

B.Sc. (Part—I) Semester—I Examination

1S : ELECTRONICS

(Basics of Electronics)

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) Question one is compulsory.

(2) Draw neat diagrams wherever necessary.

1. (A) Fill in the blanks : 2

(i) The LED converts electrical energy into _____ energy.

(ii) The CRO stands for _____ .

(iii) An ideal constant voltage source has _____ internal resistance.

(iv) Ripple factor of full wave rectifier is _____ .

(B) Select the correct answer : 2

(i) The semiconductor diode has _____ P-N junction.

(a) One

(b) Two

(c) Three

(d) None of these

(ii) In a transistor, the base region is _____ doped.

(a) Lightly

(b) Heavily

(c) Moderately

(d) None

(iii) The Zener diode is frequently used as _____ .

(a) Regulator

(b) Rectifier

(c) Amplifier

(d) Oscillator

(iv) ICs are generally fabricated using _____ .

- (a) Silicon (b) Germanium
(c) Copper (d) Iron.

(C) Answer the following questions in **one** sentence :

4

- (i) What is FET ?
(ii) What is rectifier ?
(iii) What is resistance ?
(iv) What is discrete circuit ?

EITHER

2. (A) State and explain KVL and KCL.

5

(B) State and prove Thevenin's theorem.

7

OR

(P) What is step up and step down transformer ?

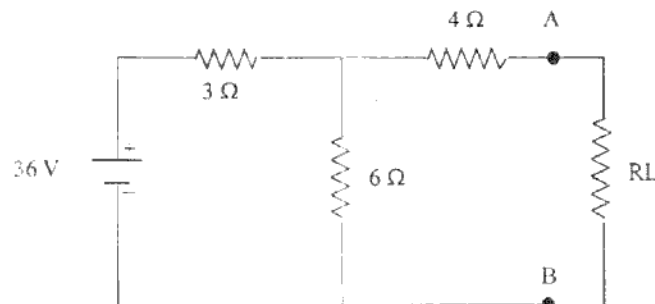
2

(Q) Explain colour code system of a resistor.

4

(R) For the following figure. Find the value of load resistance R_L connected across terminals A and B which would abstract maximum power from circuit. Find the value of this maximum power.

6



EITHER

3. (A) Draw the well labelled diagram of CRT and explain its working. 7
 (B) Explain the construction and working of multirange voltmeter with suitable diagram. 5

OR

- (P) What is ohmmeter ? Explain the working of shunt type ohmmeter. 6
 (Q) Explain the terms : 6
 (i) Internal resistance of a meter (R_m).
 (ii) Full scale deflection current (I_m).
 (iii) Volt per ohm rating.

EITHER

4. (A) What is rectifier ? Explain the construction and working of half wave rectifier using semiconductor diode. 6
 (B) Explain forward bias characteristics of P-N junction diode. 6

OR

- (P) What are different types of filters ? 2
 (Q) Draw a block diagram of regulated power supply and explain the function of each block. 6
 (R) Explain the terms :
 (i) Line regulation
 (ii) Load regulation. 4

EITHER

5. (A) What is BJT ? Explain the operation of NPN transistor with suitable diagram. 6
 (B) Define α and β and derive the relation between them. 6

OR

- (P) Explain amplification action of CE amplifier. 4
- (Q) Draw the circuit diagram of NPN transistor in CB and CE modes. 4
- (R) What is load line ? How is it constructed ? 4

EITHER

6. (A) What is FET ? Explain the construction and operation of FET. 6
- (B) Define μ , g_m and r_d for FET and derive the relation between them. 6

OR

- (P) Explain construction and working of Photodiode. 6
- (Q) State the difference between LED and Photodiode. 4
- (R) Draw electrical symbols of FET and SCR. 2

EITHER

7. (A) What is IC ? Give its classification. State the advantages and disadvantages of IC. 6
- (B) Explain fabrication of transistor in monolithic IC. 6

OR

- (P) Explain the scale of integration of ICs. 4
- (Q) Explain the fabrication of resistor in monolithic IC. 4
- (R) Explain the oxidization and base diffusion in the monolithic IC fabrication. 4