C16-EE-106

# 5037

## BOARD DIPLOMA SUPPLEMENTARY (INSTANT) EXAMINATION, (C-16)

JUNE - 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** Define :

(a) Current (b) EMF

**2** State Ohm's law.

**3** Distinguish between Insulator and Conductor in any two aspects.

**4** Define specific resistance and mention its units.

**5** Define :

(a) Work (b) Power

**6** Define energy and mention its units.

**7** Define Thermal Efficiency.

**8** State Joule's law of Electrical Heating.

**9** State Right Hand Thumb rule.

**10** State Fleming's left hand rule.

**11** Define :
(a) MMF (b) Magnetic Flux Density

**12** Define :
(a) Permeability (b) Reluctance

**13** State Lenz's law.

**14** Define :
(a) Self Inductance (b) Mutual Inductance

**15** State Faraday's laws of Electromagnetic induction.

**16** Show the relation between $L_1$, $L_2$, M&K.

**17** State Coulomb's law of Electrostatics.

**18** Define :
(a) Electric Flux (b) Electric Intensity

**19** State Gauss Theorem.

**20** Define :
(a) Dielectric strength (b) Dielectric constant

## 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) Derive the formula for equivalent resistances of 3 resistances in parallel.

(b) A sphere of volume 100 $cm^3$ is made into a thin wire of cross-section area 1 $cm^2$. Find the resistance between the two ends of wire. Specific resistance of the material is 2.5 $\mu m$.

**22** (a) Show that $\alpha_1 = \frac{\alpha_o}{1+\alpha_o t}$. **6**

(b) Write any four limitations of Ohm's law. **4**

**23** A house has the following loads :

(a) 5 Lamps of 60 W each, working for 8 hrs. a day.

(b) 4 Lamps of 100 W each, working for 5 hrs. a day.

(c) 2 Heaters of 1000 W each, working for 3 hrs. a day.

(d) 5 Fans of 80 W each, working for 12 hrs. a day.

Calculate the monthly bill, if tariff is Rs. 0.50 per unit. Add Rs. 10 as a meter rent per month.

**24** A kettle having a heater element of 15 Ω resistance has a water equivalent of 200gm. Calculate the time taken to raise the temperature of 6 lit of water from 20°C to boiling point. The supply voltage is 230v. Assume heat loss of 20%.

**25** (a) Compare magnetic and electric circuits in any four aspects. **4**

(b) Derive an expression for the force between two parallel current carrying conductors. **6**

**26** (a) Obtain an expression for lifting power of a magnet. **5**

(b) Derive an expression for total inductance when two inductances are connected in series and their flux are aiding. **5**

**27** (a) Derive an expression for energy stored in a magnetic field. **6**

(b) When two identical coupled coils are connected in series, the inductance of the combination is found to be 0.6H and 0.2H depending on the relative directions of the current in the coils. Find the coefficient of coupling. **4**

**28** (a) Draw the field pattern of : **8**

(i) Isolated Positive charge.

(ii) Isolated Negative charge.

(iii) Two positive charges.

(iv) One negative, one positive charge.

(b) Write any four properties of Electrostatic lines of force. **2**

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