

- 9) In a forward converter if number of turns in a primary winding is equal to number of turns in a demagnetizing winding, then maximum possible value of duty cycle is _____
 A) $D=0.2$ B) $D=0.6$ C) $D=0.8$ D) $D=0.5$
- 10) Give any two advantages of Zero Current Switching (ZCS) operation in a converter circuit.
- 11) Give any two advantages of multilevel inverter over two level inverter.
- 12) List any two drawbacks of linear regulated power supply over switch mode power supply.
- 13) What is the necessary condition for series resonant oscillation?
- 14) What are the advantages of parallel resonant inverters?

Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions (14)**
- (a) Draw the circuit diagram of BOOST converter and explain its operation. Draw the waveforms of gate pulse applied to the switch, inductor voltage, inductor current, capacitor current, output voltage. **07**
- (b) Derive the equation for average output voltage and average input current for BUCK converter. **07**
- Q-3 Attempt all questions (14)**
- (a) Draw the circuit diagram of FLYBACK converter and explain its operation. Draw the waveforms of gate pulse, flux, input primary current and output secondary current. **07**
- (b) Draw the block diagram of OFF LINE UPS and explain the function of each block. **07**
- Q-4 Attempt all questions (14)**
- (a) Draw the circuit diagram and waveforms of single phase full bridge inverter and explain its operation. **07**
- (b) Draw the circuit diagram of single phase five level cascaded H Bridge inverter and explain its operation . Draw the output voltage waveforms. **07**
- Q-5 Attempt all questions (14)**
- (a) Draw the circuit diagram of three level diode clamped inverter with one leg and explain its operation. Draw the output voltage waveform of three level inverter **07**



- (b) Draw the circuit diagram of five level diode clamped (neutral clamped) inverter with one leg and explain its operation. Draw the output voltage waveform of five level inverter. **07**

Q-6 Attempt all questions (14)

- (a) Draw the circuit diagram of BUCK converter and explain its operation. Draw the waveforms of gate pulse applied to the switch, inductor voltage, inductor current, capacitor current, and output voltage. **07**
- (b) Draw the circuit diagram of six pulse diode rectifier (three phase full wave bridge rectifier) and waveforms of three phase input voltage, output voltage, output current, input current waveform of any one phase and explain its operation with resistive load. **07**

Q-7 Attempt all questions (14)

- (a) Draw the connections and vector diagram of Y/Z-2 (Star-Zigzag) transformer. Show that line voltage of the secondary winding lags the primary line voltage in the range of $0^\circ < \delta < 30^\circ$. **07**
- (b) Draw and explain the structure of Switched Reluctance Motor (SRM). **07**

Q-8 Attempt all questions (14)

- (a) Draw the circuit diagram and waveforms of three phase full wave Brushless DC motor drive and explain its operation. **07**
- (b) Draw the circuit diagram and waveforms of ZCS (zero current switching) resonant dc-dc converter and explain its operation. **07**

