S.E. (Mechanical) (Sem -IV) (CCB)

[3 Hours]   [Marks: 80]

Please check whether you have got the right question paper.

N.B: 1.   Question No. 1 is compulsory.
        2.   Solve any three questions out of remaining three questions.
        3.   Figures to the right indicate full marks.

1. (a) Draw and explain V-I characteristics of SCR.   05

    (b) Draw and explain equivalent circuit of an OP-AMP.   05

    (c) State and prove Demorgan's Theorems.   05

    (d) Enlist all important features of logic family circuit.   05

2. (a) Draw and explain slip-torque characteristics of AC motor.   07

    (b) What is GTO? Explain switching characteristics of GTO.   07

    (c) Compare DIAC and TRAIC.   06

3. (a) Draw and explain full controlled rectifier with R load. Draw waveforms.   07

    (b) Explain with neat diagram MSP 430 architecture.   07

    (c) Draw and explain second order low pass filter.   06

4. (a) Draw circuit diagram and waveforms of single phase full bridge inverter with R load.   07

    (b) Compare CMOS logic family with TTL logic family.   07

    (c) What is servo speed? Explain working principle of servo motor.   06

5. (a) Derive the relation per voltage gain in inverting mode in operational amplifier and compare   07
         it with non inverting mode.

    (b) Draw and explain R triggering method of SCR.   07

    (c) Draw and explain astable mode of operation of IC 555.   06

6. (a) Explain the application of piezo-electric activator drive.   07

    (b) Compare DC series motor and DC shunt motor.   07

    (c) Explain different applications of microcontroller.   06

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