

Total Pages—5

GHR B.Tech
PE - (32)

30-04-2016
(Set-R₁)

B.Tech-6th
Tool Design

Full Marks : 70

Time : 3 hours

Answer Q. No. 1 which is compulsory and
any five from the rest

The figures in the right-hand margin indicate marks

1. Answer the following questions : 2×10
- (a) What is the role of MRS system in metal machining operation ?
 - (b) How do you check rigidity of cutting tools ?
 - (c) What is the role of chip-breaker ?
 - (d) What do you mean by depth of profile of form tool ?
 - (e) What is the difference between product drawing and machine drawing in connection with forging die design ?

(2)

- (f) How do you check the rigidity of internal pull type broach ?
- (g) Differentiate between Jig and fixture.
- (h) Differentiate between blanking and piercing.
- (i) State the role of parting plane in forging die design.
- (j) What is the function of shedder ?
2. (a) Calculate no of roughing, semifinishing and finishing teeth for a round broach for enlarging a hole of 50 mm diameter to 52 mm. Rise per tooth of roughing tooth is 0.05 mm. 5

- (b) Sketch the profile of two roughing teeth, two semifinishing teeth and two finishing teeth. The tool material is H.S.S. and workpiece is mild steel. Assume the data suitably. 5

3. (a) Classify different types of form tool. State the reason why large rake angles are not recommended for form tool. State the range

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(Continued)

(3)

of cutting variables normally recommended for form tools compared to conventional single point cutting tool. 5

- (b) Design a flat form tool for the workpiece given (Fig. 1). The orthogonal rake angle is 10° and clearance angle is 8° . Determine depth of profile of the form tool. 5

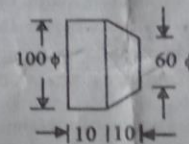


Fig. 1

4. (a) Sketch a geometry of a single point cutting tool in MRS and OPS system of nomenclature. 5

- (b) What is the role of chip breaker ? Classify different types of chip breaker. State the reason why chip breakers are the inherent feature in moder cutting tool. 5

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(Turn Over)

(4)

5. (a) Discuss how fine forging allowances are applied to design a close die forging die-block. 5

- (b) State the three buckling rules applied for up-set die design. 5

6. (a) What is the centre of pressure ? What is the necessity of locating centre of pressure in die design ? State whether the center of pressure is same for progressive and compound die for a given component. 5

- (b) Explain the action of shearing in blanking operation. What is the function of clearance ? 5

7. (a) Determine the dimensions of die and punch for making a blank of 50 mm diameter using a sheet of 2 mm thickness. The clearance per side is 10% of sheet thickness. What is the role of press shut height in die design ? 5

- (b) Explain 3-2-1 principle of location in jig and fixture design. 5

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(5)

8. (a) How do you check the rigidity of a single point cutting tool ? State how to improve the rigidity of cutting tool. 5

- (b) Explain the principle of three standard drill Jigs. 5

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