Subject: Basic Electronics Engineering
(BXE)

UNIT II

Transistor and OPAMP

Transistor:

1. Transistor is a_____terminal device.
a. Two
b. Three
c. Four
d. both (a. and (b.

Ans: b

2. The three terminals of transistor are:
a. Gate, collector and emitter
b. Collector, base and source
c. Base, collector and emitter
d. Base, gate and collector

Ans: c

3. The transistor means_____.

a. transfer resistor
b. trans resistor
c. tri resistor
d. none of the above

Ans: a

4. BJT is a_____device.
a. unipolar
b. bipolar
c. multipolar
d. both b and c

Ans: b

5. In Unipolar transistor, the current conduction is due to_____.

a. minority carriers
b. majority carriers
c. both minority and majority carriers
d. all of the above
Ans: b

6. In bipolar transistor, the current is due to
a. holes
b. electrons
c. both holes and electrons
d. all of the above

Ans: c

7. BJT IS_____controlled device.
a. field
b. voltage
c. resistor
d. current

Ans: d

8. The types of bipolar junction transistors are
a. ppn,npn
b. pnp, npn
c. npp, ppn
d. nnp, pnp

Ans: b

9. The middle region of a transistor is called ___
a. base
b. collector
c. emitter
d. none of the above

Ans: a

10. The process by which impurities are added to a pure semiconductor is
a. Diffusing
b. drift

c. doping
d. mixing

Ans: c

11. Base of the transistor is always____and ____doped.
a. thick, lightly
b. thin, lightly
c. thin, heavily
d. none of the above

Ans: b

12. The collector of a transistor is _____ doped.
a. heavily
b. moderately
c. lightly
d. none of the above

Ans: a

13. In transistors the collector region is larger than the emitter region for_____.
a. better heat dissipation
b. higher value of ß
c. better amplification
d. all of the above

Ans: a

14. Doping concentration is highest in _____ of a BJT.
a. emitter region
b. collector region
c. base region
d. all of the above

Ans: a

15. The _____ region has highest thickness than all other regions in a BJT.
a. base
b. collector
c. emitter
d. all of the above

Ans: b

16. The arrow in the transistor symbol indicates the direction of _____.
a. conventional emitter current
b. electron current in emitter
c. supply current
d. both a and b

Ans: a

17. The arrow in the transistor symbol indicates _____ terminal.
a. base
b. collector
c. emitter
d. none of the above

Ans: c

18. Transistor has _____ pn junctions.
a. one
b. two
c. three
d. none of the above

Ans: b

19. The depletion region at emitter junction in an unbiased transistor extends more into the _____ region.
a. collector
b. base
c. emitter
d. none of the above

Ans: b

20. The depletion region at collector junction in an unbiased transistor extends more into the base region because it is _____ doped.
a. heavily
b. moderately
c. lightly
d. none of the above

Ans: c

21. Barrier voltage is _____ on the N side.
a. positive
b. negative
c. zero
d. none of the above

Ans: a

22. _____ of electrons and holes in the base region consists the base current.
a. Ionization
b. Recombinations
c. Thermal agitation
d. None of the above

Ans: b

23. _____ constitute the dominant current in a npn transistor.
a. Holes
b. Electrons
c. Both holes and electrons
d. none of the above

Ans: c

24. The current gain of a transistor is defined as the ratio of the collector current to the _____.
a. base current

b. emitter current

c. supply current

d. collector current

Ans: a

25. A transistor_____.

a.   is similar to a relay in that it uses a small amount of current to
 control a larger amount of current flow.

b.   has three connections called the base, emitter and collector

c.   is like a switch in that it is used to turn a circuit on and off

d. all of the above

Ans: d

26. The graph of current gain versus collector current indicates that the current gain_____.

a. is constant

b. varies slightly

c. varies significantly

d.   equals the collector current divided by the base current

Ans: b

27. _____is the highest current in any bipolar transistor.

a. IB

b. IC

c. IE

d. none of the above

Ans: c

28.   The concentration of impurities in a transistor:

a. equal for emitter, base and collector

b. least for emitter region

c. largest for emitter region

d. largest for collector region

Ans: c

29. When NPN transistor is used as amplifier

a. electrons move from base to emitter

b. electrons move from emitter to base

c. electrons move from collector to base

d. holes move from base to emitter

Ans: b

30. The base is made thin and lightly doped because

a. about 95% of the charge carriers may cross

b. about 100% of the charge carriers may cross

c.   the transistors can be saved from large currents

d. none of these

Ans: a

31. Base to emitter voltage in forward biased transistor decreases with the increase of temperature at the following rate:

a. 2.5 mV/degree C

b. 25 mV/degree C

c. 0.25 mV/degree C

d. 0.6 mV/degree C

Ans: a

32. No. of depletion layers in a transistor are ___

a. two

b. three

c. four

d. none of the above

Ans: a

33. The emitter of a transistor is_____doped.

a. moderately

b. heavily

c. lightly

Ans: b

34. The input impedance of a transistor is _____ as compared to MOSFET.

a. low

b. high

c. very high

d. none of above

Ans: a

35. In an NPN transistor, _____ are the minority carrier.

a. electron

b. holes

c. donor ions

d. acceptor ions

Ans: b

36. In a transistor_____.

a. IB=IC+IB

b. IC=IE+IB

c. IE=IC+IB

d. IE=IC-IB

Ans: c

37. The value of alpha of a transistor is _____.

a. 0

b. 1

c. more than 1

d. less than 1

Ans: d

38. The value of ß of a transistor is_____.

a. between 20 and 500

c. less than 1

d. 0

Ans: a

39. Transistor biasing represents _____ condition.

a. ac

b. dc

c. both ac and dc

d. none of the above

Ans: b

40. Transistor biasing is generally provided by a _____.

a. biasing circuit

b. biasing battery

c. diode

d. none of the above

Ans: a

b. 1

41. The point of intersection of DC and AC load lines represents_____.
a. current point
b. operating point
c. voltage gain
d. none of the

above Ans: b

42. The phase difference between the input and output voltage in a common base arrangement is_____.
a. 90
b. 180
c. 0
d. none of the

above Ans: c

43. The phase difference between the input and output voltage in a common emitter arrangement is_____.
a. 0
b. 180
c. 90
d. 270

Ans: b

44. The phase difference between the input and output voltage in a common collector arrangement is_____.
a. 0
b. 90
c. 180
d. 270

Ans: a

45. The early effect in a bipolar transistor is caused by:
a. Large collector-base reverse bias
b. base width modulation
c. large emitter-base forward bias
d. increase in junction temperature

Ans: b

46. The_____current of a transistor is neither the largest nor the smallest.
a. Base
b. Collector
c. emitter
d. none of the above

Ans: b

47. Which of the following currents are nearly equal to each other?
a. IB and IC
b. IE and IC

c. IB and IE
d. Ib,IC and IE

Ans: b

48. For a properly biased transistor, let IC=10mA and Ie=10.2mA. What is the level of IB?
a. 0.2A
b. 200mA
c. 200µA
d. 20.2mA

Ans: c

49. Holes flow constitutes the dominant current in a_____transistor.
a. npn
b. pnp
c. a and b
d. none of the above

Ans: b

50. When the collector current increases, what does the current gain do?
a. decreases
b. stays the same
c. increases
d. any of the above

Ans: c

51. When the base resistor increases, the collector voltage will probably_____.
a. decrease
b. stays the same
c. increase
d. do all of the above

Ans: c

52. If the base resistor is very small, the transistor will operate in the_____.
a. cut off region
b. active region
c. saturation region
d. all of the above

Ans: c

53. Ignoring the bulk resistance of the collector diode, the collector-emitter saturation voltage is
.
a. 0V
b. a few tenths of a volt
c. 1V
d. supply voltage

Ans: a

54. For common base transistor teh numerical value is least for_____.
a. voltage gain
b. power gain
c. resistance gain
d. current gain

Ans: d

55. For operating in the active region, the emitter junction should be biased and collector junction should be __ biased in BJT.
a. forward, forward
b. reverse, reverse
c. forward, reverse
d. reverse, forward

Ans: c

56. The emitter junction is_____biased for operating BJT in saturation region.
a. forward

b. reverse
c. zero
d. none of the above

Ans: a

57. In which region are both the collector-base and base-emitter junctions forward biased for BJT?
a. active
b. cut-off
c. saturation
d. all of the above

Ans: c

58. For the BJT to operate in the saturation region, the base-emitter juntion must be_____ biased and the base-collector junction must be_____.
a. forward, forward
b. forward, reverse
c. reverse, reverse
d. reverse, forward

Ans: a

59. At what region of operation is the base-emitter junction forward biased and the base-collector junction reverse biased for BJT?
a. saturation
b. linear or active
c. cut-off
d. none of the above

Ans: b

60. The transistor acts as an amplifier in the _____region.
a. Cut off
b. Active
c. Saturation

d. None of the above

Ans: b

61. When there is no base current in a transistor switch, then output voltage from the transistor is .
a. low
b. high
c. unchanged
d. unknown

Ans: b

62. A circuit with a fixed emitter current is called_____.
a. base bias
b. emitter bias
c. transistor bias
d. two supply bias

Ans: b

63. The first step in analyzing emitter-based circuits is to find the_____.
a. base current
b. emitter current
c. supply current
d. collector current

Ans: b

64. If the current gain is unknown in an emitter-biased circuit, you cannot calculate the_____.
a. emitte voltage
b. emitter current
c. collector current
d. base current

Ans: d

65. If the emitter resistor is open, teh collector voltage is_____.
a. low
b. high
c. unchanged
d. unknown

Ans: b

66. If the collector resistor is open, the collector voltage is_____.
a. low
b. high
c. unchanged
d. unknown

Ans: a

67. When the current gain increases from 50 to 300 in an emitter-biased circuit, the collector current_____.
a. remains almost the same
b. decreases by a factor of 6
c. increases by a factor of 6
d. is zero

Ans: a

68. If the emitter resistance increases, the collector voltage_____.
a. decreases
b. stays the same
c. increases
d. breaks down the transistor

Ans: c

69. When using a DMM (Digital multimeter) to test a transistor, an approximate reading of 0.7V will be found with how many polarity connections?
a. One

b. Two

c. Three

d. None

Ans: b

70. What DMM polarity connection is needed on an npn transistor's base to get a 0.7V reading?

a. positive

b. negative

c. either positive or negative

d. unknown

Ans: a

71. When testing an npn transistor using an ohmmeter, the collector-emitter resistance will be low when_____.

a. The collector is positive in respect to the emitter

b. The emitterr is positive in respect to the collector

c. The transistor is normal

d. The transistor is defective

Ans: d

72. The transistor is operated as a open switch in__region.

a. Cut off

b. Active

c. Saturation

d. None of the above

Ans: a

73. The transistor may be used as a switch so that when it is in the saturated state its on resistance is very_____and in the cut-off state its off resistance is very_____.

a. high, high

b. low, low

c. low, high

d. high, low

Ans: c

74. We can not operate the transistor in _____ region for the switching applications.

a. cut-off

b. active

c. saturation

d. all of the above

Ans: b

75. The transistor is operated as a close switch in__region.

a. cut-off

b. active

c. saturation

d. all of the above

Ans: c

76. Transistor is used as a switch in_____.

a. an amplifier

b. logic gate

c. linear DC power supply

d. none of the above

Ans: b

77. Which of the following configurations can a transistor set up?

a. common base

b. common emitter

c. common collector

d. all of the above

Ans: d

78. In CB configuration a reverse biased collector junction IC=___ when the emitter is left open.
a. 0
b. IE
c. ICBO
d. none of the above

Ans: c

79. ICBO flows from_____to_____when emitter is open.
a. collector, base
b. base, collector
c. collector, emitter
d. none of the above
Ans: a

80. The_____carriers constitute current ICBO.
a. both minority and majority
b. minority
c. majority
d. none of the above

Ans: b

81. ICBO current is_____.
a. greater than IC
b. increases with termperature
c. less than ICO
d. flows when base junction is forward biased

Ans: b

82. With rise in temperature ICBO_____.
a. increases linearly
b. doubles at every 10 degree celcius
c. decreases linearly
d. none of the above

Ans: b

83. The alpha dc is always_____.
a. unity
b. less than unity
c. greater than unity
d. none of the above

Ans: b

84. The collector current is 1.5mA. If the current gain is 50, the base current is_____.
a. 3 µA
b. 30 µA
c. 150 µA
d. 3 mA

Ans: b

85. The base current is 50µA. If the current gain is 100, the collector current is closest in value to
a. 50µA
b. 500µA
c. 2mA
d. 5mA

Ans: d

86. a=_____.
a. IB/IE
b. IC/IE
c. IC/IB
d. none of the above

Ans: b

87. smaller the thickness of base,_____is the value of alpha dc.
a. smaller
b. larger
c. constant
d. none of the above

Ans: b

88. The a is the current gain of ____ configuration.
a. CB
b. CC
c. CE

Ans: a

89. In CB configuration input resistance is ____
a. change in VEB/change in IE
b. change in VCB/change in IE
c. change in VCB/change in IC
d. none of the above

Ans: a

90. The input resistance of CB configuration is measured at constant_____.
a. IB
b. IC
c. VCB
d. VCE

Ans: c

91. The dynamic output resistance of transistor in CB configuration is_____at constant IE.
a. change in VEB/change in IE
b. change in VEB/change in Ic
c. change in VcB/change in Ic
d. none of the above

Ans: c

92. The dynamic output resistance of CB configuration is measured at constant _____
a. IB
b. IC
c. IE

Ans: c

93. In CB configuration dynamic output resistance is_____.
a. low
b. medium
c. high
d. none of the above

Ans: c

94. alpha ac is the slope of _____ characteristic of transistor in CB configuration.
a. input
b. output
c. transfer
d. none of the above

Ans: c

95. The transfer characteristics of CB show the relation between_____.
a. IC and IE
b. IC and IB
c. IB and IE
d. all of the above

Ans: a

96. Which terminal represents the control input of a bipolar transistor?
a. emitter
b. collector
c. gate
d. base

Ans: d

97. Which of the following expressions represents the DC current gain of a bipolar transistor?
a. IC/IB
b. dIC/dIB
c. IC/VBE

d. $dIC/dVBE$

Ans: a

98. Output characteristics of common base configuration gives
a. skin effect
b. early effect
c. reach through effect
d. hall effect

Ans: b

99. Early effect and base width modulation effect is_____.
a. same
b. different
c. not related to each other
d. both damages the transistor

Ans: a

100. Input resistance for common base configuration is_____.
a. 20 ohm
b. 200 ohm
c. 2 Kohm
d. 2 Mohm

Ans: a

101. Input resistance for common collector configuration is_____.
a. 5 Kohm
b. 50 Kohm
c. 500 Kohm
d. 5 Mohm

Ans: c

102. Input resistance for common emitter configuration is_____.

a. 40 Kohm
b. 400 Kohm
c. 4 Mohm
d. 40 Mohm

Ans: a

103. Output resistance for common collector configuration is_____.
a. 5 ohm
b. 50 ohm
c. 5 Kohm
d. 500 Kohm

Ans: b

104. Voltage gain in common base configuration is_____.
a. always above unity
b. unity
c. less than unity
d. not any above

Ans: a

105. Voltage gain in CE configuration is _____
a. less than unity
b. unity
c. always above unity
d. not any above

Ans: c

106. Voltage gain in CC configuration is _____
a. less than unity
b. unity
c. always above unity
d. not any above

Ans: a

107. Current amplification factor alpha dc is given by_____.
a. IC/IE
b. IE/IC
c. IC/IB
d. IE/IB

Ans: a

108. Current amplification factor ßdc is given by _____.
a. IC/IE
b. IE/IC
c. IC/IB
d. IE/IB

Ans: c

109. Current amplification factor gamm dc is given by_____.
a. IC/IE
b. IC/IB
c. IE/IC
d. none of the above

Ans: d

110. For voltage amplifier function, suitable configuration is_____.
a. CE configuration
b. CC configuration
c. CB configuration
d. none of the above

Ans: c

111. Output resistance for Common Base Configuration is_____.
a. 1 Kohm
b. 1 Mohm
c. 10 Kohm
d. 100 Mohm

Ans: b

112. Current gain in CB configuration is _____.
a. unity
b. less than unity
c. greater than unity
d. not any above

Ans: b

113. Current gain in CE configuration is _____
a. 25 to few hundreds
b. less than 10
c. 10 to 15
d. unity

Ans: a

114. Current gain in CC configuration is _____
a. less than unity
b. unity
c. 25 to few hundreds
d. less than 10

Ans: c

115. Input resistance for Common Emitter Configuration is_____.
a. 100 ohm
b. 1Kohm
c. 1 Mohm
d. 100Kohm

Ans: b

116. In bipolar transistor, the current flows due to__.
a. minority carriers
b. majority carriers
c. both, majority and minority carriers
d. none of the above

Ans: c

117. Transistor device is used in the application such as_____.
a. switch
b. amplifier
c. oscillator
d. above all

Ans: d

118. When transistor is unbiased then due to following, two diffrent depletion regions form in the transistor at two respective junction _____
a. only drift process
b. drift and diffusion process
c. only diffusion process
d. diffusion and then drift process

Ans: c

119. In common base configuration, the width of depletion region also increases, which reduces the electrical base width, this effect is known as
.
a. hall effect
b. skin effect
c. early effect
d. piezo-electric effect

Ans: c

120. Which of the following expressions represents the transconductance of a bipolar transistor?
a. dIC/dIB
b. IC/IB
c. dIC/dVBE
d. IC/VBE

Ans: c

121. In a transistor as an amplifier, the reverse saturation current:
a.   Doubles for every degree C rise in temperature
b.   Doubles for every 10 degree C rise in temperature
c. Decreases linearly with temperature
d. Increase linearly with temperature

Ans: b

122.   The transfer characteristics of a CB configuration is a graph of_____.
a. VCB, IC
b. IE, IC
c. VEB, IE
d. none of the above

Ans: b

123. In saturation region the collector current _____.
a. is independent of IB
b. is proportional to IB
c. is equal to IB
d. none of the above

Ans: a

124. Shape of the transfer characteristics of CB configuration is_____.
a. non-linear
b. linear
c. parabolic
d. none of the above

Ans: b

125.   The reverse saturation current of CE configuration with base open is_____.
a. ICEO

b. ICBO

c. ICO

d. none of the above

Ans: a

126. The voltage gain of an emitter follower is _____.

a. 1

b. less than 1

c. greater than 1

d. none of the above

Ans: b

127. In_____configuration/s there is phase shift of 0 degree between input and output.

a. CB

b. CE

c. CC

d. CB and CC

Ans: d

128. The output of_____amplifier follows the input. Hence it is also called emitter follower.

a. CB

b. CE

c. CC

d. none of the above

Ans: c

129. For an CC amplifier, the input is applied to _____and the output is obtained at_____.

a. emitter, base

b. collector, base

c. base, emitter

d. none of the above

Ans: c

130. For CE amplifier, ac input is applied to ____

a. emitter

b. base

c. collector

d. none of the above

Ans: b

131. For CE configuration, in the cut-off region, IC=__.

a. ICBO

b. ICEO

c. 0

d. none of the above

Ans: b

132. The ICEO in terms of ICBO is given by __

a. ICEO=(1+ß. ICBO

b. ICEO=ß*ICBO+1

c. ICEO=ICBO/(1+ß.

d. none of the above

Ans: a

133. If R1 is the input resistance and R2 is the output resistance of the voltage gain A in the common emitter configuration is_____.

a. alpha(R2/R1.

b. ß(R2/R1.

c. alpha

d. ß

Ans: b

134. The current gain of CE configuration is ____

a. ßdc

b. alpha dc

c. gamma dc

d. none of the above

Ans: a

135. ßdc=_____.
a. IB/IE
b. IC/IE
c. IC/IB
d. none of the above

Ans: c

136. The ratio of which two currents is represented by ß?
a. IC and IE
b. IC and IB
c. IE and IB
d. none of the above

Ans: b

137. ß in terms of alpha is given by_____.
a. ß=alpha/(1+alpha.
b. ß=alpha/(1-alpha.
c. ß=(1+alpha. /alpha
d. none of the above

Ans: b

138. ß in a transistor when IB=105µA, IC=2.05mA is_____.
a. 11.5
b. 17.5
c. 13.5
d. 19.5

Ans: d

139. Determine the value of a when ß=100.
a. 1.01
b. 101
c. 0.99
d. cannot be solved with the information provided

Ans: c

140. The input resistance of CE configuration is change in VBE/change in IB at constant _____
a. VCE
b. VCB
c. IC
d. none of the above

Ans: a

141. The input resistance in CE configuration is _____at constant VCE.
a. change in VBE/change in IC
b. change in VBE/change in IB
c. change in VBE/change in IE
d. None of the above

Ans: b

142. The value of Ri in CE configuration is _____ that in CB configuration.
a. lower than
b. higher than
c. same as
d. none of the above

Ans: b

143. The typical value of VBE(sat. in CE configuration for a Si transistor is_____.
a. 0.7V
b. 0.2V
c. 0.9V
d. none of the above

Ans: a

144. Value of VBE(active) for a Ge transistor is_
a. 0.2
b. 0.6
c. 0.7
d. none of the above

Ans: a

145. The value of VBE(cut-off. for Si transistor is
a. 0.7V
b. 0V
c. 0.3V
d. none of the above

Ans: b

146.   The output characteristics of a CE configuration is the graph of_____.
a. VCE, VEC
b. IC, VEC
c. VCE, IC
d. none of the above

Ans: c

147. The value of dynamic output resistance in the CE configuration is_____than in CB configuration.
a. lower
b. higher
c. moderate
d. none of the above

Ans: a

148. Which of the following region is (are. part of the output characteristics of a transistor?
a. Active
b. cut-off
c. saturation
d. all of the above

Ans: d

149. The saturation region is defined by VCE _____VCE(sat. .
a. >
b. <
c. less than or equal to

d. greater than or equal to

Ans: c

150. In_____region the collector current is proportional to the base current.
a. saturation
b. cut-off
c. active
d. none of the above

Ans: c

151. The cut-off region is defined by IB _____ 0A.
a. >
b. <
c. less than or equal to
d. greater than or equal to

Ans: c

152. When a transistor is operated with emitter diode forward biased and collector diode reverse biased, the collector current will be __
a. almost zero
b. almost equal to the emitter current
c. infinitely high
d. many times more than the emitter current

Ans: b

153. For a BJT, under the saturation condition _
a. IC=ß*IB
b. IC > ßIB
c. IC is independent of all other parameters
d. IC < ßIB

Ans: d

154. Which of the statement for the Base-Emitter and the collector-base junctions is/are true?

a. IC is independent of VCE in the Active region.
IC=0 and VCE=VCC in the cut-off region.
IC=IC(sat) and VCE=0 in the saturation region.
b. the B-E should be forward biased and the C-B should be reverse biased in the active region
c. the base current IB controls the collector current IC in the active, cut-off and saturation regions
d. all of the above

Ans: b

155. A transistor is in saturation if
a. IB>IC/ß
b. IC/ß>/IB
c. IC=ßIB
d. none of the above

Ans: a

156. A transistor is in active region if
a. VCE > VCE(sat.
b. VCE = VCE(sat.
c. VCE < VCE(sat.
d. none of the above

Ans: a

157. Typical value of VCE(sat. is_____.
a. 0.7V
b. 0.2V
c. 0.6V
d. none of the above

Ans: b

158. The slope of the transfer characteristics in CE configuration is indicated by_____.
a. ßdc
b. ßac
c. alphadc
d. alphaac

Ans: b

159. The transfer characteristic in CE configuration is_____.
a. linear
b. nonlinear
c. parabolic
d. none of the above

Ans: a

160. gamma=_____.
a. IC/IB
b. IE/IC
c. IE/IB
d. none of the above

Ans: c

161. gamma =_____.
a. 1/(1+alpha)
b. 1/(1-alpha)
c. 1/(1+ß)
d. none of the above

Ans: b

162. The_____configuration is the most widely used.
a. CB
b. CE
c. CC
d. none of the above

Ans: b

163. The_____configuration is used as an input stage.
a. CB
b. CE
c. CC

d. none of the above

Ans: a

164. The input resistance of CC configuration is
_____.
a. low
b. high
c. 0
d. none of the above

Ans: b

165. The value of input resistance in the CE

configuration   is   _____   that   in   CB
configuration.
a. lower than
b. higher than
c. same as

d. none of the above

Ans: b

166. The current gain of common base npn
transistor is 0.96. What is the current gain if it is
used as common emitter amplifier?
a. 16
b. 24
c. 20
d. 32

Ans: b

167. In a common emitter circuit, the collector
current is 0.9 mA, base current is 100μA. The
value of current gain and emitter current is

_____.
a. 49 and 2mA
b. 9 and 1mA
c. 0.9 and 0.1 mA
d. none of these

168. Iceo indicates
a. collector Current
b. emitter Current
c. base current
d.   collector to Emitter current when base is
open.

Ans: d

169. In NPN transistor, the collector current is
24mA. If 80% of the electrons reach collector,
the base current in mA is

a. 36
b. 26
c. 16
d. 6

Ans: b

Ans: d

170. In a transistor circuit base current is increased by 50µA, the collector current increases by 1mA. The current gain of the transistor is
a. 20
b. 40
c. 60
d. 8

0

Ans:

a

171. A common emitter transistor amplifier has a current gain of 50. If the load resistance is 4Kohm and input resistance is 500 ohm, the voltage gain in amplifier is .
a. 160
b. 200
c. 300
d. 400

Ans: d

172. A common emitter amplifier is designed with npn transistor with alpha=0.99, the input impedance is 1 Kohm and load is 10Kohm. The voltage gain will be_____.
a. 9.9
b. 99
c. 990
d. 9900

Ans: c

173. Transistor has lowest output impedance in _____configuration.
a. CB
b. CE
c. CC

d. none of the above

Ans: c

174. Current gain of transistor is lowest in _____Configuration.
a. CB
b. CE
c. CC
d. none of the above

Ans: a

175. The output resistance of CC configuration is ___
a. Very Low
b. Low
c. High
d. None of these

Ans: a

176. The_____of CC configuration is less than unity.

d. None of the above

Ans: c

177. Identify which configuration has following characteristics. Voltage gain is less than one, Input impedance high and output impedance very low.
a. CB
b. CE
c. CC
d. None of these

Ans: c

178. _____ amplifier   configuration
a. Input resistance
b. Current gain
c. Voltage Gain

provides both high current and voltage gain.
a. CB
b. CE
c. CC
d. None of

these Ans: b

179. The_____configuration is used
for impedance matching.
a. CB
b. CE
c. CC
d. None of

these Ans: c

180. As compared to a CB amplifier, a CE
amplifier has _____
a. Lower current amplification
b. Higher current amplification
c. Lower input resistance
d. higher input

resistance Ans: b

181. In_____configuration there is phase shift of 180 degree between input and output.

a. CB

b. CE

c. CC

d. None of these

Ans: b

182. _____ transistor

configuration provides the highest input impedance.

a. CB

b. CE

c. CC

d. None of these

Ans: c

183. The_____configuration is used as an output stage.

a. CB

b. CE

c. CC

d. None of these

Ans: c

184. The Q point is also known as

_____.

a. open point

b. operating point

c. DC point

d. Breakdown point

Ans: b

185. The slope of a Dc load line represents_____.

a. Collector resistance

c. reciprocal of AC load resistance

d. None of the above

Ans: b

186. The position of Q point on the DC load line should be_____.

a. Stable

b. unstable

c. bistable

d. tristable

b. reciprocal of DC load resistance

Ans: a

187. In CE configuration, co-ordinates of Q
point are_____.
a. Vce, Ib
b. Vcb,Ic
c. Vce,Ic
d. Vce,I

e Ans: c

188.In CE configuration, the upper end of DC
load line is called the_____points
and the lower end is the_____point.
a. Q, base
b. base, Q
c. Saturation, Q
d. cut-off,

Q Ans: c

189. _____ has an important effect on shifting
of the operating point.
a. Voltage
b. change in beta
c. Current
d. None of the

above Ans: b

190. Which of the following factor affects the Q point stability?
a. Temperature
b. Bypass Capacitor
c. Coupling Capacitor
d. None of the above

Ans: a

191. Three different Q points are shown on a load line. The upper Q point represents the ____.
a. minimum current gain
b. intermediate current gain
c. maximum current gain
d. cut-off point

Ans: c

192. If a transistor operates at the middle of the load line, a decrease in the base resistance will move the Q point .
a. down
b. up
c. no where
d. off the load line

Ans: b

193. If the base supply voltage increases, the Q point moves_____.
a. down
b. up
c. no where
d. off the load line

Ans: b

194. When the Q point moves along the load line, VCE decreases when the collector current _____.
a. decreases

b. stays the same
c. increases
d. none of the above

Ans: c

195. Suppose the base resistor is open. The Q point will be_____.
a. in the middle of the load line
b. at the upper end of the load line
c. at the lower end of the load line
d. off the load line

Ans: c

196. If a transistor operates at the middle of the load line, a decrease in the current gain will move the Q point_____.
a. down
b. up
c. no where
d. off the load line

Ans: a

197. If the base supply voltage is disconnected, the collector-emitter voltage will equal _____.
a. 0V
b. 6V
c. 10.5V
d. collector supply voltage

Ans: d

198. If the base resistor has zero resistance, than transistor will probably be_____.
a. saturated
b. in cut-off
c. destroyed
d. none of the above

Ans: c

199. If the collector resistor opens in a base-biased circuit, the load line will become_____.
a. horizontal
b. vertical
c. useless
d. flat

Ans: a

200. If the emitter resistance decreases, the
_____.
a. Q point moves up
b. collector current decreases
c. Q point stays where it is
d. current gain increases

Ans: a

201. If the operating point of an npn transistor amplifier is selected in saturation region, it is likely to result in_____.
a. thermal runway of transistor
b. clipping of output in the positive half of the input signal
c. need for high DC collector supply
d. clipping of output in the negative half of the input signal

Ans: b

202. The output voltage of an ampifier is 5V when an input voltage is 50mV. Its voltage gain is___.
a. 100
b. 250
c. 1000
d. none of the above

Ans: a

203. The ideal voltage amplifier must have _____input resistance.
a. low
b. high
c. infinite
d. none of the above

Ans: c

204. The ideal value of Ro is_____.
a. zero
b. infinite
c. very low
d. none of the above

Ans: a

205. Ideally the bandwidth of an amplififer should be_____.
a. infinite
b. low
c. as high as possible
d. none of the above

Ans: a

206. The frequency of Vo of an amplifier is
_____.
a. less than that of Vin
b. same as that of Vin
c. greater than that of Vin
d. none of the above

Ans: b

207. Ideallly voltage gain of an ampllifier should be__.
a. zero
b. high
c. infinite
d. none of the above

Ans: c

208. In a common emitter amplifier output resistance is 5000 ohm and input resistance is 2000 ohm. If the peak value of signal voltage is 10mV and B=50, the peak value of voltage output is .
a. 5×10^{-6} V
b. 2.5×10^{-4} V
c. 1.25V
d. 125V

Ans: c

209. The current gain of_____amplifier is always less than unity.
a. CB
b. CE
c. CC
d. none of the above

Ans: a

210. The voltage gain of_ amplifier is always less than unity.
a. CB
b. CE
c. CC
d. none of the above

Ans: c

211. The_____amplifier can be used as buffer.
a. CB
b. CE
c. CC
d. none of the above

Ans: c

212. MOSFET is a_____controlled device.

a. current
b. voltage
c. field
d. all of the above

Ans: b

213. It is the insulating layer of_____in the MOSFET construction that accounts for the very desirable high input impedance of the device.
a. SiO
b. GaAs
c. SiO2
d. HCl

Ans: c

214. Which of the following applies to MOSFETs?
a. No direct electrical connection between the gate terminal and the channel
b. Desirable high input impedance
c. Uses metal for the gate, drain and source connections
d. All of the above

Ans: d

215. How many terminals a MOSFET has?
a. 2
b. 3
c. 4
d. 3 or 4

Ans: b

216. MOSFET is a_____device.
a. unipolar
b. bipolar
c. multipolar
d. none of the above

Ans: a

217. In MOSFET, the current flows due to _____
a. minority carriers
b. majority carriers
c. both, majority and minority carriers
d. none of the above

Ans: b

218.   Which of the following transistor(s)

has(have) depletion and enhancement types?
a. BJT
b. JFET
c. MOSFET
d. none of the above

Ans: d

219. VLSI technology relies on_____.
a. MOSFET
b. BJT
c. diode
d. none

Ans: c

220.   For   making   n-channel   enhancement
MOSFET the substrate taken will be of type
a. p
b. n
c. either p or n
d. none of these

Ans: a

221. The input resistance of MOSFET is _____
that of BJT.
a. lower than
b. higher than

d. none of the above

Ans: b

222. A MOSFET has a high input_____.
a. current
b. resistance
c. inductance
d. none of the above

Ans: b

223.   The packaging density of MOSFETs is

_____as compared to BJT.
c. same as

a. less
b. high
c. same
d. none of the

above Ans: b

224. Because of insulated gate, MOSFET is also called_____.
a. INFET
b. IGFET
c. IMOSFET
d. IGMOSFE

T Ans: b

225. In a enhancement mode MOSFET, the channel is_____.
a. always present
b. always absent
c. initially absent
d. none of the

above Ans: c

226. For an n-channel EMOSFET VT is_____.
a. negative
b. zero
c. positive

d. none of the above

Ans: c

227. For an EMOSFET ID=0 for_____.
a. VGS > VT
b. VGS < VT
c. VDS < VT
d. none of the above

Ans: b

228. In order to operate EMOSFET as an amplifier we have to operate it in_____region.
a. ohmic
b. saturation
c. cut-off
d. none of the above

Ans: b

229. The EMOSFET acts as a_____for VGS < VT.
a. open switch
b. closed switch
c. resistor
d. none of the above

Ans: a

230. For an n-channel EMOSFET,ID _ for VGS=0.
a. zero
b. IDSS
c. infinite
d. none of the above

Ans: a

231. In n-channel EMOSFET channel is ____ when VGS > VT.
a. disappeared
b. induced
c. none of these
d. all of the above

Ans: b

232. By connecting drain and gate terminals together EMOSFET can be used as_____.
a. amplifier
b. open switch
c. resistor
d. none of the above

Ans: c

233. In n-channel EMOSFET, the conduction begins when_____.
a. VGS=VT
b. VDS=VP
c. VDS=VDD
d. none of the above

Ans: a

234. In enhancement type MOSFET, channel is present initially.
a. The statement is false since channel is enhanced by applying gate voltage
b. The statement is true
c. No concept of channel is there
d. All the above are false

Ans: a

235. For an EMOSFET, the relation between ID and VGS is_____.
a. ID=k(VGS-VT)
b. ID=k2(VGS-VT)
c. ID=k(VGS-VT)2
d. none of the above

Ans: c

236. The drain characteristics of MOSFET is _____.

a. VDS to ID
b. VGS to ID
c. both of the above
d. none of the above

Ans: a

237. The transfer characteristics of MOSFET is
_____.
a. VDS to ID
b. VGS to ID
c. both of the above
d. none of the above

Ans: b

238. MOSFET is_____.
a. multilayer oxide semiconductor field effect
transistor
b.   most oxidized semiconductor field effect
transistor
c.   metal oxide semiconductor field effect
transistor
d. none of the above

Ans: c

239. MOSFETs are also called_____.
a. IGFETs
b. BJTs
c. UJTs
d. none of the above

Ans: a

240. _____ and_____are two basic types of
MOSFETs.
a. NPN and PNP
b. IGFET and JFET
c. DMOSFET and EMOSFET
d. none of the above

Ans: c

OPAMP:

1. CMRR is a large number, which may, alternately be quoted in ……………….
a. bel
b. voltage
c. decibel
d. None of the above

Ans: c

2. Noise appears as a ....mode signal.
a. common
b. differential
c. None of the above
d. a and b

Ans: a

3. Common-mode occurs when ....inputs are applied to both input terminal.
a. equal out of phase
b. unequal out of phase
c. equal in phase
d. unequal in phase

Ans: c

4. Input bias current also produces an output error voltage ....input voltage.
a. None of the below
b. without
c. with high
d. with small

Ans: b

5. Input offset current is the ………. of the two bias currents.
a. sum

b. difference
c. average
d. None of the above

Ans: b

6. A differential amplifier
a. is part of an operational amplifier
b. has one input and one output.
c. has two outputs
d. answers a. and c.

Ans: a

7. In the differential mode
a. opposite polarity signals are applied to the inputs
b. the gain is unity
c. the outputs are of different amplitudes
d. only one supply voltage is used

Ans: a

8. In the common-mode
a. both inputs are grounded
b. the outputs are connected together
c. an identical signal appears on both inputs
d. the output signals are in phase

Ans: c

9. Common mode gain is
a. very high
b. very low
c. always unity
d. unpredictable

Ans: b

10. To measure how successful an amplifier is in providing gain for the difference mode signal and rejecting the common mode signal, a factor called .... is used.
a. common mode rejection ratio
b. differential mode rejection ratio
c. slew rate
d. power supply rejection ratio

Ans: a

11. The value of CMRR can be expressed bs
a. Ad/2AC.
b. 2Ad/AC.
c. 20 log10Ad/AC
d. none of the above.

Ans: c

12. If the difference mode gain and common mode gain of an op-amp are 3500 and 0.35, respectively, the CMRR will be
a. 1000.
b. 10,000.
c. 80 dB.
d. b and c.

Ans: c

13. The common mode rejection ratio of an op-amp is
a. common mode gain /differential gain.
b. common mode gain /inverting mode gain,
c. differential gain/common mode gain,
d. none of the above.

Ans: c

14. The differential mode gain is
a. very high,
b. very low,

c. always unity,
d. unpredictable.

Ans: a

15. Ideally opamp has .... gain.
a. infinte.
b. very less.
c. medium.
d. None of the above

Ans: a

16. Opamp has slew rate = ... V/μs.
a. 0.25.
b. 0.5
c. 1.5
d. 0.75.

Ans: b

17. The input current through the opamp input terminals is
a. zero.
b. equal and high
c. equal and low
d. None of the above

Ans: a

18. An ideal Operational Amplifier is basically a 3-terminal device that consists of
a. two high impedance inputs, one an Inverting and the other a Non-inverting input
b.   three high impedance inputs, one an Inverting and the other two is Non-inverting input
c. four high impedance inputs, two an Inverting and the other two is Non-inverting input
d.   three high impedance inputs, two an Inverting and the another is Non-inverting input

Ans: a

19. The measure of an amplifier's ability to reject common mode single is a parameter called:
a. CMRR
b. PSRR
c. CMG
d. None of the above

Ans: a

20. The SLEW rate is…
a. The maximum rate of change of the output voltage in response to the step input voltage
b. The minimum rate of change of the output voltage in response to the step input voltage
c. The maximum rate of change of the step input voltage in response to the output voltage
d. The minimum rate of change of the step input voltage in response to the output voltage

Ans: a

21. The gain of the op-amp decreases as
a.   Frequency increases above the critical frequency.
b.   Frequency decreases below the critical frequency.
c. Frequency is equal to the critical frequency.
d. None of the above

Ans: a

22. The gain-bandwith product
a. equals the frequency at which unity voltage gain occurs.
b. double the frequency at which unity voltage gain occurs
c.   half the frequency at which unity voltage gain occurs
d. None of the above

Ans: a

23. The input offset current is the
a. difference between the two biased currents
b. sum of the two biased currents
c. sum of the three biased currents
d. None of the above.

Ans: a

24. An operational amplifier is not in saturation if
a. Its input impedance becomes very small
b.   The theoretical output voltage is less than the positive supply voltage
c. Its output impedance becomes very large
d. Its slew rate is not large enough to allow the actual output to track the ideal output
e.   The theoretical output voltage is greater than the positive supply voltage

Ans: b

25. The Gain bandwidth product is the midband voltage gain multiplied by the bandwidth.
True/False
a. True
b. False

Ans: a

26. PSRR of Op-amp is a large number.
True/False
a. True
b. False

Ans: b

27. What characteristics would characterize an ideal operational amplifier?

a. An infinite voltage gain, zero input resistance and infinite output resistance
b.   An infinite voltage gain, an infinite input resistance and zero output resistance.
c.   An infinite voltage gain, an zero input resistance and zero bias currents.
d. An infinite voltage gain, zero input resistance and an infinite bandwidth.

Ans: b

28. What would be a gain bandwidth product of operational amplifier?
a. none of above
b. zero
c. constant
d. varying

Ans: c

29. An op-amp can be used in
a. linear applications only
b. non linear applications only
c. linear as well as non linear applications
d. none of the above

Ans: b

30. The close loop gain of.........circuit is always greater than 1
a. inverting amplifier
b. noninverting amplifier
c. voltage follower
d. none of the above

Ans: b

31. The .... circuit is also called as unity gain buffer
a. inverting amplifier
b. noninverting amplifier
c. voltage follower

d. none of the above

Ans: c

32. What characteristics would characterize an ideal operational amplifier?
a. An infinite voltage gain, zero input resistance and zero output resistance
b.   An infinite voltage gain, an infinite input resistance and an infinite output resistance.
c.   An infinite voltage gain, an infinite input resistance and zero output resistance.
d. An infinite voltage gain, zero input resistance and an infinite output resistance.

Ans: c

33. What would be a typical value for the unity-gain bandwidth of a 741 operational amplifier?
a. 104
b. 105
c. 106
d. 107

Ans: c

34. The CMRR of a Diff-amp is defined as
a. Ad/Ac
b. Ac/Ad
c. CMR/Ad
d. none of the above

Ans: a

35.Ideally voltage gain of op-amp should be.....
a. 1
b. -1
c. 0
d. Infinite

Ans: d

36. The input stage of an op-amp is usually
a. a class A push pull amplifier
b. a CE amplifier
c. A differential amplifier
d. none of above

Ans: c

37. An op-amp can be used in
a. linear applications only
b. non linear applications only
c. linear as well as non linear applications
d. none of the above

Ans: b

38 Op-amps have become very popular in industry mainly because
a. they are cheaper
b. of their extremely small size
c. they are available in different packages
d. their external characteristics can be changed to suit any application.

Ans: b

39. The response time of an opamp is
a. 5ns
b. 5 ms
c. 5 µs
d. none of above

Ans: b

40. The isolation impedance of an isolation op-amp is of the order of
a. 1000
b. 1012
c. 1
d. 0.1

Ans: d

41. The number of pins of the µA741 op-amp is
a. 14
b. 16
c. 8
d. non of the above

Ans: c

42. The ideal op-amp has input resistance
a. Zero
b. Infinity
c. 10
d. 1K

Ans: b

43. An ideal op-amp has
a. an infinite voltage gain
b. infinite input resistance
c. zero output resistance
d. all of the above

Ans: d

44. The output impedance of an ideal op-amp is
a. Zero
b. infinite
c. 100 K
d. 10 K

Ans: a

45. The bandwidth of an ideal op-amp is
a. infinite
b. large
c. zero
d. small

Ans: a

46. An op-amp should have
a. high output impedance

b. low output impedance

c. high input impedance

d. low input impedance

Ans: c

47. An amplifier is constructed using a 741 op-amp. What is the maximum gain that can be achieved if the arrangement must have a bandwidth of 10 kHz?

a. 10

b. 100

c. 1000

d. 10000

Ans: b

48. Direct coupling removes frequency ------------

a. Limitations

b. variations

c. alterations

d. None of the above

Ans: a

49. Output of an ideal OPAMP is proportional to

a. (V1-V2)

b. (V1+V2)

c. (V1-V2) /2

d. (V1+V2) /2

Ans: a

50. Ideally the common mode gain of OPAMP must be

a. Infinite

b. 1000

c. One

d. Zero

Ans: d

51. Gain of OPAMP in Non-inverting amplifier mode never less than ....

a. 0

b. 1

c. -1

d. None of the above

Ans: b

52. OPAMP uses.............. Power supply

a. Single

b. Double

c. dual

d. None of the above

Ans: c

53. In OPAMP to get inverted output, input is applied to ………….

a. Inverting input terminal

b. Non-inverting input terminal

c. Negative input to inverting input terminal

d.   Inverted input to Non-inverting input terminal

Ans: a

54. In OPAMP to get in phase output, input is applied to ………….

a. Inverting input terminal

b. Non-inverting input terminal

c. Negative input to inverting input terminal

d.   Inverted input to Non-inverting input terminal

Ans: b

55. Basic block dia. of OPAMP consists of …………. stages.

a. One

b. Two

c. Three

d. Four

Ans: d

56. Input resistance of OPAMP is ideally ………….
a. Zero
b. Medium
c. Infinite
d. 1KO

Ans: c

57. Offset voltage of OPAMP is ideally ………….
a. Zero
b. Medium
c. Infinite
d. 1Kohm
Ans: a

58. Output resistance of OPAMP is ideally ………….
a. Zero
b. Medium
c. Infinite
d. 1K

Ans: a

59. PSRR of OPAMP is ideally ………….
a. Zero
b. Medium
c. Infinite
d. 1K

Ans: a

60. Bandwidth of OPAMP is ideally ………….
a. Zero
b. Medium
c. Infinite
d. 1K

Ans: c

61. Bias current of OPAMP is …………. Of two input currents.
a. Addition
b. Subtraction
c. Average
d. None of the above

Ans: c

62. Offset current of OPAMP is …………..Of two input currents.
a. Addition
b. Subtraction
c. Average
d. None of the above

Ans: b

63. OPAMP has ……… input and …… output terminal.
a. one, one
b. two, one
c. one, two
d. two, two

Ans: b

64. Typically the OPAMP has …… Input resistance.
a. 2 M
b. 2 K
c. 2
d. 1 M

Ans: a

65. Typically OPAMP has ……Output resistance.
a. 75 MOhm
b. 75 KOhm
c. 75 Ohm

d. 100 Ohm

Ans: c

66. Typically the OPAMP has............Bandwidth.
a. 2 MHz
b. 2 KHz
c. 2 Hz
d. 1 MHz

Ans: d

67. Typically the OPAMP has................ Input offset voltage.
a. 2 mV
b. 20 mV
c. 200 mV
d. 2 V

Ans: a

68. Typically the OPAMP has ....Input bias current.
a. 5 nA
b. 50 nA
c. 500 nA
d. 5 A

Ans: b

69. Typically the OPAMP has................ Input offset current.
a. 6 nA
b. 60 nA
c. 600 nA
d. 6 A

Ans: a

70. Typically the OPAMP has............. CMRR.
a. 9 dB
b. 900 dB
c. 90 dB

d. 99 dB

Ans: c

71. A common mode signal is applied to
a. the inverting input
b. the non-inverting input
c. both the inputs
d. none of the above

Ans: c

72. If the two input terminals of a diff-amp are grounded, then
a. an output offset voltage may exist
b. the ac output voltage is zero
c. the base current are equal
d. the collector currents are equal

Ans: a

73. If a differential amplifier having an open loop gain of 80 dB is fed with 2mV dc at its noninverting input and 1.9 mV dc at the inverting input ,then the output will be
a. 1 V dc
b. -1V dc
c. zero as op-amp does not amplify dc
d. none of the above

Ans: b

74. The tail current of a diff-amp is
a. equal to the difference of the base currents of the two transistors
b. equal to collector current of either of the transistors.
c. two times the collector current of either of the transistors.
d. half the collector current of either of the transistors

Ans: c

75. The input offset current of a diff-amp is the
a. average of the two base currents
b. difference of the two base currents
c. average of the two collector currents
d. difference of the two collector currents

Ans: a

76. PSRR of op-amp should be ideally.....
a. 0
b. Infinite
c. 1
d. -1

Ans: a

77. While making measurements with an op-amp , it was observed that currents flowing towards the inverting and non inverting inputs were 4µ A and 2 µ A, respectively. The input offset current in this case would be

a. 4µA
b. 2µA
c. 3µA
d. 6µA

Ans: b

78. Indicate the false statement with reference to op-amps
a.   Closed loop bandwidth of an op-amp is always greater than its open loop bandwidth
b. closed loop gain is always less than the open loop gain
c.   Input impedance is always greater than the output impedance
d. None of the above

Ans: d

79. An ideal op-amp is used to make an inverting amplifier. The two input terminals of the op-amp are at the same potential because
a. two input terminals are shorted internally
b. the input impedance of the op-amp is infinity
c. the open loop gain of the op-amp is infinity
d. CMRR is infinity

Ans: c&d

80. An analog comparator is a high gain amplifier whose output is always either positive or in negative saturation
a. True
b. False

Ans: a

81. An ideal operational amplifier has
a. infinite output impedance
b. zero input impedance
c. infinite bandwidth
d. All of the above

Ans: c

82. All of the following are basic op-amp input modes of operation EXCEPT
a. inverting mode
b. common-mode
c. double-ended
d. single-ended

Ans: a

83. If an op-amp has one input grounded and the other input has a signal feed to it, then it is operating as what?
a. Common-mode
b. Single-ended
c. Double-ended
d. Non-inverting mode

Ans: b

84. The common-mode voltage gain is
a. smaller than differential voltage gain
b. equal to voltage gain
c. greater than differential voltage gain
d. None of the above

Ans: a

85. A diff-amp has a common-mode gain of 0.2 and a common-mode rejection ratio of 3250. What would the output voltage be if the single-ended input voltage was 7 mV rms?
a. 1.4 mV rms
b. 650 mV rms
c. 4.55 V rms
d. 0.455 V rms

Ans: c

86. The input offset current equals the
a. average of two base currents
b. collector current divided by current gain
c. difference between two base-emitter voltages
d. difference between two base currents

Ans: d

87. When slew-rate distortion of a sine wave occurs, the output
a. is larger
b. appears triangular
c. appears square
d. has no offset

Ans: b

88. CMRR is a large number, which may alternately be quoted in -----------
a. Decibels
b. Volt

c. Ampere
d. Farad

Ans: a

89. Each coupling capacitor produces a ----------- cut off.
a. high frequency
b. medium frequency
c. low frequency
d. none of above

Ans: c

90. Typically the OPAMP has .... PSRR.
a. 150 μV/V
b. 15 μV/V
c. 1.5 μV/V
d. 1500μV/V

Ans: a

91. Differential input voltage of OPAMP in common mode ....
a. Negative
b. Positive
c. Zero
d. None of the above

Ans: c

92. Typically the OPAMP has 50 nA Input ....
a. bias current
b. offset current
c. offset voltage
d. current

Ans: a

93. A differential amplifier has
a. one input
b. two inputs

c. three inputs

d. none of the above

Ans: b

94. A differential amplifier has

a. an op-amp

b. a transformer

c. an emitter follower

d. none of above

Ans: a

95. In differential amplifiers, the transistors are

a. of different characteristics

b. one N-P-N and other P-N-P

c. unmatched

d. matched

Ans: d

96. A differential amplifier is used in op-amp circuits because of its

a. high input impedance

b. low input impedance

c. low CMRR

d. high CMRR

Ans: a

97. An operational amplifier is in saturation if

a. Its input impedance becomes very small

b. The theoretical output voltage is less than the positive supply voltage

c. Its output impedance becomes very large

d. Its slew rate is not large enough to allow the actual output to track the ideal output

e. The theoretical output voltage is greater than the positive supply voltage

Ans: e

98. The Gain bandwidth product is the ----------- voltage gain multiplied by the bandwidth.

a. midband

b. lowband

c. highband

d. none of above

Ans: a

99. Where the input terminals are floating ,the amplifier is usually designed to operate as a -------------- amplifier.

a. non-inverting

b. differential

c. inverting

d. summing

Ans: b

100. The addition of ……………overcomes the noise problem.

a. positive feedback

b. negative feedback

c. Answers a and b

d. None of the above

Ans: b

101. If an inverting op-amp has R2 = 2 MO and R1 = 2 KO, its scale factor is

a.   1000.

b. -1000.

c.   1020

d. -1020

Ans: a

102. When input voltage of 1 V is applied to an op-amp having Av of 100 and bias supply of 15 V, the output voltage is

a. 15 x 100V.

b. 15 V.

c. 1V

d. 150 V.

Ans: b

103. The input impedance of the non-inverting amplifier configuration is ---------- the input impedance of the op-amp itself without feedback

a. much less than

b. much greater then

c. somewhat higher

d. lower

Ans: b

104. In amplifiers with negative feedback, the gain is less liable.

a. True

b. False

c. None of the above

Ans: b

105. The smaller the closed-loop voltage gain, the greater the bandwidth.

a. True

b. False

c. None of the above

Ans: a

106. A buffer amplifier is used for isolation; between two stages.

a. True

b. False

c. None of the above

Ans: a

107. When negative feedback is used, the gain-bandwidth product of an op-amp

a. increases

b. decreases

c. stays the same

d. fluctuates

Ans: c

108. Open loop voltage gain of typical op-amp is

a. Greater than 1,00,000

b. Less than 1,00,000

c. Always equal to 1,00,000

d. None of the above.

Ans: a

109. The closed loop voltage gain is always …

a. Less than the open loop voltage gain

b. Greater than open loop voltage gain

c. Equal to the open loop voltage gain

d. None of the above.

Ans: a

110. Where the input terminals are floating ,the amplifier is usually designed to operate as a non-inverting amplifier.

a. True

b. False

Ans: b

111. When an Op-Amp is used as a inverting amplifier, the input signal is fed into the _____ input and the _____ input is grounded through a resistor.

a. Non-inverting, inverting

b. Inverting, non-inverting

c. Feedback, slew rate

d. All of the above

e. None of the above .

Ans: b

112. The open-loop voltage gain (Aol. of an op-amp is the
a. external voltage gain the device is capable of
b. internal voltage gain the device is capable of
c. most controlled parameter
d. same as Acl

Ans: b

113. With negative feedback, the returning signal
a. is proportional to output current
b. is proportional to differential voltage gain
c. opposes the input signal
d. aids the input signal

Ans: c

114. The closed-loop voltage gain (Acl. of an inverting amplifier equals
a. the ratio of the input resistance to the feedback resistance
b. the open-loop voltage gain Aol
c. the feedback resistance divided by the input resistance
d. the input resistance.

Ans: c

115. Decreasing the gain in Figure above could be achieved by
a. reducing the amplitude of the input voltage
b. increasing the value of the feedback resistor
c. increasing the value of the input resistor
d. removing the feedback resistor

Ans: c

116. If an input signal is applied to the inverting input of an op-amp with the noninverting input grounded, the output signal would be opposite in polarity with the input.
a. True
b. False
c. none of the above

Ans: a

117. Gain of OPAMP … With positive feedback
a. Reduces
b. Increases
c. Remains same
d. None of the above

Ans: b

118. In case of OPAMP as a buffer amplifier value of feedback resistor is ………
a. Always less than the input resistor
b. Always greater than the input resistor
c. Always equal to the input resistor
d. Always Zero

Ans: d

119. Sine wave generator uses .... feedback
a. negative feedback
b. positive feedback
c. No feedback

Ans: b

120. Square wave generator uses …………. feedback
a. negative feedback
b. positive feedback
c. No feedback
d. None of the above.

Ans: b

121. Input resistance of OPAMP in Inverting amplifier configuration is ………….

a. Very small
b. Very large
c. Equal to R1
d. Equal to Rf

Ans: b

122.   Input resistance of OPAMP in Non-inverting amplifier configuration is ………….
a. Very small
b. Very large
c. Equal to R1
d. Equal to Rf

Ans: c

123. Gain of OPAMP in Non-inverting amplifier mode never …… one.
a. Less than
b. Greater than
c. Equal to
d. a & c

Ans: d

124.   When an Op-Amp is used as a non-inverting amplifier, the input signal is fed into the__input and the_____input is grounded through a resistor.
a. Non-inverting, inverting
b. Inverting, non-inverting
c. Feedback, slew rate
d. All of the above
e. None of the above .

Ans: a

125.   Comparators   are   examples   of ……………circuits.
a. two bit
b. one bit
c. three bit

d. None of the above

Ans: b

126.   A   comparator   ………….   detect   zero crossings.
a. None of the below
b. can
c. cannot

Ans: b

127. When a large sine wave drives a Schmitt trigger, the output is a
a. rectangular wave
b. triangular wave
c. rectified sine wave
d. series of ramps

Ans: a

128. A comparator with a trip point of zero is sometimes called a
a. threshold detector
b. zero-crossing detector
c. positive limit detector
d. half-wave detector

Ans: b

129. 129.
a.
b.
c.
d.

Ans: a

130. A Schmitt trigger uses
a. Positive feedback
b. negative feedback
c. compensating capacitors

d. Pull-up resistors

Ans: a

131. A Schmitt trigger
a. is a. zero-crossing detector
b. has two trip points
c. produces triangular output waves
d. is designed to trigger on noise voltage

Ans: b

132. The trip point of comparator is the input voltage that cause
a. the circuit to oscillate
b. peak detection of the input signal
c. the output to switch states
d. clamping to occur

Ans: c

133. The zero-level detector is one application of a
a. comparator
b. differentiator
c. summing amplifier
d. diode

Ans: a

134. The op-comp can be used as
a. An analog to digital converter.
b. a limit detector.
c. a voltage level detector
d. all of the above.

Ans: d

135. One of the following statements with reference to the voltage follower Configuration using an op-amp is incorrect.
a. No resistance in the circuit.

b. Gain is 10
c. The Voltage gain is Unity,
d. The input is applied at the non inverting input.

Ans: b

136. The output voltage in a voltage follower ----------- follow the input voltage
a. accurately
b. inaccurately
c. crosses
d. None of above

Ans: a

137. In a non inverting adder output is the sum of inputs if ----
a. all resistors are equal
b. all resistors are unequal
c. f/b resistor is twice the input resistors
d. f/b resistor is half the input resistors

Ans: a

138. A summing amplifier can have
a. only one input
b. any number of inputs
c. only two inputs
d. only three inputs

Ans: b

139. An averaging amplifier has five inputs, The ratio Rf/Ri must be
a. 5
b. 0.2
c. 0.1
d. 2

Ans: b

140. In an averaging circuit, the input resistances are
a. equal to the feedback resistor
b. less than the feedback resistor
c. greater than the feedback resistor
d. unequal

Ans: a

141. In an summing amplifier if R1=R2=Rf , input is V1=1 V and V2=4 V The output will be
a. 10 V
b. 5 V
c. 4 V
d. 2.5 V

Ans: b

142. In an summing amplifier if R1=R2, Rf = 2 R1, input is V1=1 V and V2=4 V The output will be
a. 10 V
b. 5 V
c. 4 V
d. 2.5 V

Ans: a

143. If the volatege gain for each input of a summing amplifier with a 4.7 Kilo-Ohms feedback resistor is unity, the input resistors must have a value of
a. 4.7 Kilo-Ohms
b. 4.7 Kilo-Ohms divided by the number of inputs
c. 4.7 Kilo-Ohms times the the number of inputs

Ans: a

144. In averaging circuit if R1 = R2 = R3 = …….. and Rf = ………….

a. R, R/3
b. R, 2R
c. R, R
d. 2R/3, R

Ans: a

145. In the Subtractor, the output voltage is ……….
a. Proportional to the difference between the two input voltages
b. Inversely Proportional to the difference between the two input voltages
c. Proportional to the sum of the two input voltages
d. Inversely proportional to the sum of the two input voltages

Ans: a

146. In a scaling subtractor, the input resistors are
a. All of the same value
b. All of different values
c. Each proportional to the weight of its inputs
d. Related by the factor of two.

Ans: c

147. In averaging circuit if R1 = R2 = R3 = R and Rf = ………….
a. R/3
b. 2R
c. R
d. 2R/3

Ans: a

148. If the voltage gain for each input of a summing amplifier with a 3 Kilo-Ohms feedback resistor is unity, the input resistors must have a value of

a. 3 Kilo-Ohms

b. 3 Kilo-Ohms divided by the number of inputs

c. 3 Kilo-Ohms times the the number of inputs

Ans: a

149. In a scaling adder, the input resistors are

a. All of the same value

b. All of different values

c. Each proportional to the weight of its inputs

d. Related by the factor of two.

Ans: c

150. For the difference amplifier the inputs are connected to the.......

a. both to inverting input terminal

b. both to non-inverting input terminal

c. one to inverting input terminal and other to non-inverting input terminal

d. None of the above

Ans: c

151. For summer circuit minimum number of inputs required are ………

a. One

b. Two

c. Three

d. Ten

Ans: b

152. In an integrator the output is the integral of the ……… Input

a. Inverted

b. Squared

c. Square root of the

d. None of the above

Ans: a

153. For a positive input pulse, the output of an integrator is a ------------- ramp

a. positive going

b. negative going

c. centered

d. None of the above

Ans: b

154. A differentiator produces on output that is proportional to the rate of change of the …

a. output voltage

b. Input current

c. Input voltage

d. output current

Ans: c

155. With an inverting amplifier the output is in quadrature with the input.

a. True

b. False

c. None of the above

Ans: b

156. The input impedance of an inverting amplifier is easy to set up.

a. True

b. False

c. None of the above

Ans: a

157. Spikes are useful signals because they indicate when a rectangular input signal starts and ends.

a. True

b. False

c. None of the above

Ans: a

158. In an integrator, the feedback element is a
a. Resistor
b. Capacitor
c. Zenar Diode
d. Voltage Dividor

Ans: b

159. The feedback element in a differentiator is
a. a capacitor.
b. an inductor.
c. a zener diode.
d. A resistance.

Ans: d

160. A differentiator converts a linear ramp into
a. constant dc output.
b. saw-tooth output.
c. square output.
d. triangular output.

Ans: c

161. The output of a differentiator is proportional to the
a. input amplitude.
b. RC time constant.
c. input frequency
d. input phase.

Ans: b

162. The feedback element in a integrator is
a. a capacitor.
b. an inductor.
c. a zener diode.
d. A resistance.

Ans: a

163. In an integrator output is the...............of the input
a. Differentiation
b. multiplication with RC,
c. Integration
d. division by RC.

Ans: c

164. In integrator converts a dc level into a
a. linearly increasing ramp output.
b. saw-tooth output.
c. square output.
d. triangular output.

Ans: a

165. In an integrator the output is the integral of the inverted input and Scale multiplier of ----
----
a. 1/RC
b. 1/R
c. 1/C
d. None of the above

Ans: a

166. For step-input, the output of an integrator is a
a. Pulse
b. triangular waveform
c. spike
d. ramp

Ans: d

167. The output of the differentiator is proportional to
a. the RC time constant
b. the rate at which the input is changing
c. the amplitude of the input
d. answers a. and b.

Ans: d

168.   In an difference amplifier if R1=R2=Rf
,input is V1=1 V and V2= 4 V The output will be
a. 3V
b. 5 V
c. -3 V
d. -1.5 V

Ans: c

169. In an difference amplifier if R1=R2, Rf = 2
R1, input is V1=1 V and V2= 4 V The output will
be
a. 3V
b. 6 V
c. -3 V
d. -6 V

Ans: d

170.   An differentiator converts a triangular
wave into a
a. linearly increasing ramp output.
b. saw-tooth output.
c. square output.
d. triangular output.

Ans: c

171.   For Voltage to Current converter output
current is proportional to input ……
a. Current
b. Voltage
c. Resistance
d. None of the above

Ans: b

172.   The Differentiator Amplifier produces an
output that is the mathematical operation of
a. Differentiation

b. Integration
c. Division
d. Multiplication

Ans: a

173. In the Ideal inverting amplifier, the voltage
gain can be adjusted as
a. greater than, equal to or less than one.
b. Is always greater than one only
c. Smaller than one only
d. Equal to one only

Ans: a

174.   For Current to votage converter output
current is proportional to input ……
a. Current
b. Voltage
c. Resistance
d. None of the above

Ans: a

175. In differentiator, the feedback element is a
a. Resistor
b. Capacitor
c. Zener Diode
d. Voltage Divider

Ans: a

176. A differential amplifier has
a. one input
b. two inputs
c. three inputs
d. none of the above

Ans: b

177.   The differentiator circuit converts square
wave input to the ……..

a. Triangular wave

b. Sine wave

c. Saw tooth Wave

d. Spikes

Ans: d

178. For Voltage to Current converter output …… is proportional to input ……

a. Current, Voltage

b. Voltage, Current

c. Current, Current

d. Voltage, Voltage

Ans: a

179. For Current to Voltage converter output …… is proportional to input ……

a. Current, Voltage

b. Voltage, Current

c. Current, Current

d. Voltage, Voltage

Ans: b

180. For square wave generator the …………. is connected to inverting input terminal and ground.

a. Inductor

b. Capacitor

c. Resistor

d. Capacitor in series with resistor

Ans: b

181. Triangular wave generator uses……….

a. Square wave generator and Integrator

b. Square wave generator and Differentiator

c. Only Integrator

d.   Only Differentiator with continues square input

Ans: a

182. Integrator can not be used as

a. Triangular wave generator

b. Ramp generator

c. High pass Filter

d. A to D converter

Ans: c

183. Differentiator can be used as

a. Triangular wave generator

b. Ramp generator

c. High pass Filter

d. A to D converter

Ans: c

184. To operate the oscillator the magnitude of the product of open loop gain of the amplifier A and the feedback factor Beta is

a. >1

b. <1

c. 1

d.   none of the above

Ans: a

185. IC 555 can be used as ----------- .

a. astable multivibrator.

b. low pass filter

c. high pass filter

d. none of above

Ans: a

186. Duty cycle of perfect square wave is --------

a. 100

b. 50

c. 0

d. None of the above

Ans: b

187.IC 555 has
a. an op-amp
b. a transformer
c. an emitter follower
d. none of above

Ans: a

188.In------------mode IC 555 works as an oscillator.
a. astable
b. monostable
c. satable

d. none of above

Ans: a

189. In astable mode IC 555 works as an ----------
a. oscillator
b. rectifier
c. satable
d. none of above

Ans: a

190. The number of pins of the IC 555 has ---.
a. 14
b. 16
c. 8
d. none of the above

Ans: c

191. Capacitor is connected between ---------and ------- for deciding frequency of output signal in astable multivibrator.
a. 4 and 2
b. 8 and 1
c. 3 and 5
d. 2 and 1

192.IC 555 has ---------device for comparison.
a. op-amp
b. diode
c. no need
d. None of the above

Ans: a

193. RC phase shift oscillator uses...............RC networks to get 180º phase shift
a. One
b. Two
c. Three

Ans: d

d. Six

Ans: c

194. The 78xx series is a series of ----------
regulators.
a. positive
b. negative
c. unmatched
d. matche

d Ans: a

195. The ------ series is of negative voltage
regulators.
a. 79xx
b. 7809
c. 8765
d. 7788

Ans: a

196. The LM317 is a fixed ---------- regulators.
a. positive
b. negative
c. unmatched
d. matched

Ans: a