Instructions –

(1) All Questions are Compulsory.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any SIX of the following:

(i) State rolling principle with neat sketch.
(ii) Define forging operation. Classify it.
(iii) Give function of flywheel in mechanical press.
(iv) State different types of dies.
(v) Why colour coding of pattern is required?
(vi) Write name of any four patterns.
(vii) Write any four properties of moulding sand.
(viii) Classify melting furnace in casting process.
b) Attempt any TWO of the following: 08
   (i) Differentiate between brazing and soldering (Any four points).
   (ii) Name taper turning methods on Lathe. Explain any one.
   (iii) Explain calendaring with neat sketch.

2. Attempt any FOUR of the following: 16
   a) Compare Notching with Lancing operation (At least four points)
   b) Describe drawing operation in press working.
   c) Explain “investment casting” with neat sketch.
   d) Explain any four casting defects with causes of formation.
   e) Explain bending operation with neat sketch.
   f) Differentiate between hot chamber die casting and cold chamber die casting. (Any four points each)

3. Attempt any FOUR of the following: 16
   a) Compare hot rolling with cold rolling process (At least four points)
   b) Draw neat sketch of cupola furnace and label its various zones.
   c) Draw neat sketch of direct extrusion and explain its working.
   d) Define and write expression for following terms with reference to lathe machine:
      (i) Cutting speed
      (ii) Feed
      (iii) Depth of cut
   e) Differentiate between TIG and MIG welding process (Any four points)
   f) Draw neat sketch of Radial Drilling Machine and write function of each part.
4. Attempt any FOUR of the following: 16
   a) Compare Press forging with Drop forging. (Any four points)
   b) Explain three high rolling mill with neat sketch.
   c) Explain “Electric Arc furnace” with neat sketch.
   d) Explain nomenclature of twist drill.
   e) Explain with neat sketch “counter boring operation”.
   f) Explain compression moulding with neat sketch.

5. Attempt any FOUR of the following: 16
   a) Describe open die forging with neat sketch.
   b) Describe forward extrusion process with neat sketch.
   c) Draw neat sketch of shearing operation and describe in brief.
   d) Explain “Combination die” with neat sketch.
   e) Explain “Elements of gating system” in casting process.
   f) Explain any two types of core with neat sketch.

6. Attempt any TWO of the following: 16
   a) Explain with neat sketch
      (i) Projection welding
      (ii) Seam welding
   b) What is Injection Moulding? Draw neat sketch. Write four applications in industry.
   c) What is taper? Give taper angle calculation in turning operation with sketch.
      Find half taper angle for turning operation on Lathe machine.
      Major diameter = 30 mm
      Minor diameter = 20 mm
      Length of taper = 40 mm