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Name: _____

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

Course Code: CS207

Course Name: ELECTRONIC DEVICES AND CIRCUITS (CS)

Max. Marks: 100

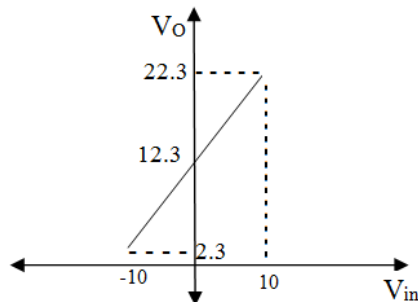
Duration: 3 Hours

PART A

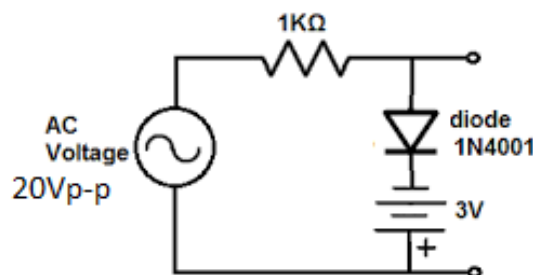
Answer all questions, each carries 3 marks.

Marks

- 1 Design a clamper circuit to get the following transfer characteristics, assuming voltage drop across the diode is 0.7V. (3)



- 2 Draw the output waveform of the following circuit, assuming voltage drop across the diode is 0.7V. (3)



- 3 Compare linear regulator with switching regulator. (3)
 4 Compare FET with BJT (3)

PART B

Answer any two full questions, each carries 9 marks.

- 5 a) With neat sketches explain the principle and working of RC integrator circuit. (5)
 b) Explain the response of an RC integrator circuit for a square wave input. (4)
 6 a) With neat sketches explain the working of n-channel JFET. (5)
 b) Draw the characteristics of n-channel JFET (4)
 7 a) Draw and explain a circuit whose output voltage is three times as that of input voltage. (5)
 b) Discuss about simple zener shunt voltage regulator with the help of circuit diagram. (4)

PART C

Answer all questions, each carries 3 marks.

- 8 Define stability factor. Write down the expression for stability factor S. (3)
 9 Compare positive feedback with negative feedback. (3)

- 10 What is meant by sustained oscillation? What are the criteria's for obtaining sustained oscillations? (3)
- 11 An astable multivibrator having $R_1=2\text{K}\Omega$, $R_2=20\text{K}\Omega$ and $C_1=0.01\mu\text{F}$, $C_2=0.05\mu\text{F}$. Determine the period and frequency of oscillation. (3)

PART D

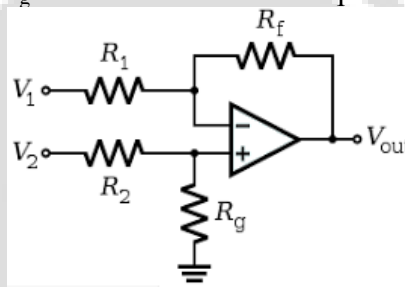
Answer any two full questions, each carries 9 marks.

- 12 a) With the help of circuit diagram explain the working of RC coupled amplifier. (5)
b) Draw and explain the frequency response of RC coupled amplifier. (4)
- 13 a) With neat diagram explain the working of Hartley oscillator using BJT. (4)
b) Derive the expression for frequency of oscillation and loop gain of a Hartley oscillator using BJT. (5)
- 14 a) Explain the effect of negative feedback on amplifiers. (5)
b) With neat diagram explain the working of monostable multivibrator using BJT (4)

PART E

Answer any four full questions, each carries 10 marks.

- 15 a) With neat diagram explain the working and hysteresis curve of a non inverting Schmitt trigger using op amp. (6)
b) The difference amplifier shown in the figure having $R_1=R_2=5\text{K}\Omega$, $R_f=10\text{K}\Omega$, $R_g=1\text{k}\Omega$. Calculate the output voltage. (4)



- 16 a) Explain RC differentiator circuit using op amp. (4)
b) With the help of diagram explain a three input inverting summing amplifier. (4)
c) Realize a circuit to obtain $V_o = -2V_1 + 3V_2 + 4V_3$ using operational amplifier. Use minimum value of resistance as $10\text{K}\Omega$. (2)
- 17 a) With neat diagram explain the working of Wien bridge oscillator using op-amp. (5)
b) Derive the expression for frequency of oscillation of Wien bridge oscillator using op-amp. (5)
- 18 a) Explain the working principle of a successive approximation type ADC. (5)
b) A 4-bit R-2R ladder type DAC having $R=10\text{K}\Omega$ and $V_R=10\text{V}$. Find its resolution and output voltage for an input 1101. (5)
- 19 a) Draw the circuit diagram and frequency response of a second order high pass Butterworth filter using OP-AMP and explain its working. (5)
b) Design a first order Butterworth LPF using OP-AMP for a high cut off frequency of 1KHz and passband gain is 2. Give the design steps and draw the frequency response. (Assume $C=0.01\mu\text{F}$) (5)
- 20 a) With neat diagram explain the working of IC555 timer. (5)
b) Design an astable multivibrator using IC 555 timer for a frequency of 1KHz and a duty cycle of 70%. Assume $C=0.1\mu\text{F}$. (5)
