



C16-AEI-106

6013

BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2017

DAEI—FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

3×10=30

**Instructions** : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State maximum power transfer theorem.
2. State Kirchoff's voltage law.
3. Define the terms 'phase' and 'phase difference'.
4. A coil resistance 10  $\Omega$  and inductance 0.1 H is connected in series with a 150  $\mu$ F capacitor across a 200 V, 50 Hz supply. Calculate the impedance of the circuit.
5. Define Q-factor of an RLC series circuit.
6. State how the heat is produced due to flow of electric current.
7. Define thermal efficiency.
8. State the relationship between voltage ratio, current ratio and turns ratio in a transformer.

\* 9. State the use of an isolation transformer.

10. Write the e.m.f. equation of an alternator.

**PART—B**

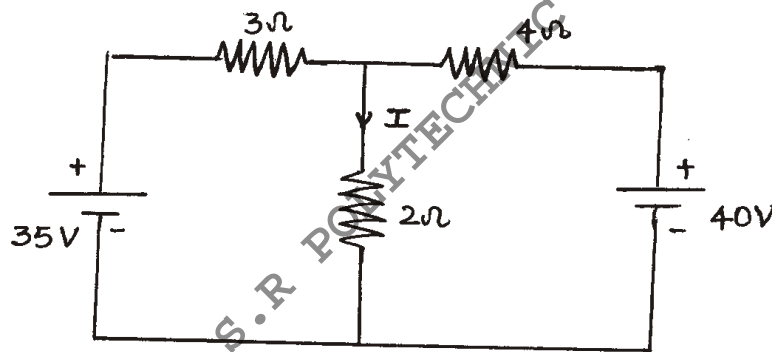
10×5=50

**Instructions :** (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

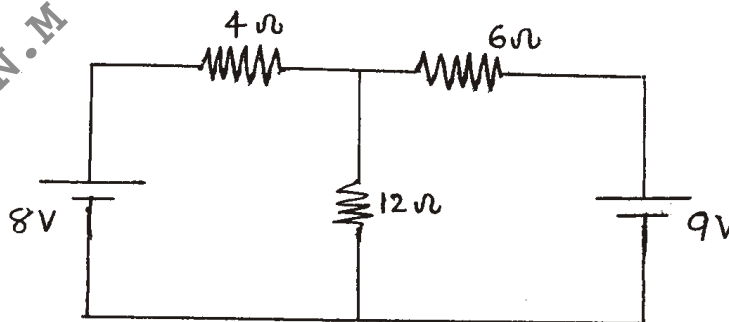
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Calculate the current  $I$  through  $2\ \Omega$  resistance in the circuit by using loop current method.



12. (a) Determine the current through  $12\ \Omega$  resistance in the given circuit using nodal analysis.

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(b) Define ideal voltage source and ideal current source.

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- \* 13. (a) A series RLC circuit has the values  $R = 100 \Omega$ ,  $L = 0.02 \text{ H}$  and  $C = 0.02 \text{ F}$ . Calculate resonant frequency of circuit. 5
- (b) List any five differences between series and parallel resonance. 5
14. Derive the relationship between voltage and current when a pure inductance connected across an AC supply.
15. (a) Explain the mechanical equivalent of a heat. 4
- (b) State how the heat is produced due to flow of electric current in an electric kettle and filament lamp. 6
16. Derive the e.m.f. equation of a transformer.
17. (a) Explain the working principle of autotransformer. 6
- (b) State the losses in a transformer. 4
18. (a) Classify DC generators on the basis of excitation. 4
- (b) Define back e.m.f. in DC motors and write the formula in terms of armature current and armature resistance and also in terms of  $\phi$ ,  $Z$ ,  $N$ ,  $P$ ,  $A$ . 6

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