Sem- IV/CBGS/Mech/I·E/Nov-2016

28-12-16

Industrial Electronics

QP Code : 555700

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining questions.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if necessary.

1. Solve **any five** :- **20**
   a) Draw characteristics of SCR, Triac, MOSFET and IGBT.
   b) Draw connection of an LED and a switch to MSP430.
   c) Explain basic principle of single phase inverter.
   d) Enlist characteristics of ideal op-amp.
   e) Give an example of analog circuit, digital circuit, combinational circuit and sequential logic circuit.
   f) Draw torque-speed characteristics of DC shunt motor and 3-phase induction motor.
   g) What do you understand by R-L and R-L-E load?

2. a) Explain in brief functional block diagram of MSP430. **7**
   b) Draw and explain block diagram of closed loop speed control of DC motor. Also state need of inner current loop. **7**
   c) Draw and explain any one application circuit of Triac-Diac. **6**

3. a) Explain IC 555 as monostable multivibrator. **7**
   b) Explain frequency control scheme of 3-phase induction motor with the help of block diagram. **7**
   c) Write a short note on :-Turn-off of SCR. **6**

4. a) Draw the circuit diagram of differentiator and integrator? Write the output equation of each. **7**
   b) Enlist triggering methods of SCR and explain any one gate triggering method of SCR. **7**
   c) What do you understand by a Digital circuit? Elaborate following terms regarding digital circuits :- **6**
   (i) logic level (ii) noise immunity (iii) propagation delay
   (iv) power dissipation (v) fan out.

5. a) Elaborate: - Accuracy, Resolution and least significant bit regarding 10-bit ADC. **7**
   b) Write a short note on 'selection of motor and power rating for a pump'. **7**
   c) Explain asymmetrical semi controlled converter with R load and derive equation of output voltage. **6**

6. a) Compare - BLDC motor, DC motor and induction motor. **7**
   b) Compare- Microprocessor and Microcontroller. **7**
   c) Compare- TTL and CMOS technology. **6**
