

2009

M.Sc.

4th Semester Examination

ELECTRONICS

PAPER—EL-2204

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

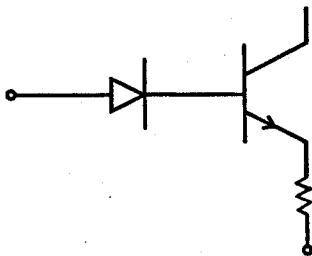
Illustrate the answers wherever necessary.

Answer Q. No. 1 and any three from the rest.

1. Answer any five questions : 2×5
- (a) What is meant by anisotropic etching?
 - (b) Why high vacuum is essential in depositing a thin film of a material on a substrate?
 - (c) Why Silicon is preferred for the fabrication of semiconductor ICs?
 - (d) What are the advantages of ion implantation over diffusion in doping a material?
 - (e) Explain how assembling is achieved in ICs?
 - (f) What is the importance of metalization in IC? Which material is suitable for this purpose and why?
 - (g) Why the electrical behaviour of a short channel MESFET differs from a long channel MESFET?
 - (h) What is photoresist?

(Turn Over)

2. (a) How do you differentiate a p-well process from an n-well process? Draw the stick diagram of a CMOS p-well inverter.
- (b) What is metal migration? Explain how such event give rise to VLSI circuit failure. State the λ -based design rules for metals. (2+2)+(2+2+2)
3. (a) What is meant by epitaxy. Describe in details the epitaxial growth of silicon on a silicon substrate.
- (b) What is meant by non ohmic contact? (2+7)+1
4. Describe in details how a npn transistor is formed through lithographic technique. 10
5. (a) Show the structure as shown in the figure in monolithic IC.
- (b) What is D.C. sputtering? 5+5



6. Write short notes on (any two) : 5+5
- (a) Diffusion process with reference to a neat diagram of double zone furnace.
- (b) Physical vapour deposition technique for thin film growth.
- (c) Electron beam lithography.
- (d) Principle of operation and limitation of a surface channel CCD.