

Total No. of Questions : 12]

[Total No. of Printed Pages : 7

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F. E. (2008 Course) Examination - 2008

BASIC ELECTRICAL ENGINEERING

Time : 3 Hours]

[Max. Marks : 100

Instructions :

- (1) Answer 3 questions from Section I and 3 questions from Section II.
- (2) Answers to the two sections should be written in separate books.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- (6) Assume suitable data, if necessary.

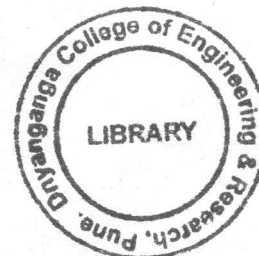
SECTION - I

- Q.1) (A) Compare Nickel Metal Hydride Battery with Nickel Cadmium Battery. [04]
- (B) The insulation resistance per km of a single core cable having a conductor diameter of 1.2 cm and insulation thickness of 1.5 cm is 550 MΩ. Find percent increase in insulation resistance if insulation thickness is increased by 50%. [06]
- (C) A heater coil, after running several hours from switched on, draws a current of 2A from constant voltage 400V. If the temperature rise is 70° C, find the change in voltage required to maintain same current at the time of starting the heater coil. Assume the heater is started at 20° C and RTC for the heater coil at 0° C is 0.0038 per °C. [08]

OR

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P.T.O.

Q.2) (A) Write down the changes taking place during the charging of lead acid cell. [05]

(B) The filament of 240V of metal filament lamp is to be constructed from a wire having a diameter of 0.03 mm and a resistivity of $4.3 \mu\Omega \cdot \text{cm}$. If the RTC of the filament material is 0.005°C at 20°C , what length of the filament is necessary for the lamp to dissipate 60 W at a filament temperature of 2420°C . Assume room temperature as 20°C . [06]

(C) A three blade wind mill is used to lift underground water and store it at ground level using a pump. For average wind speeds, the value of torque developed is 20 Nm and speed of this wind mill is 150 r.p.m. Actual head of water is 9 m and pipe friction is 1 m head loss. The wind mill mechanical efficiency and water pump efficiency are 40% and 75% respectively. Calculate the speed of this wind mill to store water quantity of 20 kiloliters at the ground level. [07]

Q.3) (A) Explain the classification of Electrical Networks. [04]

(B) Use Superposition Theorem to find current in 4Ω resistance as shown in fig. A. Hence verify your result by Thevenin's Theorem. All the resistances are in ohm. [7+5]

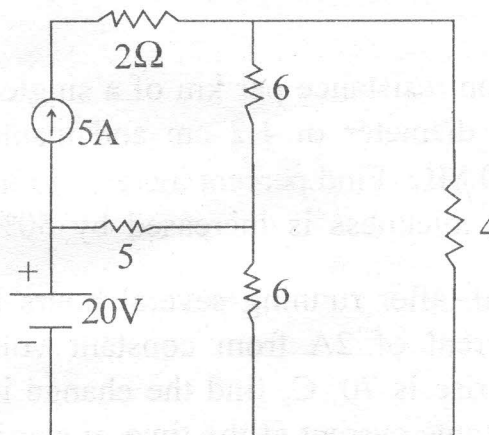


Fig. A

OR

