17404

14115

3 Hours / 100 Marks **Seat No.** | | | | | | | | |

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any TEN of the following : **20**

(a) Define : (i) frequency (ii) period.

(b) State any two applications of digital multimeter.

(c) State working principle of d.c. motor.

(d) State any two applications of transformer.

(e) List various types of starters used for 3-phase induction motor.

(f) List various types of enclosures.

(g) Define Tariff.

(h) State any two methods of power factor improvement.

(i) State any two applications of stepper motor.

(j) Define regulation of a transformer.

(k) Define R.M.S. value in terms of a.c. circuit.

(l) Classsify single phase induction motor.

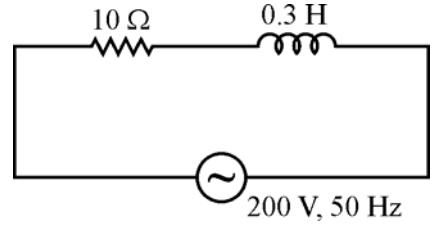
2. Attempt any FOUR of the following : **16**

(a) State relation between phase and line current & phase and line voltage of the following system :

(i) Star connected balanced system

(ii) Delta connected balanced system

(b) Find (i) Impedance, (ii) Phase angle, (iii) current, (iv) Total power for the circuit shown below :



(c) A 3 phase 6 pole induction motor works on a 25 Hz supply. Calculate the synchronous speed and rotor speed if it runs at a slip of 5 percent.

(d) Describe Butt welding and seam welding in brief along with relevant labelled diagram.

(e) Distinguish clearly between PMMC and moving iron instrument.

(f) Name four types of tariff and describe any one.

3. Attempt any FOUR of the following : **16**

(a) Draw a single line diagram of electric power supply system & show different stages in it.

(b) An alternating current is given by $i = 141.4 \sin 314 t$.

Calculate the maximum value, frequency, time period and instantaneous value when t is 3ms.

(c) Draw the speed-torque characteristics of DC shunt and series motor.

(d) Deduce the emf equation of a transformer.

(e) Draw a neat sketch of D.O.L. and explain its working.

(f) Explain in brief fire extinguishing methods adopted in electrical safety.

4. Attempt any FOUR of the following : **16**

(a) With the help of circuit connection diagram explain capacitor start run motor.

(b) Explain the factor to be considered for selection of motor for different drives.

(c) Describe the speed control of three phase induction motor using VFD drive with the help of diagram.

(d) Explain with help of diagram plate earthing.

(e) State and explain working principle of electroplating.

(f) Explain the purpose of

(i) Conservator and

(ii) Breather in a transformer

5. Attempt any FOUR of the following : **16**

(a) Describe electric arc welding. Also state its types.

(b) For R-C series circuit :

(i) Draw circuit diagram

(ii) Its phasor diagram

(iii) Waveform of voltage & current

(iv) Impedance triangle

(c) Draw and label the various parts which shows constructional details of an alternator.

(d) Explain working principle, construction and applications of stepper motor.

(e) Explain copper saving by using autotransformer instead of two winding transformer.

(f) Explain in brief concept of energy convertion.

6. Attempt any FOUR of the following : **16**

(a) Compare rating and applications of Fluorescent, CFL and LED lamps.

(b) Draw and explain the labelled circuit and phasor diagram for purely inductive circuit. What is the power factor of the circuit ?

(c) Explain in brief resistance heating.

(d) State any two applications of following motors :

(i) servomotor

(ii) universal motor

(e) With the help of circuit connection diagram explain load test for determination of efficiency and regulation of transformer.

(f) Describe the working principle, construction and working of permanent magnet moving coil instrument. State its advantages & disadvantages.

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