

BCA-03

December - Examination 2025

BCA (1st Year) Examination

BASIC ELECTRONICS

Paper : BCA-03

[Time: 3 Hours]

[Maximum Marks: 70]

Note :- The question paper is divided into three Sections A, B and C. Write answers as per the given instructions.

Section-A

7×2=14

(Very Short Answer Type Questions)

Note :- Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum up to **30** words. Each question carries **2** marks.

1. (i) What is a sequential circuit?
- (ii) What is triggering in digital electronics?
- (iii) What is a Zener diode? Mention one application.
- (iv) What is an operational amplifier (Op-Amp)?
- (v) Simplify: $(A+B)(A+B')$
- (vi) What is barkhausen criterion?
- (vii) What is doping? Why is it done?

Section-B

4×7=28

(Short Answer Type Questions)

Note :- Answer **any four** questions. Each answer should not exceed **200** words. Each question carries **7** marks.

2. Define the current characteristic in NPN transistor.
3. Describe the working of a full-wave rectifier and explain its efficiency and advantages over a half-wave rectifier.
4. Describe the construction and working of a BJT and explain its different modes of operation.
5. Define logic gates and explain the working of AND, OR and NOT gates with truth tables.
6. Explain the concept of intrinsic and extrinsic semiconductors and discuss their electrical properties.

7. Minimize the Boolean expression using K-Map:
 $F = AB + A'B + AB'$
8. A circuit consists of a 10Ω resistor connected in series with a 20Ω resistor across a 30V DC supply.
 - (a) Find the total resistance
 - (b) Calculate the circuit current
 - (c) Find the voltage drop across each resistor.
9. Describe the common emitter amplifier and explain why it is most widely used.

Section-C

2×14=28

(Long Answer Type Questions)

Note :- Answer **any two** questions. You have to delimit your each answer maximum up to **500** words. Each question carries **14** marks.

10. Explain the Diode Bridge Rectifier. Discuss its construction, working and advantages over a half-wave rectifier.
11. Describe filters in electronics. Explain the working of any one filter (low-pass or high-pass) with its applications.
12. Define Norton's theorem and explain it with suitable examples.
13. Describe the working of single phase induction motor with a neat and clean diagram.
