

Bihar Engineering University, Patna
B.Tech. 5th Semester Examination, 2023

Course: B.Tech.
 Code: 102504

Subject: Manufacturing Processes

Time: 03 Hours
 Full Marks: 70

Instructions: -

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

Q.1 Choose the correct answer of the following (Any seven question only): **[2 x 7 = 14]**

- (a) The main purpose of chaplets used in foundry practice are:
 - (i) to provide efficient venting
 - (ii) to ensure directional solidification
 - (iii) to support the core
 - (iv) to align the mould boxes
- (b) In which of the following casting process the sand is mixed with a thermosetting resin to form a mould?
 - (i) Shell moulding
 - (ii) Squeeze casting
 - (iii) Centrifugal casting
 - (iv) Die casting
- (c) The gating ratio refers to the cross sectional areas of:
 - (i) Sprue : In-gate : Runner
 - (ii) Spure : Runner : In-gate
 - (iii) In-gate : Runner : Sprue
 - (iv) Runner : Spure : In-gate
- (d) Inadequate penetration in case of welding operation will lead to
 - (i) Crack formation
 - (ii) Corrosion
 - (iii) Diffusion
 - (iv) Undercutting
- (f) Which of the following is a solid-state joining process?
 - (i) gas tungsten arc welding
 - (ii) resistance spot welding
 - (iii) friction welding
 - (iv) submerged arc welding
- (g) The number of elements on tool signature of ASA system are:
 - (i) 5
 - (ii) 6
 - (iii) 7
 - (iv) 8
- (h) The lip angle used in a drill for drilling the hard materials
 - (i) 128°
 - (ii) 136°
 - (iii) 90°
 - (iv) 60°
- (i) The angle between the face and flank of the single point cutting tool is known as :
 - (i) Rake angle
 - (ii) Clearance angle
 - (iii) Lip angle
 - (iv) Point angle
- (j) The tool life of a cutting tool mainly depends on:
 - (i) Cutting speed
 - (ii) Tool geometry
 - (iii) Ambient temperature
 - (iv) None of the above

- Q.2** (a) Explain Pattern and Pattern Materials Briefly. [7]
- (b) Explain Green sand mold, its advantages and disadvantages with neat sketch [7]
- Q.3** (a) What are the defects in casting? Explain briefly. [7]
- (b) Explain briefly the hand tools commonly used in foundry. [7]
- Q.4** (a) Differentiate Hot and Cold Working Process. [7]
- (b) Explain the phenomena of extrusion briefly. [7]
- Q.5** (a) What is Cutting Fluid? What are its functions? [7]
- (b) During orthogonal cutting a bar of 90 mm diameter is reduced to 87.6 mm. if the mean length of the cut chip is 88.2 mm and rake angle is 15°, calculate: [7]
 - (i) Cutting ratio.
 - (ii) Shear angle.

- Q.6** (a) What are the differences between orthogonal and oblique cutting? [7]
(b) Explain the characteristics of different types of tool wear. [7]
- Q.7** (a) Explain briefly with neat sketch (any two) [8]
(i) Radial drilling Machine
(ii) Gang Drilling Machine
(iii) Turret Drilling Machine.
(b) Explain briefly Up milling process. [6]
- Q.8** (a) Define term welding and name the various welding techniques. [5]
(b) Write the short notes on any three of the followings [9]
(i) Gas shielded arc welding
(ii) Submerged arc welding
(iii) Laser beam welding
(iv) Plasma Arc welding
- Q.9** Write Short notes on *any two* of the followings [7x2=14]
(i) Rapid Prototyping.
(ii) CNC Machines.
(iii) Honing.
(iv) Lapping.

