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C09–EE–105

3037

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2015

DEEE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define the following terms :

(a) Resistance

(b) Specific resistance

2. A coil wound of copper wire has a resistance of 16 ohm at 20 °C. Calculate its resistance at 60 °C. The resistance temperature coefficient of copper is 0·0043/°C at 20 °C.

3. Expand ACSR and AAC and give two applications of each.

4. Define the following terms and state their units :

(a) Magnetic field

(b) Magnetic flux

5. Define mutual inductance.

6. Find the area required for such an electromagnet to have a lifting power of 400 kg with a flux density of 0·1 Wb/m^2.

7. Define dielectric strength, dielectric constant and dielectric loss.

8. Write the three applications of each *(a)* cardboard and *(b)* glass.

9. What is the purpose of impregnation?

10. Define the following terms :

(a) Breakdown voltage

(b) Forward bias

(c) Reverse bias

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Three resistances of values 4 ohm, 6 ohm and 8 ohm are connected in series across a 36 V DC supply. Calculate the *(a)* total resistance of the circuit, *(b)* total current in the circuit, *(c)* voltage drop across each resistance, *(d)* power dissipated in each resistance and *(e)* total power dissipated in the circuit.

12. *(a)* State the function of a space heater with a neat sketch.

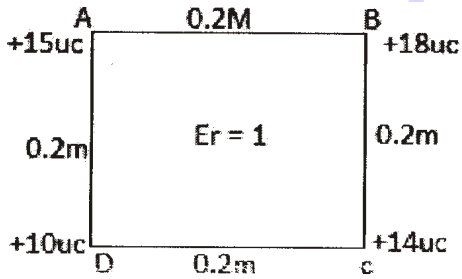
(b) An electric kettle is marked 500 W, 230 V and is found to take 15 minutes to raise 1 kg of water from 15 °C to boiling point. Calculate the efficiency of kettle.

13. A cast steel iron ring has an air gap of 2 mm and iron path of 50 cm. Find the number of ampere turns required to produce a flux density of 1·0 Wb/m^2 in the gap. Assume permeability of steel as 800 and neglect leakage.

14. *(a)* State and explain Fleming's right-hand rule and mention its applications. 4+2

(b) Calculate the e.m.f. generated in the axle of a car travelling at 100 km/hour assuming the length of the axle to be 1·5 m and the vertical component of earth field to be 320 Wb per m^2. 6

15. Find the magnitude and direction of force on charge at C of the figure shown below :



16. Explain thermoplastics and thermosetting resins with examples.

17. *(a)* Explain CE configuration of *N-P-N* transistor and sketch input and output characteristics of it. 5

(b) Explain the construction of intrinsic SC. 5

18. *(a)* Explain the effect of annealing and hardening on copper regarding mechanical properties.

(b) What is meant by thermocouple? List at least three alloys which are used in thermocouple.

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