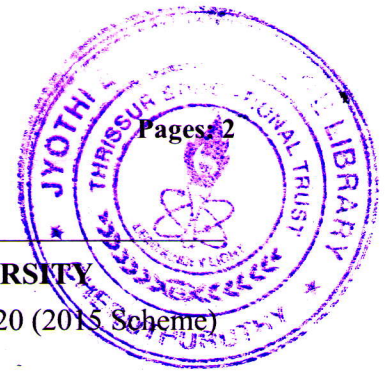


Reg No.: _____

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.*

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|----|--|-----|
| 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 $h_{ie} = 1000\Omega$, $h_{re} = 2.5 \times 10^{-4}$, $h_{fe} = 50$ and $h_{oe} = 25 \times 10^{-6} \text{ A/V}$. If the load resistance $R_L = 10k\Omega$ and source resistance is 100Ω , determine the (a) current gain and (b) voltage gain. | (4) |
| 10 | a) In a potential divider biasing circuit, $V_{CC} = 22V$, $R_1 = 39k\Omega$, $R_2 = 3.9k\Omega$, $R_E = 1.5k\Omega$, $R_C = 10k\Omega$, $\beta=100$. 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 (4)
- (i) CMRR, (ii) Slew rate
- 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)
