

SE_E&TC May_2020 ELECTRONIC DEVICES AND CIRCUITS-I CBCGS-
HSUBJECT-CODE-PCC-ETC-301 Marks: 50

1. An intrinsic semiconductor at absolute zero temperature acts as ----- . (1M)
 - a) Insulator
 - b) Conductor
 - c) Superconductor
 - d) Rectifier
2. A trivalent atom used for doping in semiconductor is called ----- . (1M)
 - a) Acceptor
 - b) Donor
 - c) Catalyst
 - d) Fermi level
3. Doping of trivalent atom leads to creation of ----- extrinsic semiconductor.
 - a) P type
 - b) N type
 - c) Junction
 - d) Barrier potential (1M)
4. A pure, undoped semiconductor material is called as ----- semiconductor.
 - a) Intrinsic
 - b) Extrinsic
 - c) Acceptor
 - d) Donor (1M)
5. Drift current is due to ----- .
 - a) Applied voltage
 - b) Difference in carrier concentration
 - c) Temperature
 - d) Barrier potential (1M)
6. A Germanium diode contains ----- volt as cut-in voltage. (1M)
 - a) 0.3
 - b) 0.7
 - c) 1
 - d) 1.3
7. The leakage current in a diode is due to (2M)
 - a) minority carriers
 - b) majority carriers
 - c) junction capacitance
 - d) doping
8. Zener diode is operated in ----- condition for voltage regulation (1M)
 - a) Forward biased

- b) Reverse biased
 - c) Short circuited
 - d) Unbiased condition
9. Operating point in a working transistor amplifier should be at----- when used as amplifier.
- a) cut off region
 - b) saturation region
 - c) mid of load line
 - d) anywhere (2M)
10. BJT is a ----- device. (1M)
- a) Unipolar
 - b) Bipolar
 - c) Passive
 - d) Active unipolar
11. The base current in a transistor is very small and is of the order of (1M)
- a) mA
 - b) A
 - c) μA
 - d) kA
12. If $\beta = 250$ and I_B is $10 \mu\text{A}$, then $I_C =$ (2M)
- a) 2.5 mA
 - b) 25 mA
 - c) 10 mA
 - d) 1 mA
13. In a fixed bias common emitter circuit $R_B = 250 \text{ K}\Omega$, $V_{CC} = 5$, and $V_{BE} = 0.7 \text{ V}$ then $I_B =$ (2M)
- a) $17.2 \mu\text{A}$
 - b) $28.8 \mu\text{A}$
 - c) $38.8 \mu\text{A}$
 - d) $48.8 \mu\text{A}$
14. In a fixed bias common emitter circuit $R_B = 100 \text{ K}\Omega$, $V_{CC} = 5$, $\beta = 200$ and $V_{BE} = 0.7 \text{ V}$ then $I_C =$ (2M)
- a) 8.6 mA
 - b) 10.6 mA
 - c) 12.6 mA
 - d) 14.6 mA
15. ----- model is most suitable model of transistor for its ac analysis. (1M)
- a) Hybrid Pi
 - b) T-model
 - c) z- model

- d) Y- model
16. Output ac resistance of a bipolar transistor for given V_A (Early voltage) = 35 V and collector current $I_{CQ} = 1$ mA is ----- (2M)
- 35 k Ω
 - 40 k Ω
 - 45 k Ω
 - 50 k Ω
17. $r_{\pi} =$ ----- for $I_{CQ} = 0.5$ mA and $B(\beta) = 100$ with $V_T = 26$ mV. (2M)
- 5.2 k Ω
 - 4.28 k Ω
 - 3.28 k Ω
 - 6.28 k Ω
18. Assume that $I_{CQ} = 0.5$ mA and $V_T = 26$ mV then $g_m =$ ----- (2M)
- 21.23 mA/V
 - 19.23 mA/V
 - 22.23 mA/V
 - 23.23 mA/V
19. $r_{\pi} =$ ----- for $I_{CQ} = 0.5$ mA and $B(\beta) = 350$ with $V_T = 26$ mV. (2M)
- 18.2 k Ω
 - 12.4 k Ω
 - 14.4 k Ω
 - 16 k Ω
20. JFET is a ----- device. (1M)
- Unipolar
 - Bipolar
 - Passive
 - Active bipolar
21. In P-channel JFET, current carriers are ----- (1M)
- Holes
 - Electrons
 - Positive ions
 - Negative ions
22. The gate in a JFET controls ----- (1M)
- The width of the channel
 - Output voltage
 - Input voltage
 - Recombination
23. For a n-channel JFET, $I_{DSS} = 2$ mA, $V_p = -3.5$ V and $V_{GS} = 0$ V then $I_D =$ ----- (2M)
- 2 mA
 - 3 mA
 - 4 mA
 - 5 mA
24. In JFET transistor, Gate and Source are ----- biased. (1M)
- Reverse
 - Forward
 - Independently

d) Not

25. Drain current in a JFET for a given value of $V_p = -3.5$ V, $I_{DSS} = 5$ mA and $V_{GS} = V_p/2$ is

- a) 1.25 mA
- b) 2.25 mA
- c) 3.25 mA
- d) 4.25 mA (2M)

26. The input impedance of an ideal FET is ----- (1M)

- a) Zero Ω
- b) Infinite Ω
- c) 100 K Ω
- d) 500 k Ω

27. Lower and upper cut off frequencies of an amplifier is 0 Hz and 2 kHz therefore bandwidth of the amplifier is-----.

- a) 2 kHz
- b) 1kHz
- c) 1.5 kHz
- d) 4 kHz (2M)

28. Voltage gain in an amplifier is given as ----- (1M)

- a) V_{out}/V_{in}
- b) V_{in}/V_{out}
- c) I_{out}/V_{in}
- d) V_{out}/I_{in}

29. Voltage gain of an amplifier is 150 and, input applied voltage is $v_i = 0.5$ mV therefore output voltage is-----.

- a) 75 mV
- b) 85 mV
- c) 95 mV
- d) 100 mV (2M)

30. Junction capacitors are ----- while calculating mid band amplifier gain. (1M)

- a) Treated short
- b) Treated open
- c) Replaced with resistors
- d) Replaced with current sources

31. For a Darlington pair of transistors which relation is correct? (1M)

(B = overall current gain, B_1 and B_2 are gain from individual amplifier)

- a) $B = B_1 * B_2$
- b) $B = B_1 + B_2$
- c) $B = B_1 - B_2$
- d) $B = B_1 / B_2$

32. In a Darlington pair transistor, emitter of first transistor is connected to the----- of second transistor.

- a) Emitter

- b) Base
- c) Collector
- d) Emitter and base (1M)

33. A Darlington transistor has (1M)

- a) A very low input impedance
- b) Three transistors
- c) A very high current gain
- d) One VBE drop

34. Let $\beta_1=250$ and $\beta_2= 250$, then overall current gain in a Darlington pair transistor is -----

-.

- a) 62,500
- b) 0
- c) 500
- d) 1 (2M)

35. Let $\beta_1=150$ and $\beta_2= 150$, then overall current gain in a Darlington pair transistor is -----

-.

- a) 22500
- b) 300
- c) 1
- d) 0 (2M)