

Roll No.

Total No. of Questions : 09]

[Total No. of Pages : 02

B.Tech (Sem. - 1st/2nd)
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
SUBJECT CODE : EE - 101 (2K4 Onwards)
Paper ID : [A0117]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Five** questions from Section - B & C.
- 3) Select atleast **Two** questions from Section - B & C.

Section - A**Q1) (Marks : 2 Each)**

- a) A wire of length 1m has a resistance of 2Ω . Obtain its resistance if specific resistance is doubled, diameter is doubled and length is made three times of the first.
- b) How much heat does 2kW electric heater produce when it is operated for 30 minutes?
- c) What techniques are used to get control for torque in an indicating instrument? Discuss.
- d) A 50Hz, 4-pole, 3-phase induction motor has rotor current frequency of 2Hz. Obtain slip and speed of the motor.
- e) Convert the fractional decimal number $(0.625)_{10}$ into binary number.
- f) Why cannot a 3-phase induction motor run at synchronous speed?
- g) Give an analogy between electric circuit and magnetic circuit.
- h) List out various losses that take place in transformer. Which loss is independent of load?
- i) Do wave shapes other than sine wave have effective values? Explain.
- j) Discuss, why the phase spread of three-phase winding is 60° and not 120° .

R-822

P.T.O.

Section - B**(Marks : 8 Each)**

- Q2)** (a) Define rms, average and form factor of a sinusoidal alternating voltage.
 (b) A resistance of $12\ \Omega$, inductance of $0.1\ \text{H}$ and a capacitance of $100\ \mu\text{F}$ are connected in series across ac 220V , 100Hz supply. Calculate the current and its power factor, power consumed and phase angle mentioning whether it is leading or lagging.
- Q3)** (a) What is meant by resonant frequency?
 (b) For a series R-L-C circuit the inductor is variable. Source voltage is $200\sqrt{2}\sin 100\pi t$. Maximum current obtainable by varying the inductance is 0.314A voltage across the capacitor then is 300V . Find the circuit element values.
- Q4)** Give a clear explanation of the production of torque in 3-phase induction motor.
- Q5)** Discuss working principle of moving iron voltmeter. What are main difference between moving coil and moving iron instruments? Discuss.

Section - C**(Marks : 8 Each)**

- Q6)** Define transducers. How are these classified? Give four examples of active transducers.
- Q7)** (a) With the help of functional block discuss working of an IC 555 timer.
 (b) How is IC- 555 used as frequency divider? Explain.
- Q8)** (a) What is T Flip flop? Give its symbol and draw wave form of T flip-flop.
 (b) What are flip-flops? How are invertors used to represents a S-R flip flop? Discuss.
- Q9)** (a) What is Bipolar junction transistor (BJT). List applications of BJT.
 (b) What is a P-N junction and how is it formed? Explain V-I characteristics of a P-N junction diode.

###