

QP Code : NP-19862

(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.



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1. Solve any five:—

- (a) SCR is a semi-controlled device-Justify
(b) Enlist applications of
(i) Rectifier diode
(ii) Zener diode
(iii) Light emitting diode
(iv) Photo diode
(c) Explain use of
(i) Multiplexer
(ii) De-multiplexer
(iii) Boolean algebra
(iv) Encoder.
(d) Discuss effect of R-L & R-L-E load on full wave rectifier operation.
(e) Compare AC and DC motors.
(f) Mention power consumption of MSP430 in different operating modes.
(g) Explain applications of BLDC motor & servomotor.
2. (a) Explain any one application circuit of TRIAC-DIAC with waveform. 7
(b) Draw different circuits of full wave controlled rectifier with R-load & calculate firing angle at which fully controlled full wave rectifier is to be operated to get output dc voltage of 110V from input voltage of 230V, 50 Hz. 7
(c) Explain register related to configuration of digital input/output port of MSP 430 microcontroller. 6
3. (a) Draw circuit diagram and waveform of 3-phase bridge inverter with R-load (180° mode of conduction) 7
(b) Explain frequency control scheme of 3-phase induction motor with the help of block diagram. 7
(c) Draw the circuit diagram and write the output voltage equation of inverting amplifier and summing amplifier. 6
4. (a) Explain IC555 astable multivibrator. 7
(b) Explain functional block diagram of MSP430 microcontroller. 7
(c) Draw and explain block diagram of closed loop speed control of DC motor (with inner current loop) 6

5. (a) Discuss interfacing of 3V system with 5V system and heavy loads like motors. 7
(b) Write a short note on 'selection of motor & power rating for a pump'. 7
(c) Discuss accuracy, resolution and least significant bit regarding 10-bit ADC. 6
6. Compare the following:—
- (a) Power transistor, SCR, MOSFET and IGBT. 7
(b) Microprocessor and microcontroller. 7
(c) TTL and CMOS technology. 6