

May-June
2009

Total No. of Questions : 12]

[Total No. of Printed Pages : 4

[3561]-103

F. E. (Semester - I) Examination - 2009

BASIC ELECTRICAL ENGINEERING

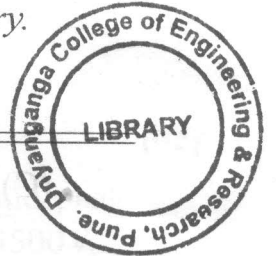
(June 2008 Course)

Time : 3 Hours]

[Max. Marks : 100

Instructions :

- (1) Attempt Q. No. 1 or 2, Q. No. 3 or 4, Q. No. 5 or 6, Q. No. 7 or 8, Q. No. 9 or 10, Q. No. 11 or 12.
- (2) Answer to the two sections must be written separate answer-books.
- (3) Figures to the right indicate full marks.
- (4) Use of non-programmable pocket size scientific calculator is permitted.
- (5) Neat diagrams must be drawn wherever necessary.
- (6) Assume suitable data, if necessary.



SECTION - I

- Q.1) (A) Define Insulation Resistance and obtain an expression for Insulation Resistance of a Single Core Cable. [08]
- (B) Determine the current flowing at the instant of switching a 60 watt lamp on a 240 V supply. The ambient temperature is 24° C. The filament temperature is 2000° C and R.T.C. of a filament material is 0.005 per °C at 0°C. [06]
- (C) Compare Lead Acid Cell and Nickel Cadmium Cell. [04]

OR

- Q.2) (A) Write down chemical equations during charging of Lead Acid Battery. [04]
- (B) If α_1 and α_2 are RTCs of material at t_1 °C and t_2 °C then prove that $\frac{\alpha_1}{\alpha_2} = 1 + \alpha_1 (t_2 - t_1)$. [06]

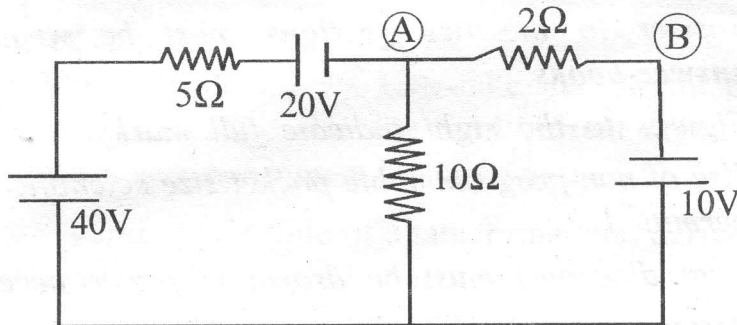
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P.T.O.

- (C) An electric pump lifts 80 m^3 of water per hour to a height of 30 m. The pump efficiency is 85% and the motor efficiency is 75%. If the pump is used for 4 hours daily, calculate the energy consumption per month and energy charges at rate of Rs. 10/kwhr. [08]

- Q.3) (A) State and explain Superposition Theorem as applied to simple D.C. circuits. [06]
- (B) Apply Thevenin's Theorem to the circuit shown in fig. 1 to calculate the current flowing in **Branch A-B** : [06]



Q. 4 (B) / Q. 3 (B) Fig. 1

- (C) State the formula to convert the star connected network into its equivalent delta connected network. [04]

OR

- Q.4) (A) State and explain Maximum Power Transfer Theorem. [06]

- (B) Using Superposition Theorem, calculate current flowing in **Branch A-B** for the circuit. **Shown in fig. 1.** [10]

- Q.5) (A) Compare Electric Circuit and Magnetic Circuit. [05]

- (B) Write a short note on Magnetic Leakage and Fringing. [05]

- (C) Explain, what do you mean by Statically Induced e.m.f. and Dynamically Induced e.m.f. [06]

OR

- Q.6) (A) Derive expression for the energy stored per unit volume, in the magnetic field. [06]

