001. The order of doping regions in npn transistor **C**

A E > B > C B C > B > E

C E > C > B D C > E > B

002. In a transistor, the base current is about .. of emitter current **D**

A 25% B 20%

C 35 % D 5%

003. At the base-emitter junctions of a transistor, one finds **C**

A a reverse bias B a wide depletion layer

C low resistance D none of the above

004. $I_C = \alpha I_E +$. **C**

A I_B B I_{CEO}

C I_{CBO} D βI_B

005. In NPN BJT transistor which of the following terminal defines P-type? **D**

A Emitter B Collector

C Drain D Base

006. BJT is a _____ device **B**

A Voltage controlled B Current controlled

C Frequency controlled D Power controlled

007. Which of the following are the charge carriers available in BJT? **D**

A Electrons B Neutrons

C Holes D Both electrons and holes

008. Which of the following BJT terminal controls the current flow? **A**

A Base B Emitter

C Collector D Gate

009. For silicon transistor what is the base-emitter voltage? **B**

A 0.3 V B 0.7 V

C 0 V D 1 V

010. The collector supply voltage for a CE configured transistor is 10V. The resistance R_L=800Ω. The voltage drop across R_L is 0.8V. Find the value of collector emitter voltage. **A**

A 9.2V B 3.7V

C 6.5V D 9.8V

011. The range of β is _____ **D**

A 50 to 300 B 30 to 400

C 10 to 20 D 20 to 500

012. As the temperature of a transistor goes up, the base-emitter resistance **A**

A decreases B increases

C remains the same D none of the above

013. If a BJT is to be used as an amplifier, then it must operate in_____ **B**

A Cut-off mode B Active mode

C Saturation mode D All of the mentioned

014. On which of the following does the scale current not depends upon? **D**

A Effective width of the base B Charge of an electron

C Electron diffusivity D Volume of the base-emitter junction

015. The input impedance of a transistor connected in .. arrangement is the highest **B**

A common emitter B common collector

C common base D none of the above

016. The phase difference between the input and output voltages in a common base arrangement is . **D**

A 180^o B 90^o

C 270^o D 0^o

017. Which of the following condition is true for cut-off mode? **A**

A The output current Is zero B The output current is proportional to the input current

C The input current is zero D The output current is inversely proportional to the input current

018. Which of the following is true for the active region of an npn transistor? **B**

A The potential difference between the emitter and the collector is greater than 0.4 V B The collector current is directly proportional to the base current

C The collector current is inversely proportional to the base current D The output current Is zero

019. The potential difference between the base and the collector Vcb in a pnp transistor in saturation region is _____ **C**

A -0.2 V B 0.2 V

C -0.5V D 0.5 V

020. Identify the true statement to operate pnp transistor in active region? **A**

A CB junction is reversed bias and the EB junction is forward bias B CB junction is forward bias and the EB junction is forward bias

C CB junction is forward bias and the EB junction is reverse bias D CB junction is reversed bias and the EB junction is reverse bias

021. A transistor is connected in CB mode. If it is not connected in CE mode with same bias voltages, the values of IE, IB and IC will .. **B**

A increase B remain the same

C decrease D doubles

022. The curve between the collector current versus the potential difference between the base and emitter is **C**

A A straight line inclined to the axes B A straight line parallel to the x-axis

C An exponentially varying curve D A parabolic curve

023. The ideal voltage gain of a transistor connected in common collector arrangement is .. **A**

A equal to 1 B more than 10

C more than 100 D less than 1

024. I_{CEO} = () I_{CBO} **C**

A β B $1 + \alpha$

C $1 + \beta$ D α

025. A germanium transistor with α=0.98 gives a reverse saturation current I_{CBO}=10 μA in a CB configuration. When it is used in CE configuration with a base current of 0.22 A, calculate the collector current. **C**

A 0.9867mA B 0.7654mA

C 0.51078mA D 0.23456mA

026. In I_{CEO}, wt does the subscript CEO mean? **C**

A collector to base emitter open B emitter to base collector open

C collector to emitter base open D emitter to collector base open

027. The magnitude of the thermal voltage is given by **B**

A k/Tq B kT/q

C q/Kt D Tk/q

028. The correct expression relating the emitter current Ie to the collector current Ic is **B**

A Ie = α Ic B Ic = α Ie

C Ie = Ic D Ic = Ie

029. The emitter current $I_E$in a transistor is 3mA. If the leakage current I_CBO is 5μA and α=0.98, calculate the collector and base current. **C**

A 3.64mA and 55μA B 3.64mA and 33μA

C 2.945mA and 55μA D 5.89mA and 33μA

030. The relation between α and β is _____ **A**

A α= β/(1+β) B β=α/(1-α)

C β=α/(1+α) D α= β/(1- β)

031. The AC current gain in a common base configuration is_____ **D**

A $-\Delta I_C/\Delta I_E$ B $\Delta I_E/\Delta I_C$

C $-\Delta I_E/\Delta I_C$ D $\Delta I_C/\Delta I_E$

032. A transistor has an $I_C$of 100mA and $I_B$of 0.5mA. What is the value of αdc? **B**

A 0.787 B 0.995

C 0.543 D 0.659

033. In a transistor, collector current is controlled by .. **B**

A collector voltage B base current

C collector resistance D all of the above

034. The element that has the biggest size in a transistor is .. **A**

A collector B base

C emitter D collector-base-junction

035. In a transistor .. **D**

A IC = IE + IB B IB = IC + IE

C IE = IC - IB D IE = IC + IB

036. The most commonly used transistor arrangement is arrangement **A**

A common emitter B common base

C common collector D none of the above

037. In a transistor, signal is transferred from a circuit **B**

A high resistance to low resistance B low resistance to high resistance

C high resistance to high resistance D low resistance to low resistance

038. A collector characteristic curve is a graph showing .. **B**

A emitter current (IE) versus collector-emitter voltage (VCE) with (VBB) base bias voltage held constant

B collector current (IC) versus collector-emitter voltage (VCE) with (VBB) base bias voltage held constant

C collector current (IC) versus collector-emitter voltage (VC) with (VBB) base bias voltage held constant

D collector current (IC) versus collector-emitter voltage (VCC) with (VBB) base bias voltage held constant

039. The Early Effect is also called as **A**

A Base-width modulation effect B Base-width amplification effect

C Base-width un amplification effect D Base-width demodulation effect

040. Collector current (Ic) reaches zero when **D**

A Vt = Vce ln (Isc/I) B Vce = Vt ln (I/Isc)

C Vce = Vt ln (Isc + I/I) D Vce = Vt ln (Isc/I)

041. The process of linearly increasing the amplitude of electrical signal is called **B**

A Attenuation B Amplification

C Modulation D Conversion

042. The early effect in bipolar junction transistor is caused by **C**

A Fast turn ON
B Fast turn OFF
C Large base - collector reverse bias
D Large base - emitter forward bias

043. In which of the following modes can a BJT be used? **D**

A Cut-off mode
B Active mode
C Saturation mode
D All of the mentioned

044. When BJT is operated in active region and EB junction potential is increasing, the width of corresponding depletion region ---------- **B**

A Increases
B Decreases
C Remains same
D disappears

045. If a 2 mV signal produces a 2 V output, estimate the voltage gain. **D**

A 0.001
B 0.004
C 100
D 1000

046. V_{CE}approximately equals _____ when a transistor switch is cut off. **A**

A Vcc
B 0.2V
C 0.3V
D 0V

047. When transistors are used in digital circuits they usually operate in the . **C**

A active region
B breakdown region
C saturation and cutoff regions
D linear region

048. A transistor may be used as a switching device or as a . **D**

A fixed resistor
B tuning device
C rectifier
D variable resistor

049. An N-channel MOSFET, the source and drain region has to be doped with **A**

A n-type material
B p-type material
C source with p-type and drain withn-type material
D source with n-type and drain withp-type material

050. A D-MOSFET typically operate in **C**

A The depletion mode only.
B The enhancement mode only.
C The both depletion & enhancementmode.
D The small impedance mode.

051. Inversion layer in an MOS circuit is formed by **D**

A doping
B impact ionization
C tunneling
D electric field

052. The function of the SiO_2layer in MOSFET is to provide **A**

A isolation
B coupling
C conduction
D amplification

053. The Transistor is connected in Common collector configuration has **A**

A highinput & low output resistance
B lowinput & high output resistance
C lowinput & low output resistance
D highinput & high output resistance

054. BJT is a _____ device **A**

A Bipolar
B Unipolar
C tripolar
D thyristor

055. In a good bipolar transistor operating in the active region, what is the spatial profile of minority carriers in the base? **D**

A Exponentially increasing from emitter to collector.
B Exponentially decreasing from emitter to collector
C Linearly increasing from emitter to collector.
D Linearly decreasing from emitter to collector.

056. With the E-MOSFET, when gate input voltage is zero, drain current is? **B**

A at saturation B zero
C widening the channel D I_{DSS}

057. Which of the following current equations is true? **C**

A $I_G = I_D$ B $I_G = I_S$
C $I_D = I_S$ D $I_G = I_D = I_S$

058. For the FET, the relationship between the input and output quantities is _____ due to the _____ term in Shockleys equation. **C**

A nonlinear, cubed B linear, proportional
C nonlinear, squared D linear, squared

059. A very simple bias for a D-MOSFET is called? **C**

A self biasing B gate biasing
C zero biasing D voltage-divider biasing

060. Consider the following statements for a metal oxide semiconductor field effect transistor (MOSFET): P: As channel length reduces, OFF-state current increases. Q: As channel length reduces, output resistance increases. R: As channel length reduces, threshold voltage remains constant. S: As channel length reduces, ON current increases. Which of the above statements are INCORRECT? **C**

A P and Q B P and S
C Q and R D R and S

061. Which one of the following is not a voltage controlled circuit? **C**

A MOSFET B IGBT
C BJT D JFET

062. Maximum no electrons in the base region of an NPN transistor will not recombine for reason being **A**

A Have a long lifetime B Have a negative charge
C Must flow a long way through thebase D Flow out of the base

063. When plotting the transfer characteristics, choosing VGS = 0.5VP will result in a drain current level of _____ I_{DSS}. **B**

A 0 B 0.25
C 0.5 D 1

064. The slope of the dc load line in a self-bias configuration is controlled by _____. **D**

A V_{DD} B R_D
C R_G D R_S

065. For _____, Shockleys equation is applied to relate the input and the output quantities. **D**

A JFETs B depletion-type MOSFETs
C enhancement-type MOSFETs D JFETs and depletion-type MOSFETs

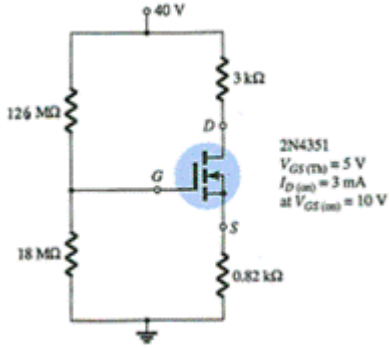
066. Which of the following is (are) true of a self-bias configuration compared to a fixed-bias configuration? **D**

A One of the dc supplies is eliminated. B A resistor RS is added.
C VGS is a function of the output current ID. D All of the above

067. Which of the following describe(s) the difference(s) between JFETs and depletion-type MOSFETs? **D**

A V_{GS} can be positive or negative for the depletion-type. B I_D can exceed I_{DSS} for the depletion-type.
C The depletion-type can operate in the enhancement mode. D All of the above

068. **A**

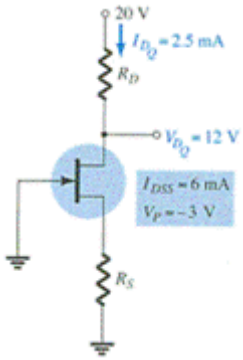


Calculate the value of V_{DSQ}.

A 40V B 30V

C 20V D 0V

069. Given the values of V_{DQ} and I_{DQ} for this circuit, determine the required values of R_D and R_S. **C**



A 2 kΩ, 2 kΩ B 1 kΩ, 5.3 kΩ

C 3.2 kΩ, 400 Ω D 2.5 kΩ, 5.3 kΩ

070. The operation of a JFET involves **D**

A A flow of minority carriers B Negative resistance

C Recombination D A flow of majority carriers

071. JFET has..... degree of isolation between input and output **B**

A Low B High

C Moderate D zero

072. A JFET is a driven device **C**

A current B voltage

C both current and voltage D none of the above

073. In an enhancement-type MOSFET, the drain current is zero for levels of VGS less than the _____ level. **A**

A $V_{GS}(Th)$ B $V_{GS}(off)$

C V_P D V_{DD}

074. To bias a e-MOSFET _____ **A**

A we can use either gate bias or a voltage divider bias circuit B we can use either gate bias or a self bias circuit

C we can use either self bias or a voltage divider bias circuit D we can use any type of bias circuit

075. When drain voltage equals the pinch-off-voltage, then drain current . with the increase in drain voltage **C**

A decreases B increases

C remains constant D none of the above

076. The input gate current of a FET is **D**

A A few micro-amperes B A few mili-amperes

C A few amperes D Negligible

077. A JFET can operate in **A**

A Only depletion mode B Only enhancement mode

C Both depletion and enhancement modes D Neither depletion nor enhancement modes

078. When a JFET is pinched off, the depletion layers are **B**

A Conducting B Close together

C Touching D Far apart

079. For a p channel MOSFET which of the following is not true? **B**

A The source and drain are a p type semiconductor B The induced channel is p type region which is induced by applying a positive potential to the gate

C The substrate is a n type semiconductor D Substrate is shorted to source terminal

080. In applications where ..... input resistance is needed, the JFET is preferred to the bipolar transistor **D**

A Low B Very low

C Zero D High

081. For NMOS transistor which of the following is not true? **C**

A The substrate is of p-type semiconductor B Inversion layer or induced channel is of n type

C Threshold voltage is negative D None of the mentioned

082. The process trans conductance parameter is directly proportional to **D**

A Electron mobility only B Electron mobility)$^{-1}$only

C Oxide capacitance only D Product of oxide capacitance and electron mobility

083. The name field effect is related to the ..... layers of a JFET **A**

A Depletion B Gate

C Source D Drain

084. As compared to a bipolar transistor, a JFET is **C**

A Equally sensitive to changes in input voltage B More sensitive changes in input voltage

C Less sensitive changes in input voltage D Highly sensitive to changes in input voltage

085. The JFETs are normally used as current sources in ---------- region **B**

A Cut-off B Saturation

C Ohmic D linear

086. Whenever a JFET operates above pinch-off voltage **D**

A Drain current starts decreasing B Drain current increases steeply

C Depletion regions become smaller D Drain current remains nearly constant

087. The drain current of the N-channel JFET increases with **A**

A .Increasing positive voltage at the gate B Constant voltage at the gate

C Decreasing positive voltage at the gate D None of the above

088. The JFET is a **A**

A Unipolar device B Tripolar device

C Bipolar device D None of the above

089. The input impedance of an ideal JFET **C**

A Is impossible to predict B Approaches unity

C Approaches infinity D Approaches zero

090. The MOSFET is almost ideal as switching device because **C**

A It has longer life B It works progressively

C It consumes low power D It has linear characteristics

091. The MOSFET also called as ---------- **D**

A EMOSFET B JFET

C DMOSFET D IGFET

092. In MOSFETs N-channel is more preferred than P-channel because **B**

A It is cheaper B It is faster

C It has better drive capability D It has better noise immunity

093. The JFET is also known as square law device because its **A**

A Drain current varies as square of the gate source voltage B Trans conductance curve is parabolic

C Reverse gate leakage current varies as square of reverse gate voltage D Drain current varies as square of its drain voltage for a fixed Vgs

094. The enhancement N-channel MOSFET **D**

A Can be operated as an enhancement MOSFET by applying -ve B bias to gate Can be operated as a JFET with zero gate voltage

C Can be operated as an enhancement MOSFET by applying +ve bias to gate D Cannot be operated as an enhancement MOSFET

095. The MOSFET stands for **C**

A Metal oxidized selenium FET B Metal oxide surface FET

C Metal oxide semiconductor FET D Metal of surface FET

096. The enhancement MOSFET is **A**

A Normally off device B Useful as a very good constant voltage source

C Widely used because of easy in its fabrication D Normally on device

097. What is the typical range of turn-off times for SCRs? **A**

A 5 μs to 30 μs B 1 μs to 5 μs

C 0.1 μs to 1 μs D D. 0.01 μs to 0.1 μs

098. What is the maximum current (rms) rating for commercially available LASCRs today? **C**

A 13 A B 15 A

C 3 A D 25 A

099. Which of the following transistors is an SCR composed of? **A**

A npn, pnp B npn, npn

C pnp, pnp D none of these

100. How many layers of semiconductor materials does a silicon-controlled rectifier (SCR) have? **C**

A 2 B 3

C 4 D 5

101. Which of the following devices has (have) four layers of semiconductor materials? **D**

A Silicon-controlled switch (SCS) B Gate turn-off switch (GTO)

C Light-activated silicon-controlled rectifier (LASCR) D D. All of the above

102. What is the frequency range of application of SCRs? **B**

A About 10 kHz B About 50 kHz

C About 250 kHz D About 1 mHz

103. Which one of the SCR terminals fires the SCR? **C**

A Anode B Cathode

C Gate D All of the above

104. An SCR is turned off by . **A**

A Reducing anode voltage to zero B Reducing gate voltage to zero
C Reverse biasing the gate D None of the above

105. In an SCR circuit the supply voltage is generally .. that of break over voltage **B**
A Equal to B Less than
C Greater than D double

106. An SCR combines the features of .. **B**
A A rectifier and resistance B A rectifier and transistor
C A rectifier and capacitor D None of the above

107. _____ are areas of application for SCRs. **D**
A Relay controls B Time-delay circuits
C Motor controls D All of the above

108. To turning OFF an SCR, it is essential to decrease current to be less than **A**
A trigger current B holding current
C break over current D none of these

109. An SCR behaves as a . switch **A**
A Unidirectional B Bidirectional
C Mechanical D magnetic

110. An SCR is sometimes called **D**
A Triac B Diac
C Unijunctiontransistor D Thyristor

111. The major drawback of the first generation IGBTs was that, they had **D**
A latch-up problems B noise & secondary breakdown problems
C sluggish operation D latch-up & secondary breakdown problems

112. Which of the following devices has a negative-resistance region in its characteristics curve? **C**
A SCR B SCS
C UJT D Phototransistor

113. From the two transistor (T1 & T2) analogy of SCR, the total anode current of SCR is _____ in the equivalent circuit. **B**
A the sum of both the base currents B the sum of both the collector current
C the sum of base current of T1 & collector current of T2 D the sum of base current of T2 & collector current of T1

114. If gate current is increased, then anode-cathode voltage at which SCR closes . **A**
A Isdecreased B Isincreased
C Remainsthe same D None ofthe above

115. When SCR is OFF, the current in the circuit is . **B**
A Exactlyzero B Smallleakage current
C Large leakagecurrent D None ofthe above

116. When SCR starts conducting, then . loses all control **A**
A Gate B Cathode
C Anode D None ofthe above

117. The two transistor model of the SCR can obtained by **D**
A bisecting the SCR vertically B bisecting the SCR horizontally
C bisecting the SCRs top two & bottom two layers D bisecting the SCRs middle two layers

118. The controlling parameter in IGBT is the **B**
A I_G B V_{GE}
C I_C D V_{CE}

119. In IGBT, the nlayer above the p^+layer is called as the **A**

A drift layer B injection layer
C body layer D collector Layer

120. In IGBT, the p^+layer connected to the collector terminal is called as the **B**

A drift layer B injection layer
C body layer D collector Layer

121. What is the range of the variable resistor in the equivalent circuit of a unijunction transistor? **A**

A 50 Ωto 5 k B 6 kΩto 10 k
C 5 Ωto 50 D 1 Ωto 5

122. IGBT possess **B**

A low input impedance B high input impedance
C high on-state resistance D second breakdown problems

123. IGBT & BJT both posses _____ **A**

A low on-state power losses B high on-state power losses
C low switching losses D high input impedance

124. The three terminals of the IGBT are **C**

A base, emitter & collector B gate, source & drain
C gate, emitter & collector D base, source & drain

125. In a photo transistor the photocurrent is flowing through **B**

A emitter base junction B collector base junction
C collector emitter junction D all the mentioned

126. Phototransistor is a form of _____ transistor which is sensitive to light. **B**

A Unipolar B Bipolar
C Tripolar D Non of these

127. What is the reason phototransistor produces more current than a photodiode? **C**

A A wider spectrum is accepted by the phototransistor than the photodiode
B The current produced by photons is amplified by the $h_{fe}$of the transistor
C The phototransistor can heavily doped than the photodiode
D At low light conditions, a photodiode is used.

128. The voltage blocking capability of the IGBT is determined by the **D**

A injection layer B body layer
C metal used for the contacts D drift layer

129. The structure of the IGBT is a **C**

A P-N-P structure connected by a MOS gate
B N-N-P-P structure connected by a MOS gate
C P-N-P-N structure connected by a MOS gate
D N-P-N-P structure connected by a MOS gate

130. The _____ is photosensitive to act as light gathering element. **A**

A Base-emitter junction B Base-collector junction
C Collector-emitter junction D Base-collector junction and Base-emitter junction

131. Phototransistors based on hetero-junction using _____ material are known as waveguide phototransistors. **C**

A InGaP B InGaAs
C InGaAsP/ InAlAs D ErGaAs

132. In opto isolators, which of the following device receives the light? **B**

A LED B Light sensitive detector

C Both D none

133. The optoisolators are categorized into _____ types **C**

A 1 B 2

C 4 D 6

134. The optoisolator consists of _____ devices **C**

A LED B Light sensitive detector

C Both D none

135. Which turn on method is preferred for triggering the LASCR? **C**

A Forward voltage B dv/dt

C light D temperature

136. When the light touches the phototransistor the current ___ into the base region **C**

A Remains doubles B Constant

C Flow D Not flow

137. Phototransistors are operated in _____ regions. **C**

A Passive B Hybrid

C Active D saturation

138. Electron-hole pair occurs in _____ biased CB junction. **A**

A Forward B Reverse

C Hybrid D none

139. Which is a type of Opto-isolator? **B**

A CMCP793V-500 B MOC3021

C MPU 6050 D L298N

140. The use of optical isolation in the input module side of a controller device is to **A**

A Reduce the effect of electrical noise and prevents the damage to the processor B Prevent the damage process

C Provide common ground D Reduces the effect of electrical noise

141. The commercially available circulators exhibit insertion losses around _____ **D**

A 2 dB B 0.7 dB

C 0.2 dB D 1 dB

142. It is a passive device which allows the flow of optical signal power in only one direction and preventing reflections in the backward direction. **C**

A Fiber slice B Optical fiber connector

C Optical isolator D Optical couple

143. Which feature of an optical isolator makes it attractive to use with optical amplifier? **B**

A Low loss B Wavelength blocking

C Low refractive index D Attenuation

144. How many implementation methods are available for optical isolators? **D**

A One B Four

C Two D Three

145. A device which is made of isolators and follows a closed loop path is called as a _____ **A**

A Circulator B Gyrator

C Attenuator D Connector