

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain in detail the function of a cupola furnace with neat sketch. (8)
- (ii) Explain with neat diagram of true centrifugal casting and write its advantages and disadvantages. (8)

Or

- (b) (i) Write down the properties of moulding sand. (8)
- (ii) Briefly describe die casting process. Draw sketch. (8)
12. (a) (i) Differentiate between hot working and cold working of metals. Bring out the advantages and disadvantages of each of these techniques. (10)
- (ii) Define rolling process. (6)

Or

- (b) Write a short note on following terms :
- (i) Extrusion (4)
- (ii) Drawing (3)
- (iii) Blanking (3)
- (iv) Punching and (3)
- (v) Piercing. (3)
13. (a) Explain with a neat sketch the principle of
- (i) Working of a lathe. (8)
- (ii) Tumbler gears and back gears. (8)

Or

- (b) (i) Write about the materials for drills. (4)
- (ii) Sketch and explain the following allied operations : reaming, counter boring, counter sinking and spot facing. (12)

(a) (i) Sketch and describe a vertical milling machine. (8)

(ii) How will you cut the following types of surfaces on milling machines?

- (1) Flat surfaces (2) Slots, grooves and splines (3) Recesses
(4) Toothed gears. (8)

Or

(b) (i) Discuss the various methods of making grinding wheels. (8)

(ii) With help of a neat sketch, discuss the working of a continuous surface broaching machine. Write the advantages and limitations of broaching machines. (8)

15. (a) Explain TIG and MIG system of arc welding and give the applications of each.

Or

(b) (i) Explain the resistant welding and process giving the equipment, parameters controlled and the applications. (10)

(ii) Explain the principle of friction welding process. (6)