TED (15)-4026

(Revision -2015)

DIPLOMA EXAMINATION IN ENGINEERING / TECHNOLOGY / MANAGEMENT / COMMERCIAL PRACTICE

PRODUCTION DRAWING
(Scheme of valuation)

PART –A
(Maximum marks: 20)

I Answer all questions. Each question carries 5 marks.

1. A fit system is a system of fits comprising of shafts and holes belonging to a limit system. From the production point of view in assembling parts, one of the mating parts is considered to a constant size by fixing its limit dimensions while the other is supposed to have a varying limit dimensions.

There are two systems of fits. They are Hole basis system and Shaft basis system.
Hole basis system, if the lower deviation of the hole is zero, the minimum limit of the hole will be equal to its basic size itself.
Shaft basis system, if the upper deviation of the shaft is zero, the maximum limit of the shaft will be equal to its basic size.

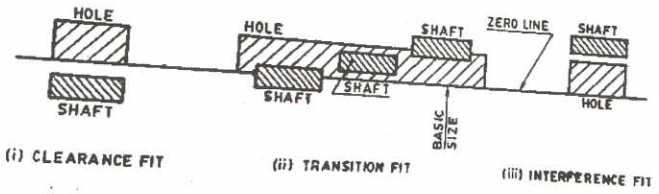


Fig. E2. 7 Hole basis system

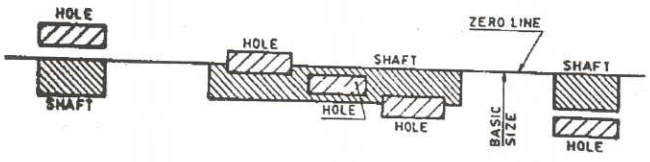


Fig. E2. 12 Shaft basis system

5 Marks (Explanation-3, Sketch-2)

2. **5 Marks (Figure 3, Identify the parts 2**

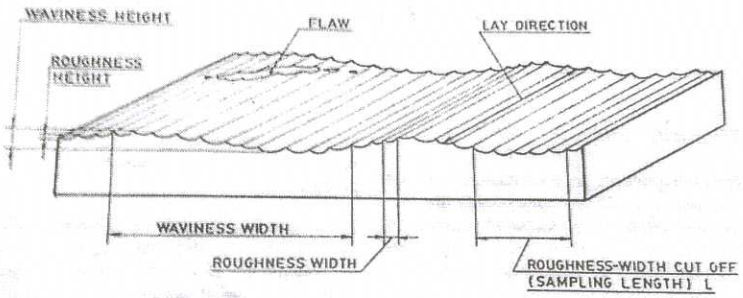


Fig. E1. 2 Nomenclature of surface texture

3. **5 Marks (Any 5 steps, 1 mark each)**

Prepare the relevant views of the parts of the given assembly, Enter the basic dimensions in three views. Prepare a list of part in the categories:

a) The list category will consist of parts which can procured directly from the market as per the specifications

b) The second category will consists of parts which are to be manufactured outsides the producers shop floor as per the specifications,

c) The third category will consists of parts which are to be manufactured in the shop floor of the producer itself.,

Prepare the complete specifications of the materials, size and quantity of the parts to be procured directly and hand over the same to the stores for the necessary action,

Prepare separate drawings for each part incorporating the dimensions, limits, and tolerances for the parts to be manufactured both inside and outside the shop floor of the producer,

incorporating the surface finish requirements on the above drawing, represent the details of the specific processes like heat treatment, plating etc. as per the standards and contact the concerned departments, to order for the items to be manufactured outside the company, giving shop floor drawings.

4. **5 Marks (Any 5 , 1 mark each)**

Operation process charts, flow process charts, man and machine process charts, operator process charts, progress process charts, progress process charts and miscellaneous process charts. **(4x5=20)**

PART-B

(Maximum marks: 30)

II Answer any two of the following questions. Each full question carries 15 marks.

1 **Hole Tolerance 4 Mark, Shaft Tolerance 4 Mark, Clearances 2Mark Check 2 Mark, Sketch 3 Mark.** **Total 15 Marks**

SOLUTION

Minimum limit of the hole = ϕ 27.500 mm

Maximum limit of the hole = ϕ27.575 mm

Tolerance on the hole = (Maximum limit of the hole) – (Minimum limit of the hole)
= ϕ27. 575 – ϕ27. 500
= 0. 075 mm

Maximum limit of the shaft = ϕ27.470 mm

Minimum limit of the shaft = ϕ27.445 mm

Tolerance on the shaft = (Maximum limit of the shaft)– (Minimum limit of the hole)
= ϕ27.470 – ϕ27.445
= 0.025 mm

Minimum clearance = (Maximum limit of the hole) – (Maximum limit of the shaft)
= ϕ27.500 – ϕ27. 470
= 0.030 mm.

Maximum clearance = (Maximum limit of the hole) – (Minimum limit of the shaft)
= ϕ27.575 – ϕ27.445
= 0. 130 mm

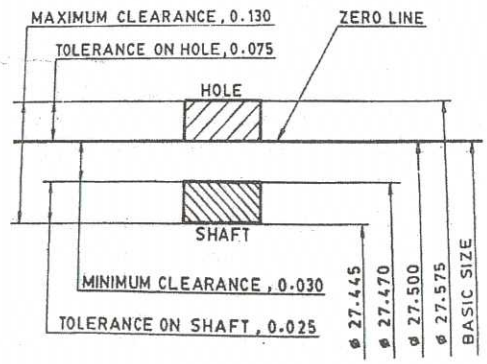
Check

Total tolerance = (Tolerance on the hole) + (Tolerance on the shaft)
= 0.075 + 0.025
= 0.100mm

Difference in clearance = (Maximum clearance) – (Minimum clearance)
= 0.130 – 0.030
= 0.100 mm

∴ Total tolerance = Difference in clearance.

Dimensions are represented schematicaly in Fig. E2.9.



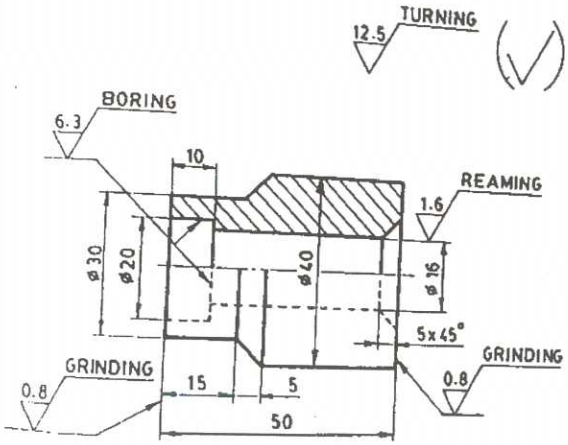
2. (i) **a represents turning to 12.5 μm finish 3 Mark**

(ii) **b represents grinding to 0.8 μm finish 3 Mark**

(iii) **c represents reaming to 1.6 μm finish 3 Mark**

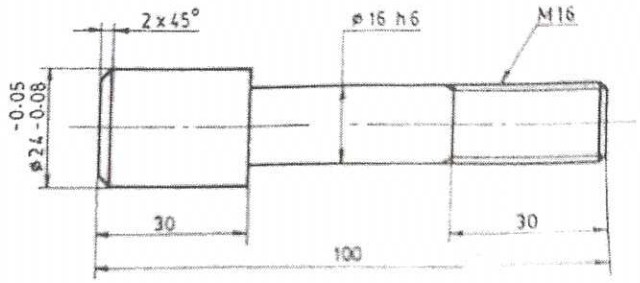
(iv) **d represents boring to 6.3 μm finish 3 Mark**

Figure 3 Mark Total 15 Marks.



3. **Weight of material per piece 3 Mark, number of operations 3 Mark, set up and operation time 3 Mark, machines, tools, gauges for production and measurements 3 Mark and Chart 3 Mark**

Total 15 Marks.



OPERATION CHART

NAME : Locating pin	MATERIAL: Steel	WEIGHT / PIECE : 1. 67 kg.
PART NO : 93 0031 08	SPEC. IS : 666 PART- I	TOTAL OPERATIONS : 11
DRG. NO : LP 0030 09	SIZE : ϕ 25 x 106	CYCLE TIME : 36 minutes
EQUIPMENT : Drill Jig	QTY. REQD : ~~25~~ 50	APPROVED :

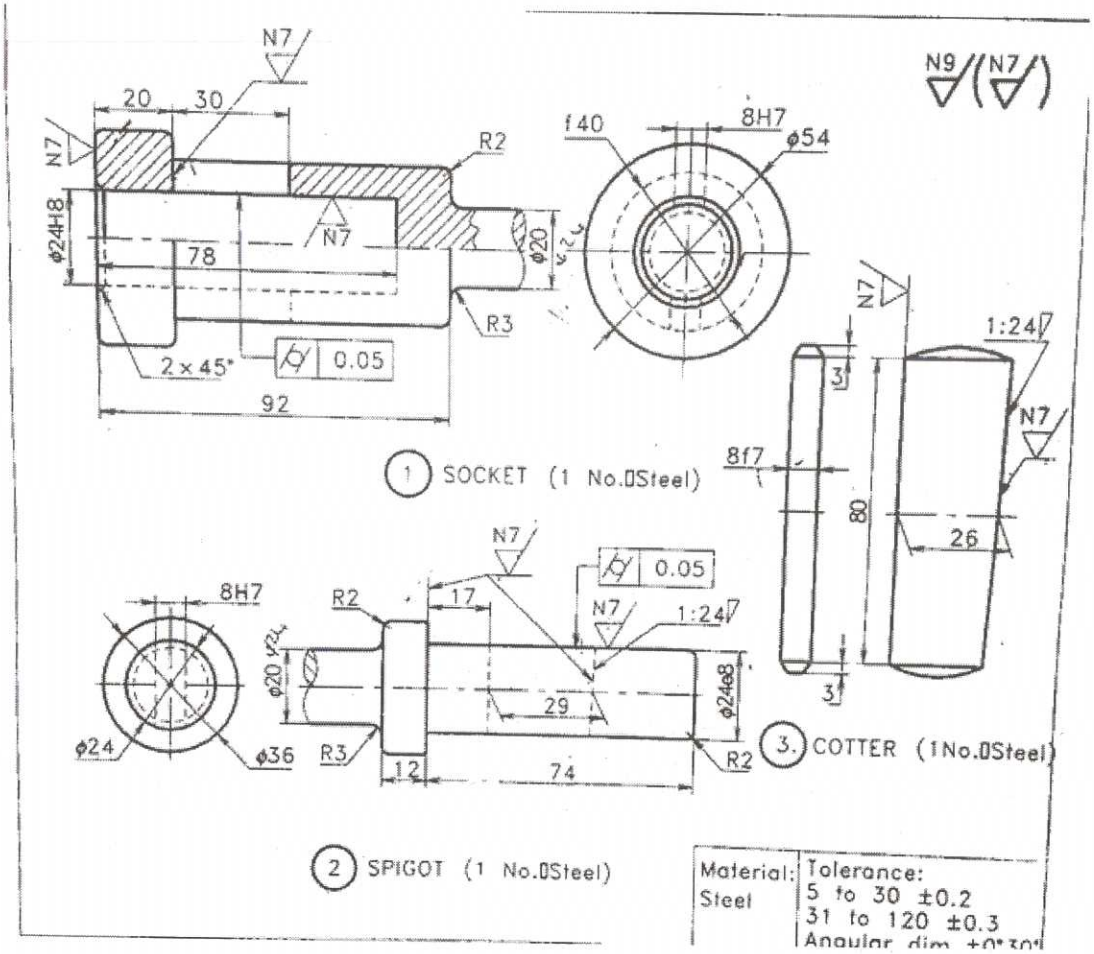
SEQUENCE	DEPT.	OPERATIONS	MACHINES	TOOLS / GUAGE	SET UP TIME (Minute)	OPEN TIME (Minute)	REMARKS
05	D_1	Remove bar stock to Turning department D_2	Truck	—	—	1	
10	D_2	Hold bar stock in self centering chuck machine to ϕ 24 for an approximate length of 106 mm	Lathe	Turning tool	1	4	
15	,,	Rough machine ϕ 18 for a length of 70 mm	,,	,,	—	6	
20	,,	Face the end	,,	Facing tool	1	2	
25	,,	Finish machine of ϕ 24	,,	Turning tool	—	4	
30	,,	Finish machine of ϕ 16 *h* 6	,,	,,	—	5	
35	,,	Thread *M* 16	,,	Threading tool	1	3	
40	,,	Chamfer the edge	,,	Chamfering tool	1	1	
45	,,	Part the pin from the bar stock	,,	Parting tool	1	3	
50	,,	Inspect the Locating pin	—	Gauges	—	1	
55	D_1	Store in bin	—	—	—	1	
		Total			5	31	

PART-C

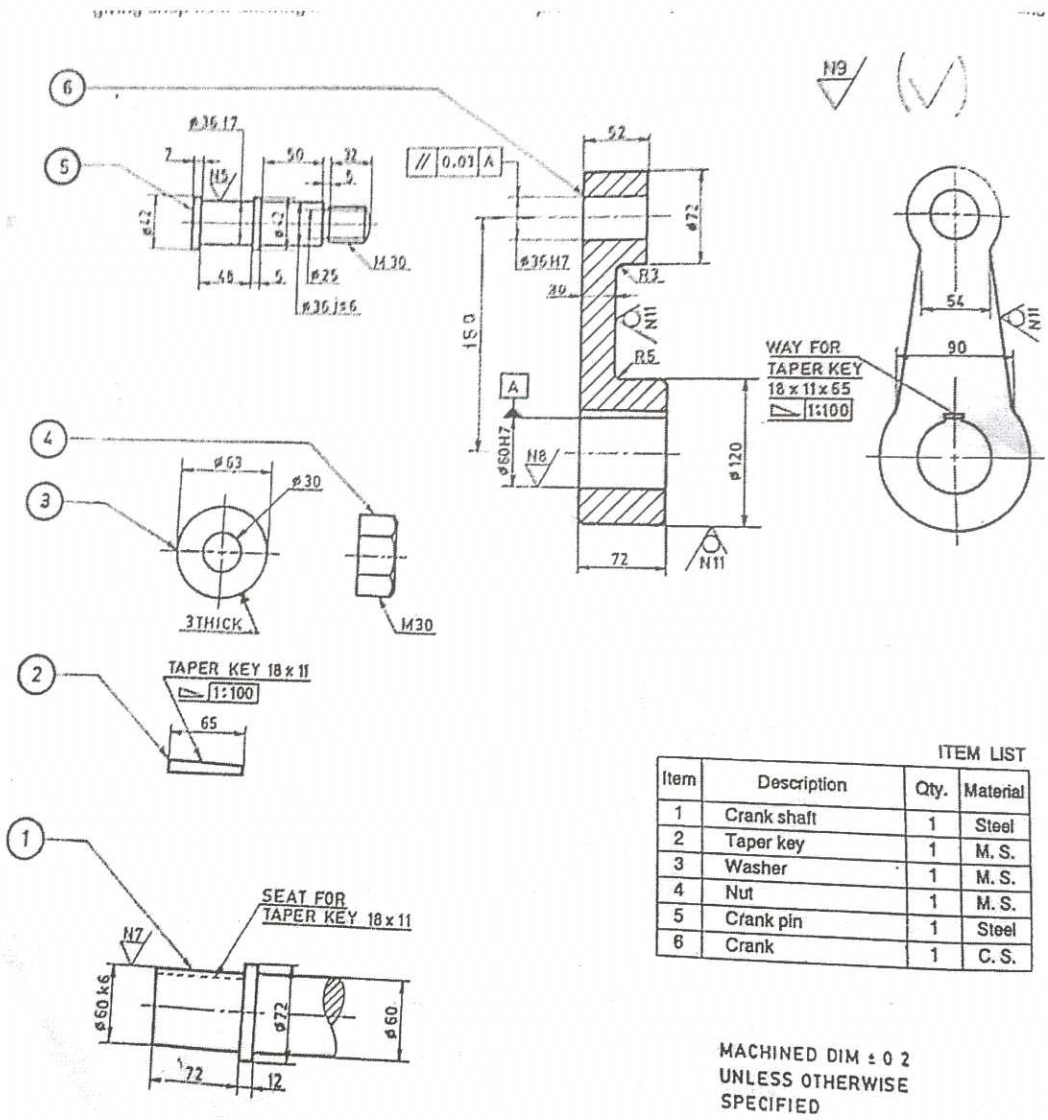
(Maximum marks: 50)

III Answer any one of the following questions. Each full question carries 50 marks.

1. **Correct views with dimension and surface finish marking 30 Marks, Geometrical tolerances 7 Mark, fits 8 Marks, item list 3 Mark, neatness 2 Mark, Total 50 Marks.**



2. **Correct views with dimension and surface finish marking 30 Marks, Crank shaft end is assembled the crank with light key fit 4 Marks; Crank pin is with normal running fit in the big end of the connecting rod. 4 Mark, Crank pin is with push fit in the crank 4 mark, A geometrical tolerance of 30 microns is allowed between the axis of the pin and the axis of the shaft 4 Mark , Item list and neatness 4 Mark, Total 50 Marks.**



Item	Description	Qty.	Material
1	Crank shaft	1	Steel
2	Taper key	1	M. S.
3	Washer	1	M. S.
4	Nut	1	M. S.
5	Crank pin	1	Steel
6	Crank	1	C. S.

Fig. 4 Overhung crank