Reg No.:_____ Name:_____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

THIRD SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

**Course Code: EE203**

**Course Name: ANALOG ELECTRONICS CIRCUITS**

Max. Marks: 100 Duration: 3 Hours

**PART A**

***Answer all questions, each carries5 marks.*** Marks

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|---|---|---|---|
| 1 | | Design a clamper circuit to create a dc offset of -3V to a sine wave input of amplitude 5V also draw the output waveform | (5) |
| 2 | | Draw the frequency response of CE amplifier and explain why gain falls at very high frequencies & very low frequencies. | (5) |
| 3 | | What is the concept of negative feedback in amplifiers? List out the advantages of negative feedback in amplifiers. | (5) |
| 4 | | Show that the closed loop gain of opamp amplifier can be made independent of its open loop gain. | (5) |
| 5 | | Draw the circuit diagram of a Schmitt trigger. Why it is called as a regenerative comparator? | (5) |
| 6 | | Explain with neat circuit diagram, the operation of Logarithmic amplifier | (5) |
| 7 | | How triangular wave can be generated using opamps? | (5) |
| 8 | | Determine the output frequency of the 555 astable multivibrator for C=0.01µF, $R_A$=2kΩ & $R_B$=200kΩ. | (5) |

**PART B**

***Answer any twofull questions, each carries10 marks.***

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|---|---|---|---|
| 9 | | Design a Voltage divider circuit for a silicon transistor with $h_{fe}$=100 and S≤8. The desired Q-point is $V_{CE}$=5V, $I_C$=1mA. Assume $V_{CC}$=10V and $R_E$=1kΩ | (10) |
| 10 | | Explain using neat sketches, the operation & characteristics of a n-channel JFET. | (10) |
| 11 | a) | Illustrate with neat circuit diagram how the change in base emitter voltage is compensated in transistor amplifiers | (5) |
| | b) | Draw the Hybrid-π model of BJT and explain significance of each parameters. | (5) |

**PART C**

***Answer any twofull questions, each carries10 marks.***

| | | | |
|---|---|---|---|
| 12 | | Show that the maximum conversion efficiency of class A power amplifier can be increased using transformer coupling. | (10) |
| 13 | | Draw the neat circuit diagram of RC phase shift oscillator and derive its | (10) |

frequency of oscillations

14 a) List out the advantages and disadvantages of a transformer coupled multistage amplifier. (5)

b) How CMRR and Slew rate influence the performance of an opamp? (5)

## PART D

***Answer any twofull questions, each carries 10 marks.***

15 With neat circuit diagram, explain the operation of an Instrumentation amplifier and derive an expression for its voltage gain. What are its advantages? (10)

16 Draw the internal circuit diagram of 555 IC and explain its operation as astable multivibrator. (10)

17 a) Explain the working of half wave precision rectifier using neat circuit diagram (5)

b) With neat circuit diagram explain the operation of Wien bridge oscillator using opamp. (5)

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