**Registration No :** | | | | | | | | | | |

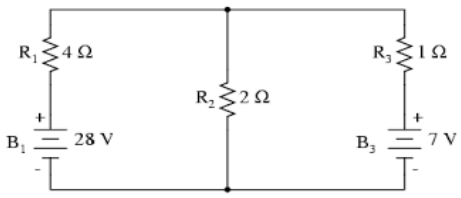
**Total Number of Pages : 02** **B.Tech**
**BE2102**

**1st Semester Back Examination 2017-18**
**BASIC ELECTRICAL ENGINEERING**
**BRANCH : AEIE, AERO, AUTO, BIOMED, BIOTECH, CHEM, CIVIL, CSE, ECE, EEE, EIE, ELECTRICAL, ENV, ETC, FASHION, FAT, IEE, IT, ITE, MANUFAC, MANUTECH, MARINE, MECH, METTA, METTAMIN, MINERAL, MINING, MME, PE, PLASTIC, TEXTILE**
**Time : 3 Hours**
**Max Marks : 70**
**Q.CODE : HB975**
**Answer Question No.1 which is compulsory and any FIVE from the rest.**
**The figures in the right hand margin indicate marks.**

**Q1** **Answer the following questions :** **(2 x 10)**

**a)** Mention the mode of ammeter and voltmeter connection in a circuit?
**b)** Distinguish between a Branch and a node of a circuit.
**c)** Give the power equation for a star connected system?
**d)** Which type of instrument is called as universal instrument?
**e)** What is the use of commutator and brush in a d.c machine?
**f)** Mention the two types of rotors of an induction motor?
**g)** What is the purpose of laminating the core in a transformer?
**h)** An alternating voltage is given by V=230sin314t.Calculate i) frequency, ii) maximum value, iii) average value, iv) RMS value.
**i)** Mention the expression for reluctance of a magnetic circuit and what is its unit?
**j)** How the direction of rotation of dc motor can be changed?

**Q2** **a)** Using The venin's Theorem find the current flowing through 2 ohm resistance, as shown in the Fig bellow **(5)**




**b)** An iron ring wound with 550 turn's solenoid produces a fluxdensity of 0.94 tesla in the ring carrying a current of 2.4 Amp. The mean length of iron path is 80 cm and that of air gapis 1 mm. Determine: **(5)**
i) The relative permeability of iron
ii) Self-inductance
iii) Energy stored in the above arrangement, if the cross sectional area of ring is 25 cms2.

**Q3** **a)** Derive the expression for the energy stored in the magnetic field in terms of energy stored per unit volume **(5)**
**b)** What are the factors governing the Value of Resistance? Explain the term Resistivity. **(5)**

**Q4** **a)** Derive the expression for instantaneous voltage, charge and charging current for a R-C circuit. **(5)**

**b)** State and explain Maximum Power Transfer theorem and give one example of application of the theorem. **(5)**

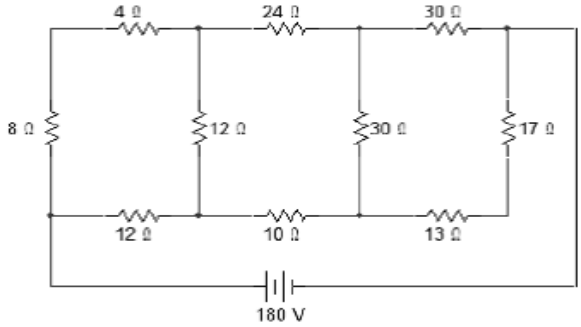
**Q5** **a)** Prove that rms value of the sinusoidal alternating current is 0.707 times its maximum value. **(5)**

**b)** Compare merits and demerits of moving iron type instruments and dynamometer type instruments. Which one is superior why? **(5)**

**Q6** **a)** With a neat circuit diagram Explain the principle of operation of DC Motor. **(5)**

**b)** Derive the EMF equation of a transformer. **(5)**

**Q7** Determine the current in 10Ω resistor in the net work shown, use star-delta conversion. **(10)**




**Q8** **Write short answer on any TWO :** **(5 x 2)**

**a)** Residential wiring

**b)** A/D conversion

**c)** Grounding and safety

**d)** PMMC instruments