

Yogesh  
18/06/2016  
B.Tech-6<sup>th</sup>-PE/Tool Design

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

DEPARTMENT OF PRODUCTION ENGINEERING

MID SEMESTER EXAM, MARCH-2016

Subject: Tool Design (TD)

Full Marks: 20

Semester: 6<sup>th</sup>, B.Tech

Time: 2 hours

Answer any four questions including Q. No. 1

Q.No.1. Answer all the questions

[1×5]

- (a) What is effective rake angle? How is it calculated?
- (b) Why negative rake angle is used for brittle material and positive rake for ductile material?
- (c) What is the importance of center of pressure in press tool operations?
- (d) Distinguish between blanking and piercing.
- (e) Describe the ironing operation done in a deep drawing operation.

Q.No.2. Answer all the questions

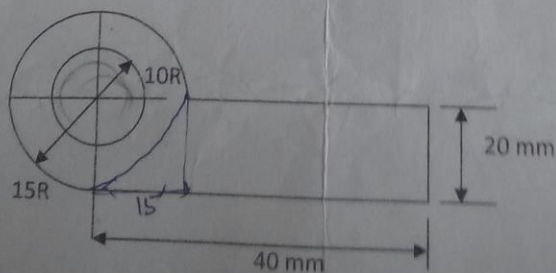
[2.5×2]

- (a) Sketch the geometry of a single point cutting tool in ASA and ORS system. Mention various angles in these two systems.
- (b) Design a HSS single point cutting tool for machine (C-20) low carbon steel. Take 0.5mm as depth of cut and 0.2mm as feed in turning operation assume other data necessary. Calculate the power required for machining.

Q.No.3. Answer all the questions

[2.5×2]

- (a) Distinguish between a compound die and a progressive die used in press working. Draw the stock strip layout for the component show in figure and calculate the % utilization. Take margin 2mm.



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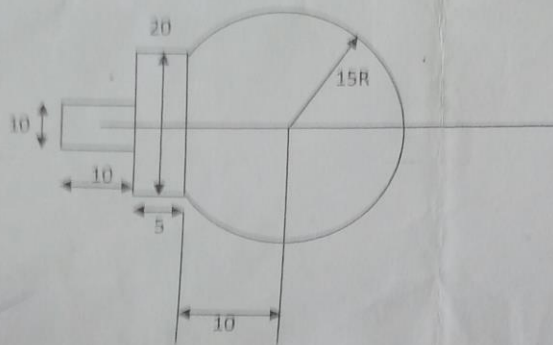
(B) A circular washer of external diameter 40mm and internal diameter 20mm is to be produced from steel sheet of thickness 1mm. Assuming a clearance of 5% of sheet thickness between the die and punch, calculate the diameter of punching and blanking die sets for producing washer.

Q.No.4. Answer all the questions

[2.5×2]

(a) How can you classify form tools? Distinguish between flat form tool and circular form tool.

(b) Design a form tool to manufacturing the component shown in diagram. All dimensions are in mm.



Q.No.5. Answer all the questions

[2.5×2]

(a) A groove of 90° angle, having a depth of 10mm is to be turned on a shaft of 50mm diameter with the help of a form tool having a rake angle 15° and clearance of 10°. Determine the angle ground on the tool in a plane perpendicular to the end flank edge.

(b) A 15mm deep V-groove of 60° included angle is to be turned on a circular work piece of radius 80mm with the help of circular form tool with rake angle of 10° and with maximum radius of 60mm. Determine the angle ground between the two faces of tool in the radial plane. The clearance angle is about 7°.

Q.No.6. Answer any two questions

[2.5×2]

(a) Chip breaker, High speed cutting tool

(b) Deep drawing defect, Design of pilot in press working

(c) Stripper, Shut height of die

All the best