Seat
No.

[5352]-512

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. Q. Nos. **1** *or* **2**, Q. Nos. **3** *or* **4**, Q. Nos. **5** *or* **6** and Q. Nos. **7** *or* **8**.

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

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

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

Q.1 (a) Explain with neat sketches the different types of cores used in foundry. [6]

(b) An aluminium strip 240 mm wide 18 mm thick is rolled to a thickness of 14 mm in one pass. The roll radius is 240 mm and roll rotates at 125 rpm. Calculate the roll force and power required for this operation if the aluminium has true stress of 78.44 N/mm^2 under unstrained condition and 242.35 N/mm^2 in maximum strained condition. [6]

OR

Q.2 (a) With sketch differentiate the universal rolling mill with planetary rolling mill. [6]

(b) A cubical shape of casting having side 'a' solidifies in time 't_1' seconds. If side of the cube is increased by 30% of the earlier side then using Chvorinor's rule obtain the solidification time of a resized cubical shape casing 't_2' in terms of solidification time 't_1'. [6]

Q.3 (a) State four applications of each of the following processes: Transfer moulding, Injection moulding and Pressure thermoforming process. [6]

b) With sketch compare forward and backward gas welding techniques. [6]

OR

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

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

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

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(b) Design a strip layout for manufacturing a mild steel component as shown in figure. The thickness of the component is 1.2 mm. Take ultimate shear stress value as 220 N/mm². Also find the percentage utilization, centre of pressure and press capacity. The dimension 'a' shown in the figure is 20 mm. [7]
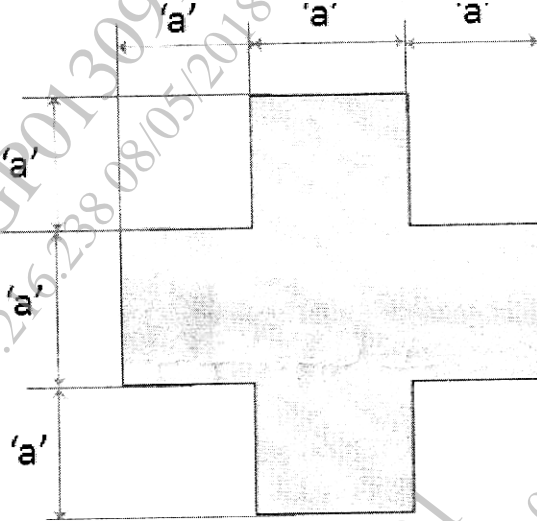
OR

Q.6 (a) Explain with neat sketches any six press working operations. [6]

(b) A cup of internal diameter 50 mm, height 70 mm is to be drawn from a 1.2 mm cold rolled steel. The corner radius for cylindrical cup is 1.6 mm. Percentage reduction permitted in the first draw is 50% and in the second, third and fourth draw is 30%, 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 for each draw. Also, draw sectional view of die block showing different dimensions for last draw. Consider value of punch and die clearance as 1.15 times thickness of sheet. [7]

Q.7 (a) Explain principle and working of thread cutting operation on lathe with neat sketch. [6]

(b) A workpiece of 76 mm diameter is to be turned down to a diameter of 68 mm. The length of the workpiece is 78 mm. The maximum allowable depth of cut is 0.8 mm. If the approach length is 20 mm and over travel is 10 mm then calculate the spindle revolution (RPM) and machining time for each pass if feed as 0.25 mm/rev and cutting speed as 200 m/min is kept constant for all the passes. Also, find the total machining time for all the passes. [7]

OR

Q.8 (a) Write a note on apron mechanism of a lathe. [6]

(b) Calculate the change gears for cutting two start right hand threads of 1.4 mm pitch on a lathe having 6 mm pitch of lead screw. Available gears are 20 to 120 teeth in steps of 5 teeth. Sketch the gear train and suggest what modification is required for cutting left hand threads? [7]