UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Digital Systems and Applications   **Semester:** III
Program: B.Sc. Physics (H)   **Time 03 hrs.**
Course Code: PHYS2003   **Max. Marks: 100**

SECTION A (All Questions are compulsory)

S. No.		Marks	CO
Q 1	Convert the Boolean expression $A\bar{B}C + \bar{B}C\bar{D} + A\bar{C}D$ to a standard sum of products (SOP) form.	4	CO2
Q 2	Using 2's complement representation, add +37 to -115.	4	CO1
Q 3	Determine the Boolean expression for the output of the logic circuit shown in the figure below. 	4	CO2
Q 4	Write a short note on ALU.	4	CO4
Q 5	Differentiate between ROM and RAM.	4	CO4
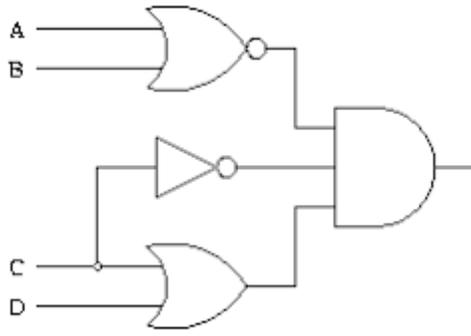
SECTION B

Q 5	Using a K-map, simplify the following function and realize it using NAND gate: $f(A,B,C,D) = \sum(1,4,6,7,8,9,10,11,15)$	10	CO2
Q 6	Draw the schematic of a 4 bit left shift register with parallel loading using D Flip-Flops. Also demonstrate its working.	10	CO3
Q 7	Draw the block diagram of a CRO and explain the function of each block? OR Demonstrate the working of an integrated circuit? Discuss the relative advantages and disadvantages of ICs over discrete assembly.	10	CO1
Q 8	A 555timer is used as an astable multivibrator. If R_A=4.7kΩ, R_B=10kΩ and C=680pF, determine its frequency and duty factor.	10	CO3

SECTION-C

Q 9	a) Draw a master-slave J-K Flip Flop system. Explain the various operation stages. How is the race around condition eliminated by using this Flip Flop? (10) b) Explain the working of 555 timer as monostable multivibrator with the help of circuit diagram and waveform. (10)	**20**	**CO3**
Q 10	a) Draw a labelled pin out diagram of a 8085 microprocessor and explain the function of each pin. (15) b) Describe the various flags used in 8085 microprocessor and show their bit positions (5) OR Explain in detail the instruction set of the 8085 microprocessor. (20)	**20**	**CO4**