

Name:	
Enrolment No:	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, December 2021**

Course Name : Digital System Design	Semester: III
Program Name : B. Tech ECE	Time : 03 hrs
Course Code : ECEG 2037	Max. Marks : 100
No of page : 02	

Instructions: *1) Attempt and answer all Questions in serial manner*  
*2) Answer must be in brief and diagrams must be clear.*

**SECTION A**

**Each Question will carry 4 Marks**

**Instruction: Complete the statement / Select the correct answer(s)**

S. No.	Question	CO
Q 1	Find the excess 3 code for the decimal numbers 56 and 812.	CO1
Q 2	Find the gray code for the decimal numbers 15 and 14	CO1
Q 3	Find the minterms for the function $Y(A,B,C)=AB^c + C^c$ where small c represents complement	CO2
Q 4	Simplify the following three variable expression using Boolean algebra  $Y(A,B,C)= \sum m(0,1,3,4,7)$	CO2
Q 5	Explain a TTL two input NAND gate with passive pull up	CO5

**SECTION B**

**Each question will carry 10 marks**

**Instruction: Write short / brief notes**

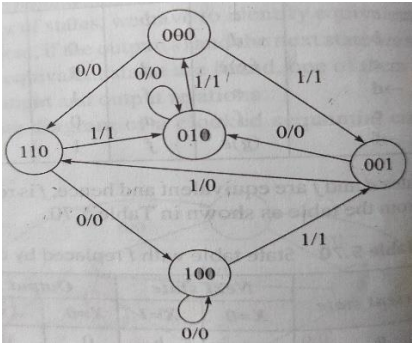
Q 1	a) Design a CMOS three input NAND gate. b) Implement the following output functions using a suitable PLA $F1(A,B,C,D)= \sum m(3,7,8,9,11,15)$ $F2(A,B,C,D)= \sum m(3,4,5,7,10,14,15)$ $F3(A,B,C,D)= \sum m(1,5,7,11,15)$	CO5
Q 2	Implement the following combinational Logic circuits using multiplexer a) Full adder b) Full subtractor	CO3
Q 3	a) Design a 2 –bit comparator using suitable decoder.	CO3

	b)Design a 4 bit binary to gray code converter	
Q 4	Covert SR flipflop to T,D and JK flipflop. Explain the operation of JK masterslave flipflop	<b>CO4</b>

**SECTION C**

**Each Question carries 20 Marks.**  
**Instruction: Write long answer.**

Q 1	a) Design a Mod-9 ripple counter using T flipflop and draw the output wave forms. b) Design a Mod 5 synchronous counter using D flipflop	<b>CO4</b>
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Q 2	<p>a) With the help of state table and state diagram , design a decade up/down counter</p> <p>b) Design a sequential circuit using J-K flipflops for the state diagram as shown below</p> 	<b>CO4</b>
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