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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech (minor) Degree Examination December 2020

Course Code: ECT281
Course Name: ELECTRONIC CIRCUITS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks Marks

1 Explain a positive shunt clipper with biasing voltage of 3.5 volts. Draw the relevant output waveform. (3)

2 With neat sketches explain the principle and working of RC integrator circuit. (3)

3 Distinguish between enhancement type and depletion type MOSFET. (3)

4 Explain the effect of cascading in amplifier's gain & bandwidth. (3)

5 State and explain Barkhausen criteria for sustained oscillation. (3)

6 Find maximum & minimum value of Zener diode current shown in Figure:1. (3)

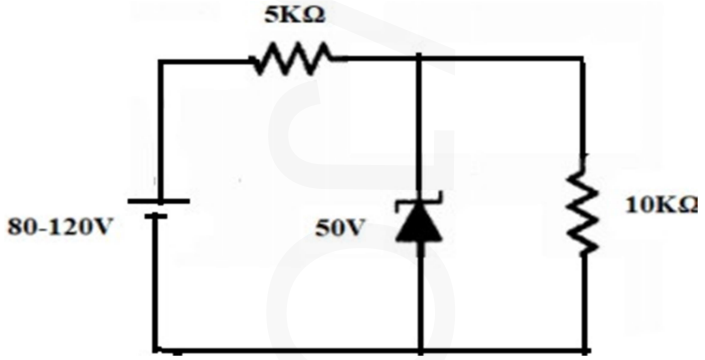

Figure: 1

7 Give a comparison of the characteristics of ideal and practical Op Amp (IC741). (3)

8 Draw and explain the transfer characteristics of a Schmitt trigger. (3)

9 List important specifications of ADC. (3)

10 Explain sample & hold circuit with neat diagram. (3)

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

11 a) A transistor with hFEmin= 50 is to be used in the potential divider bias (7)

configuration in Common emitter mode with V_{CC} =18V, V_{BE} = 0.7 V, R_1=33 kΩ, R_2 = 12 kΩ, R_E = 1 kΩ, R_C = 1.2 kΩ. Calculate biasing current I_C, I_B, $I_E$and voltages V_C, V_E and V_{CE}.

b) What is the significance of bias stabilization of a transistor? Also comment onthe various stability factors (7)

OR

12 a) Design a circuit using passive components to convert a 1 KHz triangular wave to a square wave. (5)

b) Give a detailed account on the different types of clamping circuits. (9)

Module 2

13 a) With the help of a circuit diagram explain the working of RC coupled amplifier. (8)

b) Draw and explain the frequency response of a RC coupled amplifier. (6)

OR

14 With neat sketches explain the construction, principle of operation & characteristics of an n-channel enhancement MOSFET. (14)

Module 3

15 a) With a neat diagram explain the working of Hartley oscillator using BJT. (7)

b) Explain the working of a simple series voltage regulator using transistor. (7)

OR

16 a) With a neat diagram, explain the working principle of Wein bridge oscillator using BJT. (10)

b) Compare linear regulator with switched mode regulator. (4)

Module 4

17 a) Realize Y(t) =5V1+2V2- 4V3 using an operational amplifier where V1,V2 and V3 are input voltages. (5)

b) Derive the expression for voltage gain of an inverting and non inverting amplifier. (9)

OR

18 a) What do you mean by differential amplifier? With neat sketches, explain the working of an OP-AMP differential amplifier with necessary equations. (9)

b) Differentiate Common mode gain and differential mode gain of a (5)

differential amplifier. The difference amplifier shown in Figure: 2 have R_1= R_2 = 5KΩ, R_F= 10KΩ, Rg = R_F. Calculate the output voltage.

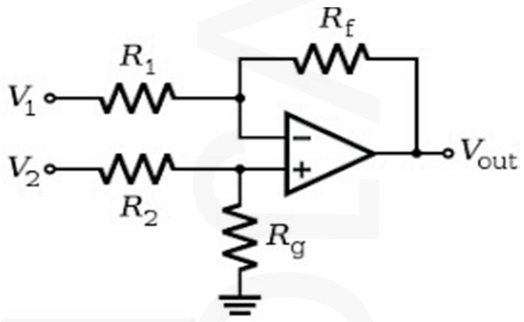

Figure: 2

Module 5

19	a)	Explain in detail a 3-bit R-2R ladder type DAC. A 4-bit R-2R ladder type DAC having R=10KΩ and VR=1V. Find its resolution and output voltage for an input 1101.	(10)
	b)	What are the important specifications of DAC?	(4)

OR

20	a)	Design an astable multivibrator to generate a waveform of 1KHz, with 70% duty cycle using 555 timer. Assume C = 0.1μF	(7)
	b)	Explain the working of a 3- bit flash ADC with neat diagram.	(7)

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