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(20524) Roll No. ....  
B.Sc.(Com.Sci.)-II Sem.

**NP-3590**

**B.Sc. (Computer Science)**

**Examination, May-2024**

**Basic Electronics**

**(BCS-203)**

*Time : Three Hours ] [Maximum Marks : 75*

**Note :** Attempt questions from **all** the  
Sections as per instructions.

**Section-A**

**(Very Short Answer Questions)**

**Note :** Attempt all the **five** parts of this  
question. Each question carries 3  
marks.  $3 \times 5 = 15$

1. Explain the Drift current density and conductivity.

2. Explain the V-I characteristics of Zener diode.
3. For a certain transistor collector current is 20 mA and current gain factor is 50. Find the emitter current.
4. Explain the merits and demerits of JFET.
5. Explain the characteristics of an ideal OP-AMP.

**Section-B**

**(Short Answer Questions)**

**Note :** Answer any **two** questions out of  
the following **three** questions. Each  
question carries  $7\frac{1}{2}$  marks.  $7\frac{1}{2} \times 2 = 15$

6. Distinguish between transition and diffusion capacitance of a P-N junction diode. Derive an expression for the diffusion capacitance  $C_D$ .

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7. Explain the working of a common emitter amplifier with the help of its circuit diagram. Explain how dc load line is drawn for a common-emitter amplifier.

8. For an N-channel JFET-

$$I_{DSS} = 8.7 \text{ mA}, V_p = -3\text{V}, V_{GS} = -1\text{V}$$

Find the values of

- (i)  $I_D$
- (ii)  $g_{mo}$
- (iii)  $g_m$

### Section-C

#### (Detailed Answer Questions)

**Note :** Attempt any **three** questions out of the following **five** questions. Each question carries **15** marks.  $15 \times 3 = 45$

9. Draw the circuit diagram of a full-wave rectifier using two diodes and calculate-

- (i)  $I_{de}$
- (ii)  $I_{rms}$
- (iii) Ripple factor

(iv) Efficiency of rectification

(v) PIV rating of diode.

10. Explain different biasing circuits of a transistor. What is stability factors? Derive an expression for stability factor for a self bias circuit.

11. Explain the common gate (CG) JFET amplifier.

12. Drive an expression for Adder-Subtractor circuit using OP-AMP.

13. Write short notes on any **three** of the following:

- (i) Half wave rectifier
- (ii) SVRR and Slew Rate
- (iii) Extrinsic Semi conductor
- (iv) Fixed biasing