CORE I - BASIC ELECTRONICS AND COMPUTER FUNDAMENTALS

For BSc Computer Science Off Campus Stream

1. The advantage of transistor over vacuum tube is

1. No heat is required
2. Small size and light in weight
3. Very low power consumption
4. **All of the above**

2. Aging effect exists in

1**. Vacuum tubes only**
2. Transistors only
3. Both vacuum tubes as well as transistors
4. None of the above

3. A collector collects

1. Electrons from the base in case of PNP transistor
2. Electrons from the emitter in case PNP transistor
3. Holes from the base in case of NPN transistor
4. **Holes from the base in case of PNP transistor**

4. In a PNP transistor, with normal bias

1. The collector junction has negligible resistance
2. Only holes cross the collector junction

3. **The collector –base junction in reverse biased and the emitter base junction is forward biased**

4. Only majority carriers cross the collector junction

5. A PNP transistor is made of

1. Silicon
2. Germanium
3. **Either silicon or germanium**
4. None of the above

6. In most transistors, the collector region is made physically larger than the emitter region

1. **for dissipating heat**
2. to distinguish it form other regions
3. as it is sensitive to ultra-violet rays
4. to reduce resistance in the path of flow of electrons

7. In a transistor which of the following region is very lightly doped and is very thin

1. Emitter
2. **Base**
3. Collector
4. None of the above

8. In a NPN transistor the function of the emitter is

1. To emit or inject holes into the collector
2. To emit or inject electrons into the collector

3. **To emit or inject electrons into the base**

4. To emit or inject holes into the base

9. In a PNP transistor, with normal bias, the emitter junction

1. is always reverse biased

2. offers very high resistance

3. **offers a low resistance**

4. remains open

10. In a NPN transistor, when emitter junction is forward biased and collector junction is reverse biased, the transistor will operate in

1. **Active region**

2. Saturation region

3. Cut off region

4. Inverted region

11. A transistor will operate in inverted region when

1. Emitter junction is forward biased and collector junction is reverse biased

2. **Emitter junction is reverse biased and collector junction is forward biased**

3. Emitter junction as well as collector junction are forward biased

4. Emitter junction as well as collector junction are reverse biased

12. In a PNP transistor, electrons flow

1. Into the transistor as the collector only

2. **Into the transistor at the base and the collector leads**

3. Out of the transistor at base and collector leads

4. Out of the transistor at base collector as well as emitter leads

13. Which of the following statement is correct

1. FET and junction transistor both are unipolar

2. FET and junction transistor both are bipolar

3. The FET is bipolar, while junction transistors are unipolar

4. **The FET is unipolar, while junction transistors are bipolar**

14. Most small signal transistors are

1. **NPN, silicon, in a plastic package**

2. PNP, silicon, ina plastic package

3. NPN, germanium in a metallic case

4. PNP, germanium in a metallic case

15. A transistor may fail due to

1. Open weld at the wire leads to the semiconductor

2. Short circuit caused by momentary overloads

3. Overheating due to circuit failures

4. **Any of the above**

16. The transistor is usually encapsuled in

1. Graphite powder

2. Enamel point

3. **Epoxy resin**

4. Any of the above

17. Arrow head on a transistor symbol indicates

1. Direction of electron current in emitter

2. **Direction of hole current in emitter**

3. Diffusion current in emitter

4. Drift current in emitter

18. Power transistors are invariably provided with

1. Soldered connections

2. **Heat sink**

3. Metallic casing

4. None of the above

19. The heat sink disposes off heat mainly by

1. Radiation

2. **Natural convection**

3. Forced convection

4. Conduction

20. Largest current flow of a bipolar transistor occurs

1. **In emitter**

2. In base

3. In collector

4. Through emitter-collector

21. Conventional biasing of a bipolar transistor has

1. EB forward biased and CB forward biased
2. EB reversed biased and CB forward biased
3. **EB forward biased and CB reverse biased**
4. EB reversed biased and CB reverse biased

22. Which of the following number specification refers to FET with one gate

1. 2N
2. **3N**
3. 3Y
4. 3X

23. In a NPN transistor if the emitter junction is reverse biased and collector junction is also reversed biased, he transistor will operate in

1. Active region
2. Saturation region
3. **Cut-off region**
4. Inverted region

24. In a normally biased NPN transistor the main current crossing the collector junction is

1. **A drift current**
2. A hole current
3. A diffusion current
4. Same as the base current

25. A transistor has

1. Collector
2. Emitter
3. Base

26. A diac is a semi-conductor device which acts as a

1. 2 terminal unidirectional switch
2. **2 terminal bidirectional switch**
3. 3 terminal bidirectional switch
4. 4 terminal multi-directional switch

27. In a NPN transistor, when emitter junction is forward biased and collector junction is reverse biased the transistor will operate in

1. **Active region**
2. Saturation region
3. Cut-off region
4. Inverted region

28. Which of the following is necessary for transistor action

1. The base region must be very wide
2. **The base region must be very narrow**
3. The base region must be made of some insulating material
4. The collector region must be heavily doped

29. A triac is a semi-conductor device which acts as a

1. 2 terminal unidirectional switch
2. 2 terminal bidirectional switch
3. **3 terminal bidirectional switch**
4. 4 terminal multi-directional switch

30. Which of the amplifier circuits using junction transistors has the best gain

1. **Common emitter**
2. Common base
3. Common collector
4. All above has the same gain

31. Which circuit has its output signal from the emitter

1. Common base
2. Common emitter
3. **Emitter follower**
4. None of the above

32. In a transistor with normal bias

1. **The emitter junction has a low resistance**
2. The emitter junction has a very high resistance
3. The emitter junction supplies majority carriers into the base region
4. None of the above

33. In a PNP transistor the electron flow into the transistor at

1. I only

2. II only

3 II and III only

4. **I and III only**

34. In a PNP junction transistor as compared to base region the emitter region is more heavily doped so that

1. Leakage current is minimized

2. Recombination will be increased in the base region

3. The flow across the base regional is only because of electrons

4. **The flow across the base region is mainly because of holes**

35. In a transistor leakage current mainly depends on

1. Doping of base

2. size of emitter

3. Rating of transistor

4. **Temperature**

36. Thermal run away of a transistor occurs when

1. Heat dissipation from transistor is excessive

2. Transistor joints melt due to high temperature

3. **There is excessive leakage current due to temperature rise**

4. None of the above

37. The leakage current in CB configuration may be around

1. **Few microamperes**
2. Few hundred microamperes
3. Few milliamperes
4. **Few hundred milliamperes**

38. The input and output signals for CE amplifier are always

1. Equal
2. Inphase
3. **Out of phase**
4. Complementary to each other

39. As compared to a CB amplifier, a CE amplifier has

1. Lower current amplification
2. **Higher current amplification**
3. Lower input resistance
4. Higher input resistance

40. Which junction transistor is preferred for high input an low output impedance

1. Common emitter
2. Common base
3. **Common collector**
4. Any of the above

41. Common base configuration is little used because

1. **It has low input impedance**

2. It has high input impedance

3. It does not heat up

4. It has very high gain

42. Common emitter transistor has

1. **High current and high voltage gain**

2. Low current gain and low voltage gain

3. High current gain and low voltage gain

4. Low current and voltage gain

43. Which of the following circuit would be preferred for a 45kHz IF amplifier

1. Resistance loaded

2. **Double tuned transformer**

3. Video amplifier

4. Class C

44. A FET has a gate source bias of -2V. The ac input signal is +-1.2V. The class of operation will be

1. A

2. B

3. C

4. AB

45. Emitter region in NPN transistor is more heavily doped than base region so that

1. Flow across the base region will be mainly of holes

2. **Flow across the base region will be mainly of electrons**

3. Base current is low

4. Base current is high

46. The leakage current in CE configuration may be around

1. Few nanoamperes

2. Few microamperes

3. **Few hundred microamperes**

4. Few milliamperes

47. Which class of amplifiers operates with leas distortion

1. Class A

2. Class B

3. Class C

4. Class D

48. When a transistor is connected in common emitter mode, it will have

1. Negligbile input resistance and high output resistance

2. High input resistance and low output resistance

3. **Medium input resistance and high output resistance**

4. Low input resistance as well as output resistance

49. Which of the following statement is correct

1. **The emitter injects holes into the base region of the PNP transistor and electrons into the base region of the NPN transistor**

2. The emitter injects electrons into the base region of the PNP transistor and holes into the base region of the NPN transistor

3. The emitter junction is reverse biased in the NPN transistors and forward biased in NPN transistor

4. None of the above

50. A FET has

1. **Very high input resistance**

2. Very low input resistance

3. High connection emitter junction

4. Forward based PN junction

51. A quiescent state of a transistor implies

1. Zero bias

2. No output

3. No distortion

4. **No input signal**

52. Which of the following is not provided in a PNP transistor

1. Base

2. Collector

3. Emitter

4. **Heater**

53. Which of the following amplifier circuit using junction transistor has the best gain

1. Common base

2. **Common emitter**

3. Common collector

4. All have the same gain

54. Which of the following represents class B amplifier

1. With a tube, cut off is -4V, the grid bias is -2V, and the ac signal is +-1V

2. With a silicon NPN transistor, cut off voltage is 0.5V, the bias is +0.6V and the ac signal is +-50 mV

3. Output current flows for 120 degree of the input cycle

4. **None of the above**

55. Each of two cascaded stages has a voltage gain of 30. The overall gain is

1. 3

2. 9

3. 30

4. **900**

56. The Darlington pair consists of the following two stages

1. CE and CC

2. **Both CE**

3. Both CC

4. CE and CB

57. In amplifiers, the parasitic oscillations result due to

1. **Transistor inter-junction capacitance**

2. Push pull operator

3. Negative feedback

4. Poor inter-stage coupling

58. Which of the following combinations has no phase inversion of the signal

1. **Two CE stages**

2. CE and CC stages

3. Three CE stages

4. CE stage and emitter follower

59. The circuit consisting of two transistors connected in series with dc supply voltage is called

1. Push pull

2. Differential pair

3. **Stacked V+**

4. Complementary symmetry

60. In oscillators class C operation is preferred because it

1. **Is most efficient**

2. has frequent stability

3. Gives larger output

4. It produces nearly square waves

61. Three cascaded stages have gains of 10, 20 and 25. The overall gain will be

1. 10

2. 55

3. 500

4. **5000**

62. How many cascaded stages of CE amplifiers will result in polarity inversion of the input signal

1. Two

2. **Three**

3. Five

4. None

63. Which coupling produces the minimum interference with frequency response

1. RC coupling

2. Transformer coupling

3. **Direct coupling**

4. Impedance coupling

64. Complementary symmetry use two transistors that are

1. Both NPN

2. Both PNP

3. **PNP and NPN**

4. Both FET

65. Which of the following circuits can operate class AB for audio power output

1. Emitter follower

2. Push pull

3. Cascade

4. **Darlington pair**

66. A dc amplifiers

1. dc only

2. ac only

3. **both ac and dc**

4. Neither of the above

67. A bipolar transistor is a _____ controlled device whereas a FET is a _____ controlled device

1. **Current –voltage**

2. Current-current

3. Voltage-current

4. Voltage-voltage

68. Which of the following devices acts as an NPN and a PNP transistor connected base to base and emitter to collector

1. UJT

2. **SCR**

3. Diac

4. Triac

69. Which of the following is the fastest switching device

1. JFET

2. BJT

3. **MOSFET**

4. Triode

70. Which of the following statement is false

1. The zener diode is used as a constant voltage-source

2. The SCR is a silicon rectifier with a gate electrode to control when current flows from cathode to anode

3. The gate electrode in the FET corresponds to the collector in a bipolar transistor

4. **None of the above**

71. Which of the following is the point of reference JFET

1. Drain

2. Gate

3. **Source**

4. None of the above

72. A Junction Field Effect Transistor can operate in

1. **Depletion mode only**

2. Enhancement mode only

3. Depletion and enhancement modes

4. Neither depletion nor enhancement mode

73. The properties of JFET resemble those of

1. Thermionic valves

2. **NPN transistors**

3. PNP transistors

4. Unijunction transistor

74. The input gate current of FET is close to

1. Few amperes

2. Few milliamperes

3. Few microamperes

4. **Negligibly smaller value**

75. Which one of the following is a unipolar device

1. **FET**

2. PN diode

3. Zener diode

4. None of the above

76. Which of the following is not true in case of FET

1. It has high input impedance

2. It is less noisy than bipolar transistor

3. **It has large (gain x bandwidth)**

4. All of the above

77. When n-channel depletion type MOSFET are used in enhanced mode

1. **The gate will be positive**

2. The gate will be negative

3. The gate will be at ground level

78. The cascaded amplifier which is often used in ICs is

1. Inductively coupled
2. Capacitively coupled
3. **Direct coupled**
4. Transformer coupled

79. Which one of the following is expected to have the highest input impedance

1. **MOSFET**
2. JEFT amplifier
3. CE bipolar transistor
4. Common collector bipolar transistor

80. Highest operating frequency can be expected in case of

1. **Bipolar transistor**
2. JFET
3. MOSFET
4. All have nearly same frequency