

(f) Draw the figure showing the structure of a crystal containing a screw dislocation. Also indicate the Burgers circuit.

2. Attempt any **TWO** out of the following :

(a) What is meant by fracture ? Explain the characteristics of brittle fracture and ductile fracture.

(b) Explain briefly the procedure for preparing the specimen for micro-examination.

(c) Define the following terms :

(i) pearlite

(ii) ferrite

(iii) cementite

(iv) bainite and

(v) martensite.

3. Attempt any **TWO** out of the following :

(a) Differentiate between grey cast iron and malleable cast iron.

(b) Explain the working of TTT diagram. What information do you get from this diagram ?

(c) Name the composition and applications of following alloys :

(i) phosphor bronze,

(ii) gun metal,

(iii) duralumin and

(iv) babbitt metal.

4. Attempt any **TWO** out of the following :

- (a) Describe the phenomenon of magnetic hysteresis. Why does it occur for ferromagnetic and ferrimagnetic materials ?
- (b) Classify intrinsic and extrinsic semi-conductors. Give two examples of each type.
- (c) What is Meisner effect ? What do you mean by
 - (i) persistent current in a superconductor and
 - (ii) type II superconductor ?

5. Attempt any **TWO** out of the following :

- (a) Classify ceramic materials with appropriate examples.
- (b) Give the general difference in strengthening mechanism between large particle and dispersion strengthened particle reinforced composites.
- (c) What are linear polymers ? Explain the difference between addition and condensation polymerization.