R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2021
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) What is PN junction diode? Explain the working of PN junction under forward bias and reverse bias with neat diagram.
  b) Explain the operation of a negative clipper with neat sketches.   [10+5]

2.a) Draw the input and output characteristics of a NPN transistor in CB configuration and explain.
  b) Compare Half Wave and Full Wave Rectifiers.   [10+5]

3.a) Draw the high frequency equivalent circuit of CS amplifier and derive the expressions for voltage gain, input and output impedance.
  b) Discuss MOSFET as a switch.   [10+5]

4.a) Draw the circuit diagram of transformer coupled class-A power amplifier and explain its operation. Also derive the expression of conversion efficiency.
  b) What are the limitations of single stage amplifiers and how are they overcome in multistage amplifiers?   [10+5]

5.a) Draw the circuit diagram of Hartley oscillator, derive the expression for frequency of oscillation.
  b) For the voltage series feedback amplifier, derive the expression for gain, input resistance.   [8+7]

6.a) Explain different coupling schemes used in multistage amplifiers with their frequency response.
  b) Calculate the gain, input impedance, output impedance of voltage series feedback amplifier having A=-300, Ri=1.5K, Ro=50K and β=-1/20.   [10+5]

7.a) Explain the following in detail:
     i) Input offset voltage   ii) Input offset current   iii) CMRR   iv) Slew Rate.
  b) With the help of a circuit diagram explain the functioning of square wave generator.
                                                                                       [8+7]

8.a) List the characteristics of an Ideal operational amplifier.
  b) Derive the transconductance g_m and drain resistance r_d of Field Effect Transistor small signal model.   [6+9]

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