B. E. ELECTRICAL ENGINEERING (PART TIME) 1ST YEAR 2ND SEMESTER EXAMINATION, 2017

Subject: Electronics-II　　　　Time: 3.0 Hours　　　　Full Marks: 100

No. of questions	Answer any **Five (5)** question: 5×20	Marks
1.	(a) Convert the following numbers: 　　(i)　　$(11011.101)_2 = ()_{10}$ 　　(ii)　　$(25.5)_{10} = ()_2$ 　　(iii)　　$(247)_{10} = ()_8$ 　　(iv)　　$(257)_8 = ()_{10}$ 　　(v)　　$(3A.2F)_{16} = ()_2$ (b) Represent $(-17)_{10}$ in (i) Sign-magnitude, (ii) 1's complement and (c) 2's complement representation. (c) Find the complement of $F = x + y\,z$; then show that $FF' = 0$ and $F + F' = 1$. (d) Given the Boolean function: $F = x\,y + x\,'y' + y\,'z$: Implement with AND, OR, and inverter gates. (e) Given the Boolean function: $F = x\,y'z + x\,'y' + w\,'x\,y + w\,x\,'y' + w\,x\,y$ (i) Obtain the truth table of the function, (ii) Draw the logic diagram and (iii) Simplify the function to a minimum number of literal using Boolean function algebra.	(5x1)+(3 x 1) +3+3+ (3 x 2)
2.	a) Express the following function in sum of min-terms and product of max-terms: 　$F(A, B, C, D) = B'D + A'D + BD$ (b) Given the Boolean function $F(A, B, C, D) = \Sigma (0, 1, 2, 3, 4, 8, 9, 12)$ (i) Simplify the function using *K- Map* in sum of product and product of sum (ii) implement the function using two level forms (x) NAND-AND and (y) AND-NOR	(3+3)+(4+4)+(3+3)
3.	a) A combinational circuit is defined by the following three Boolean functions: $F_1 = x\,'y'z' + x\,z$ $F_2 = x\,y'z' + x\,'y$ $F3 = x\,'y'z' + x\,y$ Design the circuit with a decoder and external gates (b) Implement the following Boolean function with a multiplexer: $F(A, B, C, D) = \Sigma (0, 1, 3, 4, 8, 9, 15)$ (c) Implement a full adder with two 4 x 1 multiplexers.	6+8+6
4.	a) What do you meant by an *oscillator*? (b) Classify the *oscillators* in accordance with *frequency generation*. (c)Explain the *oscillator principle*. (d) Give the circuit diagram of a *Wien-bridge oscillator* using ,*OPAMP*. 　Explain how oscillation principle is satisfied in this circuit? How the	2+3+3+(3+4+2)+3