

B. Voc Automotive Mechatronics**Subject: Digital and Power Electronics****Subject Code: ABEC-201****Semester-3rd****Theory (External): 35****Time: 03 hours****Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 6 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number					

- 6 The truth table for S-R flip flop has how many valid entries :
- a) 1
 - b) 2
 - c) 3
 - d) 4
- 7 The sequential circuit is also called as:
- a) flip-flop
 - b) latch
 - c) strobe
 - d) none
- 8 Decimal value of 1010 is
- a) 9
 - b) 10
 - c) 8
 - d) 12
- 9 All logic operations can be obtained by means of
- a) AND & NAND
 - b) OR & NOR
 - c) OR & NOT
 - d) AND & NOR
- 10 An OR gate has 4 inputs. One input is high and the other three are low. The output is
- a) Low
 - b) High
 - c) alternately high and low
 - d) may be high or low depending on relative magnitude of inputs

SECTION –B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

- 1 Implement the following multi o/p combinational logic circuit using 4 to 16-line decoder
$$F1 = \sum m(2,3,9,11)$$
$$F2 = \sum m(10,12,13,14)$$
- 2 Design full adder circuit using two half adder circuit.
- 3 Write a short note on commutation techniques of SCR.
- 4 Explain switching characteristics of IGBT using appropriate diagram.
- 5 Explain and sketch the block diagram of JK flip flop.
- 6 Explain the working of 1ϕ to 1ϕ circuit step up cyclo converter.

-----END OF THE PAPER-----

SECTION –A (OBJECTIVE TYPE QUESTIONS)

(10x1=10 Marks)

- 1 The firing angle for firing circuit is
 - a) $0 \leq \alpha \leq 90^\circ$
 - b) $90 \leq \alpha \leq 180^\circ$
 - c) $0^\circ \leq \alpha \leq 180^\circ$
 - d) None

- 2 The cycloconvertors are used to convert voltage from
 - a) Fixed AC to variable AC
 - b) Fixed AC to variable DC
 - c) Fixed DC to variable DC
 - d) Fixed DC to variable AC

- 3 Amplitude modulation is the ratio of
 - a) Amplitude of reference signal to amplitude of carrier signal
 - b) Amplitude of carrier signal to amplitude of reference signal
 - c) Both
 - d) None

- 4 In a 3 phase, 180° mode voltage source inverter, each thyristor conducts for
 - a) 120°
 - b) 180°
 - c) 90°
 - d) All

- 5 The snubber circuits are used for
 - a) overcurrent protection
 - b) di/dt protection
 - c) overvoltage protection
 - d) none