

Model

TED(15)2031

Reg No.....

REVISION -2015

Signature.....

SECOND SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL & ELECTRONICS ENGG

MODEL QUESTION PAPER

BASIC ELECTRICAL ENGINEERING

MAX MARKS: 100

TIME 3 Hours

PART A

marks

I Answer the following questions in one or two sentences. Each question carries 2 marks

1. Define resistance
2. Write name of any two materials having positive temperature co-efficient of resistance
3. Draw the model of thevenin's equivalent circuit
4. Write any two applications of electromagnets
5. Define mmf

[5x2=10]

PART B

II Answer *any five* of the following questions. Each question carries 6 marks

1. Draw the atomic structure of copper and aluminium atom. Atomic number of copper is 29 and aluminium is 13. Atomic weight of copper is 64 and aluminium is 27
2. State and explain Kirchhoff's laws
3. Derive the equations for equivalent resistances of a) series and b) parallel combination of resistances
4. Derive the expression for energy stored in a capacitor
5. Compare magnetic and electric circuits
6. Derive the expression for co efficient of magnetic coupling
7. Define potential gradient, breakdown voltage and dielectric strength

[5x6=30]

PART C

(Answer **one full** question from **each** module. Each full question carries 15 marks)

MODULE I

- III. a) Define electric power and electric energy 6
- b) Calculate the cost of energy for the month of February 2016 for the given loads as detailed below
1. 20 W bulb working 8 hours a day
 2. 40W fluorescent lamp working 6 hours a day
 3. 1 hp motor working 2 hours a day
 4. 2000 W heater working 1 hour a day. Cost of energy is Rs.2.50/kwh 9

OR

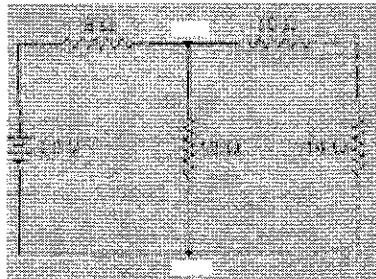
- IV. a) State laws of resistance 6
- b) The shunt winding of a motor has a resistance of 80 ohm at 15° C. Find its resistance at 50°. Resistance temperature co-efficient of copper is 0.004/°C at 0°C 9

MODULE II

- V. a) State super position theorem 6
- b) Three resistors 4 ohm, 12 ohm and 6 ohm are connected in parallel. If the total current taken is 12 A, find the current through each resistance 9

OR

- VI. a) State and explain reciprocity theorem 6
- b) Using Norton's theorem find the current through 14 Ω resistance



9

MODULE III

- VII. a) State the laws of electrostatics 6
b) Derive the expression for the capacitance of parallel plate capacitor with uniform dielectric medium 9

OR

- VIII. a) Explain the phenomenon of lightning 6
b) Three capacitors of capacitance $2\mu\text{F}$, $4\mu\text{F}$ and $6\mu\text{F}$ respectively are connected in series to a 220V dc supply. Find 9
1. the total capacitance
2. charge on each capacitor and
3. p.d across each capacitor

MODULE IV

- IX. a) State and explain Fleming's left hand rule 6
b) A coil of 200 turns is wound on a magnetic circuit of reluctance 2000 AT/mWb . If a current of 1A flowing in the coil is reversed in 10ms, find the average emf induced in the coil 9

OR

- X. a) Define 6
1. Magnetic flux density
2. Reluctance
3. Magnetic field intensity
b) A magnetic flux density of 1.2 Wb/m^2 is required in the 2 mm air gap of an electromagnet having an iron path 1 m long. Calculate the mmf required, assuming a relative permeability of iron as 1500. Neglect leakage. 9