Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree (S,FE) Examination January 2022 (2015 Scheme)

Course Code: CS207
Course Name: Electronic Devices & Circuits

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 3 marks.   Marks

1	Describe the operation of biased clipper and combination clipper.	(3)
2	Draw drain characteristics of JFET and explain how JFET works as VVR.	(3)
3	Derive the condition for a good differentiator.	(3)
4	What are the different types of MOSFET based on mode of operation.	(3)

PART B
Answer any two full questions, each carries 9 marks.

5 a) Design a loaded 5V Zener regulator for a load current of 50 mA. Input voltage is 10 V dc. Assume that Zener knee current is 5 mA.   (4)

   b) Design a low voltage regulator circuit using IC 723 to give an output voltage of 5V.   (5)

6 a) Describe the operation of transistorized series voltage regulator and also define load regulation in a voltage regulator.   (5)

   b) Draw & explain a circuit to generate an output voltage of , $V_o = 3\ V_{in}$.   (4)

7 a) A 1 KHz square wave is integrated using RC integrator first and then differentiated by RC differentiator. Draw the waveforms at   (4)

   a) Output of Integrator

   b) Output of differentiator.

   b) Assuming voltage drop across the diode as 0.6V, Design a diode shunt clipper with transfer characteristics as shown in the following diagram.   (5)
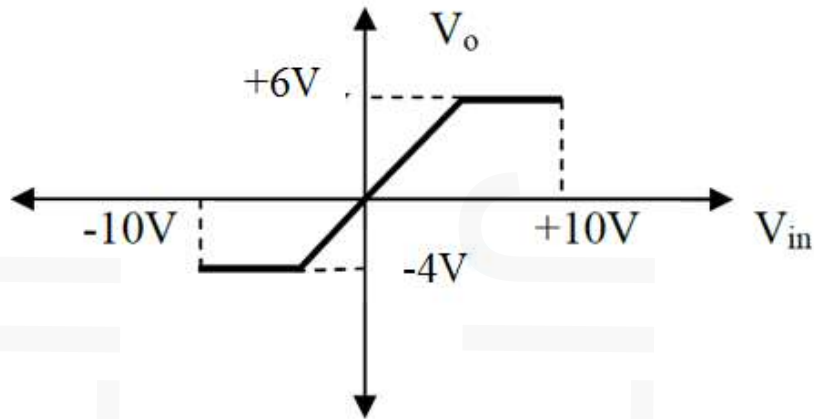
PART C

Answer all questions, each carries 3 marks.

8   In a transistor circuit , load resistance is 5KΩ and quiescent current is 2mA .   (3)
Determine the operating point when the battery voltage is Vcc= 12V.

9   Differentiate Oscillator from Amplifier.   (3)

10   Describe the effect of cascading in gain and bandwidth of amplifier.   (3)

11   Which circuit is known as 'free running oscillator' ? Why?   (3)

PART D

Answer any two full questions, each carries 9 marks.

12 a) With necessary equations explain the design of potential divider biasing for a   (4)
transistor in Common Emitter configuration.

    b) Draw the circuit diagram of a bi-stable multivibrator using transistors and   (5)
explain its working.

13 a) Design an RC Coupled Amplifier using transistors with the following   (6)
specifications :

Vcc = 12 V dc, Ic = 3 mA, hfe = 100, Lower cut off frequency = 100 Hz, Upper
cut off frequency = 100 KHz.

    b) Explain the working of a crystal oscillator with necessary diagrams.   (3)

14 a) Draw the circuit diagram and explain the working of a common source MOSFET   (4)
amplifier.

    b) Draw the circuit diagram and explain the working of Wien bridge oscillator for   (5)
an output frequency of 6 KHz.

PART E

Answer any four full questions, each carries 10 marks.

15 a) List important specifications of A/D or D/A Converters.   (4)

    b) Design a Summing amplifier and subtractor circuit using OP-Amp for two   (6)
        inputs.

16 a) Give the ideal characteristics of an OP-Amp. What are their typical values for   (5)
        IC741 OP-Amp.

    b) Draw the figure of an operational amplifier integrator and prove that the output is   (5)
        proportional to integral of the input.

17 a) Design a Wien bridge oscillator circuit using OP-Amp for a frequency of   (5)
        oscillation, 2KHz.

    b) With the help of necessary figures, explain about fastest type ADC.   (5)

18 a) Draw the block schematic of Successive Approximation type analog to digital   (5)
        converter and explain its working.

    b) Design an Astable Multivibrator using IC 555 for a frequency of 1 KHz and a   (5)
        duty cycle of 40%

19 a) Realise an active first order high pass filters using OP-Amps for a lower cut off   (5)
        frequency of 3 KHz and a pass band gain of 3.

    b) Design a regenerative comparator circuit with UTP= 2V and LTP= -3V. Assume   (5)
        input voltage is 10Vpp. Also mention Hysteresis window.

20 a) Describe: (1) Slew rate, (2) CMRR, (3) Offset voltage (4) Offset current   (4)

    b) Describe the working of a binary weighted D/A Converter, with necessary   (6)
        diagrams. What are its limitations?

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