https://www.mdustudy.com

# 24007

**B.Tech. 2nd Semester F-Scheme**

**(Common for All Branches) Examination,**

**May-2019**

## ELECTRICAL TECHNOLOGY

**Paper-EE-101-F**

*Time allowed : 3 hours]* *[Maximum marks : 100*

***Note : Question No. 1 is compulsory. Attempt any one question from each section.***

1. (a) What is the significance of back e.m.f. in working of DC motors ? 4

   (b) Distinguish between unilateral and bilateral network. 4

   (c) State and explain maximum power transfer theorem. 4

   (d) Describe advantages of polyphase system. 4

   (e) Define eddy current and hysteresis losses of transformer. 4

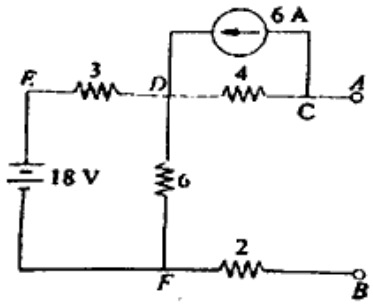
### Section-A

2. (a) State and explain Superposition theorem with some suitable example. 10



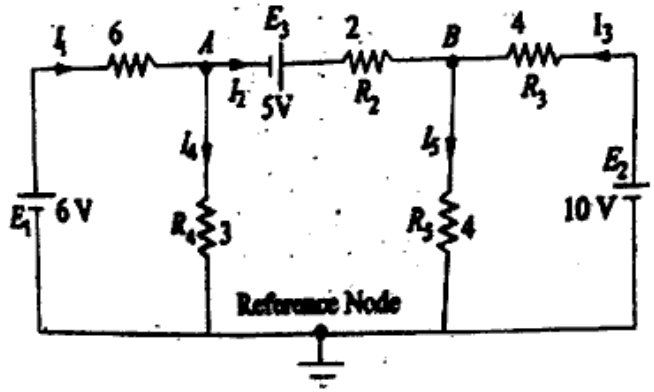


(b) Find the Thevenin equivalent circuit for the terminal pair AB of the network shown below : 10




3. (a) Derive the equation for star to delta and delta to star transformation in DC network. 10

   (b) Find the current in the various branches of the circuit shown below by using Loop analysis. 10




### Section-B

4. (a) An inductive circuit of resistance 3Ω and inductance of 0.02 H is connected to a 230 V, 50 Hz supply. What value of capacitance is placed



https://www.mdupapers.com
https://www.mdustudy.com

https://www.mdustudy.com



in parallel with the inductive circuit, such that it will produce resonance ? Also find current from supply at resonance. 10

(b) Define resonance for series circuit, also sketch resonant circuit, phasor diagram and resonant characteristics. 10

5. (a) Two coils A and B are connected in series across a 240-V, 50 Hz supply. The resistance of A is 5Ω and inductance of B is 0.015H. If the input from the supply is 3 Kw and 2 kVAR, find inductance of A and resistance of B. Calculate voltage across each coil. 10

(b) Derive the mathematical equation for RMS and average values of sinusoidal signal. 10

**Section-C**

6. (a) Draw and explain transformer's phasor diagram under loaded condition with unity, leading and lagging power factor. 10

(b) Derive emf equation of single phase transformer. A 330/250 V, 50 Hz single phase transformer is built on a core having effective cross sectional area of 12.5 cm. and 75 turns on the low voltage winding. Calculate max. Flux density and number of turns on high voltage side. 10



https://www.mdustudy.com



7. (a) Explain the circuit used for measurement of three phase power by using two wattmeter method. Derive expressions for it. 10

(b) A balanced star connected load of (8+j6) ohm per phase is connected to a 3-phase, 230 V, 50 Hz supply. Find the line current, power factor, active power and reactive power. 10

**Section-D**

8. (a) Describe constructional details of D.C. generator in detail. 10

(b) Explain the principle of operation of 3-ϕ synchronous motor. Why is starting torque not produced in this motor ? 10

9. (a) Describe construction and working principle of dynamometer type wattmeter and mention its advantages and disadvantages. 10

(b) Explain the construction of single phase induction type energy meter. Show that the revolutions made by disc are proportional to the energy supplied. 10



https://www.mdupapers.com
https://www