

**B.Sc. (Part-I) Semester—I Examination**  
**ELECTRONICS**  
**(Basic Electronics)**

Time : Three Hours]

[Maximum Marks :80

**N.B. :-** (1) Question No. 1 is compulsory.

(2) Draw neat diagram wherever necessary.

1. (a) Fill in the blanks :

2

(i) A d'Arsonval movement (PMMC) can be converted into dc ammeter by connecting a resistance in \_\_\_\_\_ with it.

(ii) CRT stands for \_\_\_\_\_.

(iii) A p-n junction diode can be usually used as \_\_\_\_\_.

(iv) SCR stands for \_\_\_\_\_.

(b) Choose the correct alternative :

2

(i) A transistor has \_\_\_\_\_ junctions.

(a) two

(b) one

(c) three

(d) four

(ii) An ideal voltage source has \_\_\_\_\_ internal resistance.

(a) infinity

(b) zero

(c) high

(d) none of these

(iii) VLSI stands for \_\_\_\_\_.

(a) Large Scale Integration

(b) Small Scale Integration

(c) Very Large Scale Integration

(d) None of these

(iv) The drain resistance of FET is given by  $r_d = \underline{\hspace{2cm}}$ .

(a)  $\left( \frac{\partial V_{DS}}{\partial I_d} \right)_{V_{GS}}$

(b)  $\left( \frac{\partial I_D}{\partial V_{DS}} \right)_{V_{GS}}$

(c)  $\left( \frac{\partial V_{GS}}{\partial I_D} \right)_{V_{DS}}$

(d)  $\left( \frac{\partial I_D}{\partial V_{GS}} \right)_{V_{DS}}$

- (c) Answer the following in one sentence : 4
- (i) What is voltmeter ?
- (ii) What is depletion region ?
- (iii) What is resistor ?
- (iv) What is filter ?
2. (a) State and prove Thevenin's theorem. 8
- (b) Explain Kirchhoff's current and voltage laws. 4
- OR**
- (p) What is inductor ? State different types of inductor. 4
- (q) State and prove maximum power transfer theorem. 8
3. (a) Explain the construction and design of multirange voltmeter. 6
- (b) Explain loading effect of voltmeter. How the loading effect can be avoided ? 6
- OR**
- (p) Explain construction and working of CRT. 8
- (q) Explain construction and working of series type ohmmeter. 4
4. (a) Explain the working of diode under reverse bias mode. 6
- (b) Explain the working of half wave rectifier. 6

**OR**

- (p) Explain : (i) Avalanche break-down  
(ii) Zener break-down 8
- (q) Explain the action of shunt capacitor filter. 4
5. (a) Explain the construction and working of pnp transistor. 8
- (b) Explain the concept of load line and state its importance. 4
- OR**
- (p) Define  $\alpha$  and  $\beta$  of a transistor and derive the relation between them. 4
- (q) Explain the amplification action of CE and CB amplifier. 8
6. (a) Explain construction and working of FET. 8
- (b) Define  $\mu$ ,  $g_m$  and  $r_d$  of FET and derive the relation between them. 4
- OR**
- (p) Explain construction, working and characteristics of photo-diode. 6
- (q) Explain construction and working of photovoltaic cell. 6
7. (a) State the advantages of IC. 4
- (b) Explain the fabrication of diode and transistor in monolithic IC. 8
- OR**
- (p) What is scale of integration ? Explain. 6
- (q) Explain the process of photolithography used in IC fabrication. 6

