

Mechanical/Automobile

QP Code : 3483

(3 Hours)

[Total Marks :80

- N.B. :** (1) Questions No. 1 is compulsory.
(2) Attempt **any three** out of remaining questions.
(3) Figure to right indicates full marks.
(3) Assume suitable data if necessary.

1. Solve any five 20
- (a) Draw and explain labelled V-I Characteristics of Zener diode.
 - (b) Classify single phase controlled rectifier.
 - (c) State important features of op-amp
 - (d) Realize basic gates using NAND gate
 - (e) Explain back EMF in DC motor.
 - (f) Draw generalized architecture of microcontroller
2. (a) Draw and explain single phase full bridge controlled rectifier with the help of waveforms for R-load, Derive the output voltage equation. 7
- (b) Explain architecture of MSP430 7
- (c) Compare R & R C triggering methods of SCR. 6
- 3 (a) Explain IC555 as monostable multivibrator. 7
- (b) Compare CMOS and TTL logic family 7
- (c) Draw and explain torque-speed characteristics of DC series and DC shunt motor, Also state application of each. 6
- 4 (a) Explain first order filter circuit. 7
- (b) Explain various registers used for digital I/O of MSP430 7
- (c) Analyse torque-speed characteristics of induction motor. State various methods of speed control of induction motor. 6
- 5 (a) What is commutation of SCR? Explain any one method in detail 7
- (b) Explain closed loop speed control of DC motor, What is the necessity of inner current loop 7
- (c) What is decoder, Demultiplexer and flip-flop 6
- 6 (a) Explain suitability of different electric motors for various industrial applications. 7
- (b) Explain with appropriate waveforms the operation of single phase bridge inverter circuit. 7
- (c) Explain different peripherals of MSP430, Why is it called as mixed signal processor? 6