

Mechanical/Automobile

QP Code : 555701

(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 four** :- 20
- (a) Enlist four applications of SCR-diode circuit.
 - (b) What is the basic principle of bridge configured converter circuit?
 - (c) Explain the operation of voltage follower circuit.
 - (d) Define and describe logic operation, power dissipation and propagation delay in digital circuits.
 - (e) What is a brushless dc motor? Give its two applications.
2. (a) What is GTO? Explain its working. What are similarities between GTO and SCR? 7
- (b) State and describe power MOSFET on the basis of construction, principles of operation, applications, rating, input and output characteristics. 7
- (c) Derive the output voltage for full wave fully controlled rectifier and find the firing angle for maximum output. 6
3. (a) Explain in detail the concept of R-L-E load in converters. 7
- (b) Classify speed control of ac motor and describe any one using block diagram. 7
- (c) How does driver circuit work? Illustrate with an example. 6
4. (a) Explain in detail first order low pass active filter. 7
- (b) What is difference between combinational and differential circuits? 7
- (c) Discuss speed torque characteristics of dc motor? Classify types of loads on the basis of time duration. 6
5. (a) Describe the functional block diagram and architecture of MSP430 microcontroller? 7
- (b) Realize basic digital gates using NOR and NAND universal gates. 7
- (c) Write a program using MSP430 for external input and output devices. 6
6. (a) Select a motor for machine tools application and describe with the speed torque characteristics. 7
- (b) Compare microprocessor and microcontroller. 7
- (c) Explain minimum six distinguishing features of MSP430 microcontroller. 6