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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Sixth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; June - 2016

Tool Engineering Design

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
ii) Assume missing data suitably.

UNIT - I

1 a. Discuss the design procedure to calculate the minimum permissible size of the shank cross section [square, Rectangular and Round] on strength basis for a single point cutting tool used in lathe. 15

b. Discuss classification of broaching method, highlighting application of each. 5

2 a. Explain with sketches the elements of an internal pull broach. 10

b. Illustrate with sketch the twist drill bit nomenclature and explain function of major element. 10

UNIT - II

3 a. Discuss the basis for classification of power press. 10

b. Explain with suitable sketch the major components of open back inclinable (OBI) press. 10

4 a. Illustrate with sketches any five power press driving mechanism. 15

b. List the different types of press work operation with its application. 5

UNIT - III

5 a. Illustrate with sketch different die accessories and explain function of each. 15

b. Compare compound dies and progressive die. 5

6 a. Illustrate with sketch and explain operation of following : 15
i) Progressive punch and blanking die ii) Compound die

b. List the features of press tool. 5

UNIT - IV

7 a. Explain how die block dimensions are calculated. 7

b. Determine the centre of pressure of components shown in Fig. Q.7a. 8

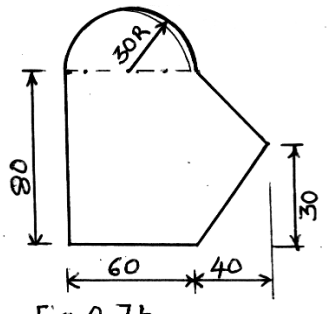

Fig. Q.7b

All dimensions in mm.

Contd….2

c. A steel washer of 36 mm outer diameter and 20 mm inside diameter is to be made from 1.2 mm thick sheet in one operation. If the shear stress is 400 N/mm^2 and percentage penetration is 20% determine; 5

i) Maximum punch force necessary to blank and punch the washer if both punches operate at the same time.

ii) Percentage reduction in punch force if 0.5 mm double shear is ground on the tool.

8 a. Explain with suitable illustrations the methods of reducing cutting force in a punch. 7

b. A steel washer is of 44 mm outer diameter and 22 mm inner hole diameter and is 12 mm thick. If the maximum shear stress is 405 N/mm^2 and percentage penetration is 24 find ; 8

i) Work done

ii) Show to be ground tool if maximum punch force is to be reduced to 0.05 MN.

c. Mention the steps involved in design of blanking die. 5

UNIT - V

9 a. Define Jig and Fixture. State the advantages of employing them. 5

b. Explain with suitable sketch the 3, 2, 1 location principles. 7

c. Illustrate with sketch following clamping devices : 8

i) Two-way clamp ii) Bridge clamp

iii) Wedge clamp iv) toggle clamp.

10 a. Discuss principal considerations in Jig and fixture design. 5

b. Illustrate with sketch the different locating methods and devices. 5

c. Illustrate with suitable sketch a typical box Jig to drill 4-holes in the component shown in Fig. 10C and mention function of major elements. 10

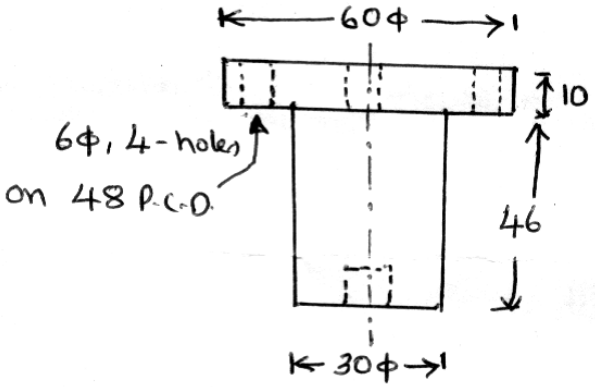

Fig 10.c

All dimension in mm.

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