Register Number: …….

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Fifth Semester

MECHANICAL ENGINEERING

U07ME505: Design of Jigs, Fixtures and Press tools

Time: Three hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. The device used for guiding, holding and supporting the work piece is

   A) Fixture B) Jigs C) Press tool D) Clamping device

2. Which of the following material is not used for designing base plate of jig?

   A) High speed steel B) Carbon steel C) Nickel chrome steel D) Aluminum

3. Channel jigs are used for

   A) Symmetrical shapes B) Unsymmetrical shapes

   C) Circular work piece D) Irregular shape

4. When large sized work piece is to be drilled in several faces the device used is

   A) Indexing Jig B) Angular post jig C) Angle plate jig D) Trunnion jig

5. Which fixture is similar to drilling jig or a milling fixture based on the type of boring operation

   A) Turning fixture B) Boring fixture C) Grinding fixture D) Broaching fixture

6. Welding fixtures are mainly used for

   A) Tack welding B) Butt welding C) Arc welding D) TIG welding

7. The scrap strip distance is controlled by

   A) Stripper plate B) Back gauges C) Punch plate D) finger stop

8. The ID of washer is 11mm and OD of washer is 20mm, the punch diameter will be

   A) 11, 19,975 B) 11.025,20 C) 11.025, 19.975 D) 11, 20

9. The production of cups, shell,boxes from metal blanks is called

   A) Drawing B) Forming C) Curling D) Bending

10. The first operation to be performed in a progressive die is

    A) Blanking B) Piercing C) Forming D) Punching

PART B (10 x 2 = 20 Marks)

11. Differentiate Jigs and Fixtures

12. What are the different types of tolerance?

13. What is the hardness of standard drill bushings?

14. What is a box jig?

15. Write the four functions of a fixture.

16. What are the three methods used to assemble a modular fixture?

17. List down the major elements of mechanical press

18. What is the function of stripper?

19. How are the dies classified?

20. How are pilots useful in progressive dies?

PART C (5 x 14 = 70 Marks)

21. (a) (i) Describe the design principles for Jigs and Fixtures. (8)

(ii) Explain briefly the different types of errors to be accounted for jigs or fixtures while designing. (6)

(OR)

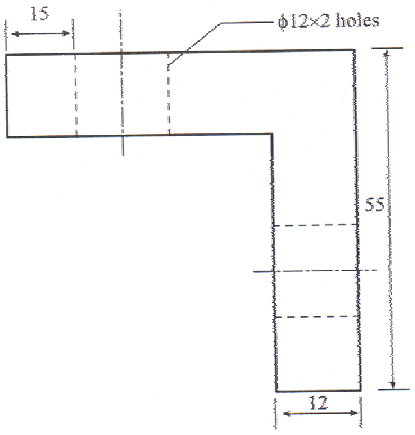
(b) Discuss the principle of pneumatic and hydraulic actuation clamping.

22. (a) (i) Explain with an example for turnover and Angle plate jig.

(ii) Illustrate the air operated drilling jig components with a sketch.

(OR)

(b) Design a jig for drilling ø12x2 number of holes on the work piece shown Fig.1 and also mention the part list



all dimensions are in mm

Figure 1

23. (a) Design a milling fixture to cut a keyway on a given component

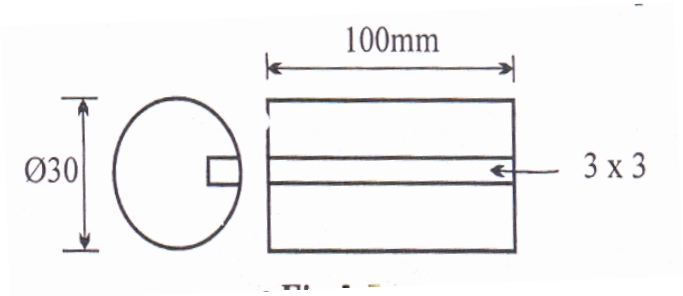


Figure. 2

(OR)

(b) (i) Briefly describe the functions of a welding fixture

(ii) Distinguish between gauging fixtures and measuring fixtures.

24. (a) (i) List down the press working terminologies

(ii) Illustrate the various method of punch support

(OR)

(b) A part shown in figure 3 is to be made from a mild steel sheet 3mm thick and 2m long.

(i) Draw the Strip layout

(ii) Determine the number of parts that can be punched from the strip

(iii) Calculate the percentage of stock used

(iv) Find the Weight of material needed to produce one blank

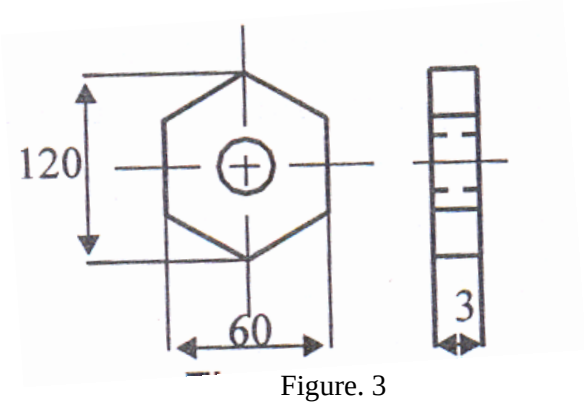


Figure. 3

25. (a) (i) Explain the briefly following

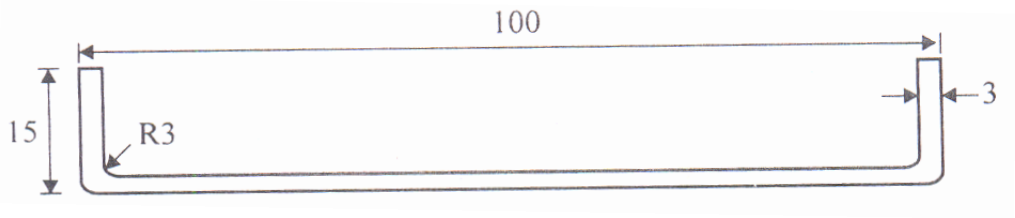
(1) Knockouts (2) Starting stops (3) Stop pins (6)

(ii) Write short notes on Compound die and Progressive die. (8)

(OR)

(b) Design a die for the component shown in figure 4. Material mild steel having f_y=200N/mm^2; f_s=120N/mm^2.

Figure 4



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