Reg. No._____

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Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY THIRD SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017

Course Code: CS207 Course Name: ELECTRONIC DEVICES AND CIRCUITS (CS)

Max. Marks 100

Duration: 3Hours

PART A

(Answer ANY THREE questions)

1. Assuming voltage drop across the diode as 0.6V, design a diode shunt clipper with transfer characteristics as shown in the following diagram.

$$+5V$$

$$+5V$$

$$+10V$$

$$+10V$$

$$V_{in}$$

$$(4)$$

2. Assuming voltage drop across the diode as 0.6V, sketch the output waveform and voltage transfer characteristics of the following circuit.

20V V_{PP}, 1kHz
$$C$$
 T RL (4)

- 3. Compare the properties of FET over BJT. (4)
- 4. Explain the functional diagram of LM723. (4)

PART B

(Answer ANY TWO questions)

- 5. With neat sketches explain the construction, principle of operation, and characteristics of an n-channel enhancement MOSFET. (9)
 6. (i)What are the necessary conditions for an RC circuit to be a differentiator? (2) (ii)Explain the working of an RC differentiator circuit for a square wave input with period T.Sketchits output waveform for RC >> T, RC << T and RC = T. (7)
 7. (i) Explain the working of a simple series voltage regulator using transistor. (5)
- (ii)Discuss about simple sweep circuit using transistor.



PART C

(Answer ANY THREE questions)

8.	State and explain Barkhausen criteria for sustained oscillation.	(4)
9.	Explain the effect of cascading on amplifier's gain and bandwidth.	(4)
10.	Briefly describe the working of a Hartley oscillator.	(4)
11.	Explain the effect of negative feedback on amplifier.	(4)

PART D

(Answer ANY TWO questions)

12.	(i) With neat diagram, explain the working principle of Wien bridge oscillator using	BJT.
		(5)
	(ii)Derive the expression for the frequency of oscillation of Wien bridge oscillator	using
	BJT.	(4)
13.	(i) Sketch and explain the frequency response of an RC coupled amplifier	(4)
	(ii) With neat diagram, explain the working of astable multivirator using BJT.	(5)
14.	(i)Explain Potential divider biasing for a transistor in Common Emitter configuration	with
	necessary equations.	(4)
	(ii) A transistor with h_{FEmin} = 50 is to be used in the potential divider bias configurate	ion in
	Common emitter mode with V_{CC}=18V, V_{BE}=0.7V R_1=33 k\Omega, R_2=12 k\Omega, R_E=1k\Omega	,R _C =
	1.2k Ω and. Calculate biasing current I_C , I_B , I_E and voltages Vc, V_E , V_{CE} .	(5)

PART E

(Answer ANY FOUR questions)

15.	(i) List out the ideal characteristics of an OP-AMP. What are their typical values for	
	IC741 OP-AMP.	(5)
	(ii)With neat diagram, explain the working and transfer characteristics of a non-invert	ing
	Schmitt trigger using OP-AMP. (4)	5)
16.	(i) With necessary equations explain the working of an integrator circuit using OP-AMI	Р
	for a square wave input with period T. (4)	5)
	(ii) What do you mean by differential amplifier? With neat sketches, explain the work	ing
	of an open loop OP-AMP differential amplifier. (4)	5)
17.	(i) Explain the working of Summing amplifier and subtractor circuit using OP-AMP.	(3)
	(ii)Design a summing amplifier circuit using OP-AMP to yield $V_0 = -V_1 + 2V_2 - 3^{\circ}$	V ₃ .
	(2)

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18. (i) With neat functional diagram explain the working of monostable multivibrator using				
IC555 timer.	(7)			
(ii) Design a monostable multivibrator using IC 555 timer for a pulse period of 1 ms.	(3)			
19. (i) Drawthe circuit diagram and frequency response of a first order low pass butterw				
filter using OP-AMP and explain its working and.	(6)			
(ii) Design a first order butterworth LPF using OP-AMP for a cut off frequency of 2k	κHz			
with a pass band gain of 2.	(4)			
20. (i)Explain the working principle of a R-2R ladder type DAC.	(6)			
(ii)A 4-bit R-2R ladder type DAC having R= 10 k Ω and V _R = 10 V. Find its resolut				
and output voltage for an input 1101.	(4)			