

Code No: 123BR/113BR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, March - 2021

BASIC ELECTRICAL ENGINEERING

(R15 - Common to CSE, IT; R13 - Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. Six resistors are connected as shown in figure 1. If a battery having an emf of 30V and an internal resistance of 2 is connected to terminals A and B. Find:
- Current supplied from battery
 - Potential difference across 8 ohms resistance.
- [7+8]

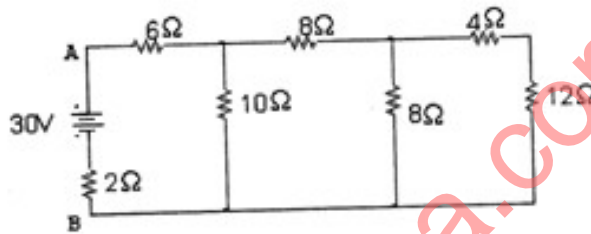


Figure: 1

- State and explain Maximum power Transfer theorem.
 - Calculate the value of Thevenin's equivalent resistance between the terminals AB as shown in the following figure 2.
- [7+8]

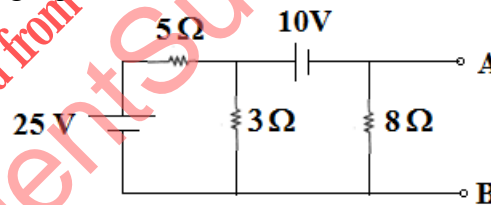


Figure: 2

- Calculate the RMS and average values of the current represented by the figure 3. When the triangular wave form has the time axis at $t = 0$ with a maximum value of 1A.

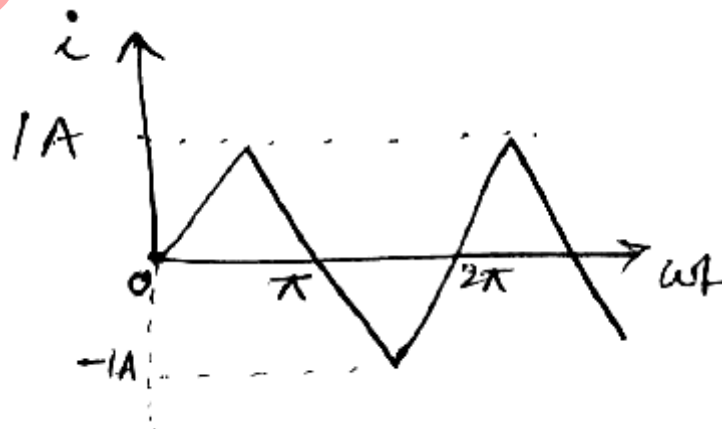


Figure: 3

- Obtain an expression for current i flowing through inductor (L) connected across $\mathcal{E}(t) = V_m \sin \omega t$.
- [8+7]

4. A coil A having a resistance of 10 ohms and inductance of 0.2 Henry is connected in series with another coil B having a resistance of 30 ohms and inductance 0.1 H. The two coils in series are fed from 200V, 50 Hz supply. Determine the voltage across each coil, power dissipated in each coil, and the power factor of the combined series circuit: Draw the phasor (vector) diagram. [15]
- 5.a) Describe the working principle of a single phase transformer.
b) A single phase 60 Hz transformer has a core cross – sectional area of 150 cm^2 , and the maximum flux density of 1.3 Wb/m^2 . There are 1300 turns in primary and 200 turns in the secondary windings. Calculate the induced e.m.fs on both sides. [9+6]
- 6.a) Explain the different types of a single phase transformer.
b) A 100 KVA, 200/1000V, 50Hz single phase transformer gave the following test results:
O.C. Test (LV Side) : 200V, 0.7A, 70W
S.C. Test (HV Side): 15V, 10A, 85W
Calculate the efficiency of the transformer at half load and full-load at 0.8 p.f lagging. [7+8]
- 7.a) Explain the construction features of a DC machine with the help of neat sketches.
b) Explain the concept of rotation magnetic field in induction Motor. [8+7]
8. Explain the constructional details and working principle of moving Iron Instruments. [15]

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