Reg No.:		: Name:	_
		APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY THIRD SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019	
		Course Code: CS207	
		<b>Course Name: ELECTRONIC DEVICES AND CIRCUITS</b>	
Ma	x. M	Tarks: 100 Duration: 3	Hours
		Answer all questions, each carries 3 marks.	Marks
1		Derive the input- output relationship of an RC integrator circuit.	(3)
2		Draw and explain the circuit of a 78XX IC based voltage regulator.	(3)
3		Design a loaded 5.1 V zener diode voltage regulator for a load current of 20 mA.	(3)
		Input voltage is 12 V dc. Assume that zener knee current is 5 mA.	
4		Distinguish between	(3)
		(i) Series and Shunt Clippers	
		(ii) Positive and Negative Clippers	
		PART B Answer any two full questions, each carries 9 marks.	
5	a)	Draw and explain the circuit of a voltage doubler.	(3)
	b)	With the help of characteristic curves, explain the principle of operation of a	(6)
		Junction Field Effect Transistor. Mark its regions of operation on the curve.	
6	a)	Draw and explain the transistorised sweep circuit using a normally off transistor	(4)
		switch.	
	b)	Draw and explain the circuit of a series voltage regulator.	(5)
7	a)	Design circuits using passive components to perform the following waveform	(4)
		conversions:	
		(i) 2 KHz triangular wave to square wave	
		(ii) 0.5 KHz square wave to triangular wave	
	b)	Draw and explain the block diagram of SMPS.	(5)
		PART C	
		Answer all questions, each carries 3 marks.	
8		Explain thermal runaway in transistors.	(3)
9		Draw the circuit of a monostable multivibrator using transistors.	(3)
10		Compare BJT and FET.	(3)
11		State and explain Barkhausen Criteria.	(3)

## PART D

## Answer any two full questions, each carries 9 marks.

12 Design an RC Coupled Amplifier using transistors with the following (9) specifications :

 $V_{cc} = 12$  V dc,  $I_c = 2$  mA,  $h_{fe} = 125$ , Lower cut off frequency = 100 Hz, Upper cut off frequency = 100 KHz.

- 13 a) What are the effects of cascading on the gain and bandwidth of transistor (3) amplifier circuits.
  - b) Sketch and explain a Wein Bridge Oscillator using transistors. Explain how (6) conditions for sustained oscillations are satisfied in this circuit.
- 14 With neat sketches and waveforms, explain the working of an Astable (9) Multivibrator using transistors.

## PART E

## Answer any four full questions, each carries 10 marks.

- 15 a) Draw and explain the circuit of a differential amplifier. (5)
  b) Realise an active first order high pass filters using OPAMPS for a lower cut off (5) frequency of 1 KHz and a pass band gain of 2.
  16 a) Derive an expression for voltage gain of an inverting and non-inverting (6) operational amplifier.
  b) Compare active and passive filters. (4)
- 17 a) Draw and explain a sample and hold circuit. Quote a few of its applications. (6)
  - b) Explain the terms CMRR and Slew Rate of an OPAMP. Also specify the typical (4) values for IC 741.
- 18 a) Draw and explain the circuit of a Schmitt Trigger using OPAMPS. Explain the (6) terms UTP and LTP of a Schmitt Trigger.
  - b) Compare binary weighted and R-2R ladder D/A Converters. (4)
- 19 a) Draw and explain the circuit of a summing amplifier using OPAMP. Realise (5)  $Y(t) = 5 V_1 + 2 V_2 - 4V_3$  where  $V_1$ ,  $V_2$  and  $V_3$  are input magnitudes.
  - b) Sketch and explain the circuit of a monostable multivibrator using IC 555. (5)
- 20 a) Explain the circuit of a Wein Bridge Oscillator using OPAMPS (5)
  - b) Design an Astable Multivibrator using IC 555 for a frequency of operation (5)
     2 KHz and a duty cycle 60%.

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