II

3. (a) Compare the mesh and nodal analysis for reduction of electrical network. 4M
(b) Find the current through 15Ω resistor by using Superposition Theorem. 8M

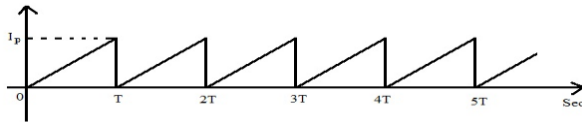


(OR)

4. (a) Define and explain complex, real and reactive powers of a AC circuit. 4M
(b) Find out the Thevenin's equivalent circuit between terminals A&B. 4M



- (c) Compute average and effective values of the wave form given below: 4M



UNIT-III

5. (a) Define flux, flux density, magnetic field intensity and permeance. 4M
(b) A coil of 600 turns is wound uniformly on a ring on a non magnetic material. The ring has a cross sectional area of 200mm^2 and mean circumference of 500mm if the current in the coil is 4A. Determine magnetic field strength, flux density and total magnetic flux. 8M

(OR)

6. (a) Derive the relation between MMF, Reluctance and Flux. 4M
(b) A straight conductor of length 40cm moves perpendicularly to it's axis at a velocity of 50m/s in uniform Magnetic field of flux density 1.2Tesla. Evaluate the emf induced in the conductor if the direction of motion (i) normal to the field (ii) parallel to the field (iii) at an angle 60° to the orientation of the field. 8M

UNIT-IV

7. (a) (i) Classify semiconductor diode. 2M
(ii) What is an intrinsic semiconductor? 2M
(b) Explain the phenomenon of diffusion of charge carries in semi conductor 8M

(OR)

8. (a) (i) What is hall effect? **2M**
(ii) What is the disadvantage of JFET over BJT? **2M**
- (b) With the help of V-I characteristics, explain the working of SCR. **8M**

UNIT-V

9. (a) (i) What are the essential parts of electro mechanical energy conversion system? **2M**
(ii) What is fundamental principle involved in electro mechanical energy conversion? **2M**
- (b) Explain the principle components of DC machine with neat sketch. **8M**

(OR)

10. (a) (i) Why is the armature of a DC machine made of silicon steel? **2M**
(ii) Why is armature winding placed on a rotor of a DC machine? **2M**
- (b) Explain the working principle of a DC machine by using simple loop Generator. **8M**