

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Computer Science and Engineering)

Time: 3 hours

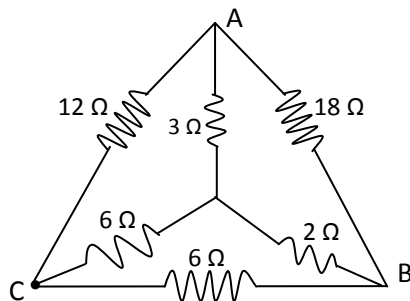
Max. Marks: 70

Answer all questions
(Use single answer booklet only)

PART – A

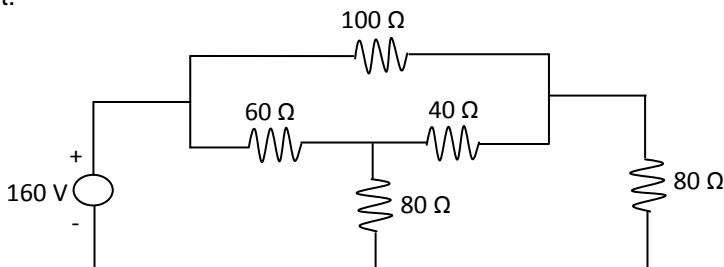
UNIT – I

- 1 (a) Derive the expression for delta to star transformation for a resistive network.
- (b) For the network shown below. Calculate the equivalent resistance between nodes A and B.



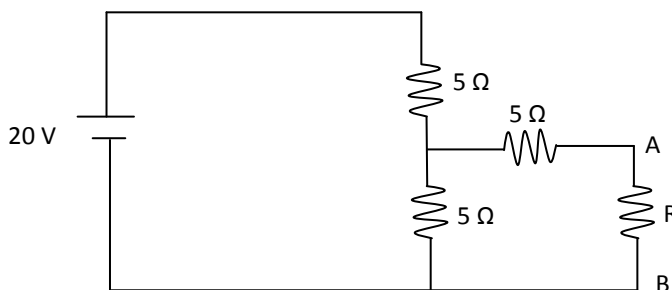
(OR)

- 2 Determine the equivalent resistance for the circuit shown below and hence find the total current flowing in the circuit.



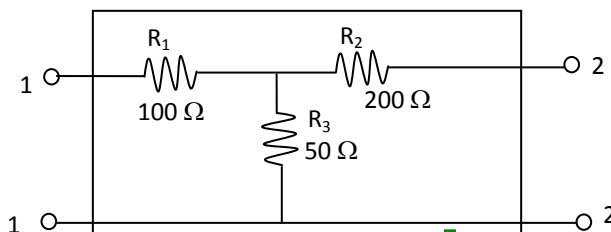
UNIT – II

- 3 State maximum power transfer theorem. Find the value of R_{eq} and determine maximum power to R for the given network.



(OR)

- 4 Calculate the open circuit impedance parameters for the resistor T-network shown in figure below.



UNIT – III

- 5 (a) (i) Derive an expression for the torque of an induction motor and obtain the condition for maximum torque.
(b) (ii) The armature of a six pole D.C generator has a wave winding containing 650 conductors. Calculate the generated e.m.f when the flux per pole is 0.055 Wb and the speed is 300 r.p.m. Calculate speed at which the armature must be driven to generate an e.m.f of 550 V, if the flux per pole is reduced to 0.05 Wb.

(OR)

- 6 (a) (i) Derive an expression for the voltage induced in a D.C generator.
(b) (ii) The power input to the rotor of a 415 V, 50 Hz, 6-pole, 3-phase induction motor is 75 kW. The rotor electromotive force is observed to make 120 complete cycles per minute. Calculate slip, rotor speed and the rotor resistance per phase if the rotor current is 60 A.

PART – B

UNIT – I

- 7 Draw the circuit diagram and explain the working of HWR with necessary waveforms and find out the ripple factor.

(OR)

- 8 Draw and explain the energy band diagram for intrinsic semiconductor.

UNIT – II

- 9 (a) Calculate the collector current and emitter current for a transistor with $\alpha_{dc} = 0.99$ and $I_{CBO} = 50 \mu A$ when the base current is $20 \mu A$.
(b) Explain the output characteristics of CE configuration of a transistor and indicate various regions.

(OR)

- 10 (a) Derive the stability factors for fixed bias circuit.
(b) Write short notes on FET as a VVR.

UNIT – III

- 11 (a) Draw the block diagram of basic OP-AMP with inverting and non-inverting inputs.
(b) Indicate the equivalent circuit.

(OR)

- 12 (a) Define positive feedback. Explain it.
(b) What is the relationship between A_f and A for positive feedback.
