

2112E157

BACHELOR OF VOCATION
Mechatronics
Subject: Digital and Power Electronics
Subject Code: ECE-601
Semester: Third
December 2021
Theory (External): 35 Marks
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 8 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

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*****END OF PAPER*****

3. Explain half adder and full adder with suitable diagram.
4. Minimize the given function using K-Map
 $f(A,B,C,D)=\Sigma m(0,2,4,6,9,11,14,15)$
5. Realize the Ex-OR gate using NAND gate.
6. What is flip-flop? Explain truth table, characteristics table, and excitation table of JK flip flop.
7. Explain multiplexer and demultiplexer.
8. What is cyclo converter? Enumerate some of its industrial applications.

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SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A. Convert the binary number 01011 into decimal
a) 10
b) 11
c) 12
d) 13
- B. Which device has one input and many outputs?
a) Flip flop
b) Multiplexer
c) Demultiplexer
d) counter
- C. What are the universal gates?
a) XOR & NOT
b) AND & OR
c) NAND & NOR
d) All of the above
- D. Which is the correct order of sequence for representing input values in K-map?
a) (00,01,10,11)
b) (00,10,01,11)
c) (00,01,11,10)
d) (00,10,11,01)
- E. The Boolean expression of an XOR gate is
a) $A.B$
b) $A'B+AB'$
c) $A+B$
d) $A'B'$
- F. The function of transistor is to
a) Rectify

- b) Amplify
c) Limit
d) control
- G. Which terminal of transistor is heavily doped?
a) Emitter
b) Base
c) Collector
d) None of the above
- H. BJT stands for
a) Biomedical Junction Table
b) Binary Justified Transistor
c) Bipolar Junction Transistor
d) Bipolar Junction Thyristor
- I. An SCR is a
a) Four layer, four junction device
b) Four layer, three junction device
c) Four layer, two junction device
d) Three layer, single junction device
- J. Which terminal does not belong to SCR?
a) Anode
b) Gate
c) Base
d) Cathode

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

1. What is BJT? Explain its characteristics.
2. Draw the static VI characteristics of SCR and explain.