

AP-406

B.Sc. Part – I (Semester – I) Examination

1 S : ELECTRONICS (Basic Electronics)

Time—Three Hours]

[Maximum Marks—80

Note :— (i) Question No. 1 is compulsory.

(ii) Draw neat diagrams wherever necessary.

1. (A) Fill in the blanks :

(i) CRT stands for _____ .

(ii) LED stands for _____ .

(iii) IC stands for _____ .

(iv) The unit of inductance is _____ . 2

(B) Select the correct answer :

(i) The number of junctions in SCR is _____ .

(a) Three

(b) Two

(c) One

(d) None of the above.

(ii) The capacitance of capacitor is measured in _____.

(a) Ohm

(b) Farad

(c) Henry

(d) None

(iii) The maximum efficiency of a half wave rectifier is _____.

(a) 50%

(b) 40.6%

(c) 81.2%

(d) None

EITHER

7. (A) Explain fabrication of transistor in monolithic IC.

6

(B) Explain the following steps in the fabrication of monolithic IC :

(i) Wafer Preparation

(ii) Epitaxial Growth.

4

(C) State four merits of ICs.

2

OR

(P) Explain the process of photolithography in monolithic IC technology.

6

(Q) Explain fabrication of diode in monolithic IC.

6

(B) Define α and β . Derive relation between them. 6

OR

(P) Draw the circuit of PNP transistor connected in CB and CE mode. 4

(Q) Define Stability Factor. Find the expression for stability factor of fixed biased circuit. 4

(R) In a CB connection, current amplification factor is 0.9. If the emitter current is 1mA, determine the value of base current. 4

EITHER

6. (A) Explain construction and working of JFET. 6

(B) Define FET parameter and show that $\mu = r_d \times g_m$. 6

OR

(P) Explain construction and working of photodiode. 6

(Q) Explain construction and working of LDR. 6

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6

(Contd.)

(iv) In a transistor, $I_C = \beta I_B + \underline{\hspace{1cm}}$.

(a) ICBO

(b) ICEO

(c) IB

(d) IBEO

2

(C) Answer the following questions in one sentence :

(i) What is Zener diode ?

(ii) What is UJT ?

(iii) Define operating point in amplifier.

(iv) What is Ideal Current Source ? 4

EITHER

2. (A) Explain the construction and working of carbon composition resistor. 4

(B) State and prove maximum power transfer theorem. 6

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(Contd.)

(C) What is Electrolytic Capacitor ? 2

OR

(P) What is transformer ? Give the construction and working of transformer. 6

(Q) Give the statement of Norton's theorem with suitable example. 3

(R) Find out the value of resistance and tolerance having following codes :

(i) Brown, Red, Blue and Silver

(ii) Red, Brown, Red and Gold. 3

EITHER

3. (A) Explain the construction and working of multirange ammeter with suitable diagram. 5

(B) Draw the well labelled block diagram of CRO and explain the function of each block. 7

OR

(P) Explain the construction and working of series type ohmmeter. 6

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4

(Contd.)

(Q) Explain how measurement of phase and frequency using CRO ? 6

EITHER

4. (A) What is filter ? Give its classification. 2

(B) Explain operation of P-N junction diode under forward bias condition. Draw its V-I characteristics. 6

(C) Distinguish between avalanche and zener breakdown. 4

OR

(P) What is rectifier ? Explain construction and working of full wave rectifier circuit using semi conductor diode. 6

(Q) Draw the block diagram of regulated power supply and explain it. 6

EITHER

5. (A) Explain construction and working of PNP transistor with suitable diagram. 6

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(Contd.)