

I B. Tech II Semester Supplementary Examinations, Jan/Feb-2024
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common CSE-CS&T, CSE-CS, CSE-IOT&CS Incl BCT, CSE-CS&BS, CSE-IOT, Cyber Security)

Time: 3 hours

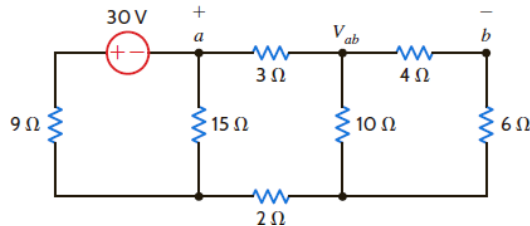
Max. Marks: 70

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

UNIT-I

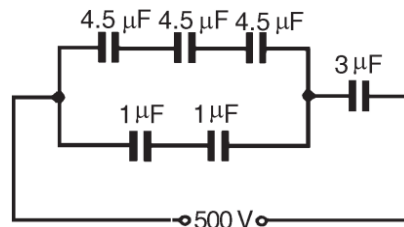
- 1 a) Define the following: [7M]
 (i) Potential Difference (ii) Resistance
 (iii) Inductance (iv) Capacitance
 (v) Work (vi) Power and
 (vii) Energy

- b) Using the KCL and KVL equations, find the V_{ab} in the following circuit. [7M]

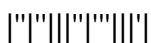
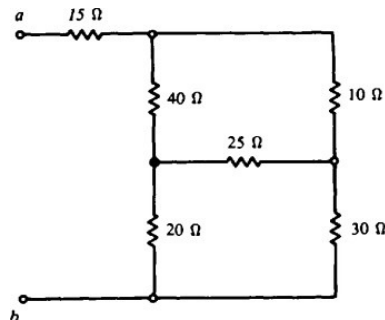


(OR)

- 2 a) For the arrangement shown in following figure, find (a) the equivalent capacitance and (b) the voltage across a $4.5 \mu\text{F}$ capacitor. [7M]

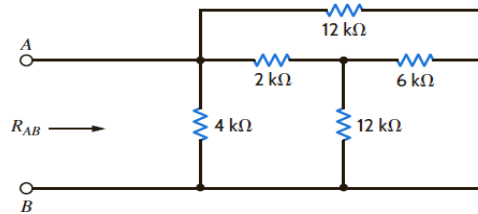


- b) If 100V dc supply is given across the terminals 'ab' of the following circuit [7M] then what is voltage across the 15Ω resistance?



UNIT-II

- 3 a) Find R_{AB} in the following circuit using star-delta transformation. [7M]

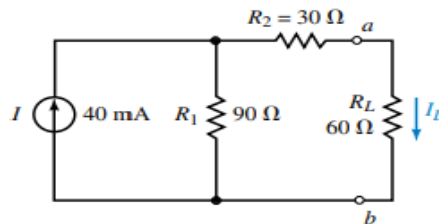


- b) Explain Maximum power transfer theorem with an example. [7M]

(OR)

- 4 a) Explain Thevenin's theorem with an example. [7M]

- b) Find the Norton's equivalent external to R_L in circuit shown in the following figure. Also determine load current I_L . [7M]



UNIT-III

- 5 a) Derive the torque equation of a dc motor? [7M]

- b) A dc generator has an armature e.m.f of 100 V when the useful flux per pole is 20 mWb and the speed is 800 r.p.m. Calculate the generated e.m.f (i) with the same rated flux and a speed of 1000 r.p.m (ii) with a flux per pole of 25 mWb and a speed of 900 r.p.m. [7M]

(OR)

- 6 a) Describe the operation of a single phase transformer, explaining clearly the functions of the different parts? [7M]

- b) The no - load ratio required in a single phase 50 Hz transformer is 8000/800V. If the maximum value of flux in the core is to be about 0.066 Wb , find the number of turns in each winding. [7M]

UNIT-IV

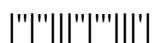
- 7 a) Describe the different types of the construction of rotors used in alternators [7M]

- b) Explain the operation of a synchronous motor. Why it will not run at speed other than synchronous speed? [7M]

(OR)

- 8 a) Explain the principle of operation of a three-phase induction motor. [7M]

- b) A three phase 6-pole induction motor runs at 60rpm on the full load. It is supplied from a 4-pole alternator running at 1500 rpm. Calculate (i) the full-load slip of the motor, (ii) speed of stator held with respect to rotor, (iii) frequency of IM rotor current at full load slip. [7M]



UNIT-V

- 9 a) Explain the working and analysis of a Half wave rectifier with a neat diagram and corresponding wave forms. [7M]
- b) Explain the operation of a half-wave rectifier with relevant waveforms. What is its output current when rms input voltage is 120V ac and $R_L = 150 \Omega$? [7M]

(OR)

- 10 a) Explain with the help of circuit, the working of a transistor as an amplifier in CE configuration? [7M]
- b) Explain the operation of NPN transistor with neat circuit diagram. [7M]

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