

**B.Tech/3rd/ME**  
**Manufacturing Science and Tech. - I**

Full Marks : 70

Time : 3 hours

Answer Q.No.1 which is compulsory and any five from the rest.

The figures in the right-hand margin indicate marks

1. Briefly discuss the following :

- (a) Camber allowance. 2
- (b) Center line feeding resistance. 2
- (c) Caine's method. 2
- (d) Directional solidification. 2
- (e) Fluidity of metal. 2
- (f) Types of flames in Oxy-acetylene gas welding. 2
- (g) Functions of electrode coating in manual metal arc welding. 2

( Turn Over )

(iii) What is the use of 'half nut' ?

(iv) Name two methods of taper turning in a centre lathe.

(v) What is the use of 'pawl and ratchet' mechanism? 5

8. (a) A grinding wheel is specified as B100K100B. Explain the grinding wheel specification. 5

(b) Draw a neat schematic diagram to show the horizontal spindle traverse (cross-feed) surface grinding operation and identify the grinding parameters like downfeed, table speed, grinding velocity, cross-feed etc. 5

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- (h) An application of thermite welding. 2
- (i) Safety precautions in welding. 2
- (f) A steel billet of 120 mm width is being face milled with a 200 mm diameter cutter with 12 inserts (or cutting edges). The cutting speed is 100 m/min. The feed is 0.1 mm/tooth. Determine the feed rate in mm/min. 2
2. (a) What is meant by aspiration effect in sand casting process? What is the design consideration in the sprue to avoid this effect? 2 + 3
- (b) Show schematically the use of relief sprue, skim bob and strainer in the gating system. Why are these used in sand casting? 3 + 2
3. (a) Explain the process sequences of the hot chamber die casting process with a neat sketch. What are the important process parameters in this manufacturing process? 3 + 2
- (b) What are advantages and limitations of the hot chamber die casting process? 3 + 2
4. (a) Briefly describe the hot tearing defect in casting. What are remedial measures to avoid cold shut in casting? 3 + 2

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- (b) What do you mean by G-factor in true centrifugal casting? What is the importance of this factor in centrifugal casting process? 2 + 3
5. (a) Show schematically the principle of induction furnace with a neat sketch? What do you mean by carbon boiling during melting practice? 3 + 2
- (b) What is the difference between brazing and soldering? Give an application of each process. 5
6. (a) With neat sketches, briefly explain the principle of formation of an electric arc when potential field is applied between the electrode and the work. 5
- (b) Explain Tungsten inert gas (TIG) welding process. Briefly explain the role of the inert gas in this welding process. 5
7. (a) Name any three typical arc welding defects. Briefly explain a method for non-destructive inspection of weld defects. 5
- (b)(i) What is apron constant?
- (ii) In which machine tool would one come across quick return mechanism?