BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - IV R&A :SUMMER- 2022
SUBJECT : POWER ELECTRONICS & DRIVES

Day : Monday
Date : 20-06-2022

S-24788-2022

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labelled diagram **WHEREVER** necessary.
4) Assume suitable data, if necessary.

Q.1 **a)** Explain any one voltage control techniques in voltage source inverter with require D circuit diagram. **(05)**

b) Compare the different types of pulse width modulation technique. **(05)**

OR

Q.1 Explain the working of three phase 180^0 mode of voltage source inverter with circuit diagram and switching table. Draw line and phase voltage waveform for any one phase. **(10)**

Q.2 **a)** Explain the operation of line commutated current source inverter with waveform. **(05)**

b) Write the comparison between voltage and current source inverter. **(05)**

OR

Q.2 What is matrix converter? Draw the circuit diagram of 3 x 3 matrix converter and write the voltage, current equation matrix. **(10)**

Q.3 **a)** What are the different applications of multilevel inverter, explain any one application with required diagram. **(05)**

b) Draw the switching table of diode clamped multilevel inverter and explain its operation. **(05)**

OR

Q.3 What is the basic concept of mutilevel inverter? Write its basic features, equation and draw general topology diagram with waveform. **(10)**

Q.4 **a)** Explain with the neat diagram and waveform operation of single phase full converter drive fed separately excited DC motor. **(05)**

b) What is DC servo drive? Explain in brief. **(05)**

OR

Q.4 A 220 V, 1500 RPM, 10 A, separately excited dc motor has an armature resistance of 1 Ω. It is fed from a single phase fully controlled bridge rectifier with an ac source voltage of 230 V, 50 Hz. Compute: **(10)**

i) motor speed at firing angle of 30^0 and torque of 5 N-m.

ii) Developed torque at firing angle of 45^0 and speed of 1000 rpm.

Q.5 **a)** Explain with the circuit diagram stator voltage control technique for 3 phase induction motor. **(05)**

b) With the help of block diagram, explain closed loop speed control of 3 phase induction motor. **(05)**

OR

Q.5 Explain in detail static slip power recovery scheme for 3 phase induction motor. **(10)**

Q.6 **a)** Explain load commutate inverter fed synchronous motor drive with circuit diagram. **(05)**

b) How to control the speed of synchronous motor by cyclo-converter? **(05)**

OR

Q.6 Explain the current regulated VSI fed sinusoidal PMAC motor drive for servo application. Draw the closed loop diagram of it. **(10)**

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