



C16-EE-106

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BOARD DIPLOMA EXAMINATION, (C-16)

MARCH / APRIL - 2019

DEEE - FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 Hours]

[Total Marks : 80

PART - A

2×15=30

Instructions :

- (1) Answer any 15 questions.
- (2) Each question carries 2 marks.
- (3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

- 1 State ohm's law.
- 2 Define specific resistance and write its unit.
- 3 Define temperature coefficient of resistance.
- 4 Draw and write down an expression for equivalent resistance when three resistors are connected in parallel.
- 5 Write the symbols and units of electrical work, electrical power.
- 6 Calculate the input of an electric motor when the output of the motor is 10 H.P. and efficiency is 90%.
- 7 Write down the expression for joule's law of electric heating and expand the terms.
- 8 Define thermal efficiency.
- 9 State Right Hand Thumb rule.
- 10 Write down expressions for field strength (a) At the centre of a circular conductor (b) At any point on the axis of a circular conductor.

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- 11 Define magnetic flux and reluctance.
- 12 Define magnetic leakage coefficient.
- 13 State Faraday's first law of electro magnetic induction.
- 14 Define self inductance.
- 15 State Fleming's Right Hand rule.
- 16 Write down expression for lifting power of a magnet and expand the terms.
- 17 State coulomb's first law of electro statics.
- 18 Define relative permittivity.
- 19 Plot electrostatic field around an isolated positive charge and isolated negative charge.
- 20 Write down the formula for capacitance of a capacitor explaining each term and mention its unit.

PART - B**10×5=50**

Instructions :

- (1) Answer any **FIVE** questions.
- (2) Each question carries **TEN** marks.
- (3) Answer should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 21 (a) Distinguish between conductor, insulator and semi conductor with respect to valence electrons. **4**
- (b) Two resistances of $50\ \Omega$ and $10\ \Omega$ are connected in parallel and the combination draws a current of 20 A from the supply. Determine the current in each branch and supply voltage. **6**
- 22 A coil of copper wire has a resistance of $70\ \Omega$ at 20°C and is connected to a 230 V supply. By how much the voltage be increased in order to maintain the current constant if the temperature of the coil rises to 60°C . Take the temperature coefficient of resistance of copper as 0.00428 at 0°C .

- 23** A house has the following load :
- (a) 10 lamps of 60 W each working for 10 hrs a day.
 - (b) 1 electric iron of 450 W working for 1 hr a day.
 - (c) 8 fans of 80 W each working for 12 hrs a day.
 - (d) 1 heater of 1000 W working for 1 hr a day.
 - (e) 1 refrigerator of 250 W working for 12 hrs a day.
- Calculate the monthly bill if rate of charge per unit is Rs. 1.20 plus Rs. 20/- as meter rent for the month of March.
- 24** Calculate the time taken and the cost of energy used to raise the temperature of one litre of water from 15°C to 90°C in a 250 V electric kettle . Resistance of kettle is 100 Ω . Efficiency of kettle is 85%, cost of electrical energy is 75 paise per unit.
- 25** (a) Derive an expression for the force between two long and straight parallel current carrying conductors. 7
- (b) Define ampere. 3
- 26** Develop an expression for energy stored in a magnetic field.
- 27** The combined inductance of two coils connected in series is 0.6 H and 0.1 H, depending on the relative directions of the currents in the coils. If one of the coils when isolated has a self inductance of 0.2 H, Calculate the (a) mutual inductance (b) coupling coefficient
- 28** Three capacitors of 2 μF , 4 μF and 6 μF are connected in series across a 220 V d.c. supply . Find (a) the total capacitance (b) charge on each capacitor (c) potential drop across each capacitor.
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