Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree (S,FE) Examination December 2020 (2015 Scheme)

Course Code: EE203

Course Name: ANALOG ELECTRONIC CIRCUITS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks. Marks

1 With neat circuit diagram, explain the working of two level clipper. (5)

2 Explain construction and operation of depletion type metal oxide semiconductor FET with neat diagram. (5)

3 An amplifier has a mid frequency gain of 100 and bandwidth of 200kHz. What will be the new gain and bandwidth if 5% negative feedback is introduced? (5)

4 What are the characteristics of ideal op-amp? Compare it with practical opamp? (5)

5 Explain the working of zero crossing detector. (5)

6 Design an adder circuit to get the output voltage as $V_o = - [2V_1+3V_2+4V_3]$, where V_1, V_2 and V_3 are inputs to Op-Amp. (5)

7 Draw and explain square wave generator using op –amp. (5)

8 Differentiate between astable and monostable multivibrator operation with waveforms. (5)

PART B

Answer any two full questions, each carries 10 marks.

9 a) Derive the equation for voltage gain and current gain for a BJT using h - parameter model for Common Emitter configuration. (6)

b) A CE amplifier has the h-parameters given by h_{ie} = 1000Ω, h_{re} = 2.5 x 10^{-4}, h_{fe} = 50 and h_{oe} = 25 x 10^{-6} A/V. If the load resistance R_L = 10kΩ and source resistance is 100 Ω, determine the (a) current gain and (b) voltage gain. (4)

10 a) In a potential divider biasing circuit, V_{CC} = 22V, R_1 = 39kΩ, R_2 = 3.9kΩ, R_E = 1.5kΩ, R_C = 10kΩ, β=100. Determine the operating point. (5)

b) Explain how FET can be used as a voltage controlled resistance. (5)

11		Draw and explain common source FET amplifier. Using small signal equivalent circuit, derive the expression for input impedance, output impedance and voltage gain.	(10)

PART C

Answer any two full questions, each carries 10 marks.

12	a)	Draw the circuit diagram of a RC coupled amplifier. Explain the frequency response curve of RC coupled amplifier. Why does the gain fall off at low and high frequencies?	(5)
	b)	Prove that maximum efficiency of class B power amplifier is 78.5%.	(5)
13	a)	What is the role of coupling elements in multistage amplifiers? Compare different types of couplings used in multistage amplifier.	(6)
	b)	Explain the following terms regarding an op-amp (i) CMRR, (ii) Slew rate	(4)
14		With neat diagram, explain the working of Hartley oscillator. Derive the expression for frequency of oscillation.	(10)

PART D

Answer any two full questions, each carries 10 marks.

15	a)	Explain how op-amp can be used as a differentiator.	(5)
	b)	Design a Schmitt trigger circuit with LTP= -5V and UTP= +5V. Explain its operation.	(5)
16		With the help of internal functional diagram, explain the working of astable multivibrator using 555 timer.	(10)
17	a)	Explain how logarithmic amplifier is realized using op-amp.	(5)
	b)	Design a Wein bridge oscillator using opamp to have an output frequency of 3.5kHz.	(5)

****