

Scheme – I
Sample Question Paper

Program Name : Computer & Electronics Engineering Program Group
Program Code : CO/CM/IF/CW/IF/DE/EJ/IE/IS/ET/EN/EX/IC/EQ
Semester : Second
Course Title : Elements of Electrical Engineering
Marks : 70

22215

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) Define Magnetic circuit.
- b) Draw impedance triangle and show various quantities on it.
- c) Define phase sequence RYB and RBY.
- d) State the difference between step up and step down Transformer.
- e) Write EMF equation of transformer. State the meaning of each notation in it.
- f) Define FHP Motor.
- g) State various types of Fuses.

Q.2) Attempt any THREE of the following.

12 Marks

- a) Compare Electric Circuit and Magnetic Circuit on any four points.
- b) Write standard formula for each of the following and state its unit.
 - (i) Active Power (ii) Reactive Power (iii) Apparent Power and (iv) Copper Loss.
- c) Draw a balanced 3-phase delta connected load. Show various line and phase quantities on
it. Also write relationship between line and phase values of voltages and currents
- d) Draw schematic diagram for each of the following motor.
 - (i) DC Shunt Motor (ii) DC Series Motor (iii) Short Shunt DC Compound Motor and (iv) Long Shunt DC Compound Motor.

Q.3) Attempt any THREE of the following.

12 Marks

- a) Explain with neat diagram Static and Dynamic Induced EMF.
- b) Explain working of autotransformer. State its any two applications.
- c) Write principle of operation of Split Phase Induction Motor.
- d) Explain importance of Earthing.

Q.4) Attempt any THREE of the following.

12 Marks

- a) A non-magnetic ring has a mean diameter of 44.5 cm and a cross-sectional area of 12 cm^2 . It is uniformly wound with 500 turns. Calculate the field strength and total flux produced in the ring by a current of 1 Amp.
- b) Write any two applications of each of the following.
 - i) DC Shunt Motor
 - ii) DC Series Motor
- c) Explain principle of operation of Universal motor with neat diagram.
- d) State the types of stepper motor. Explain working of any one type of Stepper Motor.
- e) Explain with neat diagram operation of MCB.

Q.5) Attempt any TWO of the following.

12 Marks

- a) A sinusoidal voltage with equation $v=173 \sin (314 t - 30^\circ)$ Volt is applied to a load. Calculate: (i) Maximum Voltage (ii) RMS Voltage (iii) Frequency (iv) Time Period (v) Phase and (vi) Angular Frequency.
- b) Three similar coils each of resistance of 20Ω and an inductance of 0.5 H are connected in star to a 3-phase, 440 V , 50Hz supply system. Calculate the phase current, line current, phase voltage, line voltage, total phase power and total line power.
- c) A 1-Phase, 1 kVA , $230/115 \text{ V}$ transformer used in a laboratory. Calculate: (i) Primary winding current (ii) Secondary winding current (iii) Turns Ratio and (iv) Current Ratio.

Q.6) Attempt any TWO of the following.

12 Marks

- a) Write any two applications of each of the following motor: (i) Universal Motor (ii) Stepper Motor (iii) Capacitor Start Induction Run Motor
- b) Explain operation of each of the following: (i) Fuse and (ii) MCB
- c) Write any two applications of each of the following: (i) ELCB (ii) MCCB (iii) MCB and (iv) Fuse.

Scheme – I
Sample Question Paper - I

Program Name : Computer & Electronics Engineering Program Group
Program Code : CO/CM/IF/CW/IF/DE/EJ/IE/IS/ET/EN/EX/IC/EQ
Semester : Second
Course Title : Elements of Electrical Engineering
Marks : 20

22215

Time: 1 Hour.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) Draw series and parallel magnetic circuit.
- b) State Lenz's law.
- c) Define form factor and peak factor for a sinusoidal waveform.
- d) If $v=50\sqrt{2} \sin\omega t$ Volts and $i=10\sqrt{2} \sin(\omega t-30)$ Amps. Draw phasor diagram for above two quantities.
- e) State difference between 3-phase balanced and 3-phase unbalanced load.
- f) Draw a 3-phase, star connected balanced load and show phase and line quantities on it.

Q.2 Attempt any THREE.

12 Marks

- a) Define each of the following terms: (i) Magnetic flux (ii) Magnetic flux density (iii) Permeability and (iv) Reluctance.
- b) Draw & explain hysteresis loop.
- c) A 30 Ohm resistance is connected in series with 0.1 H inductance and the combination is connected across a 230 V, 50 Hz, 1-phase supply. Calculate: (i) Current (ii) Power factor (iii) active power consumed and (iv) Reactive power.
- d) Write any four advantages of AC supply over DC supply.
- e) Each phase of a delta connected load consist of impedance $(8+j6)$ Ohm. Calculate the line current, the power absorbed the total kVA and power factor when connected to a 400 V, 3-phase, 50 Hz supply.
- f) Draw a 3-phase EMF generation sinusoidal waveform on a time scale.

Scheme – I
Sample Test Paper - II

Program Name : Computer & Electronics Engineering Program Group
Program Code : CO/CM/IF/CW/IF/DE/EJ/IE/IS/ET/EN/EX/IC/EQ
Semester : Second
Course Title : Elements of Electrical Engineering
Marks : 20

22215

Time: 1 Hour.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) State the different losses in transformer.
- b) Define Motor and Generator.
- c) State how the direction of Universal motor is reversed.
- d) Write the meaning of FHP motor.
- e) Write any four factors affecting earthing.
- f) Write general specifications of earthing.

Q.2 Attempt any THREE.

12 Marks

- a) Draw constructional diagram of DC motor. Show different parts on it and write function of each part.
- b) Compare autotransformer with two winding transformer on any four points.
- c) Explain principle of operation of shaded pole motor.
- d) Explain working of capacitor start capacitor run FHP motor.
- e) Write any four IE rules relevant to earthing.
- f) Explain operation of ELCB.