

2112E129

**BACHELOR OF VOCATION**  
**Automotive Mechatronics (Captive)**  
**Subject: Electronic Devices and Circuits**  
**Subject Code: DBEC-202**  
**Semester: Fifth**  
**December 2021**  
**Theory (External): 35 Marks**  
**Time: 03 Hours**

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**Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

**Roll Number**

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**SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)**  
(10x1=10 Marks)

- A. The value of ripple factor in a full wave rectifier is?
- B. The direction of arrow marked on the body of a crystal diode shows the direction in which diode can?
- C. The arrow head on the transistor symbol always point in the direction of?
- D. The main current crossing the collector junction in a normally biased NPN transistor is
  - a. diffusion current
  - b. a drift current
  - c. a hole current
  - d. equal to the base current
- E. Define the following: a) Drift current b) Diffusion current.
- F.  $I_{CBO}$  in a transistor can be reduced by
  - a. Reducing  $I_B$
  - b. Reducing  $V_{CC}$
  - c. Reducing  $I_E$
  - d. Reducing temperature
- G. For amplification of very low frequency (<10 Hz), the most appropriate amplifier is?
- H. A typical R-C coupling capacitor does a transistor amplifier is..... Farad.
- I. Explain Barkhausen criteria for oscillations?
- J. What is a load line?

**SECTION -B (ESSAY TYPE QUESTIONS)**  
(5x5=25 Marks)

1. Explain why bridge rectifier is preferred over a centre tap rectifier.
2. Explain the action of a zener diode as a voltage regulator.
3. In an npn silicon transistor  $\alpha = 0.995$ ,  $I_E = 10$  mA, leakage current  $I_{CBO}$ (or  $I_{CO}$ ) =  $0.5 \mu A$ . Determine  $I_C$ ,  $I_B$ ,  $\beta$  and  $I_{CEO}$ .
4. Explain why CE configuration is most popular in amplifier circuits.
5. Explain the following terms in connection with a transistor voltage amplifier:
  - a) Input impedance
  - b) Output impedance
  - c) Voltage gain
  - d) Current gain
  - e) Power gain
6. State what will happen to the voltage gain of an amplifier if the bypass capacitor( $C_E$ ) is open circuited.
7. Define and explain the following terms:
  - a. Decibel gain
  - b. Frequency response
  - c. Bandwidth
8. Why do we need negative feedback in a Wein bridge oscillator in addition to positive feedback? Describe its frequency range.

===ENF OF PAPER===