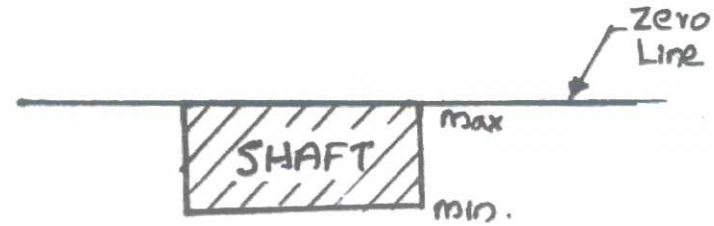
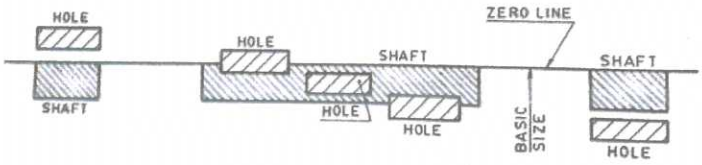
Scoring Indicators

Code: TED (15) 4026 PRODUCTION DRAWING

Q No.	Scoring Indicators	Split Score	Total Score
	PART A		
I 1.	= represents parallel to the plane of projection of the view. ⊥ represents perpendicular to the plane of projection of the view. X represents crossed in two slant directions relative to the plane of projection of the view. M represents multi directional. C represents approximately circular relative to the centre of the surface R represents approximately radial relative to the centre of the surface. Any 5 points	5x1	5
2	1. operation process chart 2. Flow process charts, 3. Man and machine process charts, 4. Operator process charts, 5. Progress process charts and 6. Miscellaneous process charts. *Operation process chart* is a document which furnishes all the operations to be performed in a given process. *Flow process chart* indicates the flow of material forms etc. *Man and machine process chart* establishes the relation between the part of the cycle which under the control of the man who operatres and the other part which is under the control of machine or process. *Operator process chart* specifies what the right and left hands of the operator are doing during the process apart from the actions executed by the other parts of the body. *Progress process chart* is intended to study the progress which has been made on any project. *Miscellaneous process chart* deals with all other process charts that are not covered by the above. Only operation process chart is discussed in this article.	5x1	5

3	Shaft basis system-shaft whose upper deviation (max limit)is zero.   Definition 2.5 Diagram 2.5	2.5 x2	5
4	**Any 5 ,1 mark each** Characteristics to be toleranced / Symbols Single features — Form tolerances: Straightness; Flatness; Circularity; Cylindricity Single or related features — Form tolerances: Profile of any line; Profile of any surface Single or related features — Orientation tolerances: Parallelism of a line (axis) with reference to a datum line; Perpendicularity of a line (axis) with reference to a datum surface; Angularity of a line (axis) with reference to a datum surface Related feature — Location tolerances: Position of a line; Coaxiality of an axis; Symmetry of a median plane Related feature — Run - out tolerances: Circular run-out radial; Total run-out radial	5x1	5

Minimum limit of the hole = ϕ 27.500 mm

Maximum limit of the hole = ϕ 27.575 mm

Tolerance on the hole = (Maximum limit of the hole) – (Minimum limit of the hole)
= ϕ 27. 575 – ϕ 27. 500
= 0. 075 mm

Maximum limit of the shaft = ϕ 27.470 mm

Minimum limit of the shaft = ϕ 27.445 mm

Tolerance on the shaft = (Maximum limit of the shaft) – (Minimum limit of the hole)
= ϕ 27.470 – ϕ 27.445
= 0.025 mm

Minimum clearance = (Maximum limit of the hole) – (Maximum limit of the shaft)
= ϕ 27.500 – ϕ 27. 470
= 0.030 mm.

Maximum clearance = (Maximum limit of the hole) – (Minimum limit of the shaft)
= ϕ 27.575 – ϕ 27.445
= 0. 130 mm

Check

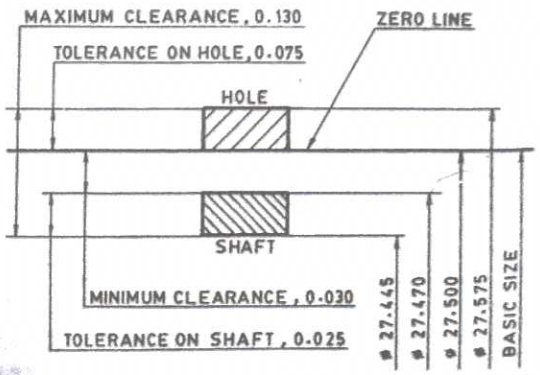
II 1

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.

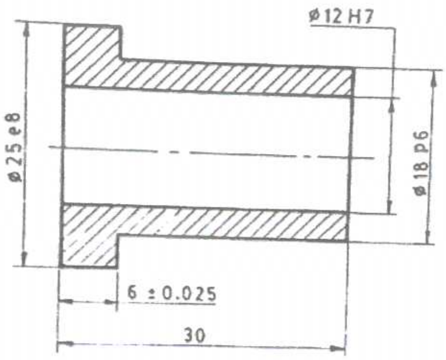
Dimensions are represented schematicaly in Fig. E2.9.



CALCULATION AND ANSWER 10MARKS
DIAGRAM 5 MARK

10x1
5x1

15

	PART B		
II 2	SEPARATE SHEET IS ATTACHED FIG 1 CORRECT FORMAT 5 points CONTENTS 8 POINTS WEIGHT CALCULATION 2POINT	5x1 8X1 2X1	15
3	 **Fig. E2. 38** Bush (Tolerance indicated by symbol and grade) FROM BIS TABLE OR BY CALCULATION Hence, the numerical value of ϕ 25 *e* 8 can be represented as below: $\phi\, 25\, e\, 8 = \phi\, 25 \begin{smallmatrix} -0.040 \\ -0.073 \end{smallmatrix}$ Similarly, the numerical values for ϕ 12 *H*7 and ϕ 18 *p*6 can be calculated and they can be indicated as shown below: $\phi\, 12\, H7 = \phi\, 12 \begin{smallmatrix} +0.018 \\ 0 \end{smallmatrix}$ $\phi\, 18\, p\, 6 = \phi\, 18 \begin{smallmatrix} +0.029 \\ +0.018 \end{smallmatrix}$ DIAGRAM 8 MARKS OBTAINING TOLERANCE VALUES 7 MARK	8x1 7x1	15
III A	**PART C** ANSWER FIGURE IS ATTACHED SEPERATELY FIG NO 2 CORRECTNESS OF VIEWS 20 MARK DIMENSIONAL TOLERANCE 15 MARKS SURFACE TEXTURE 15 MARKS	20x1 15x1 15x1	50
111 b	**PART C** ANSWER FIGURE IS ATTACHED SEPERATELY FIG NO 3 CORRECTNESS OF VIEWS 20 MARK DIMENSIONAL TOLERANCE 15 MARKS SURFACE TEXTURE 15 MARKS	20x1 15x1 15x1	50

OPERATION CHART

NAME : Locating pin	MATERIAL: Steel	WEIGHT / PIECE : 0.416 kg	
PART NO : 93 0031 08	SPEC. IS : 666 PART- I	TOTAL OPERATIONS : 11	
DRG. NO : LP 0030 09	SIZE : ϕ 25 × 106	CYCLE TIME : 36 minutes	
EQUIPMENT : Drill Jig	QTY. REQD : 25	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	

FIG 1

$\therefore$ Size $= \phi 25 \times 106$

Weight of the single piece of the locating pin can be calculated by taking the specific weight of steel as 8 gm / cc.

$$\therefore \quad \text{Weight / piece} = \left(\frac{\pi 25^2 \times 106}{4 \times 10^3}\right)\frac{8}{1000}$$

$$= 0.416 \text{ kg}$$

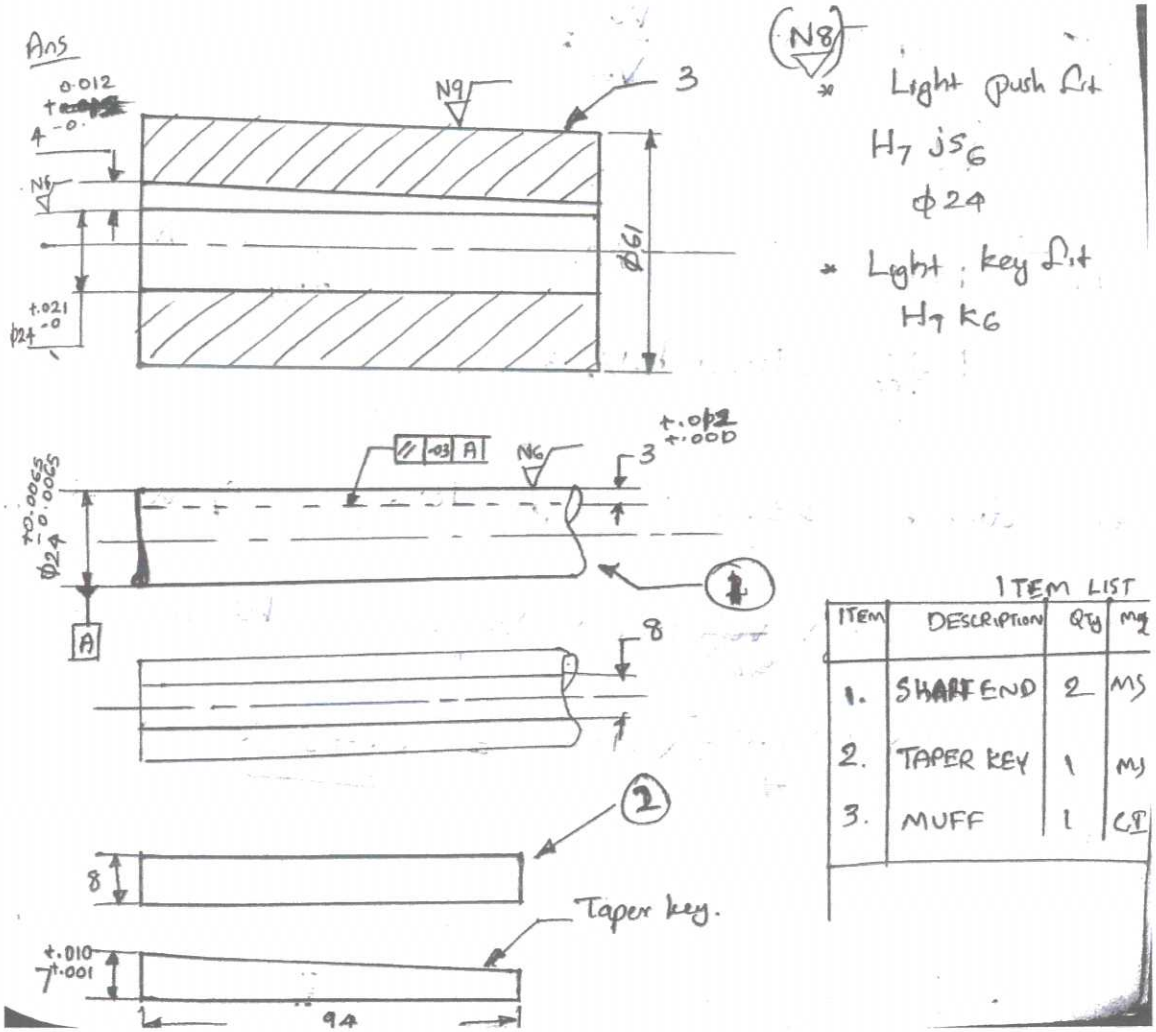
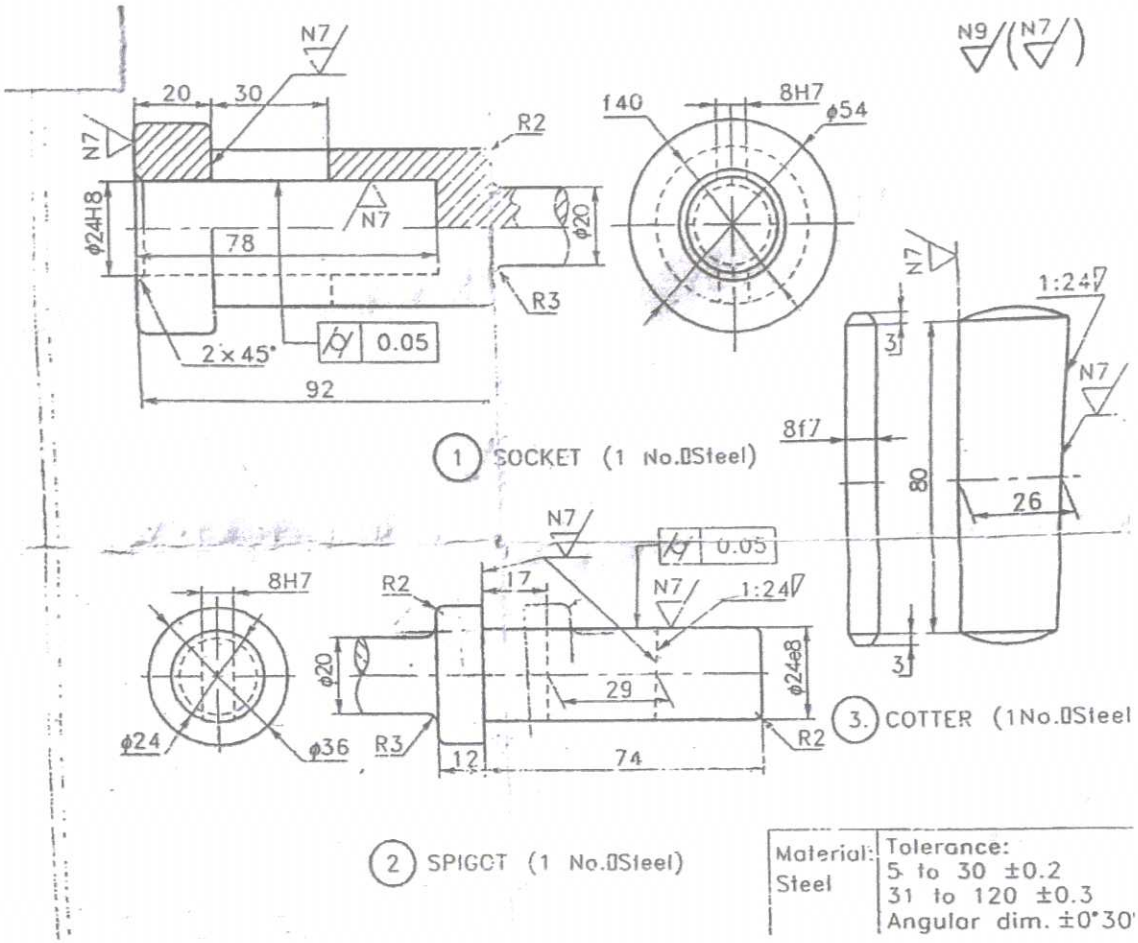

Ans
N9
3
N8
* Light push fit
H7 js6
φ24
* Light : key fit
H7 k6
N6
3
8
2
Taper key.
94
ITEM LIST
ITEM | DESCRIPTION | QTY | MAT
1. | SHAFT END | 2 | MS
2. | TAPER KEY | 1 | MS
3. | MUFF | 1 | CI

FIG 2



Easy running fit – H8 e8 or H7 e8

Normal running fit – H8 f7 or H7 f7

$24\,H8 = 24^{+0.033}_{+0.00}$

$24\,H7 = 24^{+0.021}_{+0.00}$

$24\,e8 = 24^{-0.040}_{-0.073}$

$8\,H8 = 8^{+0.022}_{+0.000}$

$8\,H7 = 8^{+0.015}_{+0.000}$

$8\,f7 = 8^{-0.013}_{-0.028}$

FIG 3