

Library

S.E. (MECH) (III) (REV)

28/12/07

Machine Drawing

Master

363 - 2nd Ed. - J

Con. 5295-07.

(REVISED COURSE)

CD-6633

(4 Hours)

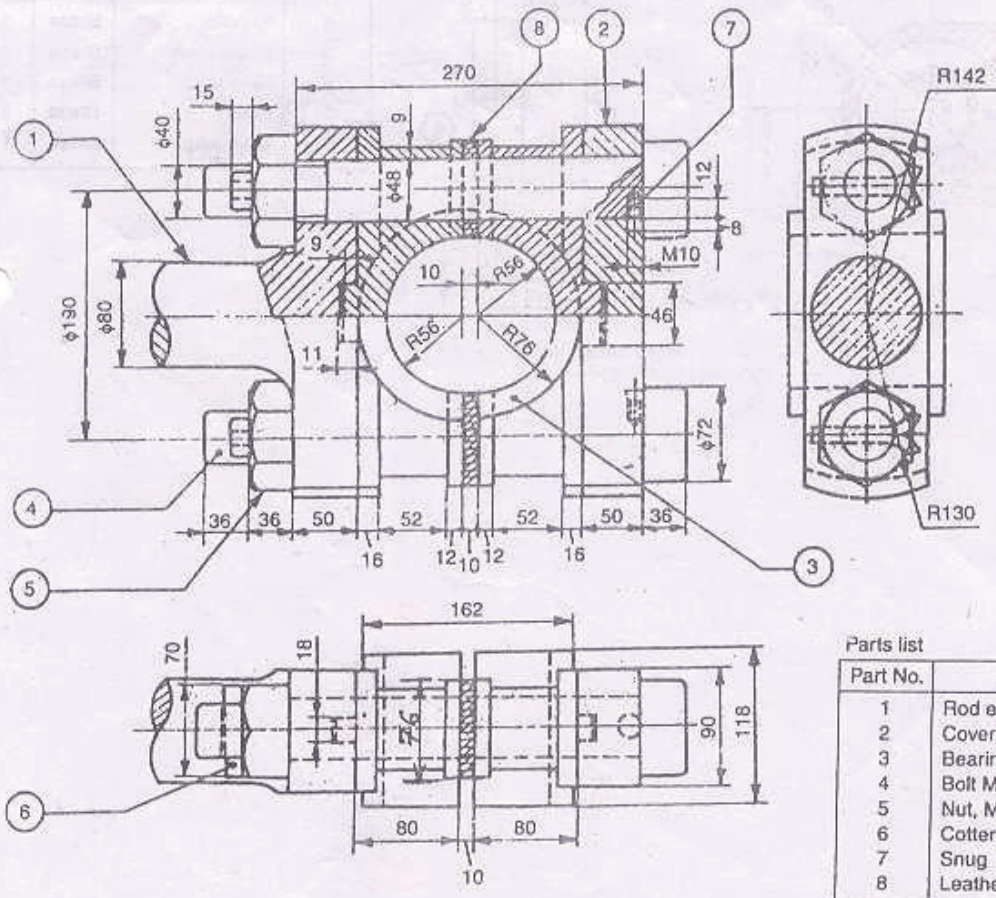
[Total Marks : 100

Dec'07

- N.B.** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions from remaining questions.
 (3) Assume suitable dimensions wherever necessary.
 (4) Use drawing sheet only.

1. (a) A vertical cone of base diameter 90 mm and 100 mm height has an axial triangular hole of 50 mm side cut through it one of the faces of the hole is parallel to VP and nearer to it. Draw front view and top view showing curves of intersection. **8**
- (b) A pentagonal prism side of base 60 mm and height 100 mm long is lying on the H.P. on one of its pentagonal base, such that an edge of base is parallel to V.P. and nearer to it. This prism is penetrated by horizontal cylinder of base diameter 70 mm and length 120 mm such that the axis of both, prism and cylinder bisect each other at right angle, while the plane containing the two axis is parallel to V.P. Draw the projections showing the curve of intersection. **12**

2. Figures shows assembly of "Marine engine connecting rod end". Draw the following details as stated :—
- (a) Cover end : (i) Sectional F.V. **4**
 (ii) T.V. **2**
- (b) Right Hand Bearing Brass : (i) Upper half sectional F.V. **6**
 (ii) T.V. **4**
- (c) Bolt : (i) F.V. **2**
 (ii) L.H.S.V. **2**



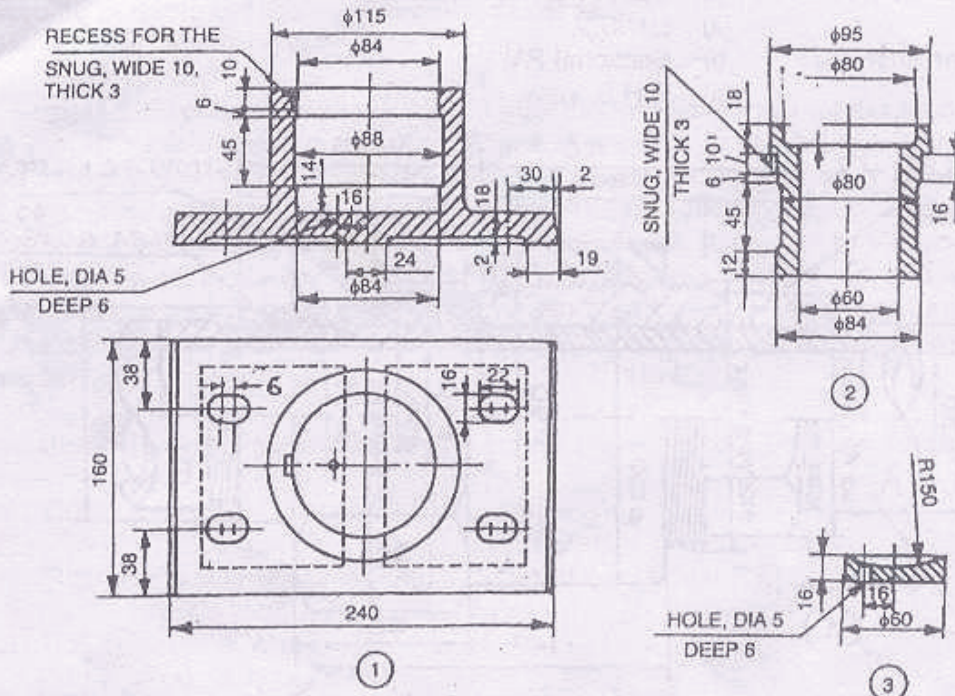
Marine engine connecting rod end

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4. Figure shows the details of "Foot step bearing". Assemble all the parts and draw the following view :-

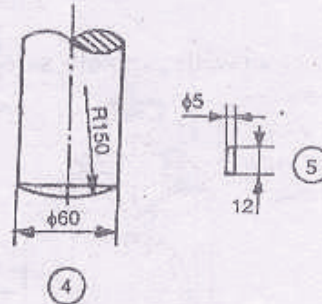
- (a) Sectional Front View
- (b) Top View.

12
8



Parts list

Sl. No.	Name	Matl.	Qty.
1	Body	Cast iron	1
2	Bush	Brass	1
3	Disc	P Bronze	1
4	Shaft	Mild steel	1
5	Pin	Mild steel	1



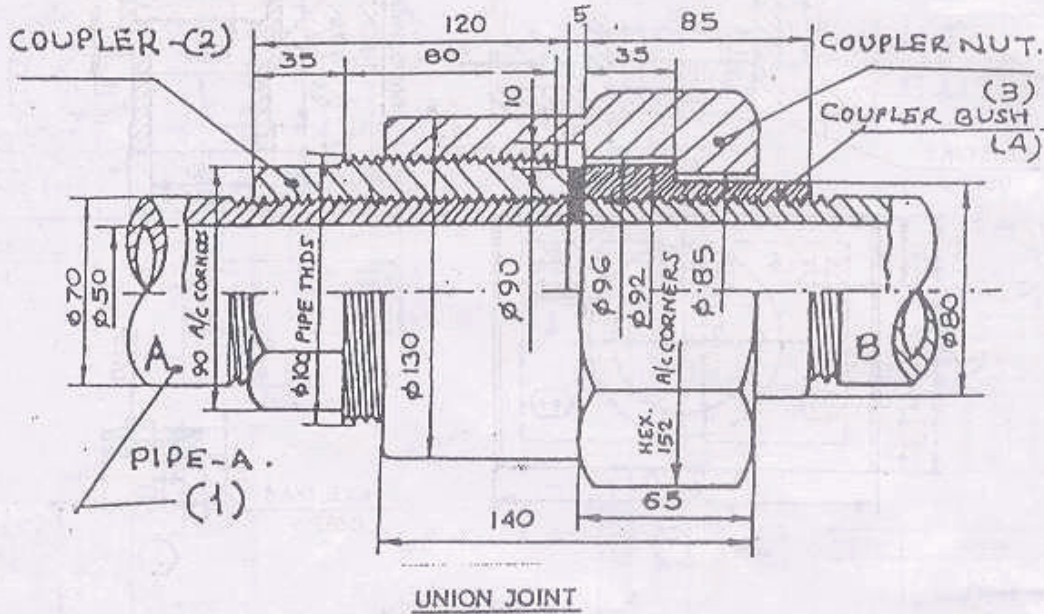
Foot-step bearing

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5. Figure shows the assembly of "Union joint" used for pipe of 50 mm bore. Draw the details as follow :-

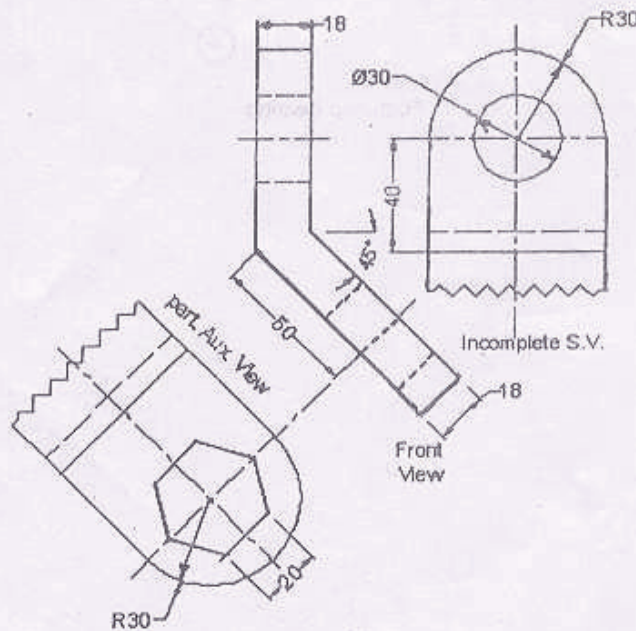
- | | | | |
|----------------------|---|-------------------------------|---|
| (a) Coupler (2) | : | (i) Upper half sectional F.V. | 4 |
| | | (ii) L.H.S.V. | 3 |
| (b) Coupler Nut (3) | : | (i) Upper Half sectional F.V. | 5 |
| | | (ii) L.H.S.V. | 3 |
| (c) Coupler Bush (4) | : | (i) Sectional F.V. | 3 |
| | | (ii) R.H.S. view. | 2 |



UNION JOINT

6. (a) Figure show front view, incomplete side view and partial auxiliary view of an object. Draw the following view :-

- | | |
|------------------|---|
| (i) Front view | 2 |
| (ii) R.H.S. view | 5 |
| (iii) Top view. | 5 |



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5

- (b) Draw two views of fast and loose pulley assembly. 6
- (c) Show conventional representation of internal and external thread. 2
7. (a) Make neat free hand sketches of the following any **two**, in two view each :— 10
- Split muff coupling
 - Old ham coupling
 - Knuckle joint.
- (b) Calculate the maximum and minimum limits for both the shaft and hole in the following :
Using the tables (Refer Tables) for tolerance and indicate the type of fit with sketches. 5
- $\phi 60 H_7/d_5$ 5
 - $\phi 45 H_8/r_6$

Table : 1 Fundamental tolerances of grades 01, 0 and 1 to 16 (values of tolerances in microns) (1 micron = 0.001 mm)

Diameter steps in mm	Tolerance Grades																	
	01	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14*	15*	16*
Under inc 3	0.3	0.5	0.8	1.2	2	3	4	6	10	14	25	40	60	100	140	250	400	600
Over 3																		
To and inc 6	0.4	0.6	1	1.5	2.5	4	5	8	12	18	30	48	75	120	180	300	480	750
Over 6																		
To and inc 10	0.4	0.6	1	1.5	2.5	4	6	9	15	22	36	58	90	150	220	360	580	900
Over 10																		
To and inc 18	0.5	0.8	1.2	2	3	5	8	11	18	27	43	70	110	180	270	430	700	1100
Over 18																		
To and inc 30	0.6	1	1.5	2.5	4	6	9	13	21	33	52	84	130	210	330	520	840	1300
Over 30																		
To and inc 50	0.6	1	1.5	2.5	4	7	11	16	25	39	62	100	160	250	390	620	1000	1600
Over 50																		
To and inc 80	0.8	1.2	2	3	5	8	13	19	30	46	74	120	190	300	460	740	1200	1900

Table : 2 Fundamental deviations for shafts of types a to zc of sizes upto 500mm

Diameter steps in mm		Upper deviation (es)								js*	Lower deviation (ei)				
over	upto	a	b	c	d	e	f	g	h		m	n	p	r	s
Fundamental deviation in microns (1 micron = 0.001 mm)															
All grades															
—	*3	-270	-140	-60	-20	-14	-6	-2	0	$\pm IT/2$	+2	+4	+6	+10	+14
3	6	-270	-140	-70	-30	-20	-10	-4	0		+4	+8	+12	+15	+19
6	10	-280	-150	-80	-40	-25	-13	-5	0		+6	+10	+15	+19	+23
10	14	-290	-150	-95	-50	-32	-16	-6	0		+7	+12	+18	+23	+28
14	18														
18	24	-300	-160	-110	-65	-40	-20	-7	0		+8	+15	+22	+28	+35
24	30														
30	40	-310	-170	-120	-80	-50	-25	-9	0		+9	+17	+26	+34	+43
40	50	-320	-180	-130											
50	65	-340	-190	-140	-100	-60	-30	-10	0		+11	+20	+32	+41	+53
65	80	-360	-200	-150									+43	+59	

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Table 3 Fundamental deviations for holes of types A to ZC for sizes upto 500 mm

A to T

Fundamental deviation in microns											(1 micron = 0.001 mm)									
Diameter steps in mm		Lower deviations (EI)									Upper deviations (ES)									
		A*	*B	C	D	E	F	G	H	Js+	J			K		P	R	S	T	
Over	Upto	All grades									6	7	8	≤ 8	> 8	* ≤ 7				
-	3*	+ 270	+ 140	+ 60	+ 20	+ 14	+ 6	+ 2	0	± IT/2	+ 2	+ 4	+ 6	0	0	- 6	- 10	- 14	-	
3	6	+ 270	+ 140	+ 70	+ 30	+ 20	+ 10	+ 4	0		+ 5	+ 6	+ 10	- 1 + Δ	-	- 12	- 16	- 19	-	
6	10	+ 280	+ 150	+ 80	+ 40	+ 25	+ 13	+ 5	0		+ 5	+ 8	+ 12	- 1 + Δ	-	- 15	- 19	- 23	-	
10	14	+ 290	+ 150	+ 95	+ 50	+ 32	+ 16	+ 6	0		+ 6	+ 10	+ 15	- 1 + Δ	-	- 18	- 23	- 28	-	
14	18										+ 8	+ 12	+ 20	- 2 + Δ	-	- 22	- 28	- 35	-	
18	24	+ 300	+ 160	+ 110	+ 65	+ 40	+ 20	+ 7	0											- 41
24	30										+ 10	+ 14	+ 24	- 2 + Δ	-	- 26	- 34	- 43	- 48	
30	40	+ 310	+ 170	+ 120	+ 80	+ 50	+ 25	+ 9	0 ₄											- 54
40	50	+ 320	+ 180	+ 130							+ 15	+ 18	+ 28	- 2 + Δ	-	- 32	- 41	- 53	- 65	
50	65	+ 340	+ 190	+ 140	+ 100	+ 60	+ 30	+ 10	0											- 65
65	80	+ 360	+ 200	+ 150															- 75	

F deviation as for grades > T + Δ