BJT Basic

Q1. A transistor has ……

1. one pn junction
2. two pn junctions
3. three pn junctions
4. four pn junctions

Answer : 2

Q2. The number of depletion layers in a transistor is ……

1. four
2. three
3. one
4. two

Answer : 4

Q3. The base of a transistor is……doped

1. heavily
2. moderately
3. lightly
4. none of the above

Answer : 3

Q4. The element that has the biggest size in a transistor is ……..

1. collector
2. base
3. emitter
4. collector-base-junction

Answer : 1

Q5. In a pnp transistor, the current carriers are …….

1. acceptor ions
2. donor ions
3. free electrons
4. holes

Answer : 4

Q6. The collector of a transistor is.....doped

1. heavily
2. moderately
3. lightly
4. none of the above

Answer : 2

Q7. A transistor is a.....operated device

1. current
2. voltage
3. both voltage and current
4. none of the above

Answer : 1

Q8. In a npn transistor,.....are the minority carriers

1. free electrons
2. holes
3. donor ions
4. acceptor ions

Answer : 2

Q9. The emitter of a transistor is.....doped

1. lightly
2. heavily
3. moderately
4. none of the above

Answer : 2

Q10. In a transistor, the base current is about.....of emitter current

1. 25%
2. 20%
3. 35 %
4. 5%

Answer : 4

Q11. At the base-emitter junctions of a transistor, one finds ……

1. a reverse bias
2. a wide depletion layer
3. low resistance
4. none of the above

Answer : 3

Q12. The input impedance of a transistor is …….

1. high
2. low
3. very high
4. almost zero

Answer : 2

Q13. The output impedance of a transistor is ……..

1. high
2. zero
3. low
4. very low

Answer : 1

Q. In a transistor, signal is transferred from a.....**circuit**

1. high resistance to low resistance
2. low resistance to high resistance
3. high resistance to high resistance
4. low resistance to low resistance

Answer : 2

Q. The arrow in the symbol of a transistor indicates the direction of …….

1. electron current in the emitter
2. electron current in the collector

3. hole current in the emitter
4. donor ion current

Answer : 3

Q. Most of the majority carriers from the emitter ……..

1. recombine in the base
2. recombine in the emitter
3. pass through the base region to the collector
4. none of the above

Answer :3

Q. The current I_B is ……

1. electron current
2. hole current
3. donor ion current
4. acceptor ion current

Answer : 1

Q. In a transistor ……..

$I_C = I_E + I_B$

$I_B = I_C + I_E$

$I_E = I_C - I_B$

$I_E = I_C + I_B$

Answer : 4

Q. A heat sink is generally used with a transistor to ……

1. increase the forward current
2. decrease the forward current
3. compensate for excessive doping
4. prevent excessive temperature rise

Answer : 4

Q. The most commonly used semiconductor in the manufacture of a transistor is …….

1. germanium
2. silicon

3. carbon
4. none of the above

Answer : 2

BJT Configuration

Q16. The value of α of a transistor is …….

1. more than 1
2. less than 1
3. 1
4. none of the above

Answer : 2

Q17. $I_C = \alpha I_E$ + ……..

1. I_B
2. I_{CEO}
3. I_{CBO}
4. βI_B

Answer : 3

Q19. In a tansistor, I_C = 100 mA and I_E = 100.2 mA. The value of β is ……

1. 100
2. 50
3. about 1
4. 200

Answer : 4

Q20. In a transistor if β = 100 and collector current is 10 mA, then I_E is ……

1. 100 mA
2. 100.1 mA
3. 110 mA
4. none of the above

Answer : 2

Q21. The relation between β and α is ……..

1. $\beta = 1 / (1 - \alpha)$
2. $\beta = (1 - \alpha) / \alpha$
3. $\beta = \alpha / (1 - \alpha)$
4. $\beta = \alpha / (1 + \alpha)$

Answer : 3

Q22. The value of β for a transistor is generally ……..

1. 1
2. less than 1
3. between 20 and 500
4. above 500

Answer : 3

Q23. The most commonly used transistor arrangement is ……. arrangement

1. common emitter
2. common base
3. common collector
4. none of the above

Answer : 1

Q24. The input impedance of a transistor connected in …….. arrangement is the highest

1. common emitter
2. common collector
3. common base
4. none of the above

Answer : 2

Q25. The output impedance of a transistor connected in ……. arrangement is the highest

1. common emitter
2. common collector
3. common base
4. none of the above

Answer : 3

Q26. The phase difference between the input and output voltages in a common base arrangement is …….

1. 180^o
2. 90^o
3. 270^o
4. 0^o

Answer : 4

Q27. The power gain in a transistor connected in.....arrangement is the highest

1. common emitter
2. common base
3. common collector
4. none of the above

Answer : 1

Q28. The phase difference between the input and output voltages of a transistor connected in common emitter arrangement is ……

1. 0^o
2. 180^o
3. 90^o
4. 270^o

Answer : 2

Q29. The voltage gain in a transistor connected in ……. arrangement is the highest

1. common base
2. common collector
3. common emitter
4. none of the above

Answer : 3

Q30. As the temperature of a transistor goes up, the base-emitter resistance ……

1. decreases
2. increases
3. remains the same
4. none of the above

Answer : 1

Q31. The voltage gain of a transistor connected in common collector arrangement is ……..

1. equal to 1
2. more than 10
3. more than 100
4. less than 1

Answer : 4

Q32. The phase difference between the input and output voltages of a transistor connected in common collector arrangement is ……

1. 180^o
2. 0^o
3. 90^o
4. 270^o

Answer : 2

Q33. If the value of α is 0.9, then value of β is ……..

1. 9
2. 0.9
3. 900
4. 90

Answer : 4

Q46. When transistors are used in digital circuits they usually operate in the …….

1. active region
2. breakdown region
3. saturation and cutoff regions
4. linear region

Answer : 3

Q A current ratio of I_C/I_E is usually less than one and is called ……

1. beta
2. theta
3. alpha
4. omega

Answer : 3

QA transistor has a β_{DC} of 250 and a base current, I_B, of 20 μ A. The collector current, I_C, equals to …….

1. 500 μA
2. 5 mA
3. 50 mA
4. 5 A

Answer : 2

Q Voltage-divider bias provides …….

1. an unstable Q point
2. a stable Q point
3. a Q point that easily varies with changes in the transistor's current gain
4. a Q point that is stable and easily varies with changes in the transistor's current gain

Answer : 2

Q To operate properly as a amplifier, a transistor's base-emitter junction must be forward biased with reverse bias applied to which junction?

1. collector-emitter
2. base-collector
3. base-emitter
4. collector-base

Answer : 4

Q54. The ends of a load line drawn on a family of curves determine ……

1. saturation and cutoff
2. the operating point
3. the power curve
4. the amplification factor

Answer : 1

Q The C-B configuration is used to provide which type of gain?

1. voltage
2. current
3. resistance
4. power

Answer : 1

Q57. The Q point on a load line may be used to determine ……

1. V_C
2. V_{CC}
3. V_B
4. I_C

Answer : 3

Q58. A transistor may be used as a switching device or as a …….

1. fixed resistor
2. tuning device
3. rectifier
4. variable resistor

Answer : 4

Q59. If an input signal ranges from 20–40 μA (microamps), with an output signal ranging from .5–1.5 mA (milliamps), what is the ac beta?

1. 0.05
2. 20
3. 50
4. 500

Answer : 3

Q60. Beta's current ratio is ……..

1. I_C/I_B
2. I_C/I_E
3. I_B/I_E
4. I_E/I_B

Answer: 1

Q61. A collector characteristic curve is a graph showing ……..

1. emitter current (I_E) versus collector-emitter voltage (V_{CE}) with (V_{BB}) base bias voltage held constant
2. collector current (I_C) versus collector-emitter voltage (V_{CE}) with (V_{BB}) base bias voltage held constant
3. collector current (I_C) versus collector-emitter voltage (V_C) with (V_{BB}) base bias voltage held constant

4. collector current (I_C) versus collector-emitter voltage (V_{CC}) with (V_{BB}) base bias voltage held constant

Answer: 2

Q62. With low-power transistor packages, the base terminal is usually the …….

1. tab end
2. middle
3. right end
4. stud mount

Answer: 2

Q63. When a silicon diode is forward biased, V_{BE} for a CE configuration is ……..

1. voltage-divider bias
2. 0.4 V
3. 0.7 V
4. emitter voltage

Answer: 3

Q64. What is the current gain for a common-base configuration where I_E = 4.2 mA and I_C = 4.0 mA?

1. 16.8
2. 1.05
3. 0.2
4. 0.95

Answer: 4

Q65. With a PNP circuit, the most positive voltage is probably ……

1. ground
2. V_C
3. V_{BE}
4. V_{CC}

Answer: 1

Q66. If a 2 mV signal produces a 2 V output, what is the voltage gain?

1. 0.001
2. 0.004
3. 100
4. 1000

Answer: 4

Q67. Most of the electrons in the base of an NPN transistor flow ……

1. out of the base lead
2. into the collector
3. into the emitter
4. into the base supply

Answer: 2

Q68. In a transistor, collector current is controlled by ……..

1. collector voltage
2. base current
3. collector resistance
4. all of the above

Answer: 2

Q69. Total emitter current is ……

1. $I_E - I_C$
2. $I_C + I_E$
3. $I_B + I_C$
4. $I_B - I_C$

Answer: 3

Q70. Often a common-collector will be the last stage before the load; the main function(s) of this stage is to ……

1. provide voltage gain
2. provide phase inversion
3. provide a high-frequency path to improve the frequency response
4. buffer the voltage amplifiers from the low-resistance load and provide impedance matching for maximum power transfer

Answer: 4

Q71. For a CC configuration to operate properly, the collector-base junction should be reverse biased, while forward bias should be applied to …..... junction.

1. collector-emitter
2. base-emitter
3. collector-base
4. cathode-anode

Answer: 1

Q72. The input/output relationship of the common-collector and common-base amplifiers is ……..

1. 270 degrees
2. 180 degrees
3. 90 degrees
4. 0 degrees

Answer: 4

Q73. If a transistor operates at the middle of the dc load line, a decrease in the current gain will move the Q point …….

1. off the load line
2. nowhere
3. up
4. down

Answer: 4

Q74. Which is the higher gain provided by a CE configuration?

1. voltage
2. current
3. resistance
4. power

Answer: 4

Q75. What is the collector current for a CE configuration with a beta of 100 and a base current of 30 μ A?

1. 30 μ A
2. 0.3 μ A
3. 3 mA
4. 3 MA

Answer: 3