R20

SET - 1

I B. Tech II Semester Regular Examinations, September- 2021
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Com. to ME, AME, Mining, PE, FE, Pharm. E)

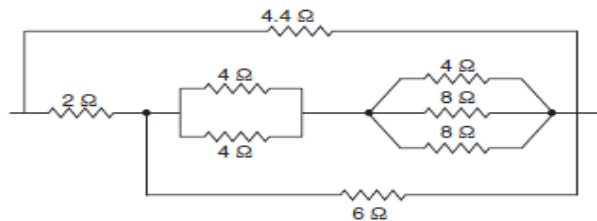Time: 3 hours   Max. Marks: 70

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

1 a) Derive an expression for the equivalent resistance when the resistances are connected in parallel.   (7M)

   b) Find the equivalent resistance for the circuit shown below: (7M)

Or

2 a) Explain the procedure to convert the Delta connection circuit to a star connection.   (7M)
   b) A 60 W, 40 W and a 75 Watt lamps are connected across a supply of 100 V. Determine the total resistance and total current.   (7M)

UNIT-II

3 a) How do you Classify the DC machine based on excitation systems and explain each one of it in brief.   (7M)
   b) A 4-pole shunt generator with lap connected armature having field and armature resistances of 50 Ω and 0.1 Ω respectively supplies sixty 100 V 40-watt lamps. Calculate the total armature current, the current per armature path and the generated emf. Allow a brush contact drop of 2 V.   (7M)

Or

4 a) Explain the working of a three-point starter with a neat connection diagram.   (7M)
   b) Explain the need for conducting the brake test on a DC Shunt motor and give its procedural steps for proper conduction.   (7M)

UNIT-III

5 a) Explain the significance of conducting OC and SC test on a Single-phase transformer.   (7M)

   b) A 25 kVA transformer has 500 turns on the primary and 40 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz mains, calculate (i) primary and secondary currents at full load, (ii) the secondary emf, and (iii) the maximum flux in the core. Neglect magnetic leakage, resistance of the winding and the primary no-load current in relation to the full-load current.   (7M)

Or

6   A 3 MVA, 6600 V, three-phase, star-connected synchronous generator has a resistance of 0.2 Ω and synchronous reactance of 3.5 Ω per phase. Calculate the regulation at rated output at 0.8 power factor lagging. The speed and excitation remain constant.   (14M)

UNIT-IV

7   a)   Draw and explain the forward and reverse characteristics of a p – n junction.   (7M)

    b)   Explain the operation of Full wave bridge rectifier circuit with corresponding circuit diagram and necessary input and output waveforms.   (7M)

Or

8   a)   Explain the operation of op – amp as a voltage follower.   (7M)

    b)   Explain how an op – amp can be used as a summing amplifier.   (7M)

UNIT-V

9   a)   Draw the circuit diagram of the Common base configuration and explain the necessary operation of it.   (7M)

    b)   Derive the relationship between α and β of a transistor.   (7M)

Or

10 a)   Draw and explain the Driving point or input and output characteristics of the Common base configuration.   (7M)

    b)   In a transistor, the emitter current is 8 m A and $I_B = I_C/100$. Determine I_C and I_B.   (7M)

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