B.Tech-1st

Basic Manufacturing Processes

Full Marks : 50

Time : $2\frac{1}{2}$ hours

Answer **all** questions

The figures in the right-hand margin indicate marks

Symbols carry usual meaning

1. Answer *all* questions : 2×5

(*a*) What is a master pattern ?

(*b*) Write down the effect of cooling rate of metal on grain size.

(*c*) Among different gas welding techniques, which one is most suitable & Why ?

(*d*) What is Tandem Rolling mill ?

(*e*) What are the three basic components of an NC system ?

2. With neat sketches explain different types of patterns. 8

Or

With neat sketches explain the different types of pattern allowances. 8

3. (*a*) Considering a square mould and pure metal is poured at high temperature into it, how the final grain structure will be formed ? Explain with neat sketches. 4

(*b*) Distinguish between directional solidification and progressive solidification with a neat sketch. 4

Or

Describe three different types of centrifugal casting process with neat sketches. 8

4. What is the basic principle of Resistance welding process. Describe different resistance welding techniques with neat sketches. 8

Or

Describe MIG and TIG welding processes with neat sketches and describe advantages and disadvantages of the same. 8

5. (*a*) Distinguish between cold and hot working of metal. 4

(*b*) Explain the role of friction in rolling. 4

Or

Calculate the rolling load if a steel sheet is hot rolled 30% from a 40 mm thick slab using 900 mm roll diameter. The slab is 760 mm wide. Assure $\mu = 0.3$. The plane strain flow stress = 140 MPa at entrance and 200 MPa at exit due to increasing velocity. 8

6. (*a*) Explain the principle of fused deposition modeling. 4

(*b*) Write down the different applications of robots in manufacturing. 4

Or

(*a*) Distinguish between NC and CNC. 4

(*b*) What is material Jetting ? 4
