E E7252

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: CS207

Course Name: ELECTRONIC DEVICES AND CIRCUITS (CS)

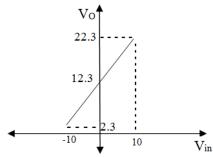
Max. Marks: 100 **Duration: 3 Hours**

PART A

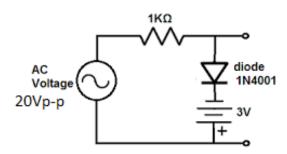
Answer all questions, each carries 3 marks.

Marks

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



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



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

PART B

Answer any two full questions, each carries 9 marks.

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

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)

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| 10 | | What is meant by sustained oscillation? What are thecriteria's for obtaining sustained oscillations? | (3) |
|----|----|--|-----|
| 11 | | An astable multivibrator having R_1 = $2K\Omega$, R_2 = $20K\Omega$ and C_1 = $0.01\mu F$, C_2 = $0.05\mu F$. | (3) |
| | | Determine the period and frequency of oscillation. | |
| | | 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 | (6) |
| | | Schmitt trigger using op amp. | |
| | b) | The difference amplifier shown in the figure having $R_1=R_2=5K\Omega$, $R_F=10K\Omega$, $R_g=1k\Omega$. Calculate the output voltage. | (4) |
| | | $V_1 \circ \longrightarrow V_{\text{out}}$ $V_2 \circ \longrightarrow R_2$ $R_2 \longrightarrow R_g$ | |
| 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 Vo= $-2V_1+3V_2+4V_3$ using operational amplifier.Use minimum value of resistance as $10K\Omega$. | (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 $R=10~K\Omega$ and $V_R=10V$. Find its | (5) |
| 19 | ۵) | resolution and output voltage for an input 1101. | (5) |
| 19 | a) | Drawthe 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 of frequency of 1KHz and passband gain is 2. Give the design steps and draw the frequency | (5) |
| | | response. (Assume C=0.01μF) | |
| 20 | a) | With neat diagram explain the working of IC555 timer. | (5) |
| | b) | Design an astablemultivibrator using IC 555 timer for a frequency of 1KHz and a | (5) |

duty cycle of 70%. Assume c=0.1μF.