Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[5459]-111

S.E. (Mechanical/Auto. Engineering) (I Sem.)

EXAMINATION, 2018

MANUFACTURING PROCESS–I

(2015 PATTERN)

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

N.B. **:—** (*i*) All questions are compulsory i.e. Solve Q. **1** *or* Q. **2**, Q. **3** *or* Q. **4**, Q. **5** *or* Q. **6**, Q. **7** *or* Q. **8**.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data, if necessary.

(*iv*) Neat diagrams must be drawn wherever necessary.

1. (*a*) Explain the following casting defects with neat sketches and state their remedies : [6]

(*i*) Blow holes,

(*ii*) Scabs,

(*iii*) Cold shuts.

(*b*) A cylinder of diameter 'D' and height 'H' having height to diameter ratio of three is reduced in height by 50% with the help of open die forging. A forging force of 700 kN is required at the end of the stroke to reduce the said height. If the work material flow stress is 350 MPa and coefficient of friction

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is 0.28, find the true strain, shape factor and diameter 'D' of the cylinder. Also, comment on the required forging force if height to diameter ratio of the cylinder is changed to two keeping the diameter of the cylinder, coefficient of friction and work material flow stress values same as in the earlier case. [6]

Or

2. (*a*) Explain with a neat sketch rotary swaging process. Is this process useful for forming parts of both symmetrical and unsymmetrical cross-sections ? [6]

(*b*) A cube of side 'a' solidifies in time 't_1' seconds. If side of the cube is doubled ('2a'), then using Chvorinor's rule obtain the solidification time 't_2' of a resized cubical shape casing in terms of solidification time 't_1'. [6]

3. (*a*) State *four* applications of each of the following processes : Blow moulding, mechanical thermoforming and transfer moulding process. [6]

(*b*) With sketch compare leftward and rightward gas welding techniques. [6]

Or

4. (*a*) State any *four* welding defects with their causes and remedies. [6]

(*b*) With a neat sketch explain the sheet extrusion process. [6]

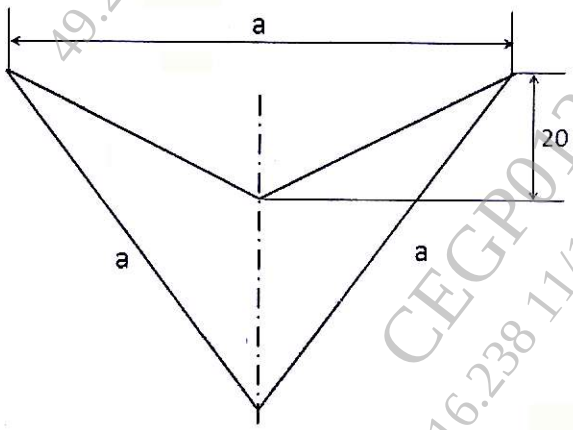
5. (*a*) With schematic sketches differentiate the compound and combination dies. [6]

(*b*) A cup of internal diameter 30 mm, height 45 mm is to be drawn from a 1.3 mm cold rolled steel with ultimate tensile strength of 320 MPa. The corner radius for cylindrical cup is 1.2 mm. Percentage reduction permitted in the first draw is 50% and in the second, third and fourth draw is 35%, 20% and 15% respectively. Consider trimming allowance of 3.2 mm for each 25 mm of cup diameter. Find size of the blank, number of draws required, punch and die dimensions and drawing pressure for each draw. Consider value of die constant 'c' as 0.7 and value of punch and die clearance as 1.15 times thickness of sheet. [7]

Or

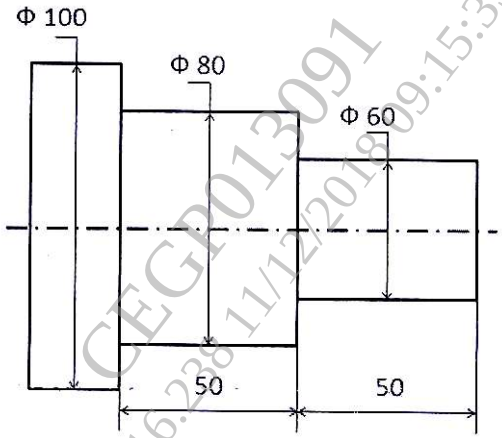
6. (*a*) Explain with sketches *three* methods of reducing shear force in sheet metal works. [6]

(*b*) Find the centre of pressure and press capacity for manufacturing a mild steel component as shown in figure. The thickness of the component is 1.3 mm. Take ultimate shear stress value as 230 N/mm^2. The dimensions shown in figure are in mm and dimension 'a' is 60 mm. [7]



7. (*a*) List the main steps required to cut an external taper using the taper turning attachment with a neat sketch. [6]

(*b*) The part shown below will be turned in two machining steps. In the first step a length of 100 mm (50+50) will be reduced from diameter 100 mm to diameter 80 mm and in the second step a length of 50 mm will be reduced from diameter 80 mm to diameter 60 mm. Calculate the required total machining time with the following cutting conditions, Cutting speed 'V' = 80 m/min, feed 'f' = 0.8 mm/rev and depth of cut 'd' = 2 mm/pass. [7]



Or

8. (*a*) Explain with a neat sketch external thread cutting operation to be carried on lathe. [6]

(*b*) Describe with neat sketches procedure to carry out eccentric turning operation and knurling operation on a lathe. [7]