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**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 carries 5 marks.*

Marks

- 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  $C=0.01\mu F$ ,  $R_A=2k\Omega$  &  $R_B=200k\Omega$ . (5)

**PART B**

*Answer any two full questions, each carries 10 marks.*

- 9 Design a Voltage divider circuit for a silicon transistor with  $h_{fe}=100$  and  $S\leq 8$ . (10)  
The desired Q-point is  $V_{CE}=5V$ ,  $I_C=1mA$ . Assume  $V_{CC}=10V$  and  $R_E=1k\Omega$
- 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- $\pi$  model of BJT and explain significance of each parameters. (5)

**PART C**

*Answer any two full questions, each carries 10 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 (10) and derive an expression for its voltage gain. What are its advantages?
- 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)

