Code No: 153AB **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, March - 2022
ANALOG AND DIGITAL ELECTRONICS
(Common to CSE, IT, ECM, ITE, CSE(SE), CSE(CS), CSE(N))

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
Each Carries Equal Marks
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1.a) Explain the operation of PN junction under forward bias condition with its characteristics.
b) Describe the operation of Half Wave Rectifier with and without filters. [7+8]

2.a) Explain about RC coupled amplifier and sketch the frequency response plot of an RC coupled amplifier
b) A transistor operating in CB configuration has I_C = 2.98mA, I_E = 3.00 mA and I_{CO} =0.01 mA. What current will flow in the collector circuit of this transistor when connected in CE configuration with a base current of 30μA. [10+5]

3.a) What is thermal runaway? What is the condition for thermal stability in CE configuration?
b) Derive the expression for stability factor S in self-bias circuit. [8+7]

4.a) Explain the operation of JFET and draw the drain and transfer characteristics.
b) Explain about 2 input TTL NAND Gate. [10+5]

5.a) Convert the decimal number $(128.25)_{10}$ into binary, octal, hexadecimal number system.
b) Build basic gates AND, NOT, OR using NAND and NOR gates. [6+9]

6.a) Simplify the following Boolean expression into one literal. W′X(Z′+YZ) + X(W+Y′Z).
b) What is multiplexer? Draw circuit diagram of 8:1 multiplexer. Explain its working in brief. [6+9]

7.a) Design a full subtractor circuit by using K-map method and draw the logic diagram.
b) Explain 4-bit ring counter with circuit diagram and waveforms. [8+7]

8.a) Draw the logic diagram of clocked RS flip-flop using NAND gates and explain its working.
b) With a neat diagram, explain 3-bit parallel in serial out shift register. [7+8]

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