

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, APRIL-2023**

**PRODUCTION DRAWING**

[Maximum marks: 100]

(Time: 3 Hours)

- [Note:- 1. Use of BIS tables and charts are permitted.  
2. Missing data if any suitably assumed.  
3. Sketches to be Accompanied.]

**PART – A**

**(Maximum mark: 20)**

I (Answer all of the following questions. Each question carries 5 marks)

1. Explain Unilateral system and Bilateral system of tolerances with sketch.
2. Draw and show the method of indicating surface texture characteristics on a surface texture symbol.
3. Determine the values of the following tolerances for shaft and hole from the standard table for a nominal size of 40mm. (a) p6/H8 (b) js6/H7
4. Draw the symbols representing following geometrical tolerances:  
(a) Flatness (b) Perpendicularity (c) Circularity (d) Coaxiality  
(e) Parallelism

(4 x 5 = 20)

**PART – B**

**(Maximum Marks:30)**

II (Answer any *two* questions from the following. Each question carries 15 marks)

1. Draw the production drawing of a sleeve shown in figure.1, by incorporating following requirements: (i) Surface 1 should not have a radial run out greater than 0.008mm with respect to the axis of the sleeve. Also the surface should be contained between two parallel planes 0.008mm apart. (ii) Surface 1 and 2 should be parallel to each other with a parallelism tolerance of 0.004mm. (iii) surface 3 should have a circularity and cylindricity tolerance within 0.003mm each. (iv) Surface 4 has radial run out limited to 0.008mm with respect to the axis, circularity tolerance limited to 0.003mm and a cylindricity tolerance of 0.003mm.

2. Compute the limit dimensions for a clearance fit on shaft basis system. Basic size =  $\Phi$  50mm, Minimum clearance = 0.03mm, Tolerance on hole = 0.035mm, Tolerance on shaft = 0.025mm. Check the calculated dimensions and represent it schematically.
3. A locating pin shown in figure 2 is to be manufactured in a machine shop, Prepare an operation chart incorporating the following details.  
Part Name: Locating pin, Part Number: 93003138, Drawing No.LP 0030 09,  
Equipment: Drill Jig, Material: Steel, Specification: 15:666 PART – I, Qty required: 25Nos. Also mention the details like departments, machines, tools, gauges, weight/piece, total number of operations, setup and operation times and cycle time. (2 x 15 = 30)

### PART – C

**(Maximum marks : 50)**

III. Answer one full question from the following. Each question carries 50 marks

1. Prepare a shop floor drawing of over hung crank shown in figure 3 by incorporating following information's and also prepare an item list showing name of numbered parts, material and quantity required.
  - (i) Crank shaft end is assembled in crank with light keying fit.
  - (ii) Crank pin is with push fit in the crank.
  - (iii) Crank pin is with normal running fit in the big end of the connecting rod.
  - (iv) A parallelism tolerance of 30  $\mu$ m is allowed between the axis of the pin and the axis of the shaft.
  - (v) Mark necessary surface finish grade numbers for the mating parts with light keying fit, normal running fit, and push fit.
  - (vi) Crank is made of sand casting process and all the remaining surfaces having a finish value of 6.3  $\mu$ m.

**OR**

2. Figure 4 shows the assembly drawing of a Socket and Spigot joint. Prepare a shop floor drawing of the parts and mark dimensional as well as geometrical tolerances to result easy running fit between socket and spigot. The cotter and the hole are to be toleranced for normal running fit. Give N7 finish to mating surfaces and N9 for the remaining. A cylindricity tolerance of 50 microns for the outside surface of spigot and inside surface of the socket is needed. Also prepare an item list showing part, material and quantity.

(1 x 50 = 50)

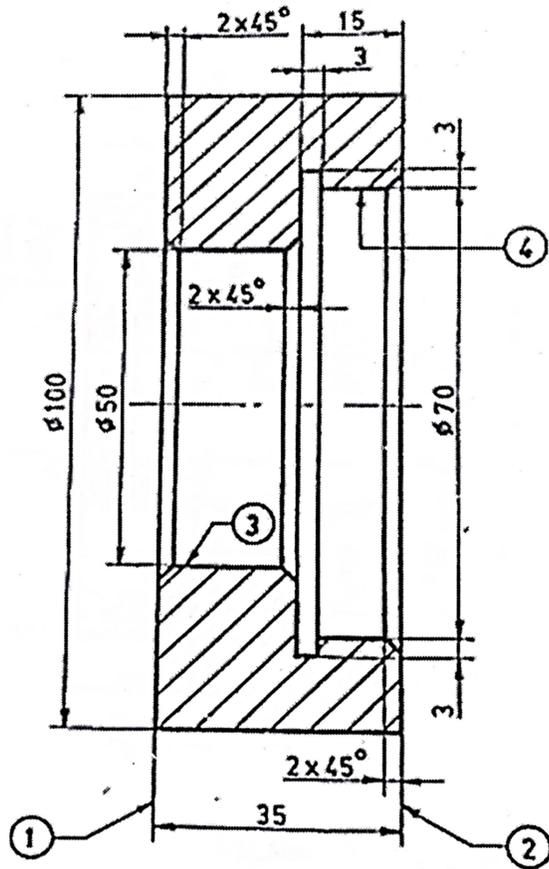


Figure - 1

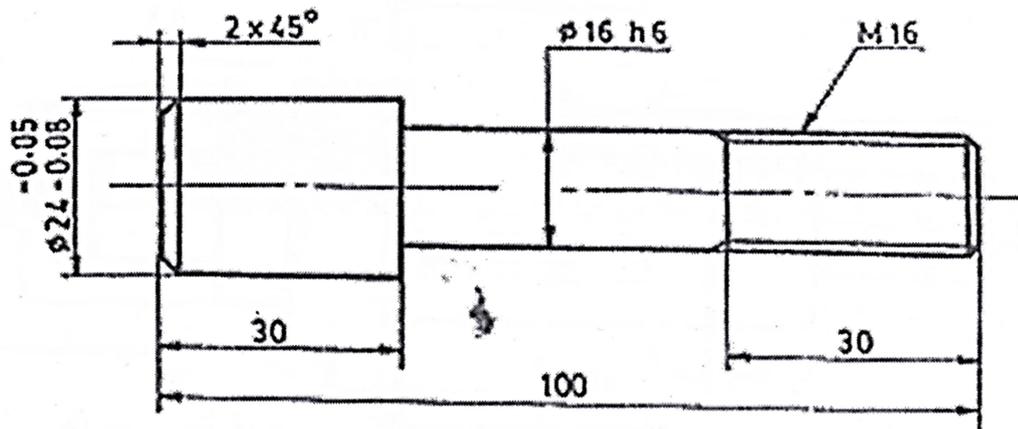


Figure - 2

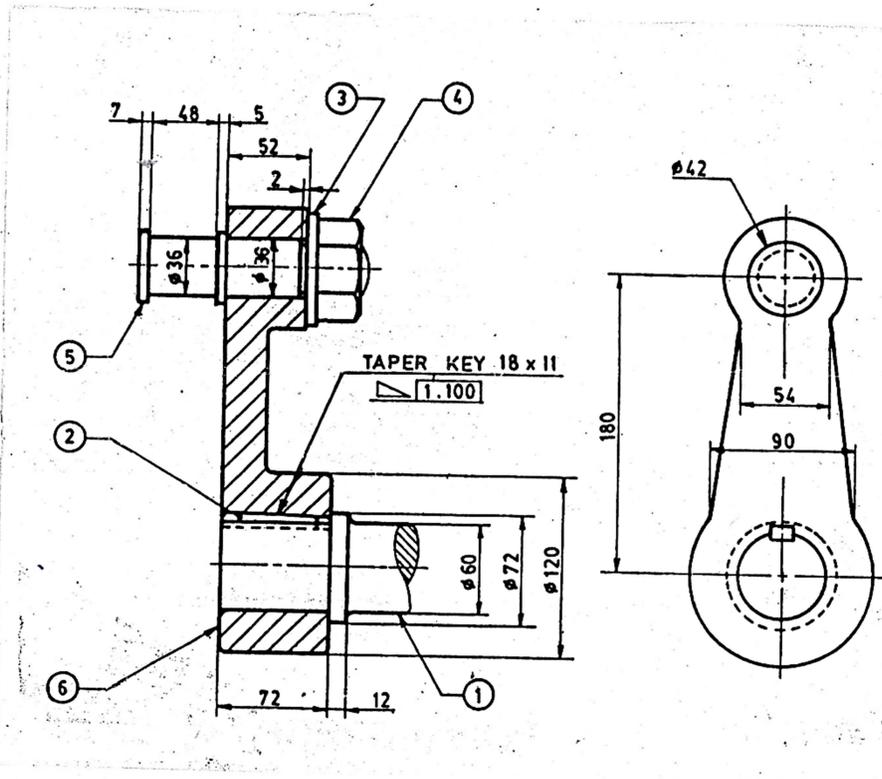


Figure - 3

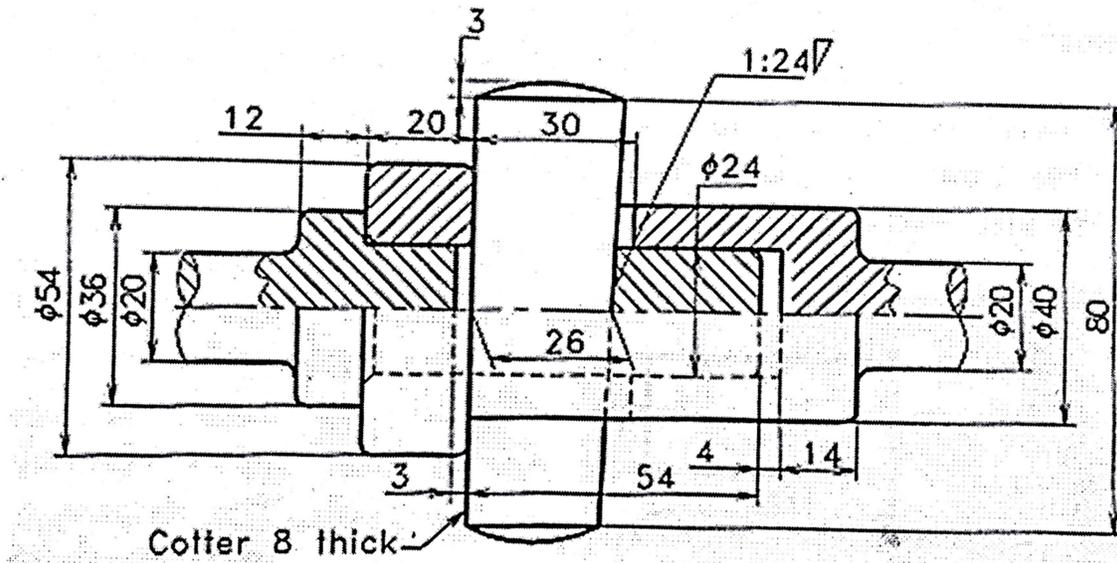


Figure - 4

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