

S.Y. Diploma : Sem. III
 [AE/ME/MH/MI/PG/PT]
Mechanical Engineering Drawing



Time: 4 Hrs.]

Prelim Question Paper Solution

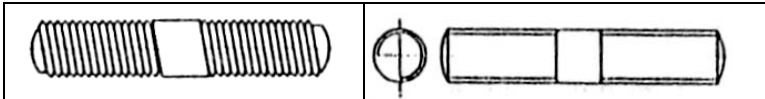
[Marks : 70

Q.1. Attempt any FIVE of the following : [10]

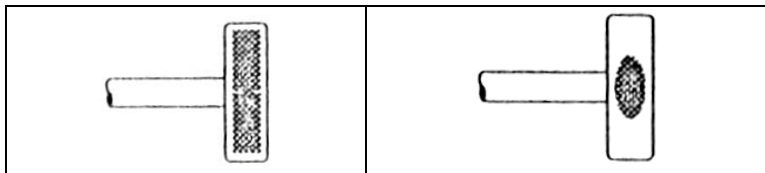
Q.1.(a) Draw the conventional representation of the following: [2]

- (i) External Screw Thread (ii) Diamond Knurling

Ans.: (i) External Screw Thread



(ii) Diamond Knurling



Q.1.(b) Draw sketch to represent taper 1:10 on a shaft of diameter 30mm and length 100mm. [2]

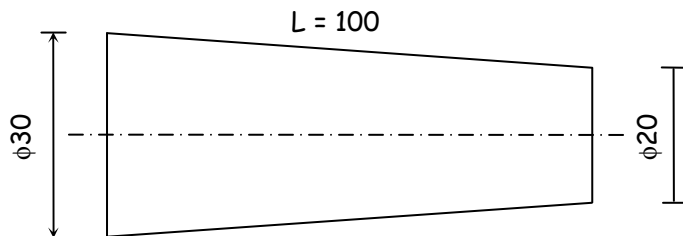
Ans.: $D = 30$

$L = 100$

$$\text{Taper} = \frac{1}{10}$$

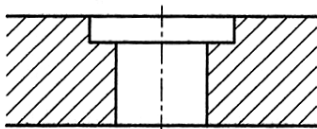
$$\text{Taper} = \frac{D - d}{L}$$

$d = 20$

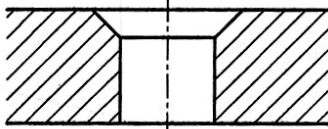


Q.1.(c) Draw a sketch of (i) Counter bore hole (ii) Counter sunk hole [2]

Ans.: (i) Counter bore hole



(ii) Counter sunk hole



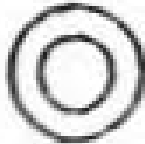
Q.1.(d) Draw the symbol for representing the geometrical tolerance in case of following: [2]

- (i) Angularity (ii) Concentricity

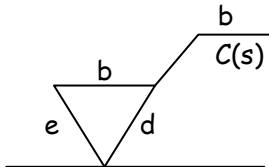
Ans.: (i) Angularity



- (ii) Concentricity



Q.1.(e) State the meaning of the symbol shown in figure. [2]



- Ans.: a = [roughness value in micron]
b = Manufacturing method
c = Sampling length
d = Direction of lay
e = Machining allowance
f = Other sampling length

Q.1.(f) State the meaning of following symbol [2]

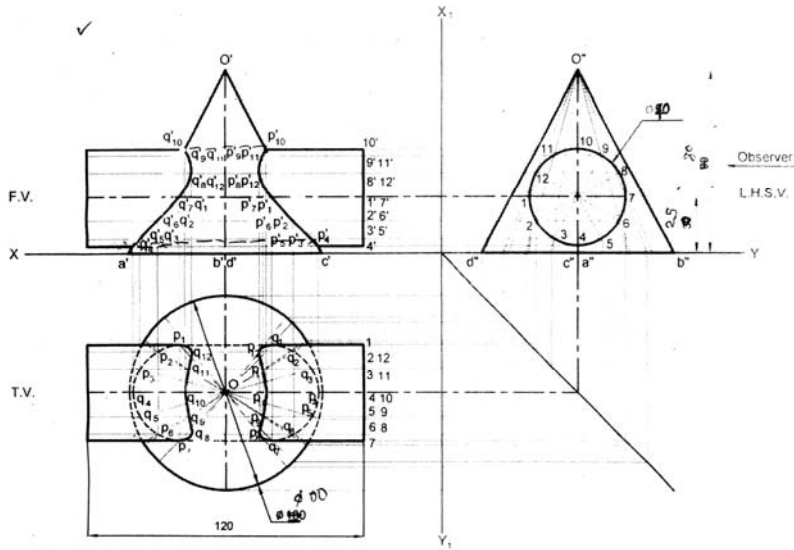
- (i) X (ii) =

Ans.: (i) X : Direction of lay is crossed in two slant direction.
(ii) = : Direction of lay is parallel to plane of projection.

Q.2 Attempt any TWO of the following : [12]

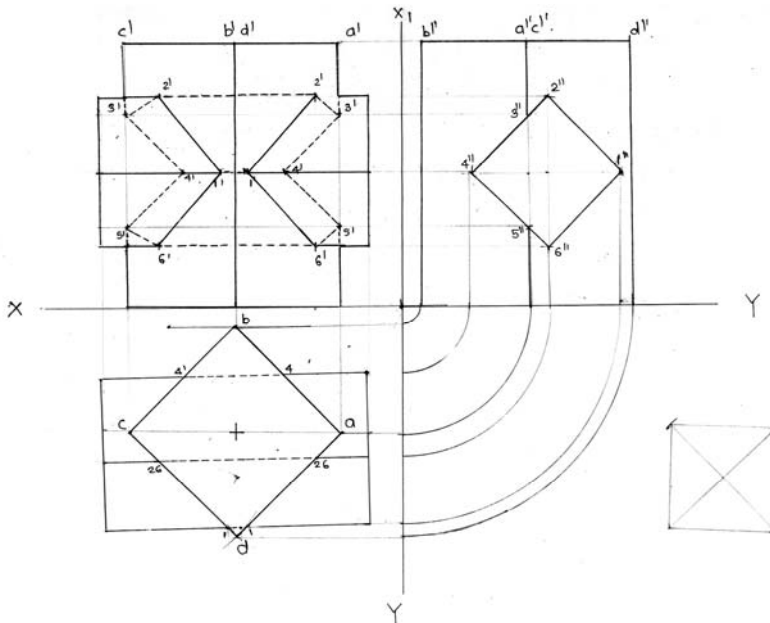
Q.2 (a) A cone with a base diameter 80 mm and axis height 75 mm is resting on H.P. It is penetrated by cylinder of diameter 40mm with its axis parallel to V.P. and intersecting axis of cone at a distance 25mm above the base of the cone. Draw the projections of the solids showing the curves of intersection. [6]

Ans. :



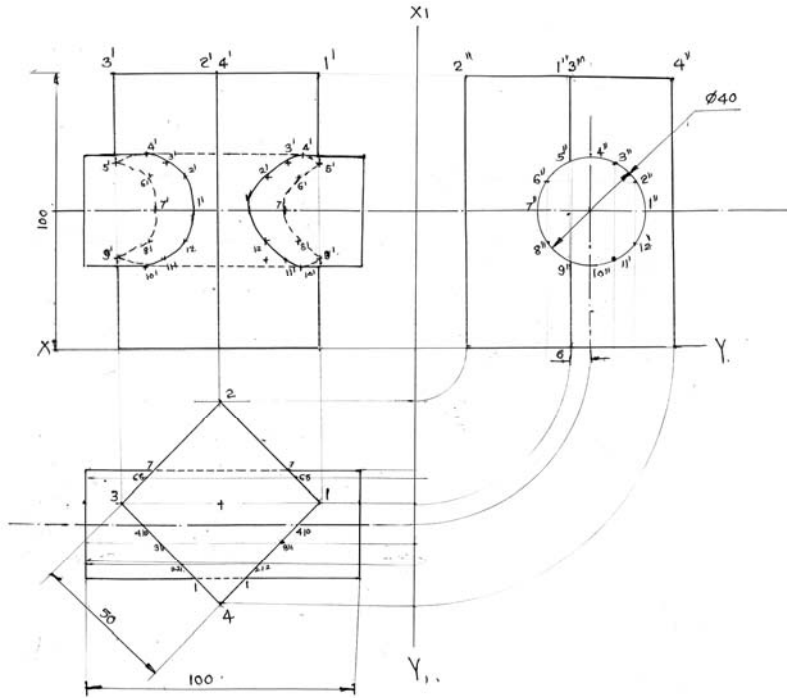
Q.2 (b) A vertical square prism base 50 mm side and height 90 mm is completely penetrated by a horizontal square prism, 35 mm side and axis 90 mm long so that their axes are 6 mm apart. The axis of the horizontal prism is parallel to V.P. while the faces of both prisms are equally inclined to the V.P. Draw the projections of the prisms showing lines of intersections. [6]

Ans. :



Q.2(c) A vertical square prism of 50 mm side of base and 100 mm long [6]
 having its faces equally inclined to V.P. is completely penetrated by
 a horizontal cylinder 40 mm diameter and 100 mm length of axis,
 which is parallel to V.P. and 6 mm away from the axis of prism.
 Draw the projections of solids showing lines of intersections.

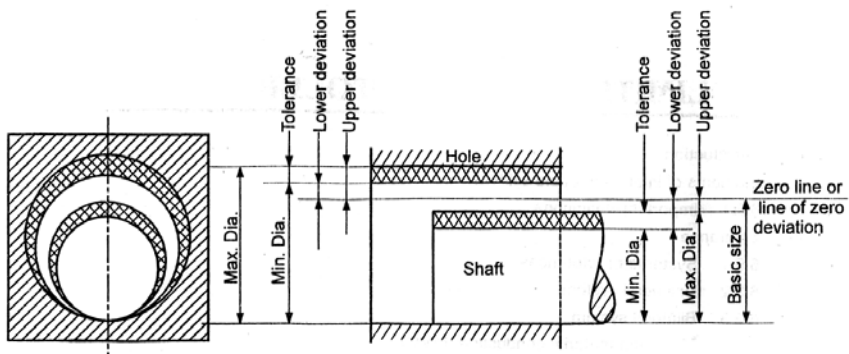
Ans. :



Q.3 (a) Attempt any ONE of the following. [4]

Q.3 (a)(i) Draw a neat sketch showing zero line, shaft, hole upper [4]
 deviation, lower deviation, Basic size, tolerances.

Ans. :



Q.3 (a)(ii) The shaft size is given as $\phi 15^{+0.034/0.023}$ the hole size is given $\phi 15^{-0.018}$. Determine the type of fit. [4]

Ans.: Maximum allowance = Maximum size of hole - minimum size shaft
 = 15.018 - 15.023
 = - 0.005 (-ve) allowance

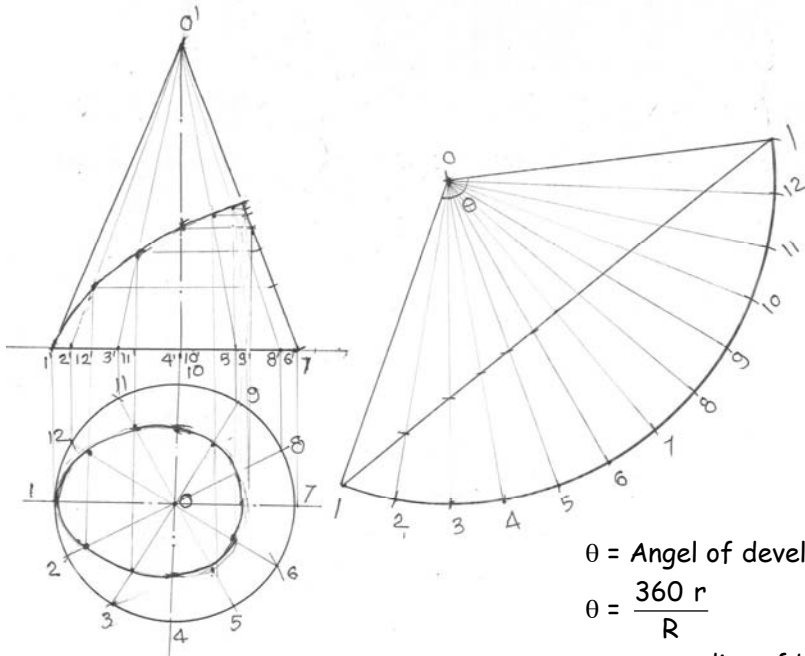
Minimum allowance = Minimum size of hole - maximum size of shaft
 = 15.000 - 15.034
 = - 0.034 (-ve allowance)

Both allowance are (- ve) give fit is. (interference fit)

Q.3.(b) Attempt any TWO of the following. [12]

Q.3(b) (i) Draw the projections of a cone resting on the ground on its base and show on them the shortest path by which a point P starting from the point on the circumference of the base and moving around the cone will return to the same point. Base of the cone 60 mm diameter and axis 75 mm long. [6]

Ans.:



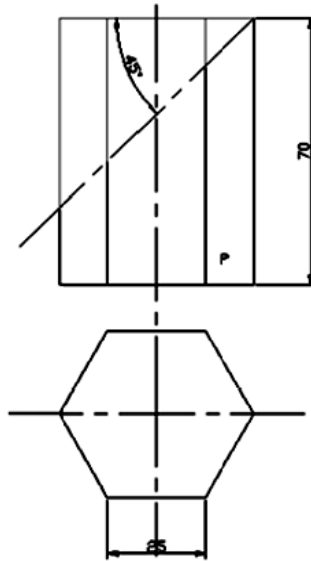
θ = Angel of development

$$\theta = \frac{360 r}{R}$$

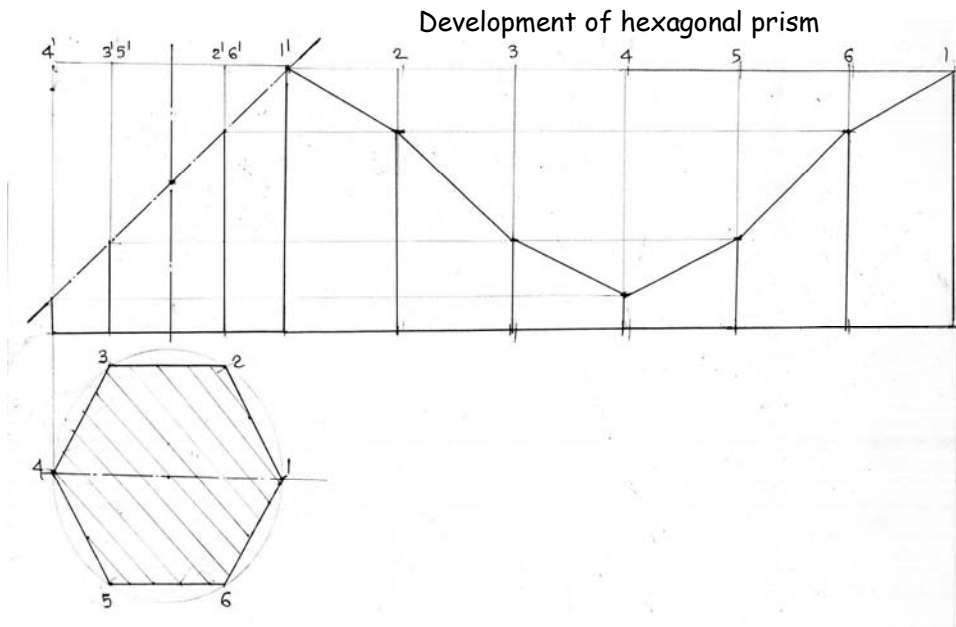
r = radius of base

R = T.L. of gen.

Q.3(b) (ii) Draw the development of Part P of the Hexagonal Prism shown [6]
in the figure.

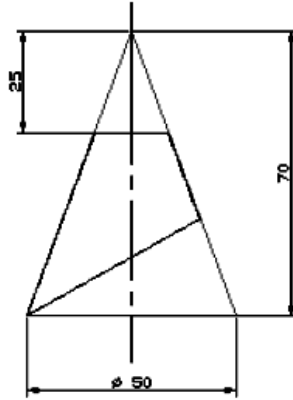


Ans. :

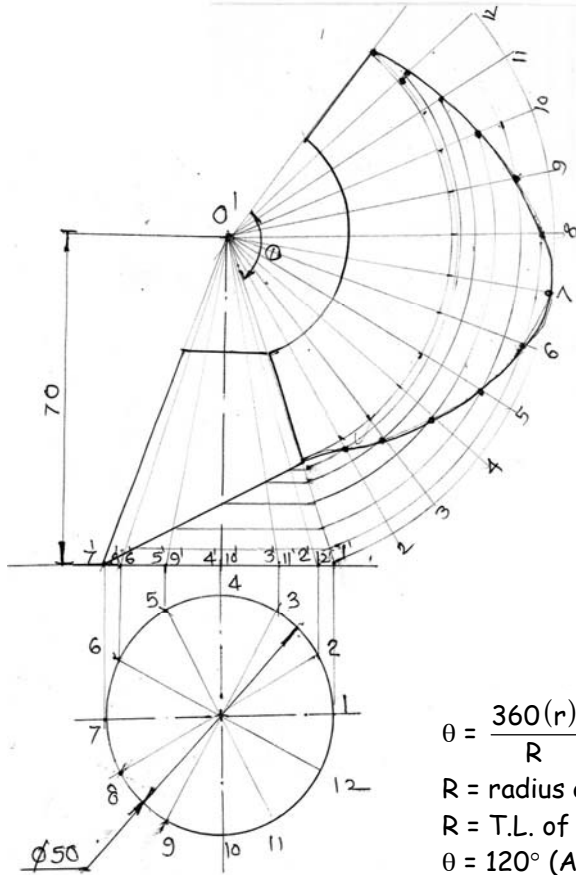


Q.3(b) (iii) Draw the development of a cone shown in Figure.

[6]



Ans. :



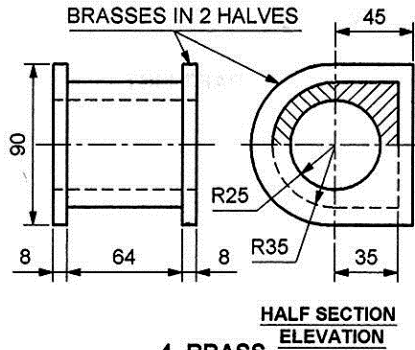
$$\theta = \frac{360(r)}{R}$$

$R = \text{radius of base} = 25$

$R = \text{T.L. of gen.} = 75$

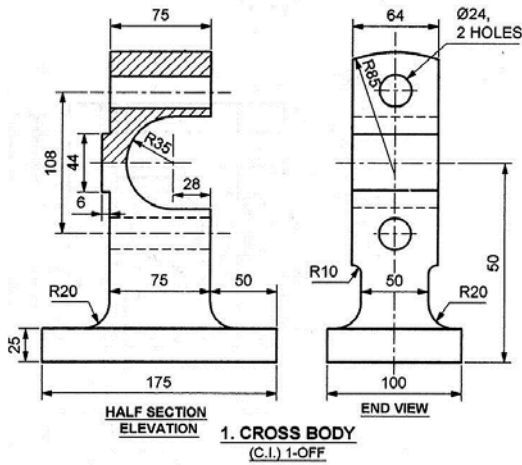
$\theta = 120^\circ$ (Angle of development)

Ans.: (i) Brass

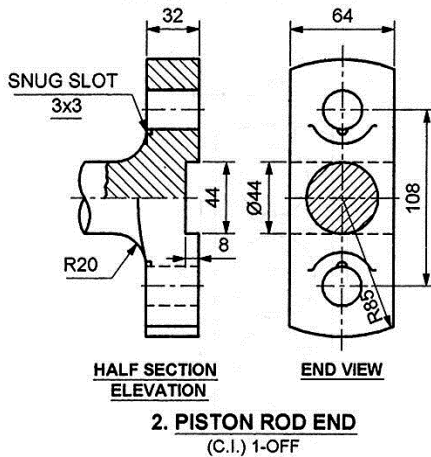


4. BRASS
(G.M.) 1-OFF

(ii) Cross head body

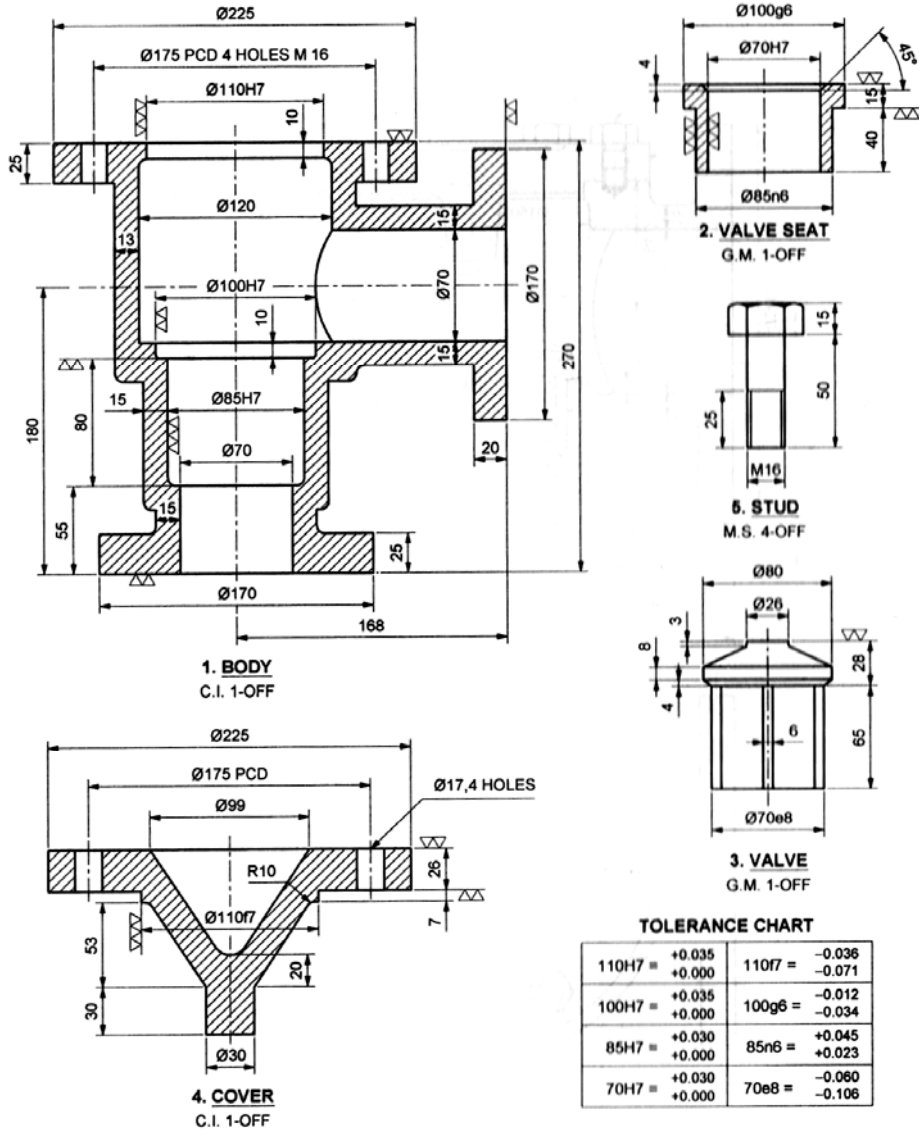


(iii) Piston rod end

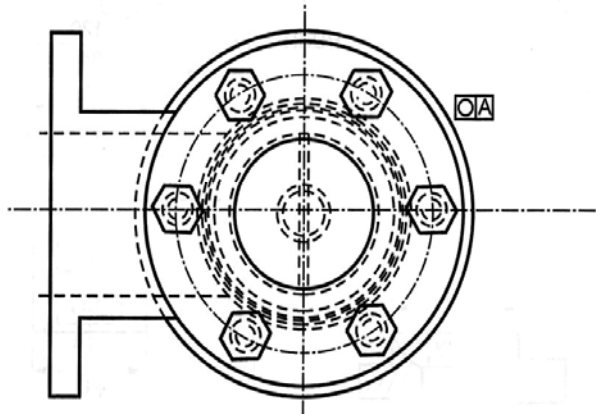
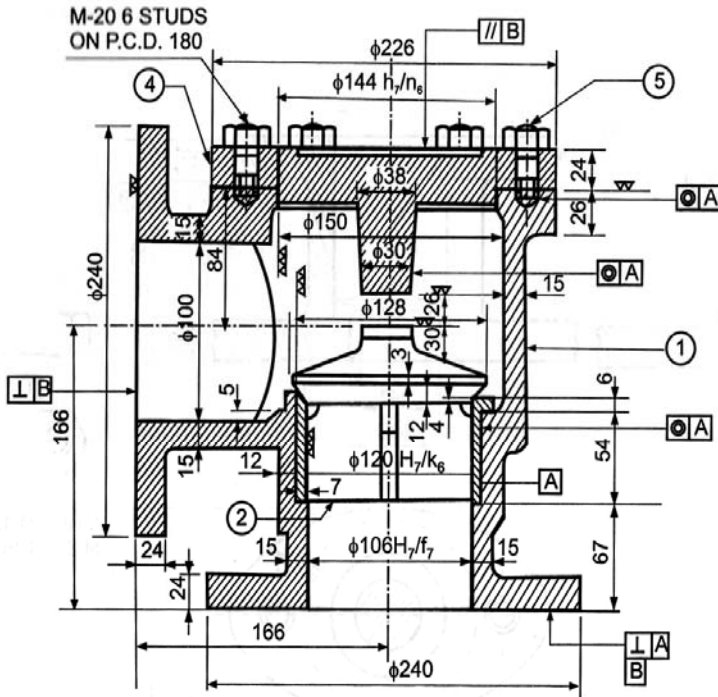


Q.5 Figure shows details of non-return valve. Draw the
 (a) Sectional front view (b) T.V.
 (c) Prepare the part list of assembly

[8]
 [4]
 [4]



Ans. :



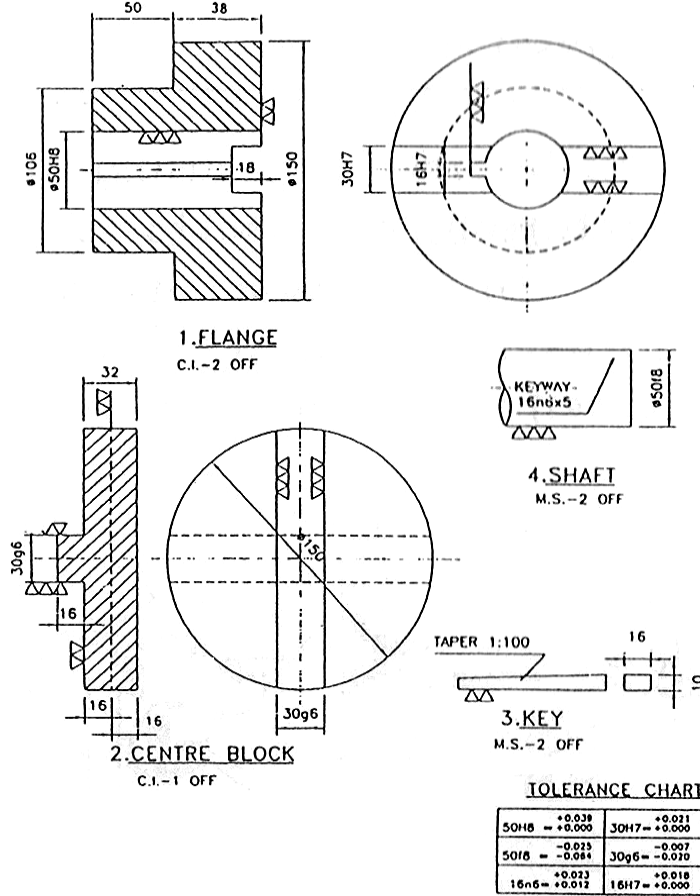
FIT CHART

$106H_7/f_7$ = CLEARANCE FIT
$100H_7/h_8$ = CLEARANCE FIT
$120H_7/k_6$ = TRANSITION FIT

PART LIST

PART NO.	PART NAME	MATERIAL	QUANTITY
1.	BODY	C.I.	1
2.	VALVE SEAT	G.M.	1
3.	VALVE	G.M.	1
4.	COVER	C.I.	1
5.	STUD	M.S.	4

6. Figure shows details of oldham's coupling Draw assembly.



Ans.: Assembly of oldham's Couplings.

