DEPARTMENT OF MECHANICAL ENGINEERING

Unit 1 — 2 marks

1. Define current, voltage, resistance.
2. State ohm's law.
3. What is work, power and energy?
4. Define magnetic flux, MMF, Reluctance.
5. Define permeability.
6. Write the applications of DC generator and DC motor.

3 marks

1. State kirchoff's law.
2. State faraday's law of electromagnetic induction.
3. Why starter is necessary in DC motor.
4. Write the type of DC generator and DC motor.
5. Derive an expression for the equivalent resistance when two resistors are connected in parallel and series.

10 marks

1. Explain the principle operation of DC generator with sketch.
2. Explain the working of DC motor.
3. Draw and explain the operation of three point starter / four point starters.
4. Explain with neat sketches, constructional details of DC Machine(Generator / Motor).

Unit 2 — 2 marks

1. Define cycle, time period and frequency.
2. Define average value and power factor.
3. Write the emf equation of transformer.
4. Write the types of alternator.
5. Define RMS value.
6. Write the applications of Ac motor

3 marks

1. What are the losses in transformer?
2. Write the relation between line voltage and phase voltage, line current and phase current in star and delta connected system.
3. What are the starters used in Ac motor.
4. Write the types of single phase induction motor.
5. Write the methods of speed control in induction motor.
6. Compare squirrel cage and slip ring induction motor.

10 marks

1. Explain the construction and working principle of Transformer.
2. Explain the construction of salient pole and turbo alternator.
3. Explain the construction and working principle of three phase induction motor.
4. Explain the working of DOL and star delta starter.
5. Explain the working of capacitor start induction motor.

Unit 3 — 2 marks

1. What is servo motor?
2. Write the types of electrical drives?
3. What is earthing?
4. Write any three applications of PMDC, Stepper motor and servo motor?
5. Define Energy conservation.

3 marks

1. Draw the block diagram of variable frequency drive.
2. What is stepper motor? Define step angle.
3. What is electric shock? Write any four precautions to prevent electric shock.
4. What is half stepping / full stepping?
5. What is accident? Write any four precautions of accident.

10 marks

1. Explain the construction and working principle of stepper motor.
2. Explain the working of brushless and permanent magnet servo motor.
3. Explain the individual drive, group drive and multimotor drive with neat sketch.
4. Explain the construction and working principle of PMDC motor.
5. Explain electric shock and accident and their preventive measures.

Unit 4 **2 marks**

1. Define rectifier and diode?
2. What is Inverter?
3. Write the types of rectifier.
4. Write the types of filter, necessity of filter.
5. What is IC voltage regulator and their types.
6. Expand SMPS, UPS, LED, and LCD?

3 marks

1. Write the applications of SMPS.
2. What is positive logic and negative logic.
3. Difference between ONLINE and OFFLINE UPS.
4. Write the advantages and disadvantages of SMPS.
5. Define De-Morgan's theorem.

10 marks

1. Explain the working of Rectifier (half wave, full wave or bridge) with input and output waveforms.
2. Explain the forward biasing and reverse biasing of a diode.
3. With block diagram, explain SMPS.
4. Draw the symbol and truth table of OR, AND, NOT, NAND, NOR and EX-OR gates.

Unit 5 **2 marks**

1. What is fuse? Type of fuses.
2. Expand MCB, MCCB, ELCB, OCB.
3. Symbol of NO and NC.
4. What is sensor?
5. Different types of switches.

3 marks

1. Draw the block diagram of inductive proximity sensor used for metal detection.
2. Explain the usage of float switch, limit switch.
3. What is relay, contactor and circuit breaker (CB).
4. What is PLC?
5. Write the features of PLC.

10 marks

1. Explain ELCB, Oil CB with neat sketch.
2. Draw a neat diagram of solenoid type contactor and explain its working.
3. Draw the block diagram of PLC and explain each block.
4. Explain the types of PLC scan.