Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017

Course Code: **CS207**

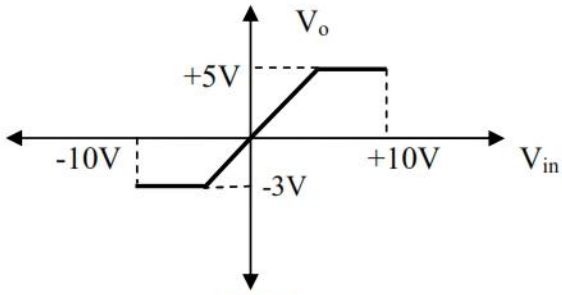
Course Name: **ELECTRONIC DEVICES AND CIRCUITS (CS)**

Max. Marks 100 Duration: 3Hours

PART A

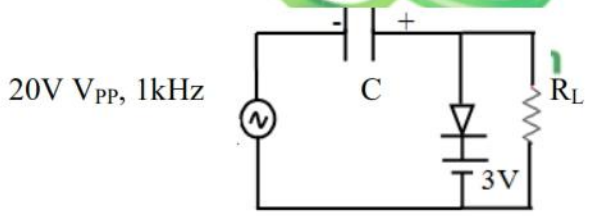
(Answer ANY THREE questions)

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



(4)

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



(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 $RC \gg T$,$RC \ll T$ 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. (4)

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 configuration in Common emitter mode with V_{CC}=18V,V_{BE}=0.7V. R_1=33 kΩ,R_2= 12 kΩ, R_E= 1kΩ ,R_C= 1.2kΩ 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-inverting Schmitt trigger using OP-AMP. (5)

16. (i) With necessary equations explain the working of an integrator circuit using OP-AMP for a square wave input with period T. (5)

    (ii) What do you mean by differential amplifier? With neat sketches, explain the working of an open loop OP-AMP differential amplifier. (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 $V_0 = -V_1 + 2V_2 - 3V_3$. (2)

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 butterworth 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 2kHz 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 kΩ and V_R= 10 V. Find its resolution and output voltage for an input 1101. (4)