Reg. No. : | | | | | | | | | | |

Question Paper Code: 51529

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Second Semester

Electronics and Instrumentation Engineering

15UEI209 - ELECTRONIC DEVICES AND CIRCUITS

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Tunnel diode is a PN diode with

    (a) Very high doping in p region
    (b) Very high doping in n region
    (c) Very high doping in both p and n region
    (d) Low doping in both p and n region

2. In Schottky barrier diode, conduction is

    (a) Entirely by electrons
    (b) Entirely by holes
    (c) Mainly by holes but partly by electrons
    (d) Mainly by electrons but partly by holes

3. After firing an SCR, if the gate pulse is removed the SCR current.

    (a) Remains the same   (b) Reduces to zero
    (c) Rises up   (d) Rises a little and then falls to zero

4. The JFET can operate in

    (a) depletion mode only
    (b) enhancement mode only
    (c) either depletion or enhancement mode at a time
    (d) both depletion and enhancement modes simultaneously

5. In a JFET, beyond the pinch off voltage as the drain voltage increase the drain current

    (a) Remains almost constant   (b) Decreases

    (c) Increases   (d) May increase or decrease

6. The current gain of amplifier stage is lowest in

    (a) Common base configuration   (b) Common emitter configuration

    (c) Common collector configuration   (d) Same in all configuration

7. The reason for cross over distortion in a push-pull amplifier is that

    (a) the transistor are overdriven at cross over points

    (b) switching of current from one transistor to the other

    (c) the combined transfer characteristic of the two transistors is most nonlinear at
        zero base current

    (d) the input signals rise fast at their zeros

8. In the Barkhausen criterion, the loop gain A is equal to

    (a) ∞ (b) 200,000   (c) 0   (d) 1

9. Mono-stable multi vibrator may be used to generate

    (a) Sweep voltage   (b) Pulses

    (c) Sinusoidal voltage   (d) Sweep current

10. Schmitt trigger is also known as

    (a) Squaring circuit   (b) Sweep circuit

    (c) Blocking oscillator   (d) Astable multivibrator

PART - B (5 x 2 = 10 Marks)

11. What is meant by Zener breakdown?

12. How the MOSFET does has high input impedance?

13. List out the characteristics of CE amplifier.

14. In the Hartley oscillator L_2 = 0.4 mH and C = 0.004micro farad. If the frequency of the
    oscillator is 120KHz, find the value of L_1. Neglect the mutual inductance.

15. Give two applications of bistable multivibrator.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss the construction and operation of a tunnel diode with a neat energy band
    diagram.   (16)

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Or

(b) (i) What is thermal runaway? Derive the necessary condition to avoid the thermal runaway. (8)

   (ii) Explain the operation of NPN and PNP transistor with neat diagram. (8)

17. (a) (i) Explain the transfer characteristics and drain characteristics of JFET. (10)

   (ii) In a n-channel JFET I_{DSS} =2 mA and V_P= -6V. Calculate the drain Current when V_{GS}= -3V. (6)

Or

(b) With neat diagram, explain the operation, VI characteristics and transfer characteristics of N-channel depletion type MOSFET. (16)

18. (a) Draw the hybrid-π common emitter transistor model and derive the values of the various components in terms of the h-parameters. (16)

Or

(b) (i) Derive the equation for efficiency of a class B amplifier. (8)

   (ii) What is cross over distortion? How it can be minimized. (8)

19. (a) (i) Draw the circuit diagram of a Wein bridge oscillator and briefly explain its operation. (8)

   (ii) In an RC phase shift oscillator if R1=R2=R3=200Kohm and C1=C2=C3=100PF. Find the frequency of the oscillation. (8)

Or

(b) Describe Hartley oscillator with neat circuit diagram. Determine the frequency of oscillations and the oscillation conditions for it. (16)

20. (a) What is multivibrator? On what basis are multivibrators classified? With neat sketch explain the working of an Astable multivibrator. (16)

Or

(b) With the circuit details, explain the operation of a Schmitt trigger using transistors. Show how Schmitt trigger can be used for wave shaping purposes. List out the application of Schmitt trigger. (16)

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