ELECTRONICS

ALL LECTURES

اللهم صل على محمد وعلى آل محمد، كما صليت على إبراهيم وعلى آل إبراهيم
إنك حميد مجيد، اللهم بارك على محمد وعلى آل محمد كما باركت على إبراهيم
وعلى آل إبراهيم إنك حميد مجيد

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[ANSWERED]

1) Electric circuit theory and electromagnetic theory are the two fundamental theories upon which all branches of electrical engineering are built.
a) T *
b) F
(Slide 5)

2) Many branches of electrical engineering, such as power, electric machines, control, electronics, communications, and instrumentation, are based on electric circuit theory.
a) T *
b) F
(Slide 5)

3) An electric circuit is an interconnection of … elements.
a) physical
b) electrical *
(Slide 6)

4) Electric circuit basic components
a) battery
b) lamp
c) connecting wires
d) All of the above *
(Slide 6)

5) Electrical devices take the energy of electric current and transform it in simple ways into some other form of energy – most likely light, heat or motion
a) T *
b) F
(Slide 6)

6) Electronic devices manipulate electric current in a way that adds meaningful information to the current.
a) T *
b) F
(Slide 8 .. Electronic => adds meaningful information, Electrical => transform it in simple ways)

7) the most complicated electronic devices have simple electrical components in them
a) T *
b) F
(Slide 11)

8) simple electrical devices often include some electronic components.
   a) T *
   b) F
   (Slide 10)

9) Length basic unit (SI)
   a) meter *
   b) centimeter
   (Slide 12)

10) Mass basic unit (SI)
   a) gram
   b) Kilogram *
   (Slide 12)

11) Time basic unit (SI)
   a) second *
   b) Minute
   (Slide 12)

12) Electric current basic unit (SI)
   a) ampere *
   b) kilo ampere
   (Slide 12)

13) Thermodynamic temperature basic unit (SI)
   a) Kelvin *
   b) Celsius
   (Slide 12)

14) Luminous intensity (SI)
   a) landau
   b) candela *
   (Slide 12)

15) When a conducting wire is connected to a battery, the charges are compelled to move; positive charges move in one direction and negative charges move in the same direction. This motion of charges creates an electric current.
   a) T
   b) F *
   (Slide 14 .. negative charges move in the opposite direction)

16) …. is the time rate of change of charge
a) Electric current *
b) Voltage
(Slide 15)

17) 1 ampere= 1coulomb/second
a) T *
b) F
(Slide 15)

18) … is a current that varies sinusoidally with time.
a) dc
b) ac *
(Slide 16)

19) … is a current that remains constant with time.
a) dc *
b) ac
(Slide 16)

20) … is the energy required to move a unit charge through an element
a) Electric current
b) Voltage *
(Slide 17)

21) 1 volt = 1 joule/coulomb
a) T *
b) F
(Slide 17)

22) w is energy in ..
a) coulombs
b) joules *
c) ampere
d) watts
(Slide 17)

23) q is charge in …
a) coulombs *
b) joules
c) ampere
d) watss
(Slide 17)

24) is the time rate of expending or absorbing energy
   a) Energy
   b) Power *
   (Slide 18)

25) p is power in
   a) coulombs
   b) joules
   c) ampere
   d) watts *
   (Slide 18)

26) p = +vi
   a) supplying power
   b) absorbing power *
   (Slide 19)

27) p = -vi
   a) supplying power *
   b) absorbing power
   (Slide 19)

28) is the capacity to do work
   a) Power
   b) Energy *
   c) Voltage
   d) current
   (Slide 20)

29) is capable of generating energy
   a) active element *
   b) passive element
   (Slide 21)

30) resistors, capacitors, and inductors.
   a) active element
   b) passive element *
   (Slide 21)

31) generators, batteries, and operational amplifiers.
   a) active element *
   b) passive element
   (Slide 21)

32) The most important active elements are voltage or current sources that generally deliver power to the circuit connected to them.
a) T *
b) F
(Slide 22)

33) There are two kinds of sources: independent and dependent sources.
a) T *
b) F
(Slide 22)

34) … is an active element that provides a specified voltage or current that is completely independent of other circuit variables.
a) independent source *
b) dependent source
(Slide 23)

35) … Is an active element in which the source quantity is controlled by another voltage or current.
a) independent source
b) dependent source *
(Slide 24)

36) .. are usually designated by diamond-shaped symbols.
a) independent source
b) dependent source *
(Slide 24)

37) Types of dependent sources
a) A voltage-controlled voltage source (VCVS).
b) A current-controlled voltage source (CCVS).
c) A voltage-controlled current source (VCCS).
d) A current-controlled current source (CCCS).
e) All of the above *
(Slide 24)

38) Ohm’s law states that the voltage v across a resistor is …. proportional to the current i flowing through the resistor.
a) directly *
b) inversely
(Slide 27)

39) The resistance is a material property which can't be changed if the internal or external conditions of the element are altered
a) T
b) F *
(Slide 27)

40) The resistance R of an element denotes its ability to resist the flow of electric current
a) T *
b) F
(Slide 27)

41) Resistance is measured in ohms
a) T *
b) F
(Slide 27)

42) Kirchhoff's first law is based on the law of conservation of charge, which requires that the algebraic sum of charges within a system cannot change.
a) T *
b) F
(Slide 28)

43) Kirchhoff's ….law states that the algebraic sum of currents entering a node (or a closed boundary) is zero.
a) current *
b) voltage
(Slide 29)

44) By Kirchhoff's current law, currents entering a node may be regarded as positive, while currents leaving the node may be taken as negative or vice versa.
a) T *
b) F
(Slide 29)

45) Kirchhoff's current law : The sum of the currents entering a node is more than the sum of the currents leaving the node.
a) T
b) F *
(Slide 29)

46) states that the algebraic sum of all voltages around a closed path(or loop) is zero.
a) Kirchhoff's current law
b) Kirchhoff's voltage law *
(Slide 32)

47) KVL can be applied in two ways: by taking either a clockwise or a counterclockwise trip around the loop.
a) T *
b) F
(Slide 32)

48) The equivalent resistance of any number of resistors connected in … is the sum of the individual resistances.
a) Parallel
b) series *
(Slide 34)

49) The equivalent resistance of two parallel resistors is equal to the product of their resistances divided by their sum.
a) T *
b) F
(Slide 35)

50) The equivalent conductance of resistors connected in …is the sum of their individual conductances.
a) parallel *
b) series
(Slide 35)

51) I1 = (R2/ R1+ R2) I
a) T *
b) F
(Slide 36)

52) The equivalent resistance Req = 0.
a) Open circuit
b) Short circuit *
(Slide 37)

53) The entire current flows through the ..
a) Open circuit
b) Short circuit *
(Slide 37)

54) When R = infinity it’s considered as

a) Open circuit *

b) Short circuit

(Slide 38)

55) The op amp is an electronic unit that behaves like a ….

a) VCVS *

b) CCCS

c) CCVS

d) VCCS

(Slide 3)

56) An op amp is … circuit element designed to perform mathematical operations of addition, subtraction, multiplication, division, differentiation, and integration.

a) Active *

b) Passive

(Slide 3)

57) In an operational amplifier Inverting input is on bin number …

a) 1

b) 2 *

c) 3

d) 4

(Slide 4)

58) In an operational amplifier non-Inverting input is on bin number …

a) 1

b) 2

c) 3 *

d) 4

(Slide 4)

59) In an operational amplifier output is on bin number …

a) 5

b) 6 *

c) 7

d) 8

(Slide 4)

60) In an operational amplifier v+ is on bin number …
   a) 4
   b) 5
   c) 6
   d) 7 *
   (Slide 4)

61) In an operational amplifier v- is on bin number …
   a) 4 *
   b) 5
   c) 6
   d) 7
   (Slide 4)

62) In an operational amplifier there's no connection on bin number …
   a) 5
   b) 6
   c) 7
   d) 8 *
   (Slide 4)

63) In an operational amplifier balance is on bin number …
   a) 1
   b) 5
   c) both a and b *
   d) 8
   (Slide 4)

64) The differential input voltage vd is given by
   a) v1 – v2
   b) v2 – v1 *
   c) v1 + v2
   (Slide 5)

65) … is the voltage between the inverting terminal and ground
   a) v1 *
   b) v2
   (Slide 5)

66) ... is the voltage between the noninverting terminal and ground
   a) v1
   b) v2 *
   (Slide 5)

67) Vo = Avd = A(v2 – v1)
   a) T *
   b) F
   (Slide 5)

68) ... is called the open-loop voltage gain because it is the gain of the op amp without any external feedback from output to input.
   a) Vd
   b) Vo
   c) A *
   d) v2
   (Slide 6)

69) An op amp is ideal if it has
   a) A=∞.
   b) Ri= ∞.
   c) Ro= 0
   d) all of the above *
   (Slide 7)

70) In ideal op amp i1 = ...
   a) 0 *
   b) ∞
   (Slide 8)

71) In ideal op amp i2 = ...
   a) 0 *
   b) ∞
   (Slide 8)

72) In ideal op amp v1 = v2
   a) T *
   b) F
   (Slide 8)

73) In ideal op amp $v2 - v1 = \ldots$

a) 0 *

b) ∞

(Slide 8)

74) $Av = vo/vi$

a) T *

b) F

(Slide 9)

75) $Vo = (-Rf/R1)\, vi$

a) Inverting Amplifier *

b) Noninverting Amplifier

c) Voltage Follower

d) Summing Amplifier

e) Difference (Differential) Amplifier

f) Cascaded Op. Amp

(Slide 9 -20)

76) $A = A1A2A3$

a) Inverting Amplifier

b) Noninverting Amplifier

c) Voltage Follower

d) Summing Amplifier

e) Difference (Differential) Amplifier

f) Cascaded Op. Amp *

(Slide 9 -20)

77) is an op amp circuit that combines several inputs and produces an output that is the weighted sum of the inputs.

a) Inverting Amplifier

b) Noninverting Amplifier

c) Voltage Follower

d) Summing Amplifier *

e) Difference (Differential) Amplifier

f) Cascaded Op. Amp

(Slide 9 -20)

78) reverses the polarity of the input signal while amplifying it
a) Inverting Amplifier *
b) Noninverting Amplifier
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp
(Slide 9 -20)

79) Vo = (1+(Rf/R1)) vi
a) Inverting Amplifier
b) Noninverting Amplifier *
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp
(Slide 9 -20)

80) Vo = Vi
a) Inverting Amplifier
b) Noninverting Amplifier
c) Voltage Follower *
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp
(Slide 9 -20)

81) is a device that amplifies the difference between two inputs.
a) Inverting Amplifier
b) Noninverting Amplifier
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier *
f) Cascaded Op. Amp
(Slide 9 -20)

82) a head-to-tail arrangement of two or more op amp circuits such that the output of one is the input of the next. This happens in
a) Inverting Amplifier
b) Noninverting Amplifier
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp *
(Slide 9 -20)

83) The overall gain of the cascade connection is the product of the gains of the individual op amp circuits,
a) Inverting Amplifier
b) Noninverting Amplifier
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp *
(Slide 9 -20)

84) Vo = R2/R1 (V2 – V1)
a) Inverting Amplifier
b) Noninverting Amplifier
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier *
f) Cascaded Op. Amp
(Slide 9 -20)

85) The gain becomes 1 when
a) Rf = 0
b) R1 = infinity
c) Both of them *
(Slide 13)

86) Under these conditions (Rf =0 and R1 =∞), the circuit is called …
a) Inverting Amplifier
b) Noninverting Amplifier
c) Voltage Follower *
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp
(Slide 9 -20)

87) is an op amp circuit designed to provide a positive voltage gain
a) Inverting Amplifier
b) Noninverting Amplifier *
c) Voltage Follower
d) Summing Amplifier
e) Difference (Differential) Amplifier
f) Cascaded Op. Amp
(Slide 9 -20)

88) If R2 = R1 and R3 = R4, the difference amplifier becomes a subtractor, with the output: Vo = v2 – v1
a) T *
b) F
(Slide 19)

89) The ideal diode is a … terminal device
a) 0
b) 1
c) 2 *
d) 3
(Slide 3)

90) The n-side of the diode is sometimes referred to as the
a) Anode
b) Cathode *
(Slide 4)

91) The p-side of the diode is sometimes referred to as the
a) Anode *
b) Cathode
(Slide 4)

92) The characteristics of an ideal diode are those of a switch that can conduct current in … direction/s
a) 1 *
b) 2
(Slide 5)

93) The ideal diode, therefore, is … circuit for the region of conduction
a) open
b) short *
(Slide 6)

94) The ideal diode, therefore, is … circuit in the region of nonconduction.
a) open *
b) short
(Slide 6)

95) is a material that offers a very low level of conductivity under pressure from an applied voltage source.
a) conductor
b) insulator *
c) semiconductor
(Slide 9)

96) is applied to any material that will support a generous flow of charge when a voltage source of limited magnitude is applied across its terminals.
a) conductor *
b) insulator
c) semiconductor
(Slide 9)

97) is a material that has a conductivity level somewhere between the extremes of an insulator and a conductor.
a) conductor
b) insulator
c) semiconductor *
(Slide 9)

98) mica is considered as
a) conductor
b) insulator *
c) semiconductor
(Slide 9)

99) copper is considered as
a) conductor *
b) insulator
c) semiconductor
(Slide 9)

100) germanium is considered as
a) conductor
b) insulator
c) semiconductor *
(Slide 9)

101) silicon is considered as

a) conductor
b) insulator
c) semiconductor *
(Slide 9)

102) Ge is referred to as

a) univalent
b) bivalent
c) trivalent
d) tetravalent *
(Slide 10)

103) Si is referred to as

a) univalent
b) bivalent
c) trivalent
d) tetravalent *
(Slide 10)

104) there are 4 electrons in the outermost (valence) shell.

a) Si
b) Ge
c) Both of them *
(Slide 10)

105) the germanium atom has 32 orbiting electrons

a) T *
b) F
(Slide 10)

106) silicon has 14 orbiting electrons

a) T *
b) F
(Slide 10)

107) A bonding of atoms, strengthened by the sharing of electrons, is called covalent bonding

a) T *
b) F
(Slide 10)

108) …. materials are those semiconductors that have been carefully refined to reduce the impurities to a very low level—essentially as pure as can be made available through modern technology.
a) Extrinsic
b) Intrinsic *
(Slide 13)

109) … in temperature of a semiconductor can result in a substantial increase in the number of free electrons in the material.
a) Increase *
b) Decrease
(Slide 13)

110) As the temperature rises from absolute zero (0 K), an increasing number of valence electrons absorb sufficient thermal energy to break the covalent bond and contribute to the number of free carriers as described above. This increased number of carriers will increase the conductivity index and result in a lower resistance level
a) T *
b) F
(Slide 14)

111) The more distant the electron from the nucleus, the higher the energy state, and any electron that has left its parent atom has a higher energy state than any electron in the atomic structure.
a) T *
b) F
(Slide 15)

112) 1 ev = …
a) 1.6 x 10^-16
b) 1.6 x 10^-19 *
c) 1.6 x 10^16
d) 1.6 x 10^19
(Slide 16)

113) A semiconductor material that has been subjected to the doping process is called … material
a) Extrinsic *
b) Intrinsic
(Slide 18)

114) n-type and p-type
a) Extrinsic *
b) Intrinsic
(Slide 18)

115) Both the n- and p-type materials are formed by adding a predetermined number of impurity atoms into a germanium or silicon base.
a) T *
b) F
(Slide 19)

116) The n-type is created by introducing those impurity elements that have … valence electrons
a) 3
b) 4
c) 5 *
(Slide 19)

117) is formed by doping a pure germanium or silicon crystal with impurity atoms having three valence electrons
a) n-type
b) p-type *
(Slide 21)

118) boron, gallium, and indium.
a) n-type
b) p-type *
(Slide 21)

119) antimony, arsenic, and phosphorus.
a) n-type *
b) p-type
(Slide 19)

120) pentavalent
a) n-type *
b) p-type
(Slide 19)

121) Trivalent
a) n-type
b) p-type *
(Slide 21)

122) In … The resulting vacancy is called a hole and is represented by a small circle or positive sign due to the absence of a negative charge. Since the resulting vacancy will readily accept a “free” electron: The diffused impurities with three valence electrons are called acceptor atoms.
a) n-type
b) p-type *
(Slide 23)

123) In … Since the inserted impurity atom has donated a relatively “free” electron to the structure: Diffused impurities with five valence electrons are called donor atoms.
a) n-type *
b) p-type
(Slide 23)

124) the electron is called the majority carrier and the hole the minority carrier.
a) n-type *
b) p-type
(Slide 24)

125) the hole is the majority carrier and the electron is the minority carrier
a) n-type
b) p-type *
(Slide 24)

126) When the fifth electron of a donor atom leaves the parent atom, the atom remaining acquires a net positive charge: hence the positive sign in the donor-ion representation. For similar reasons, the negative sign appears in the acceptor ion.
a) T *
b) F
(Slide 24)

127) The semiconductor diode is formed by simply bringing these materials together (constructed from the same base—Ge or Si)
a) T *
b) F
(Slide 26)

128) At the instant the two materials are “joined” the electrons and holes in the region of the junction will combine, resulting in a lack of carriers in the region near the junction.
a) T *
b) F
(Slide 26)

129) This region of uncovered positive and negative ions is called the depletion region due to the depletion of carriers in this region.
a) T *
b) F
(Slide 26)

130) When the anode and cathode of a pn-junction diode are connected to external voltage such that the potential at anode is higher than the potential at cathode, the diode is said to be …. Biased
a) forward *
b) Reverse
(Slide 28)

131) In a reverse-biased diode current is allowed to flow through the device
a) T
b) F *
(Slide 28)

132) In a reverse-biased diode current is blocked.
a) T *
b) F
(Slide 28)

133) When potential at anode is smaller than the potential at cathode, the diode is said to be … biased
a) forward
b) Reverse *
(Slide 28)

134) In the absence of an applied bias voltage, the net flow of charge in any one direction for a semiconductor diode is zero
a) T *
b) F
(Slide 29)

135) The current that exists under …-bias conditions is called the reverse saturation current and is represented by Is.
a) forward
b) Reverse *
(Slide 28)

136) A …-bias is established by applying the positive potential to the p-type material and the negative potential to the n-type material

a) forward *
b) Reverse
(Slide 32)

137) Represents “on” condition

a) forward *
b) Reverse
(Slide 32)

138) The reverse-bias potential that results in this dramatic change in characteristics is called the Zener potential and is given the symbol Vz.

a) T *
b) F
(Slide 36)

139) The maximum reverse-bias potential that can be applied before entering the Zener region is called the peak inverse voltage (referred to simply as the PIV rating) or the peak reverse voltage (denoted by PRV rating).

a) T *
b) F
(Slide 38)

140) Vt of Si is

a) 0
b) 0.3
c) 0.7 *
(Slide 39)

141) Vt of Ge is

a) 0
b) 0.3 *
c) 0.7
(Slide 39)

142) the general characteristics of a semiconductor diode can be defined by the following equation:

Id = Is((e^(kVd/Tk)) – 1)

a) T *
b) F
(Slide 34)

143) Is = reverse saturation current

a) T *
b) F
(Slide 35)

144) Tk = Tc + 273 degree

a) T *
b) F
(Slide 35)

145) K = 11,600/n with n = 1 for Ge and n = 2 for Si for relatively low levels of diode current (at or below the knee of the curve) and n = 1 for Ge and Si for higher levels of diode current (in the rapidly increasing section of the curve)

a) T *
b) F
(Slide 35)

146) Vd < 0

a) forward-bias
b) reverse-bias *
c) no-bias
(Slide 33)

147) Vd > 0

a) forward-bias *
b) reverse-bias
c) no-bias
(Slide 33)

148) Id = -Is

a) forward-bias
b) reverse-bias *
c) no-bias
(Slide 33)

149) Vd = 0

a) forward-bias
b) reverse-bias
c) no-bias *
(Slide 33)

150) Id > 0
a) forward-bias *
b) reverse-bias
c) no-bias
(Slide 33)

151) Id = 0
a) forward-bias
b) reverse-bias
c) no-bias *
(Slide 33)

152) a diode is in the "…" state if the current established by the applied sources is such that its direction matches that of the arrow in the diode symbol, and VD>=0.7 V for silicon and VD>=0.3 V for germanium.
a) on *
b) off
(Slide 15)

153) in Si diode The applied signal must now be at least 0.7 V before the diode can turn "on."
a) T *
b) F
(Slide 29)

154) in Si diode For levels of vi less than 0.7 V, the diode is still in an open circuit state and vo =0 V
a) T *
b) F
(Slide 29)

155) Diodes can be used in wave shaping circuits
a) T *
b) F
(Slide 15)

156) Shift the dc voltage level of a signal
a) clippers
b) clampers *
(Slide 15)

157) Limit signal portions

a) clippers *
b) clampers
(Slide 15)

158) There are a variety of diode networks called clippers that have the ability to “clip” off a portion of the input signal without distorting the remaining part of the alternating waveform.

a) T *
b) F
(Slide 16)

159) There are two general categories of clippers: series and parallel.

a) T *
b) F
(Slide 17)

160) The series configuration is defined as one where the diode is in series with the load , while the parallel variety has the diode in a branch parallel to the load.

a) T *
b) F
(Slide 17)

161) In the biased series clipper vi must be positive to turn it on

a) T *
b) F
(Slide 20)

162) In the biased series clipper voltage vi be greater than V volts to turn the diode on.

a) T *
b) F
(Slide 20)

163) In the biased series clipper The negative region of the input signal is “pressuring” the diode into the “on” state

a) T
b) F *
(Slide 21 .. off)

164) The clamping network is one that will “clamp” a signal to a different dc level.

a) T *
b) F
(Slide 27)

165) The clamping network must has

a) capacitor
b) diode
c) resistive element
d) All of them *
(Slide 27)

166) The clamping network can employ an independent dc supply to introduce an additional shift

a) T *
b) F
(Slide 27)

167) In the clamping network The magnitude of R and C must be chosen such that the time constant RC is large enough to ensure that the voltage across the capacitor does not discharge significantly during the interval the diode is nonconducting.

a) T *
b) F
(Slide 28)

168) If V >=VZ, the Zener diode is “off”

a) T
b) F *
(Slide 38)

169) A diode is an electronic device made of a …material

a) conductor
b) semiconductor *
c) insulator
(Slide 2)

170) A diode has … terminals

a) 1
b) 2 *
c) 3
(Slide 2)

171) A diode act like an on-off switch

a) T *
b) F
(Slide 2)

172) A diode is made from a small piece of semiconductor material, usually silicon , in which half is doped as a P region and half is dopped as an N region with a PN junction and depletion region in between

a) T *
b) F
(Slide 2)

173) The P region is called the … and is connected to a conductive terminal

a) anode *
b) cathode
(Slide 2)

174) The N region is called the … and is connected to a second conductive terminal.

a) anode
b) cathode *
(Slide 2)

175) When the diode is “on”, it acts as ….circuit

a) open
b) short *
(Slide 3)

176) When the diode is “off” it acts as ….circuit

a) open *
b) short
(Slide 3)

177) … circuit passes no current

a) open *
b) short
(Slide 3)

178) … circuit passes all current

a) open
b) short *
(Slide 3)

179) In the diode The two terminals are different and are marked as plus and minus.

a) T *
b) F
(Slide 3)

180) If the polarity of the applied voltage matches that of the diode it's ..

a) forward bias *
b) reverse bias
(Slide 3)

181) the diode turns "on".

a) forward bias *
b) reverse bias
(Slide 3)

182) When the applied voltage polarity is opposite

a) forward bias
b) reverse bias *
(Slide 3)

183) it turns "off"

a) forward bias
b) reverse bias *
(Slide 3)

184) To Bias a diode , you apply a DC voltage across it

a) T *
b) F
(Slide 5)

185) is the conduction that allows the current through the PN junction.

a) forward bias *
b) reverse bias
(Slide 3)

186) to get a forward bias The bias voltage (Vbias), must be less than the barrier potential

a) T
b) F *
(Slide 5)

187) The negative side of $VBias$ is connected to the N region of diode and the positive side is connected to the P region

a) forward bias *
b) reverse bias
(Slide 5)

188) Forward bias narrow the depletion region and produces a voltage drop across the pn junction equal to the barrier potential
(Slide 7)

189) is the condition that essentially prevents current through the diode
a) forward bias
b) reverse bias *
(Slide 8)

190) The positive side of $VBias$ is connected to the N region of the diode and the Negative side is connected to the P region
a) forward bias
b) reverse bias *
(Slide 8)

191) In the reverse bias, the depletion region is much wider than the forward bias or equilibrium.
a) T *
b) F
(Slide 8)

192) In Ideal Diode Model for reverse bias Vr = ..
a) 0
b) Vbias *
c) Vbias – 0.7
(Slide 12)

193) In Ideal Diode Model for reverse bias Ir = …
a) 0 *
b) Vbias / R
c) (Vbias – 0.7) / R
(Slide 12)

194) In Ideal Diode Model for forward bias Vf = …
a) 0 *
b) Vbias
c) Vbias – 0.7
(Slide 12)

195) In Ideal Diode Model for forward bias If = …

a) 0
b) Vbias / R *
c) (Vbias – 0.7) / R
(Slide 12)

196) In Practical Diode Model for reverse bias Vr = ..

a) 0
b) Vbias *
c) Vbias – 0.7
(Slide 13)

197) In Practical Diode Model for reverse bias Ir = ..

a) 0 *
b) Vbias
c) Vbias – 0.7
(Slide 13)

198) In Practical Diode Model for forward bias Vf = ..

a) 0
b) 0.7 *
c) Vbias – 0.7
(Slide 13)

199) In Practical Diode Model for forward bias IF= ..

a) 0
b) Vbias / R
c) (Vbias – 0.7) / R *
(Slide 13)

200) Signals: It is the voltage that change in the time in a particular way.

a) T *
b) F
(Slide 20)

201) is generally considered as unidirectional and not varying with time

a) alternating current
b) direct current *
(Slide 21)

202) Batteries, Generators, Power supplies
a) alternating current
b) direct current *
(Slide 21)

203) A voltage that is varies with time may be called varying direct voltage.
a) T *
b) F
(Slide 22)

204) The graphic representation of the intensity of the AC current as a function of time.
a) T *
b) F
(Slide 22)

205) The sinusoidal signal is a voltage that vary with time according to a cosine function
a) T
b) F *
(Slide 23 .. sine => $V = A \sin(2\pi f t)$)

206) F is the frequency in cycles per second or hertz "HZ"
a) T *
b) F
(Slide 23)

207) A is called the amplitude.
a) T *
b) F
(Slide 23)

208) It is simply a voltage rising(or failing) at constant rate.
a) Sawtooth signal
b) Ramp signals *
(Slide 24)

209) It is a periodic ramp signal
a) Sawtooth signal *
b) Ramp signals
(Slide 24)

210) The triangle wave is close to the ramp

a) T *

b) F

(Slide 25)

211) Triangle is simply a symmetrical ramp

a) T *

b) F

(Slide 25)

212) is a signal defined by amplitude and pulse width

a) Square signal

b) Pluses *

(Slide 26)

213) a signal that varies in time

a) Square signal *

b) Pluses

(Slide 26)

214) Pulses can have positive or negative polarity

a) T *

b) F

(Slide 26)

215) It as sine wave

a) Square signal *

b) Pluses

(Slide 26)

216) It is characterized by amplitude and frequency.

a) Square signal *

b) Pluses

(Slide 26)

217) Pluses could be positive going or negative going

a) T *

b) F

(Slide 26)

218) Pluses signal can be

a) Positive polarity & positive going
b) positive polarity & negative going
c) negative polarity & positive going
d) negative polarity & negative going
e) All of the above *
(Slide 27)

219) is simply a (voltage or current)jump of very short duration

a) Step
b) Spike *
(Slide 28)

220) is the transition from one voltage(or current) level to another and staying there at the new level

a) Step *
b) Spike
(Slide 28)

221) …. is a circuit that convert AC to DC

a) Modulator
b) Rectifier *
(Slide 33)

222) Half-wave rectifier will generate a waveform Vo

a) T *
b) F
(Slide 34)

223) The average value of the half–wave rectified output voltage is the value you would measure on a dc voltmeter.

a) T *
b) F
(Slide 36)

224) In the half wave rectifier V avg = Vm/ π

a) T *
b) F
(Slide 36)

225) In the half wave rectifier Using silicon diode The applied signal must now be at least 0.7 V before the diode can turn “on.”

a) T *

b) F

(Slide 37)

226) In the half wave rectifier Using silicon diode For levels of Vi < 0.7 V, the diode is in an open circuit state and Vo = 0 V

a) T *

b) F

(Slide 38)

227) In the half wave rectifier Using silicon diode Vo = Vi – VT

a) T *

b) F

(Slide 38)

228) in the half wave rectifier Using silicon diode Vm(out) = Vm(in) – 0.7 V.

a) T *

b) F

(Slide 38)

229) A full–wave rectifier allows … current through the load during the entire input cycle.

a) unidirectional *

b) bidirectional

(Slide 40)

230) A…–wave rectifier allows current through the load only during one–half of the cycle

a) half *

b) full

(Slide 40)

231) In the full wave rectifier V avg = Vm/ π

a) T

b) F *

(Slide 45 .. 2*vm/ π)

232) If silicon is used instead of ideal diode in the full-wave rectifier Vo = Vi – 1.4

a) T *

b) F

(Slide 47)

233) If silicon is used instead of ideal diode in the full-wave rectifier Vm(out) = Vm(in) – 1.4

a) T *

b) F

(Slide 47)

234) Peak Inverse voltage(PIV) in full wave bridge for ideal diode = $Vp(out)$

a) T *

b) F

(Slide 48)

235) Peak Inverse voltage(PIV) in full wave bridge for practical = $Vp(out)$+0.7

a) T *

b) F

(Slide 48)

236) A transformer is … electrical device

a) Active

b) Passive *

(Slide 50)

237) A transformer is a passive electrical device that couple the ac input voltage from the source to the rectifier

a) T *

b) F

(Slide 50)

238) Transformer commonly used for increasing ac voltage (a step–up) or decreasing ac voltage (a step–down).

a) T *

b) F

(Slide 50)

239) Transformer can also be used for isolation, where the VP equals the VS, with separate coils not electrically bonded to one another.

a) T *

b) F

(Slide 50)

240) Transformer coupling advantage

a) allows the source voltage to be stepped down as needed

b) the ac source is electrically isolated from the rectifier, thus preventing a shock hazard in the secondary circuit.

c) Both of them *

(Slide 51)

241) The amount that the voltage is stepped down is determined by the turns ratio (N) of the transformer

a) T *

b) F

(Slide 52)

242) N ratio = NS / NP

a) T

b) F *

(Slide 52 .. NP/NS)

243) N = (NP / NS) = (VP / VS)

a) T *

b) F

(Slide 52)

244) primary turns

a) VP

b) NP *

c) VS

d) NS

(Slide 52)

245) secondary turns

a) VP

b) NP

c) VS

d) NS *

(Slide 52)

246) primary Voltage

a) VP *

b) NP

c) VS

d) NS

(Slide 52)

247) secondary voltage.

a) VP
b) NP
c) VS *
d) NS
(Slide 52)

248) a transformer with a turns ratio … than 1 is a step–down type

a) less
b) greater *
(Slide 53)

249) a transformer with a turns ratio greater than 1 is a step–up type

a) less *
b) greater
(Slide 53)

250) A center–tapped rectifier is a type of full–wave rectifier that uses two diodes connected to the secondary of a center–tapped transformer

a) T *
b) F
(Slide 54)

251) The ac voltage on each side of the secondary of the center–tap is 1 ⁄ 2 of the total secondary voltage.

a) T *
b) F
(Slide 55)

252) In Center–Tapped Full–Wave Rectifier Generally, during the positive half–cycles D1 is forward biased & D2 is reverse biased. While, during the negative half– cycles D2 is forward biased & D1 is reverse biased.

a) T *
b) F
(Slide 56)

253) The peak voltage is determine by the turns ratio N of the center–tapped transformer

a) T *
b) F
(Slide 58)

254) Vps = Vpin / 2N

a) T *
b) F
(Slide 58)

255) V out = (Vpin / 2N) – 0.7

a) T *
b) F
(Slide 58)

256) Peak Inverse voltage(PIV) in full wave center Tapped for ideal case = 2Vp

a) T *
b) F
(Slide 59)

257) Peak Inverse voltage(PIV) in full wave center Tapped for practical case = 2Vp + 0.7

a) T *
b) F
(Slide 59)

258) A power supply filter ideally eliminates the fluctuations in the output voltage of a half–wave or full–wave rectifier and produces a constant level dc voltage.

a) T *
b) F
(Slide 61)

259) In most power supply applications, the standard ac power line voltage must be converted to an approximately constant dc voltage

a) T *
b) F
(Slide 61)

260) Initial charging of the capacitor (the diode is forward–biased) happens only once when power is turned on.

a) T *
b) F
(Slide 63)

261) The capacitor discharges through RL after peak of positive alternation when the diode is reverse–biased.

a) T *
b) F
(Slide 63)

262) The capacitor charges back to peak of input when the diode becomes forward–biased
a) T *
b) F
(Slide 64)

263) the filter is a capacitor connected from the rectifier output to ground.
a) T *
b) F
(Slide 64)

264) RL represents the equivalent resistance of a load.
a) T *
b) F
(Slide 64)

265) Ripple voltage is the variation in the capacitor voltage due to the charging and discharging
a) T *
b) F
(Slide 66)

266) the larger the capacitor value, the … the ripple for the same input and load
a) bigger
b) smaller *
(Slide 66)

267) If peak output voltage of full wave center tapped rectifier is 24.3 V then peak inverse voltage will be:
a) 23V
b) 49.3V *
c) 0.5V
d) 70V
(Slide 67)

268) A type of full wave rectifier that uses two diodes connected to secondary of center tapped transformer is called
a) single tapped transformer
b) side tapped transformer
c) double tapped transformer
d) center tapped transformer *
(Slide 68)

269) Which rectifier requires four diodes?

a) half-wave voltage doubler
b) full-wave voltage doubler
c) full-wave bridge circuit *
d) voltage quadrupler
(Slide 69)

270) What is rectification?

a) Process of conversion of ac into dc *
b) Process of conversion of low ac into high ac
c) Process of conversion of dc into ac
d) Process of conversion of low dc into high dc
(Slide 69)

271) What is a Zener diode used as?

a) Oscillator
b) Regulator *
c) Rectifier
d) Filter
(Slide 70)

272) Forward biasing of p-n junction offers infinite resistance

a) T
b) F *
(Slide 70)

273) What can a p-n junction diode be used as?

a) Condenser *
b) Regulator
c) Amplifier
d) Rectifier
(Slide 71)

274) The forward voltage drop a cross a Silicon diode is about

a) 2.5V
b) 3V
c) 10V
d) 0.7V *
(Slide 71)

275) There is a need for transformers for

a) Center tapped Full wave rectifier *

b) Half wave rectifier

c) Bridge Full wave rectifier

(Slide 72)

276) If the PIV rating of the diode is exceeded

a) the diode conduct poor

b) The diode destroyed *

c) The diode acts as Zener diode

(Slide 72)

277) ….-terminal devices are more useful than …-terminal ones, such as the diodes, because they can be used in a multitude of applications

a) Two – Three

b) Three – Two *

(Slide 3)

278) Transistors can be used in

a) signal amplification

b) design of digital logic and memory circuits

c) Both of them *

(Slide 3)

279) The basic principle of transistor is the use of the …. between two terminals to control the … flowing in the third terminal

a) current – Voltage

b) Voltage – current *

(Slide 3)

280) In this way, a ….-terminal device can be used to realize a controlled source

a) Two

b) Three *

(Slide 3)

281) Functions of a transistor

a) Amplifying

b) Switching

c) Both of them *

(Slide 4)

282) Transistors

a) BJT
b) FET
c) Both of them *
(Slide 5)

283) MOSFET

a) BJT
b) FET *
(Slide 5)

284) NPN

a) BJT *
b) FET
(Slide 5)

285) JFET

a) BJT
b) FET *
(Slide 5)

286) P-channel

a) BJT
b) FET *
(Slide 5)

287) PNP

a) BJT *
b) FET
(Slide 5)

288) N-channel

a) BJT
b) FET *
(Slide 5)

289) N-channel

a) JFET
b) MOSFET
c) Both of them *
(Slide 5)

290) P-channel

a) JFET
b) MOSFET
c) Both of them *
(Slide 5)

291) The BJT : is constructed with .. doped semiconductor regions separated by … pn junctions

a) Two – Two
b) Three – Three
c) Three – Two *
d) Two – Three
(Slide 7)

292) Bipolar junction transistors (BJTs)

a) npn
b) pnp
c) Any of them *
(Slide 7)

293) The three regions are called

a) channel, base, and collector.
b) sender, base, and receiver.
c) emitter, base, and collector. *
d) sender, base, and collector.
(Slide 7)

294) consists of two n regions separated by a p region

a) npn *
b) pnp
(Slide 7)

295) consists of two p regions separated by an n region

a) npn
b) pnp *
(Slide 7)

296) The term bipolar refers to the use of …. as current carriers in the transistor structure.

a) holes
b) electrons
c) Both holes and electrons *
(Slide 7)

297) This mode of operation is contrasted with …. transistors, such as field-effect transistors, in which only one carrier type is employed (electron or hole, ex: diode).

a) unipolar *
b) bipolar
c) tripolar
d) quadpolar
(Slide 8)

298) The pn junction joining the base region and the emitter region is called

a) base-collector junction
b) base-emitter junction.*
c) emitter-collector junction
(Slide 9)

299) The pn junction joining the base region and the collector region is called

a) base-collector junction *
b) base-emitter junction.
c) emitter-collector junction
(Slide 9)

300) A wire lead connects to each of the three regions.

a) T *
b) F
(Slide 9)

301) heavily doped

a) base
b) emitter *
c) collector
(Slide 9)

302) very thin

a) base *
b) emitter
c) collector
(Slide 9)

303) moderately doped

a) base
b) emitter
c) collector *
(Slide 9)

304) lightly doped
a) base *
b) emitter
c) collector
(Slide 9)

305) Arrow direction from Base to Emitter
a) npn *
b) pnp
(Slide 10)

306) Arrow direction from Emitter to Base
a) npn
b) pnp *
(Slide 10)

307) Transistor consists of …. pn-junctions
a) 2 *
b) 3
(Slide 12)

308) In BJT there is a emitter-collector junction
a) T
b) F *
(Slide 12)

309) used for switching
a) active mode
b) cutoff mode
c) saturation mode
d) b and c *
(Slide 12)

310) used for amplification
a) active mode *
b) cutoff mode
c) saturation mode
d) b and c
(Slide 12)

311) in Cutoff mode EBJ is

a) forward
b) reverse *
(Slide 12)

312) in Cutoff mode CBJ is

a) forward
b) reverse *
(Slide 12)

313) in active mode EBJ is

a) forward *
b) reverse
(Slide 12)

314) in active mode CBJ is

a) forward
b) reverse *
(Slide 12)

315) in saturation mode EBJ is

a) forward *
b) reverse
(Slide 12)

316) in saturation mode CBJ is

a) forward *
b) reverse
(Slide 12)

317) In order for a BJT to operate properly as an amplifier, the two pn junctions must be correctly biased with external ... voltages

a) ac
b) dc *
(Slide 13)

318) The Figure shows a bias arrangement for both npn and pnp BJTs for operation as an amplifier. In both cases, the base-emitter (BE) junction is …. and the base-collector (BC) junction is

a) forward-biased - forward-biased

b) reverse-biased. - reverse-biased.

c) forward-biased - reverse-biased. *

d) reverse-biased - forward-biased.

(Slide 13)

319) This condition is called … bias

a) forward-forward

b) reverse-reverse

c) forward-reverse *

(Slide 13)

320) For the … type shown, the collector is more positive than the base, which is more positive than the emitter.

a) npn *

b) pnp

(Slide 14)

321) For the pnp type, the voltages are reversed to maintain the forward-reverse bias.

a) T *

b) F

(Slide 14)

322) The heavily doped n-type emitter region has a very high density of conduction-band (free) electrons as indicated in Figure .

These free electrons easily diffuse through the forward biased BE junction into the lightly doped and very thin ptype base region.

The base has a low density of holes, which are the majority carriers, as represented by the white circles.

a) T *

b) F

(Slide 15)

323) The heavily doped n-type emitter region has a very high density of conduction-band (free) ….

a) Holes

b) Electrons *

(Slide 15)

324) These free electrons easily diffuse through the forward biased BE junction into the lightly doped and very thin …. base region.

a) n-type

b) p-type *

(Slide 15)

325) The base has a low density of holes, which are the …. carriers, as represented by the white circles

a) minority

b) majority *

(Slide 15)

326) The base has a low density of…, which are the majority carriers, as represented by the white circles.

a) Holes *

b) Electrons

(Slide 15)

327) A very little free electron recombine with holes in base and move as valence electrons through the base region and into the emitter region as hole current

a) T *

b) F

(Slide 17)

328) The valence electrons leave the crystalline structure of the base, become free electrons in the metallic base lead, and produce the external base current.

a) T *

b) F

(Slide 17)

329) Majority of free electrons move toward the reverse-biased BC junction and swept across into the collector region by the attraction of the positive collector supply voltage.

a) T *

b) F

(Slide 17)

330) The free electrons move through the collector region, into the external circuit, and then return into the emitter region along with the base current

a) T *

b) F

(Slide 17)

331) The conventional current flows in the direction of the arrow on the … terminal

a) emitter *
b) collector
(Slide 19)

332) The emitter current (IE) is the sum of the collector current (IC) and the small base current (IB)

a) T *
b) F
(Slide 19)

333) Choose the right one

a) IC = IB + IE
b) IE = IB + IC *
c) IE = IB – IC
d) IB = IC – IE
(Slide 19)

334) IB is very … compared to IE or IC

a) big
b) small *
(Slide 19)

335) The capital-letter subscripts indicate … values.

a) ac
b) dc *
(Slide 19)

336) The voltage drop between base and emitter is VBE whereas the voltage drop between collector and base is called VCE

a) T *
b) F
(Slide 19)

337) dc current gain

a) βDC *
b) ADC
(Slide 22)

338) When a transistor is connected to dc bias voltages, as shown in Figure for both npn and pnp types, VBB forward-biases the base-emitter junction, and VCC reverse-biases the base-collector junction

a) T *
b) F
(Slide 22)

339) When a transistor is connected to dc bias voltages, as shown in Figure for both npn and pnp types, VBB …. the base-emitter junction

a) forward-biases *
b) reverse-biases
(Slide 22)

340) VCC …. the base-collector junction

a) forward-biases
b) reverse-biases *
(Slide 22)

341) The collector current : is …. proportional to the base current

a) directly *
b) inversely
(Slide 23)

342) The βDC of a transistor is the ratio of the dc collector current (IC) to the dc base current (IB).

a) T *
b) F
(Slide 23)

343) The βDC of a transistor is the ratio of the dc … to the dc ….

a) base current - collector current
b) collector current - base current *
(Slide 23)

344) This equation explains amplification of current

a) βDC = IC x IB
b) βDC = IC / IB *
c) βDC = IB / IC
(Slide 23)

345) αDC: The ratio of the dc collector current (IC) to the dc emitter current (IE)

a) T *

b) F

(Slide 24)

346) IC / IB

a) βDC *

b) αDC

(Slide 24)

347) IC / IE

a) βDC

b) αDC *

(Slide 24)

348) αDC is always

a) <= 1

b) > 1

c) < 1 *

d) >= 1

(Slide 24)

349) IB = 25 A

IC = 75 A

IE = ...

a) 3

b) 25

c) 50

d) 100 *

(Slide 25)

350) IB = 25 A

IC = 75 A

βDC = ...

a) 1/4

b) 1/3

c) 3 *

d) 4

(Slide 25)

351) IB = 25 A
IC = 75 A
αDC = ….
a) 1/4
b) 1/3
c) 3/4 *
d) 4
(Slide 25)

352) dc voltage across base-emitter junction
a) IB
b) IE
c) IC
d) VBE *
e) VCE
f) VCB
(Slide 27)

353) dc collector current
a) IB
b) IE
c) IC *
d) VBE
e) VCE
f) VCB
(Slide 27)

354) dc base current
a) IB *
b) IE
c) IC
d) VBE
e) VCE
f) VCB
(Slide 27)

355) dc voltage across collector-base junction

a) IB
b) IE
c) IC
d) VBE
e) VCE
f) VCB *
(Slide 27)

356) dc voltage across collector-emitter junction

a) IB
b) IE
c) IC
d) VBE
e) VCE *
f) VCB
(Slide 27)

357) dc emitter current

a) IB
b) IE *
c) IC
d) VBE
e) VCE
f) VCB
(Slide 27)

358) When the base-emitter junction is forward-biased, it is like a forward-biased diode and has a forward voltage drop of VBE = 0.7V

a) T *
b) F
(Slide 28)

359) VCE = VCC – VRC

a) T *
b) F
(Slide 28)

360) IB = (VBB – VBE) / RB

a) T *
b) F
(Slide 28)

361) The voltage across the reverse-biased collector-base junction is VCB = VCE – VBE

a) T *
b) F
(Slide 28)

362) VCB = VCE – VBE

a) T *
b) F
(Slide 29)

363) The collector characteristic curves shows … mode of operations of transistor with the variation of collector current IC varies with the VCE for a specified value of base current IB.

a) 1
b) 2
c) 3 *
d) 4
(Slide 31)

364) When both BE and BC junctions are forward biased, and the transistor is in … region

a) cutoff
b) active
c) saturation *
(Slide 32)

365) IC=βDC IB is no longer valid

a) cutoff
b) active
c) saturation *
(Slide 32)

366) an increase of base current has no effect on the collector current

a) cutoff
b) active
c) saturation *
(Slide 32)

367) Ic(SAT) = (VCC – VCE(SAT)) / Rc

a) T *
b) F
(Slide 32)

368) At this point, the transistor current is …. and voltage across collector is minimum, for a given load.
a) Minimum – Maximum
b) Maximum – Minimum *
c) Maximum – Maximum
d) Minimum – Minimum
(Slide 34)

369) When VCE is increased furthers and exceeds …, the base-collector junction becomes reverse-biased and the transistor goes into the active, or linear, region of its operation
a) 0 V
b) 0.7V *
(Slide 34)

370) IC levels off and remains essentially constant for a given value of IB as VCE continues to increase. The value of IC is determined only by the relationship expressed as IC=βDCIB
a) T *
b) F
(Slide 34)

371) A family of collector characteristic curves is produced when IC versus VCE is plotted for several values of IB, as illustrated in Figure “Collector characteristic curves”.
a) T *
b) F
(Slide 35)

372) It can be read from the curves. The value of βDC is nearly the same wherever it is read in … region.
a) active *
b) saturation
(Slide 35)

373) In a BJT, … is the condition in which there is no base current (IB=0), which results in only an extremely small leakage current (ICEO) in the collector circuit
a) cutoff *
b) active
c) saturation
(Slide 35)

374) The subscript …represents collector to-emitter with the base open

a) SEO
b) CEO *
c) SOE
d) COE
(Slide 35)

375) For practical work, I CEO is assumed to be ...

a) 0 *
b) 0.7
(Slide 35)

376) neither the BE junction, nor the BC junction are forward-biased

a) cutoff *
b) active
c) saturation
(Slide 35)

377) Base-emitter and base-collector junctions are reverse-biased.

a) cutoff *
b) active
c) saturation
(Slide 36)

378) Ic and VC exceed specifications damage to the transistor

a) cutoff region
b) active region
c) saturation region
d) breakdown region *
(Slide 37)

379) B-E and C-B junctions are forward biased

a) cutoff region
b) active region
c) saturation region *
d) breakdown region
(Slide 37)

380) No current flow
a) cutoff region *
b) active region
c) saturation region
d) breakdown region
(Slide 37)

381) Ic reaches a maximum which is independent of Ib and ß
a) cutoff region
b) active region
c) saturation region *
d) breakdown region
(Slide 37)

382) B-E junction is forward biased, C-B junction is reverse biased
a) cutoff region
b) active region *
c) saturation region
d) breakdown region
(Slide 37)

383) VCE <VBE
a) cutoff region
b) active region
c) saturation region *
d) breakdown region
(Slide 37)

384) VBE <VCE
a) cutoff region
b) active region *
c) saturation region
d) breakdown region
(Slide 37)

385) Control
a) cutoff region
b) active region *
c) saturation region
d) breakdown region
(Slide 37)

386) VBE <VCE <VCC
a) cutoff region
b) active region *
c) saturation region
d) breakdown region
(Slide 37)

387) Ic = ß Ib
a) cutoff region
b) active region *
c) saturation region
d) breakdown region
(Slide 37)

388) No control
a) cutoff region
b) active region
c) saturation region *
d) breakdown region
(Slide 37)

389) B-E junction is reverse biased
a) cutoff region *
b) active region
c) saturation region
d) breakdown region
(Slide 37)

390) If Ic is …. Ic(sat) the transistor is saturated
a) > *
b) <
(Slide 39)

391) IBQ = (VBB – 0.7) / RB
a) T *
b) F
(Slide 5)

392) ICQ = βDC IBQ
a) T *
b) F
(Slide 5)

393) VCEQ = VCC – ICQ RC

a) T *
b) F
(Slide 5)

394) As shown in Figure a dc load line the …

a) cutoff point
b) saturation point
c) Both of them *
(Slide 6)

395) bottom of the load line is at ideal … where IC=0 and VCE=VCC

a) cutoff *
b) saturation
(Slide 6)

396) top of the load line is at … where IC=IC(sat) and VCE=VCE(sat).

a) cutoff
b) saturation *
(Slide 6)

397) In between cutoff and saturation along the load line is the … region of the transistor's operation

a) cutoff
b) saturation
c) active *
d) breakdown
(Slide 6)

398) As VBB increase IB ….

a) increase *
b) decrease
(Slide 7)

399) As VBB increase VCE ….

a) increase
b) decrease *
(Slide 7)

400) At saturation, BCJ becomes …

a) Forward-biased *
b) Reverse-biased
(Slide 7)

401) At saturation, BCJ becomes Fwd-biased and there is … increase for IC

a) more
b) no more *
(Slide 7)

402) VCE = VCE(sat)

a) cutoff
b) saturation *
c) active
d) breakdown
(Slide 7)

403) In saturation

a) IC = IC(sat) = βIC
b) IC = IC(sat) != βIC *
(Slide 7)

404) It is the region along the load line including all points between saturation and cutoff

a) cutoff
b) saturation
c) active *
d) breakdown
(Slide 10)

405) The BJT is normally operated in linear region to act as ….

a) amplifier *
b) switch
(Slide 10)

406) BJT configurations

a) DC Fixed-biasing
b) Emitter-stabilized Bias Circuit
c) DC Collector Feedback biasing
d) Voltage-divider biasing
e) All of the above *
(Slide 12)

407) As shown in Figure, .. dc voltage supplies are needed to bias a BJT which is not practical.

a) 1
b) 2 *
c) 3
(Slide 13)

408) In a simple biasing circuit(Fixed-bias), …. is eliminated by connecting the resistor RB to the supply ….

a) VCC – VBB

b) VBB – VCC *

(Slide 13)

409) simple biasing circuit is called …

a) base bias

b) fixed bias

c) Both of them *

(Slide 13)

410) DC Fixed-bias Circuit IB = (VCC – VBE) / RB

a) T *

b) F

(Slide 14)

411) DC Fixed-bias Circuit VCE = VCC - VRC

a) T *

b) F

(Slide 14)

412) DC Fixed-bias Circuit VCE = VC - VE

a) T *

b) F

(Slide 14)

413) DC Fixed-bias Circuit VCE = VC

a) T *

b) F

(Slide 14)

414) DC Fixed-bias Circuit VBE = VB - VE

a) T *

b) F

(Slide 14)

415) DC Fixed-bias Circuit VBE = VB

a) T *

b) F

(Slide 14)

416) DC Fixed-bias Circuit $I_{BQ} = (V_{CC} – V_{BE}) / R_B$

a) T *
b) F
(Slide 14)

417) DC Fixed-bias Circuit $V_{BC} = V_B – V_C$

a) T *
b) F
(Slide 14)

418) Emitter-stabilized Bias Circuit $I_E = (\beta + 1) I_B$

a) T *
b) F
(Slide 18)

419) Emitter-stabilized Bias Circuit $I_B = (V_{CC} – V_{BE}) / R_B + (\beta + 1) R_E$

a) T *
b) F
(Slide 18)

420) As Shown In Figure, the base resistor RB is connected to the collector rather than to VCC.

a) DC Fixed-biasing
b) Emitter-stabilized Bias Circuit
c) DC Collector Feedback biasing *
(Slide 22)

421) The collector voltage provides the bias for the base-emitter junction.

a) DC Fixed-biasing
b) Emitter-stabilized Bias Circuit
c) DC Collector Feedback biasing *
(Slide 22)

422) The … feedback creates an “offsetting” effect that tends to keep the Q-point stable.

a) positive
b) negative *
(Slide 22)

423) If IC tries to…, it drops more voltage across RC, thereby causing VC to decrease.

a) increase *
b) decrease
(Slide 22)

424) When VC …., there is a decrease in voltage cross RB, which decreases IB.

a) increases

b) decreases *

(Slide 22)

425) The decrease in IB produces less IC which drops … voltage across RC and thus offsets the decrease in VC

a) more

b) less *

(Slide 22)

426) In this figure, VCC is used as the single bias source

a) DC Fixed-biasing

b) Emitter-stabilized Bias Circuit

c) DC Collector Feedback biasing

d) Voltage-divider biasing *

(Slide 25)

427) A dc bias voltage at the base of the transistor can be developed by a resistive voltage divider consisting of R1 and R2.

a) T *

b) F

(Slide 25)

428) There are two current paths between point A and ground: one through R2 and the other through the base-emitter junction of the transistor and RE

a) T *

b) F

(Slide 25)

429) Voltage-divider Bias solutions

a) Exact

b) Approximate

c) Both of them *

(Slide 26)

430) A BJT can be used as a switching device in logic circuits to turn on or off current to a load.

a) T *

b) F

(Slide 34)

431) As a switch, the transistor is normally in

a) cutoff
b) saturation
c) Both of them
d) either one of them *
(Slide 34)

432) Cutoff. Load is ….

a) on
b) off *
(Slide 34)

433) Saturation. Load is …

a) on *
b) off
(Slide 34)

434) BEJ is not forward -biased

a) Cutoff-open switch *
b) Saturation -closed switch
(Slide 35)

435) BEJ is forward -biased.

a) Cutoff-open switch
b) Saturation -closed switch *
(Slide 35)

436) Ideally, VCE=VCC

a) Cutoff-open switch *
b) Saturation -closed switch
(Slide 35)

437) IB is large enough to cause Ic reach its saturation

a) Cutoff-open switch
b) Saturation -closed switch *
(Slide 35)

438) Ideally, VCE(sat) can be neglected

a) Cutoff-open switch
b) Saturation -closed switch *
(Slide 35)

439) BCJ is reverse Biased

a) Cutoff-open switch *
b) Saturation -closed switch
(Slide 35)

440) IC(sat) = (VCC – VCE) / RC

a) Cutoff-open switch
b) Saturation -closed switch *
(Slide 35)

441) Ideally, IC(sat) = (VCC – VCE) / RC

a) Cutoff-open switch
b) Saturation -closed switch *
(Slide 35)

442) Bias establishes the operating point (Q-point) of a transistor amplifier

a) T *
b) F
(Slide 37)

443) The .. signal moves above and below this point

a) ac *
b) dc
(Slide 37)

444) If an amplifier is not biased with correct dc voltages on the input and output, it can go into saturation or cutoff when an input signal is applied.

a) T *
b) F
(Slide 37)

445) .... biasing can cause distortion in the output signal

a) proper
b) improper *
(Slide 37)

446) is the process of increasing the power, voltage, or current by electronic means and is one of the major properties of a transistor

a) Distortion
b) Amplification *
c) Switching
(Slide 37)

447) a BJT exhibits current gain (called β).

a) T *

b) F

(Slide 38)

448) When a BJT is biased in the active (or linear) region, the BE junction has a … resistance due to forward bias and the BC junction has a …. resistance due to reverse bias.

a) High – High

b) Low – Low

c) High – Low

d) Low – High *

(Slide 38)

449) Output voltage limited (clipped) by cutoff

a) Linear operation

b) Non-Linear Operation *

(Slide 38)

450) Output voltage limited (clipped) by saturation

a) Linear operation

b) Non-Linear Operation *

(Slide 38)

451) Larger output has same shape as input except that it is inverted

a) Linear operation *

b) Non-Linear Operation

(Slide 38)

452) The point at which the load line intersects a characteristic curve represents the Q-point for that particular value of IB

a) T *

b) F

(Slide 39)

453) The region along the load line including all points between saturation and cutoff is known as the linear region of the transistor’s operation; the transistor is operated in this region

a) T *

b) F

(Slide 39)

454) Variations in IC and VCE as a result of a variation in … current.

a) base *
b) emitter
c) Collector
(Slide 39)

455) For example, the bias has established a low Q- point. As a result, the signal is will be clipped because it is too close to …

a) cutoff *
b) saturation
(Slide 40)

456) Configuration to amplifier

a) The Common-Emitter Amplifier
b) The common-Base Amplifier
c) The common-Collector Amplifier
d) All of the above *
(Slide 10)

457) The i/p signal is applied to the base and the o/p is taken from the collector

a) The Common-Emitter Amplifier *
b) The common-Base Amplifier
c) The common-Collector Amplifier
(Slide 11)

458) The i/p signal is applied to the … and the o/p is taken from the ….

a) collector – base
b) base – collector *
(Slide 11)

459) The emitter is common to the AC signal

a) The Common-Emitter Amplifier *
b) The common-Base Amplifier
c) The common-Collector Amplifier
(Slide 11)

460) Voltage gain Av =

a) vi / vo
b) vo / vi *
c) vi x vo
(Slide 12)

461) i/p signal is applied to the emitter and the o/p is taken from the collector

a) The Common-Emitter Amplifier
b) The common-Base Amplifier *
c) The common-Collector Amplifier
(Slide 13)

462) The i/p signal is applied to the … and the o/p is taken from the ….

a) collector – emitter
b) emitter – collector *
(Slide 13)

463) The base is common to the AC signal

a) The Common-Emitter Amplifier
b) The common-Base Amplifier *
c) The common-Collector Amplifier
(Slide 13)

464) The i/p signal is applied to the base and the o/p is taken from the emitter

a) The Common-Emitter Amplifier
b) The common-Base Amplifier
c) The common-Collector Amplifier *
(Slide 13)

465) The i/p signal is applied to the … and the o/p is taken from the …

a) emitter – base
b) base – emitter *
(Slide 15)

466) The collector is common to the AC signal

a) The Common-Emitter Amplifier
b) The common-Base Amplifier
c) The common-Collector Amplifier *
(Slide 13)

467) The field-effect transistor (FET) is a …-terminal device

a) Two
b) Three *
(Slide 3)

468) is a voltage-controlled device

a) BJT
b) JFET *
(Slide 3)

469) is a current-controlled device

a) BJT *
b) JFET
(Slide 3)

470) the current IC is a direct function of the level of IB

a) BJT *
b) JFET
(Slide 3)

471) FET:

a) field-effect transistor *
b) field-effect transmitter
c) field-emitter transistor
d) field- emitter transmitter
(Slide 3)

472) the current I will be a function of the voltage VGS applied to the input circuit.

a) BJT
b) JFET *
(Slide 3)

473) For the FET the current I will be a function of the voltage … applied to the input circuit.

a) GPS
b) VGS *
c) VCS
d) VMS
(Slide 3)

474) the current of the output circuit is being controlled by a parameter of the input circuit

a) BJT
b) JFET
c) Both of them *
(Slide 3)

475) the current of the output circuit is being controlled by a current level

a) BJT *
b) JFET
(Slide 3)

476) the current of the output circuit is being controlled by an applied voltage

a) BJT
b) JFET *
(Slide 3)

477) voltage-controlled devices

a) BJTs
b) FETs *
(Slide 4)

478) current controlled devices

a) BJTs *
b) FETs
(Slide 4)

479) have higher gains

a) BJTs *
b) FETs
(Slide 4)

480) have a higher input impedance

a) BJTs
b) FETs *
(Slide 4)

481) less sensitive to temperature variations

a) BJTs
b) FETs *
(Slide 4)

482) more easily integrated on ICs

a) BJTs
b) FETs *
(Slide 4)

483) generally more static sensitive

a) BJTs
b) FETs *
(Slide 4)

484) Amplifiers

a) BJTs
b) FETs
c) Both of them *
(Slide 4)

485) Switching device

a) BJTs
b) FETs
c) Both of them *
(Slide 4)

486) JFET:

a) Junc FET
b) Junction FET *
(Slide 5)

487) MOSFET:

a) Meta–Oxide–Semiconductor FET
b) Metal–Oxide–Semiconductor FET *
c) Mega–Oxide–Semiconductor FET
d) Metal–Oxide–Semijunction FET
(Slide 5)

488) D-MOSFET:

a) Decompression MOSFET
b) Depletion MOSFET *
(Slide 5)

489) E-MOSFET

a) Enhancement MOSFET *
b) Emitter MOSFET
(Slide 5)

490) MOSFET

a) D-MOSFET
b) E-MOSFET
c) Both of them *
(Slide 5)

491) FET
a) JFET
b) MOSFET
c) Both of them *
(Slide 5)

492) n-channel
a) JFET *
b) MOSFET
(Slide 6)

493) p-channel
a) JFET *
b) MOSFET
(Slide 6)

494) The … is more widely used
a) n-channel *
b) p-channel
(Slide 6)

495) There are … terminals
a) 1
b) 2
c) 3 *
d) 4
(Slide 6)

496) Drain (D) and Source (S) are connected to the …
a) n-channel *
b) p-channel
(Slide 6)

497) Gate (G) is connected to the …
a) n-type material
b) p-type material *
(Slide 6)

498) Drain, Source, Gate … Construction
a) BJT
b) JFET *
(Slide 7)

499) Just as there are npn and pnp bipolar transistors, there are n-channel and pchannel field-effect transistors

a) T *

b) F

(Slide 9)

500) However, it is important to keep in mind that the … transistor is a bipolar device— the prefix bi- revealing that the conduction level is a function of two charge carriers, electrons and holes.

a) BJT *

b) JFET

(Slide 9)

501) is a unipolar device depending solely on either electron (n-channel) or hole (p-channel) conduction.

a) BJT

b) JFET *

(Slide 9)

502) operating conditions for a JFET

a) VGS = 0, VDS increasing to some positive value

b) VGS < 0, VDS at some positive value

c) Voltage-controlled resistor

d) All of the above *

(Slide 10)

503) … things happen when VGS = 0 and VDS is increased from 0 to a more positive voltage

a) 2

b) 3 *

(Slide 11)

504) The depletion region between p-gate and n-channel …. as electrons from n-channel combine with holes from p-gate

a) increases *

b) decreases

(Slide 11)

505) Increasing the depletion region, ….the size of the n-channel which increases the resistance of the n-channel.

a) increases

b) decreases *

(Slide 11)

506) Even though the n-channel resistance is increasing, the current (ID) from source to drain through the n-channel is …

a) increasing *
b) decreasing
(Slide 11)

507) Even though the n-channel resistance is increasing, the current (ID) from source to drain through the n-channel is increasing. This is because VDS is increasing.

a) T *
b) F
(Slide 11)

508) If VGS = 0 and VDS is further increased to a more positive voltage, then the depletion zone gets so large that it pinches off the n-channel

a) T *
b) F
(Slide 12)

509) This suggests that the current in the n-channel (ID) would drop to 0A, but it does just the opposite–as VDS increases, so does ID.

a) T *
b) F
(Slide 12)

510) Any further increase in VGS does not produce any increase in ID

a) pinch-on point
b) pinch-off point *
(Slide 13)

511) VGS at pinch-off is denoted as …

a) Vg
b) Vs
c) Vp *
d) Vm
(Slide 13)

512) ID is at saturation or maximum

a) pinch-on point
b) pinch-off point *
(Slide 13)

513) ID is at saturation or maximum. It is referred to as …

a) IDS
b) IDSS *
c) IDSSS
d) IDSSSS
(Slide 13)

514) At the pinch-off point: The ohmic value of the channel is ….

a) maximum *
b) minimum
(Slide 13)

515) As VGS becomes more…., the depletion region increases

a) positive
b) negative *
(Slide 14)

516) The JFET experiences pinch-off at a lower voltage (Vp)

a) VGS = 0, VDS increasing to some positive value
b) As VGS becomes more negative *
(Slide 15)

517) ID decreases (ID < IDSS) even though VDS is increased.

a) VGS = 0, VDS increasing to some positive value
b) As VGS becomes more negative *
(Slide 15)

518) Eventually ID reaches 0 A. VGS at this point is called Vp or VGS (off)..

a) VGS = 0, VDS increasing to some positive value
b) As VGS becomes more negative *
(Slide 15)

519) at high levels of VDS the JFET reaches a breakdown situation. ID increases uncontrollably if VDS > VDSmax.

a) T *
b) F
(Slide 15)

520) The region to the left of the pinch-off point is called the … region.
a) voltage
b) current
c) ohmic *
d) Ampire
(Slide 16)

521) The JFET can be used as a ….resistor, where VGS controls the drain-source resistance (rd).
a) Fixed
b) Variable *
(Slide 16)

522) As VGS becomes more negative, the resistance (rd)…
a) increases *
b) decreases
(Slide 16)

523) rd = ro / (1 – (VGS / VP))^2
a) T *
b) F
(Slide 16)

524) The p-channel JFET behaves the same as the n-channel JFET, except the voltage polarities and current directions are reversed.
a) T *
b) F
(Slide 17)

525) As VGS increases more positively The depletion zone increases
a) P-Channel JFET *
b) N-Channel JFET
(Slide 18)

526) As VGS increases more positively in P-Channel JFET ID …. (ID < IDSS)
a) increases
b) decreases *
(Slide 18)

527) As VGS increases more positively in P-Channel JFET Eventually ID = 0 A
a) T *
b) F
(Slide 18)

528) at high levels of VDS the JFET reaches a breakdown situation: ID increases uncontrollably if VDS > VDSmax

a) T *

b) F

(Slide 18)

529) The transfer characteristic of input-to-output is as straightforward in a JFET as it is in a BJT

a) T

b) F *

(Slide 19)

530) In a..., β indicates the relationship between IB (input) and IC (output).

a) BJT *

b) JFET

(Slide 19)

531) In a JFET, the relationship of VGS (input) and ID (output) is a little more complicated

a) T *

b) F

(Slide 19)

532) ID = IDSS (1 - (VGS / VP))^2

a) T *

b) F

(Slide 19)

لا تنسونا من صالح دعائكم

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