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SET - 1

I B. Tech II Semester Supplementary Examinations, March- 2022
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
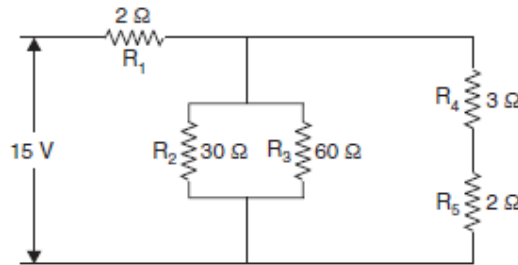(Com. CSE-CS&T, CSE-CS, CSE-IOT&CS Incl BCT, CSE-CS&BS, CSE-IOT, Cyber Security)

Time: 3 hours   Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks
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UNIT-I

1 a) State and explain Kirchhoff's law with necessary example.   (7M)
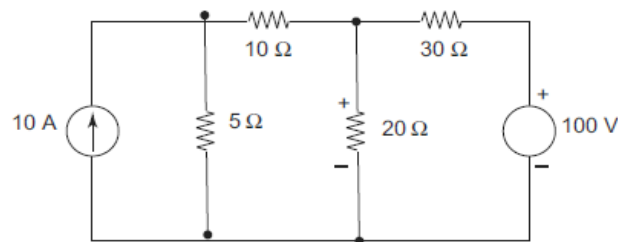   b) In the series-parallel circuit shown in the following figure,   (7M)

   find:
   (i) The total resistance of the circuit.
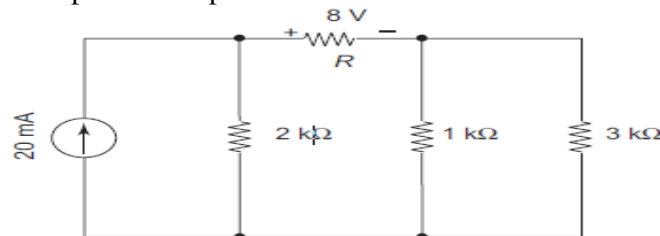   (ii) The total current flowing through the circuit.

Or

2 a) Explain the concept of Node analysis for an Electric circuit and give its   (7M)
       significance
   b) Determine the voltage across the 20 Ω resistance using mesh analysis: (7M)

UNIT-II

3 a) State and explain Maximum Power Transfer theorem   (8M)
   b) Determine the power dissipated in Resistor R.   (6M)

Or

4 a) Explain the concept and significance of Inductive reactance, Capacitive reactance,   (7M)
       impedance and Admittance.

b) A coil has a resistance of 5 Ω and an inductance of 32 mH. Calculate the current taken by the coil and power factor when connected to 220 V, 50 Hz supply. If a non-inductive resistance of 10 Ω is then connected in series with coil, calculate the new value of current and its power factor.   (7M)

UNIT-III

5 a) Explain the function of armature and commutator in a DC machine   (7M)

b) An 8-pole wave connected D.C. generator has 1000 armature conductors and flux/pole 0.035 Wb. At what speed must it be driven to generate 500 V?   (7M)

Or

6 a) Derive an expression for induced e.m.f. in a transformer in terms of frequency, the maximum value of flux and the number of turns on the windings.   (7M)

b) A single-phase transformer is connected to a 230 V, 50 Hz supply. The net cross-sectional area of the core is 60 cm^2. The number of turns in the primary is 500 and in the secondary 100. Determine: (i) Transformation ratio. (ii) Maximum value of flux density in the core. (iii) E.m.f. induced in secondary winding.   (7M)

UNIT-IV

7 a) Explain the constructional features of Synchronous machines   (7M)

b) Calculate the EMF induced per phase for a three-phase four-pole synchronous generator having 72 slots on the armature. The number of conductors per slot is 10. The flux per pole is 20 mWb. The alternator is driven at 1,500 rpm. Full-pitch coils have been used for the armature winding.   (7M)

Or

8 a) Explain the term Slip and how it is going effect the Three phase induction motor   (7M)

b) Explain how No – load test and Blocked rotor test are used to determine the efficiency of the three-phase induction motor.   (7M)

UNIT-V

9 a) Draw and explain the Diode characteristics   (6M)

b) A full-wave bridge rectifier with an input of 100 V (rms) feeds a load of 1 kW.
Firing potential voltage = 0.7 V
(i) If the diodes employed are of silicon, what is the dc voltage across the load?
(ii) Determine the maximum current that each diode conducts and the diode power rating.
(iii) Determine the PIV rating of each diode.   (8M)

Or

10 a) Draw and explain the Common emitter configuration along with input and output characteristics.   (7M)

b) Explain how an op- amp can be used as a non - inverting amplifier.   (7M)

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