T.E.(INSTRUMENTATION)(SEM VI) (CBSGS) / DEC 2019/05.12.2019

Time: 3 Hours   Total Marks :80

NB.   Q.1 is Compulsory.
       Solve any four questions from the remaining.

Q1   20
   a) Explain SCR ratings
   b) compare IGBT & MOSFET
   c) Explain Commutation in Thyristor circuit
   d) Differentiate between series & parallel inverter

Q2.   20

   Design a converter to give output voltage 120 V at 1A load current. The input is 230 V
   50 Hz ac supply. Use UJT 2N2646.
   $V_{BBmax}= 35$ V for Vbb=16 V, C=0.1μF , η_{min}=0.56 ,η_{max}=0.75, η_{type}=0.63
   Iv=4mA, Ip=25μA   Consider temperature compensation.

Q3
a) with the help of a neat diagram and associated waveforms discuss the operation of Buck   10
   converter. Also list the advantages and disadvantages of this type of converter.
b) Explain variable frequency I.M. drive.   10

Q4
   a) Describe the working of 1phase fully controlled bridge converter in the following two modes.
      1) Rectifying mode   10
      2) Inversion mode.
         Also sketch the following waveforms for α=45^0 ,& α=120^0

   b) Write a note on control strategies used in chopper.   10

Q 5
   a) Explain the application of power electronics in industrial heating process.   10
   b) Explain application of triac as an ac regulator. Draw relevant waveforms.   10

Q6
   a) Explain PWM inverter with appropriate waveforms   10
   b) Explain full bridge inverter with R-L load. Also explain purpose of feedback   10
      diodes in these inverters.

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