B.E. ELECTRICAL ENGINEERING EXAMINATION 2019

SECOND YEAR FIRST SEMESTER

ELECTRONICS - II

Full Marks: 100 *(Use a separate answer script for each part)* Time: 3 hours

PART -I **Full Marks: 50**

1.	Answer **any FOUR** questions:	4x5
a.i)	State De Morgan's Theorem.	2
ii)	For a 16 term expression, all odd terms are true, except the last one. Find its minimized Boolean expression in SOP form.	3
b.i)	How XOR gate can be used as controlled inverter?	2
ii)	Design XOR gate using minimum no of NAND gate.	3
c.i)	Subtract $(1111)_2$ from $(1010)_2$ using 2's complement method.	2
ii)	Implement the function $F(A,B,C)=\sum m(1,3,5,6)$ by using only 4:1 multiplexer.	3
d)	Implement half subtractor circuit using minimum no. of NAND gates.	5
e.i)	What are the asynchronous inputs of flip flop? Explain their function.	2
ii)	Realize D flip flop using S-R flip flop.	3
2.	Answer **any FIVE** questions:	5x6
a.i)	Consider the function $F(A,B,C,D)=\sum m(0,2,3,6,7) + \sum d(8,10,11,15)$. By using Karnaugh map, find out its (a) minimal SOP and (b) minimal POS expressions.	3+3
b)	Design a 4- bit parallel adder. State its limitations.	4+2
c.i)	Establish the logical circuit diagram of 1:4 de-multiplexer.	4
ii)	Design XOR gate by using only 2:1 multiplexer.	2
d)	What is the *Race Around condition* appeared in a J-K flip flop? Describe how the problem is eliminated in a Master Slave configuration.	3+3
e)	Design MOD-6 synchronous counterwith thehelpof J-K flip flop.	6
f)	What is shift register? Implement Parallel In Serial Out (PISO) shift register using D flip flop.	1+5

Ref No. Ex/EE/ET/T/214/2019

B. ELECTRICAL ENGINEERING 2ND YEAR 1ST SEMESTER EXAMINATION, 2019
ELECTRONICS-II

Time: 3 Hours **Full Marks: 100**

Use separate Answer - Script for each Part
50 marks for each part

PART - II

Answer any **Five (5)** Questions from the followings: 10×5

1. Give a circuit diagram of an integrated current mirror circuit using two transistors Explain how it works? Show that the source current I is closely mirrored in the collector of second transistor.
2. Make a comparative study between discrete regulator and IC regulator. Give the circuit diagram of IC 7805 full wave voltage regulator circuit and explain the operation of this circuit.
3. What do you meant by constant sources and sinks? Explain with suitable circuit diagram and output characteristic how a BJT circuit provides a constant current?
4. Design an OPAMP RC Phase shift oscillator for oscillation frequency 320 MHz. Assume that $C = 0.12$ μF and $R_f > 15 \times R$ (Symbols have their usual meanings). Derive the necessary formula you use.
5. Differentiate between different multivibrators. Give the internal circuit diagram of 555 IC and explain its operation principle. Calculate the frequency (f), width (W) and duty cycle (D) of astable -multivibrator circuit using IC 555 with $R_1 = 70$ KΩ, $R_2 = 35$ KΩ and $C = 45$ nF (Symbols have their usual meanings).
6. Write down the salient feature of the Darlinton transistor? Show that for a Darlinton transistor $\beta_D = \beta_1 \times \beta_2$ (Symbols have their usual meanings). How the input impedance of this transistor is calculated?
7. Give the circuit diagram of complementary MOSFET (CMOS) NAND circuit. Explain how it performs the NAND operation?
8. Write short note (any two of the followings): 2×5
   a. Two input TTL NAND circuit
   b. Transistorised series voltage regulator
   c. Bootstrap circuit
   d. Schmitt trigger circuit