Roll No…….. **Total No. of Printed Pages: 1**

Total No. of Questions: [09]

B. Tech ECE (Semester – 4th)
DIGITAL ELECTRONICS
Subject Code: BECE1411
Paper ID: [111308]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:
a) Differentiate between combinational and sequential circuits.
b) Explain the terms Resolution and Accuracy of A/D converter.
c) Convert Grey Code to BNS (110001101).
d) What is the range of signed decimal values which can be represented by 8 bits?
e) Compare a synchronous and asynchronous counter.
f) Implement the basic gates AND, OR and NOT using NAND gate only.
g) What is the difference between ordinary encoder and priority encoder?
h) Can the input to a D/A converter be BCD? Explain.
i) Write the excitation table of a J-K and D flip-flop.
j) Define tri-state logic.

Section – B **(5 marks each)**

Q2. What is a ring counter? What type of flip-flop is used in such counters? Write one application of this counter.
Q3. Give the comparison of TTL, ECL and CMOS basis on various parameters (give the approximate numerical values).
Q4. In a new number system X and Y are successive digits such that $(XY)_r = (25)_{10}$ and $(XY)_r = (31)_{10}$ Find X, Y and r.
Q5. What is a dual slope A/D converter? Draw its circuit and explain its working.
Q6. Design full adder and full subtractor using 4:1 multiplexer.

Section – C **(10 marks each)**

Q7. Solve using Q-M method and verify the result with K-map. Also implement using NOR gates only.
$F(v, w, x, y, z) = \Sigma m (0, 1, 2, 4, 5, 14, 15, 19, 23, 25, 27, 29, 31) + d(5, 7, 9, 11)$
Q8. Design MOD-6 up-down counter using D flip-flop.
Q9. Draw and explain working of a 4-bit bidirectional shift register controlled by multiplexers.