Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[5057]-213

S.E. (Mechanical & Automobile)
(First Semester) EXAMINATION, 2016
MANUFACTURING PROCESSES—I
(2012 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) *All* the four questions should be solved in one answer-book and attach extra supplements if required.
(*ii*) Figures to the right indicate full marks.
(*iii*) Neat diagrams must be drawn wherever necessary.
(*iv*) Use of non-programmable electronic pocket calculator is allowed.
(*v*) Assume suitable data, if necessary.
(*vi*) Solve Q. No. **1** *or* **2**, Q. No. **3** *or* **4**, Q. No. **5** *or* **6**, Q. No. **7** *or* **8**.

1. (*a*) Explain any *three* types of patterns used in casting process with neat sketch and application. [6]

(*b*) An aluminium billet of length 60 mm and diameter 20 mm is to be extruded by direct extrusion process. It has extrusion ration of 3. The extrudate has a round cross-section. The work metal has flow curve defined by strength coefficient 380 MPa and strain hardening exponent 0.18. Determine the pressure applied to the end of billet. [6]
(At lengths = 60 mm, 40 mm, 20 mm) as the ram moves forward. Take a = 0.8 and b = 1.5 for the Johnson equation.

P.T.O.

Or

2. (*a*) Compare open-die and closed-die forging. [6]

(*b*) Calculate the size of cylindrical riser with d/h ratio as 1.5, required to feed a steel slab casting of 350 × 350 × 50 mm^3. Assume the volume shrinkage on solidification as 5% for steel and volume of riser is three times that directed by shrinkage consideration done. If required also find corrected volume of riser. [6]

3. (*a*) Explain stud welding. State the advantages and limitations of the process. [6]

(*b*) Explain with sketch extrusion of pipes and state its application. [6]

Or

4. (*a*) Explain with sketch FCAW. State the advantages and limitations of the process. [6]

(*b*) Explain with sketch pressure thermoforming process. [6]

5. (*a*) Explain with neat sketch what is clearance and angular clearance, also explain size calculation of punch and die for blanking and piercing operation. [7]

(*b*) Determine force required for manufacturing the washer of 40 mm outer diameter and 20 mm inner diameter by press work from M.S. sheet of 1 mm thickness. Shear strength of material is 380 N/mm^2. Calculate die and punch dimensions for piercing operation. Consider clearance of 10% of stock thickness (Assume staggering of punches). [6]

Or

6. (*a*) Explain with sketch any *three* metal forming operations. [7]

(*b*) A square washer with 10 mm internal hole and 25 mm outer square is to be made from 1 mm thickness with ultimate tensile strength 250 N/mm^2. Find : [6]

(*i*) Draw strip layout

(*ii*) Percentage utilization for the same.

7. (*a*) Explain with neat sketch back gear cone pulley type headstock. [7]

(*b*) Explain the following lathe operations with neat sketch : [6]

(*i*) Eccentric turning

(*ii*) Grooving

(*iii*) Knurling.

Or

8. (*a*) List various parts of feed mechanism and explain end of bed gearing with sketch. [7]

(*b*) Determine the angle at which the compound rest will be swiveled when cutting a taper on a workpiece having outside diameter 90 mm, length of the tapered portion 60 mm and conicity is 1. Also find small diameter of taper. [6]