Code No: 153AC

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, March - 2022
ANALOG ELECTRONICS
(Electrical and Electronics Engineering)

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

Answer any five questions
All questions carry equal marks
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1.a) How does the reverse saturation current of a diode and voltage varies with temperature? Explain.
 b) Derive the expressions for the following parameters of the half wave rectifier circuit:
    i) Average DC current   ii) RMS value of current   iii) Rectifier efficiency.   [6+9]

2.a) Discuss the self bias circuit and derive the expression for S?
 b) Explain the drain characteristics of depletion MOSFET.   [7+8]

3.a) Explain the small signal model of CS MOSFET amplifier. Also derive the expression for amplification factor.
 b) Write short note on MOSFET as a resistor.   [10+5]

4.a) Explain the working of common emitter direct coupled amplifier.
 b) Prove that class B push pull amplifier efficiency is 78.5%.   [7+8]

5.a) Derive the voltage gain for unbalanced output differential amplifier.
 b) Explain the operation direct coupled class-A power amplifier.   [7+8]

6.a) Draw the circuit of current series feedback amplifier and derive the expressions for input and output resistances.
 b) Why are RC oscillators preferred for the generation of low frequencies?   [10+5]

7.a) Calculate the gain, input impedance and output impedance of voltage series feedback amplifier having A = -300, R_i =50KΩ and $\propto$ = -1/20.
 b) Explain non inverting op-amp circuit.   [7+8]

8.a) Construct an op-amp integrator circuit to and explain.
 b) Explain differential amplifier using one op-amp.   [8+7]

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