PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2022 - 23Examination

Semester:4th   Date: 27-3-2023
Subject Code: 203112259   Time: 2.00 pm to 4.30 pm
Subject Name: Electronic Devices & Circuits   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions -   **(15)**

1.The primary function of the bias circuit is to

  a) hold the circuit stable at VCC
  b) hold the circuit stable at vin
  c) ensure proper gain is achieved
  d) hold the circuit stable at the designed Q-point

2. The capacitor that produces an ac ground is called a(n)

  a) coupling capacitor
  b) dc open
  c) bypass capacitor
  d) ac open

3.In a class B push-pull amplifier, the transistors are biased slightly above cutoff to avoid

  a) crossover distortion
  b) unusually high efficiency
  c) negative feedback
  d) a low input impedance

4.The value of V_{BE} in active region in NPN transistor

  a) 0.7V
  b) 1V
  c) 0V
  d) 5V

5. Which of the following is not an electronic device?

  a) Mobile
  b) Computer
  c) Magnifying glass
  d) Keyboard

6.The voltage gain (A_v) of any transistor amplifier circuit equals the _____.

7.The gain of a BJT is called _____

8.Reverse bias is a condition that essentially _____ current through the diode.

9.Atoms that normally have three electrons in their outer shell are called _____atoms.

10.Size of collector is _____ compare to emitter.

11.Draw the symbol of NPN transistor.

12. Draw the symbol of PNP transistor.

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

14. If a 3 mV signal produces a 2 V output, what is the voltage gain?

15. What is the collector current for a C-E configuration with a beta of 100 and a base current of 30 μA?

Q.2 Answer the following questions. (Attempt any three)   **(15)**

1. Compare LED and photodiode.

2. Explain varactor diode with necessary circuit diagram.

3. Explain schottky diode with necessary circuit diagram.

4. If the base current of transistor is 20μA when the emitter current is 5.2 mA, what are the values of β and α?

Q.3 A) Explain & draw voltage divider biasing & derive its voltage gain using AC analysis.   **(07)**

B) Explain operation of class -B amplifier with the help of circuit and wave form.   **(08)**

OR

B) Draw ac equivalent circuit of given figure.   **(08)**
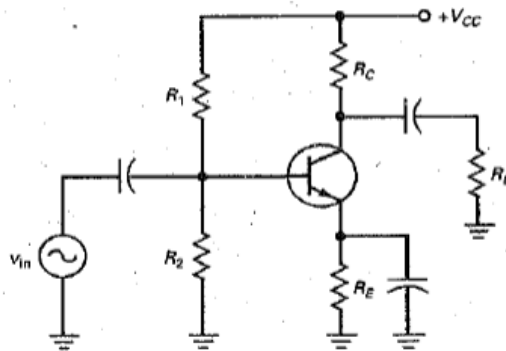
Q.4 A) Explain and draw the circuit of n-channel JFET also derive its drain current.   **(07)**

OR

A) Explain the fixed bias network for BJT & derive its DC voltage & current.   **(07)**

B) Explain & draw voltage divider biasing & derive its DC voltage & current.   **(08)**