

Seat
No.

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मधुर - 003

Electrical Circuits and Machines (143102/183102/233102)

P. Pages : 3

Time : Three Hours

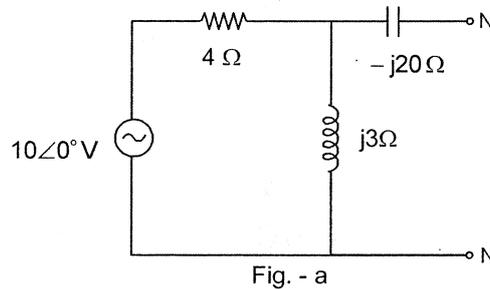
Max. Marks : 80

Instructions to Candidates :

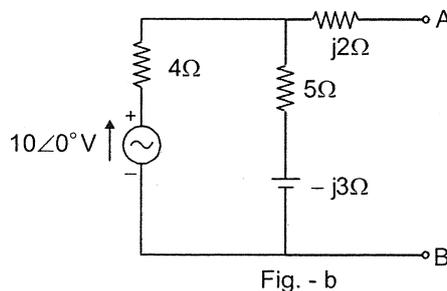
1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** sub - questions from each unit.
5. Assume suitable data wherever necessary & state the assumptions made.
6. Diagrams / sketches should be given wherever necessary.
7. Use of logarithmic table, drawing instruments & non - programmable calculators permitted.
8. Figures to the right indicate full marks.

UNIT - I

1. a) i) Find the Thevenins equi. of the ckt Shown below fig (a) & determine the value of c/n flows through load impedance of $(6+j30)\Omega$ connected across terminals M & N Also calculate the power dissipated in load impedance. 4



- ii) Find the Norton's equi. - n/w of terminals AB of the ckt - Shown below fig (b). 4



- b) i) Explain the working principle of transformer. 4
- ii) Draw the phasor diagram for transformer on load at unity and lagging P. F. load. 4
- c) Write a short notes on. 8
- i) Autotransformer.
- ii) Current transformer.

UNIT - IV

4. a) Derive an expression of emf equation of an alternator. 8
- b) i) Explain the principle of operation of an alternator. 4
- ii) What are the different methods of starting synchronous motors & explain any one in detail. 4
- c) i) Explain with phasor diagram the effect of varying the excitation on the performance of a synchronous motor or load with constant excitation. 4
- ii) Write a short note on Hunting in synchronous motors ? 4

UNIT - V

5. a) Explain working principle of three phase induction motor & the concept of rotating magnetic field ? 8
- b) i) Draw & explain the torque - slip characteristics of 3 phase induction motor. 4
- ii) Write a short note on Autotransformer starter. 4
- c) i) With the help of neat sketch, Explain the working & applications of capacitor start single phase induction motor. 4
- ii) With the help of neat sketch, Explain the working & applications of universal motor. 4
