Reg No.:_______________ 00000CS207121902 Name:___________________________

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

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

Course Code: CS207

Course Name: ELECTRONIC DEVICES AND CIRCUITS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		"A half wave rectifier is the simplest form of a clipper". Elaborate.	(3)
2		Design a passive circuit to convert a 2 KHz sinusoidal input to a cosine waveform.	(3)
3		Compare buck, boost and inverting types of DC to DC Converters.	(3)
4		Sketch and explain the working of a simple transistor shunt regulator.	(3)

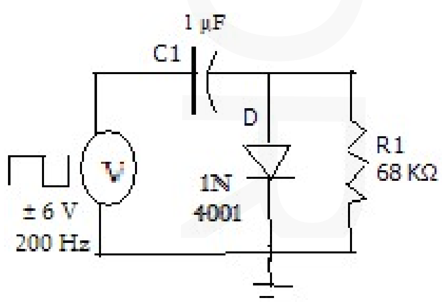
PART B

Answer any two full questions, each carries 9 marks.

5 a) Draw and explain the circuit of a slicer for levels of -3V and -6V. (4)

b) Draw and explain the block diagram of SMPS. (5)

6 a) Sketch and explain a biased clamper circuit using a zener diode. The clamper circuit shown below has a ± 6 V, 200 Hz square wave input. Determine the tilt in the output waveform. (4)



b) Draw and explain the functional block diagram of IC 723. (5)

7 a) Compare series and shunt voltage regulators (3)

b) Draw the characteristics and explain the working of an n-channel JFET. (6)

PART C

Answer all questions, each carries 3 marks.

8 Compare common emitter, common base and common collector amplifier configurations. (3)

9 Find the overall gain of a negative feedback amplifier with a gain of 200 and a feedback factor of 0.1 (3)

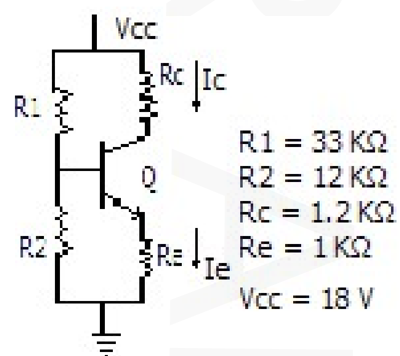
10 What do you mean by Barkhausen criteria? How is it satisfied in a Wein Bridge oscillator? (3)

11 Draw the circuit of a monostable multivibrator using transistors. Identify the operating regions of the transistors. (3)

PART D

Answer any two full questions, each carries 9 marks.

12 a) Analyse the biasing arrangement shown below and indicate its operating point on the load line. Given Vcc = 18 V, Ic ≈ Ie = 4.1 mA, R1 = 33 KΩ, R2 = 12 KΩ, Rc = 1.2 KΩ and Re = 1 KΩ. (6)



Also identify the function of each component in this circuit.

b) What will be the effect of negative feedback on the gain and bandwidth of an amplifier? (3)

13 a) With neat sketches, explain the working of a common source MOSFET amplifier. (5)

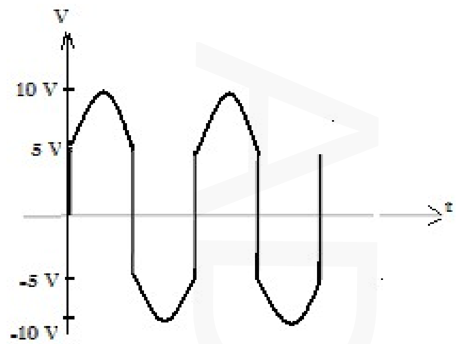
b) Derive an expression for frequency of oscillations of a Hartley oscillator. (4)

14 Draw and explain the circuit of a bistable multivibrator using transistors. Quote a few applications of bistable multivibrators. (9)

PART E

Answer any four full questions, each carries 10 marks.

15 a) Given a 10 V peak to peak sine wave input, design a circuit using OPAMPS to obtain the following output waveform: (6)



b) List down the important specifications of data converters. (4)

16 a) Design inverting and non inverting amplifiers using OPAMPS for voltage gains of 12 and 11 respectively. (4)

b) Design a 4 bit R-2R ladder type D/A Converter for a positive span of 10 V. Explain the working of the circuit. (6)

17 a) Draw and explain the circuit of a Wein Bridge oscillator using OPAMPS. (6)

b) Design a circuit using IC 555 to drive a LED for 0.5 second on and 0.5 second off continuously. (4)

18 a) Design an active differentiator for a frequency of 2 KHz. (6)

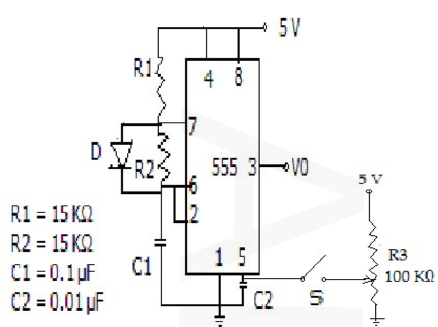
b) Compare active and passive filters. (4)

19 a) Draw the circuit of an OPAMP adder and explain its working. (4)

b) Sketch and explain a successive approximation type of A/D Converter. (6)

20 a) Draw the circuit of an OPAMP Schmitt Trigger and explain its working. What are the applications of Schmitt Trigger? (5)

b) Analyse the following circuit diagram and plot the output waveform. Given Vcc = 5 V, R1 = R2 = 15KΩ, C1 = 0.1 μF and C2 = 0.01 μF. If the switch S is closed and the potentiometer R3 is varied, how will the circuit respond? (5)



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