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Question Paper Code: 41251

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

Second Semester

Electronics and Instrumentation Engineering

14UEI207 - ELECTRONIC DEVICES AND CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

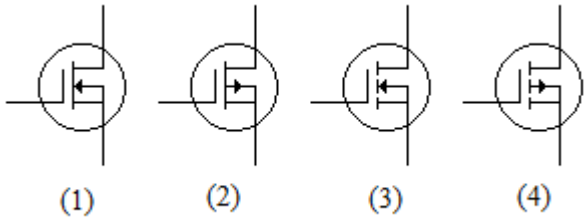
1. The Schottky diode is used

   (a) in high-power circuits
   (b) in circuits requiring negative resistance
   (c) in very fast-switching circuits
   (d) in power supply rectifiers

2. Which transistor bias circuit arrangement provides good Q-point stability, but requires both positive and negative supply voltages?

   (a) base bias (b) collector-feedback bias
   (c) voltage-divider bias (d) emitter bias

3. Identify the n-channel D-MOSFET



(a) (1) (b) (2) (c) (3) (d) (4)

4. The SCR can be triggered on by a pulse at the

(a) gate (b) anode (c) cathode (d) none of the above

5. An emitter-follower is also known as a

(a) common-emitter amplifier (b) common-base amplifier
(c) common-collector amplifier (d) darlington pair

6. Which type of power amplifier is biased for operation at less than 180^{o} of the cycle?

(a) Class A (b) Class B or AB (c) Class C (d) Class D

7. Feedback in an amplifier always helps to

(a) control its output (b) increase its gain
(c) decrease its input impedance (d) stabilize its gain

8. Which of the following factors do not affect the frequency stability of an oscillator?

(a) output load
(b) inter-element capacitances and stray capacitances
(c) temperature variation
(d) coil size

9. The clamper circuit is used to

(a) introduce a DC level into AC signal
(b) suppress variations in amplitude of the input signal
(c) obtain an output which is integral of the input signal
(d) remove a certain portion of the input signal

10. A transistor series voltage regulator is called emitter-follower regulator because the emitter of the pass transistor follows the _____voltage

(a) output (b) input (c) base (d) collector

PART - B (5 x 2 = 10 Marks)

11. Why do we choose Q point at the center of the load line?

12. List the applications of SCR.

13. Define hybrid parameters.

14. Give the two Barkhausen conditions required for sinusoidal oscillations to be sustained.

15. What is a multivibrator?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the diffusion and transition capacitances and also derive the expressions for CD and CT. (16)

Or

(b) Describe the static input and output characteristics of CE configuration of a transistor with neat circuit diagram. (16)

17. (a) (i) Compare DMOSFET and EMOSFET. (8)

(ii) Discuss the voltage divider bias for FET. (8)

Or

(b) Explain the working and principle of operation of UJT and mention its applications. (16)

18. (a) Draw and explain the h-parameter equivalent circuit of a transistor in CE configuration. Derive the expressions for input impedance, output impedance, voltage gain and current gain. (16)

Or

(b) With neat circuit diagram, explain the working principle of push-pull Class B amplifier. (16)

19. (a) Discuss the different voltage / current – series / shunt feedback connections with expression for gain, input resistance and output resistance. (16)

Or

(b) Explain RC phase oscillator and derive its frequency of oscillation. (16)

20. (a) (i) Explain astable multivibrator with neat sketch. (8)

(ii) Explain the operation of a zener diode shunt voltage regulator. (8)

Or

(b) With necessary waveforms, explain the full-wave bridge rectifier with and without filter. Also derive the necessary expressions. (16)

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