17305

15162

4 Hours / 100 Marks   Seat No.

Instructions :   (1) *All questions are **compulsory**.*

(2) *Illustrate your answers with neat sketches **wherever** necessary.*

(3) *Figures to the **right** indicate **full** marks.*

(4) *Assume suitable data, if **necessary**.*

(5) *Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.*

Marks

1. A) Draw conventional representation for **any six** of the following :   **12**

    a) Rubber

    b) Rectangular section (wood)

    c) Removed section

    d) Counter bore

    e) Check valve

    f) Sunk key

    g) Socket pipe joint

    h) Helical compression spring of wire of rectangular cross-section.

  B) Attempt **any two** of the following :   **8**

    a) The hole size is $\phi\,20^{+0.018}_{-0.000}$ and shaft size is $\phi\,20^{+0.023}_{+0.012}$. Determine the type of fit between hole and shaft.

b) State the meaning of symbol shown in Fig.1.

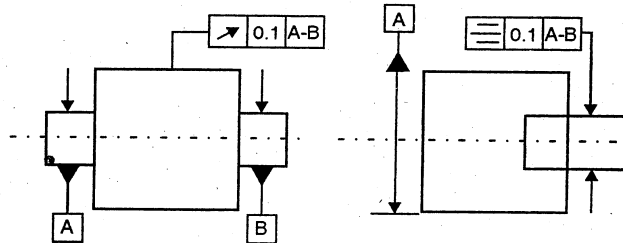Fig. 1.

c) Draw suitable machining symbol and indicate following machining parameters on it.

Machining method is milling, surface roughness value is 12 µm , machining allowance is 5 and direction of lay is circular.

2. A) Fig. 2 shows front view, Auxiliary top view and incomplete side view. Using first angle method of projection, complete side view. **12**
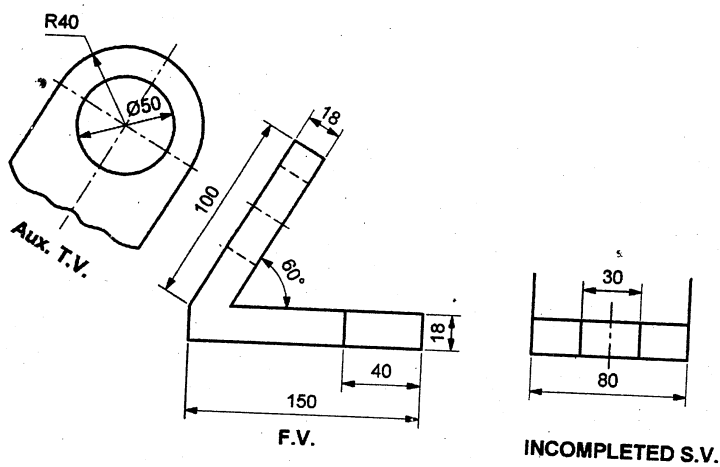

Fig. 2.

B) Attempt **any two** of the following : **8**

a) Draw the following symbols used in geometrical tolerancing.

   i) Position

   ii) Angularity

   iii) Profile of any line

   iv) Roundness.

b) Two rectangular plates are to be welded with each other along the length. The thickness and length of both plates is 12 mm and 60 mm respectively. The plates are to be 'V' butt welded with convex counter. Prepare welding drawing.

c) Draw the symbols for the following :

   i) Single – bevel butt weld

   ii) Spot weld

   iii) Convex double V – butt weld

   iv) Single J. butt weld.

3. Attempt **any two** of the following : **20**

a) A vertical square prism, base 60 mm side is completely penetrated by a horizontal square prism, base 40 mm side so that their axes are 25 mm apart. The axis of the horizontal prism is parallel to V. P., while faces of both prisms are equally inclined to V. P. Draw the projections showing lines of intersection. Assume suitable length of prisms.

b) A vertical cone, base 80 mm diameter and axis 100 mm long resting on H. P. is penetrated by a horizontal cylinder of 50 mm diameter. The axis of cylinder is 30 mm above the base of cone and 10 mm infront of the axis of cone. Draw the projections showing curves of intersection. Assume suitable length of penetrating cylinder.

c) A vertical cylinder of 80 mm diameter and 100 mm length is penetrated by another cylinder of same size. The axis of penetrating cylinder is parallel to H. P. and V. P. and 10 mm away from the axis of vertical cylinder. Draw the projections showing curves of intersection.

4. Attempt **any one** of the following : **20**

   a) Fig. 3 shows the details of machine vice. Draw sectional F. V. and T. V. of an assembly. Also prepare bill of material.

Ø12

5

15

13

CRS 152

SECTION B-B

3   46

R8

3

74

Ø38

5

13

41

28

19

B

B

Ø27

Ø12

6

20

32

Ø19

95

44

22

A

A

2. SLIDING JAW
M.S. - 1 OFF

R12

R25

60

Ø19 H7

Ø12 H7

96

38 54

82

19

12

R16

44   44   30

60

1. BODY
C.I. - 1 OFF

1.5

22

Ø10

8. WASHER
M.S. - 1 OFF

M12   CRS 19

12

Ø25

5. CIRCULAR NUT
M.S. - 1 OFF

M10

5

7. LOCK NUT
M.S. - 1 OFF

M10

10

6. HEX NUT
M.S. - 1 OFF

M12

19

19

Ø19

26

23

50

10

38

54

4. CLAMPING BOLT
M.S. - 1 OFF

32

48

170

20   20

Ø38

3   14

Ø19e8

SQ.20x2 R.H.

12e8

3. SCREW
M.S. - 1 OFF

DETAILS OF MACHINE VICE

TOLERANCE CHART

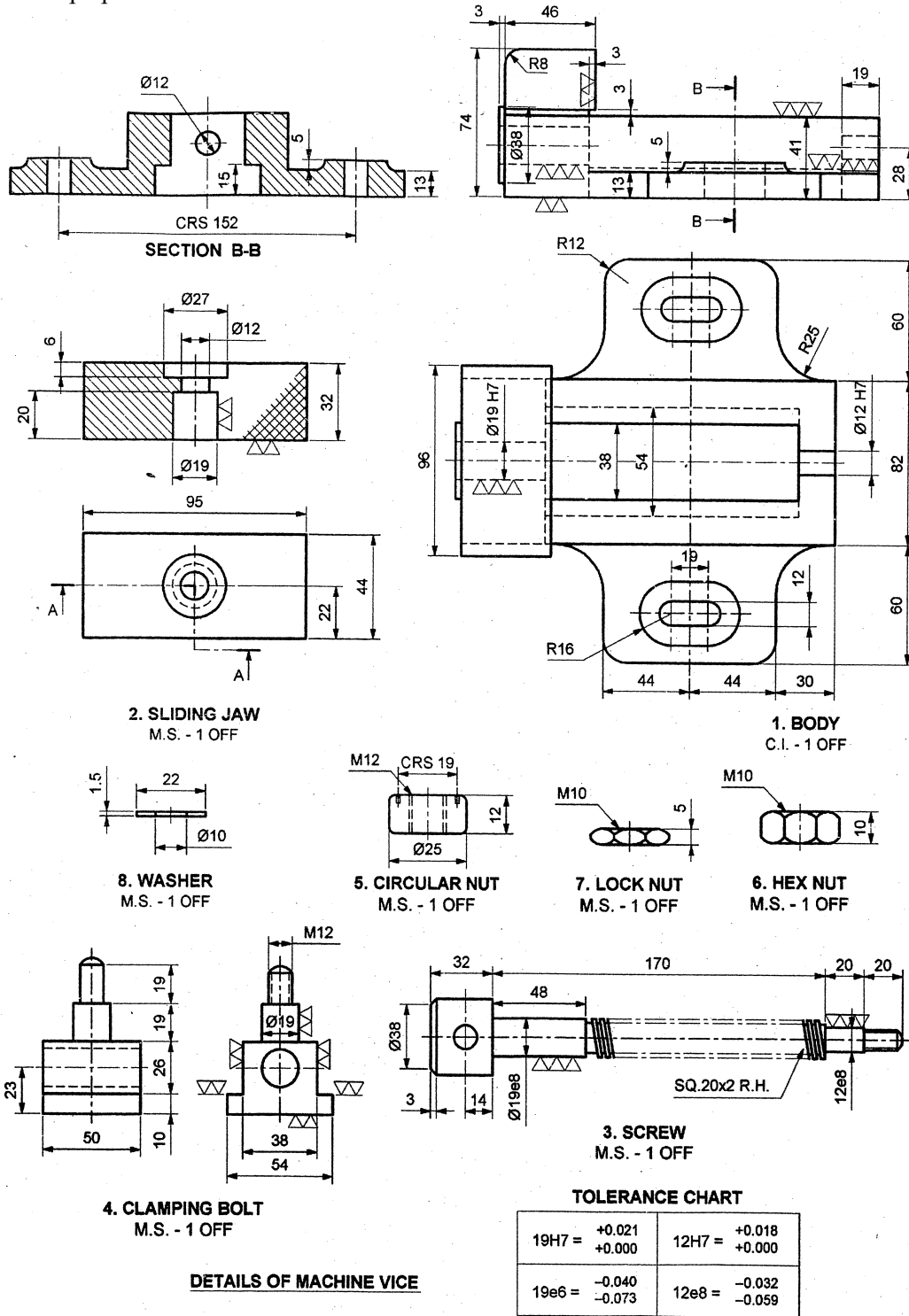| 19H7 =	+0.021 +0.000	12H7 =	+0.018 +0.000
19e6 =	−0.040 −0.073	12e8 =	−0.032 −0.059

Fig. 3

b) Fig. 4 shows the details of universal coupling. Draw sectional F. V. and T. V. of an assembly prepare bill of material.
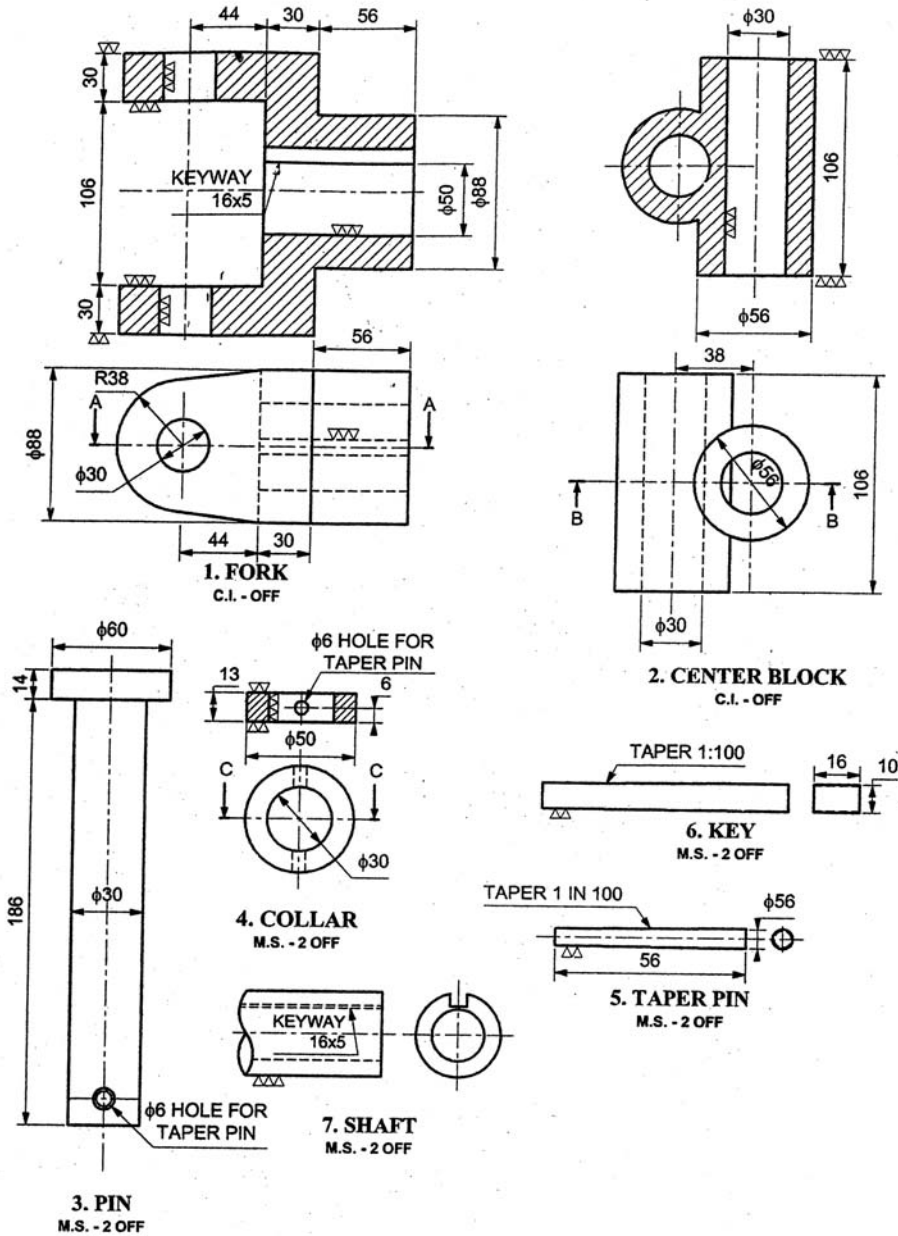

Fig. 4

Marks

5. Attempt **any one** of the following :   **20**

    a)   Fig. 5 shows the assembly of piston and connecting rod of I. C. engine.
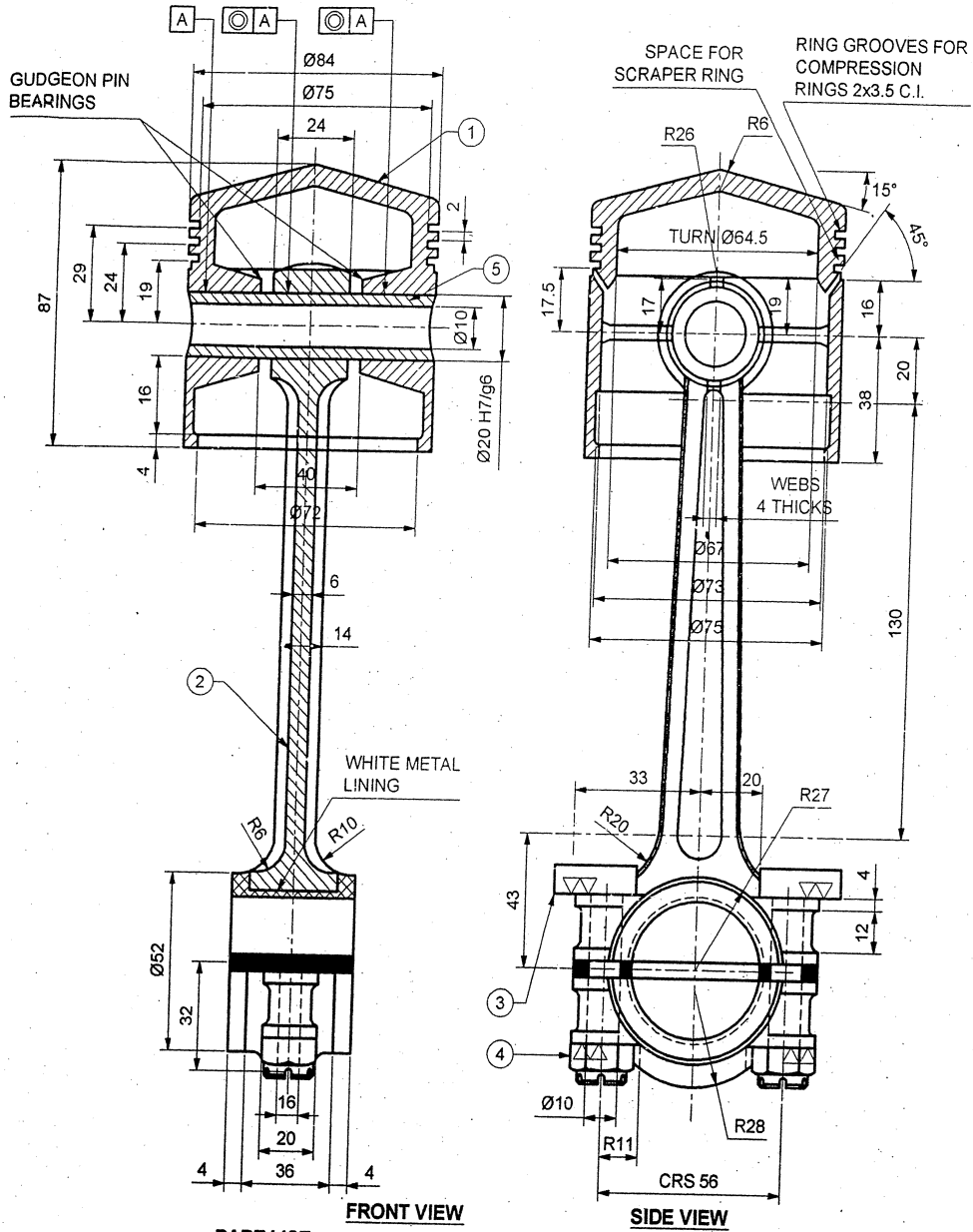   Draw the following views :

      i) Piston – Sectional F. V. and side view   **10**

     ii) Connecting rod – Sectional F. V. and side view.   **10**

FRONT VIEW   **SIDE VIEW**

PART LIST

PART NO.	PART NAME	MATL.	QTY.
1	PISTON	ALLOY ALLOY	1
2	CONNECTING ROD	ALLOY STEEL	1
3	BIG-END BOLT	M.S.	2
4	CASTLE NUT	M.S.	2
5	GUDGEON PIN	HARDENED STEEL	1

FIT CHART

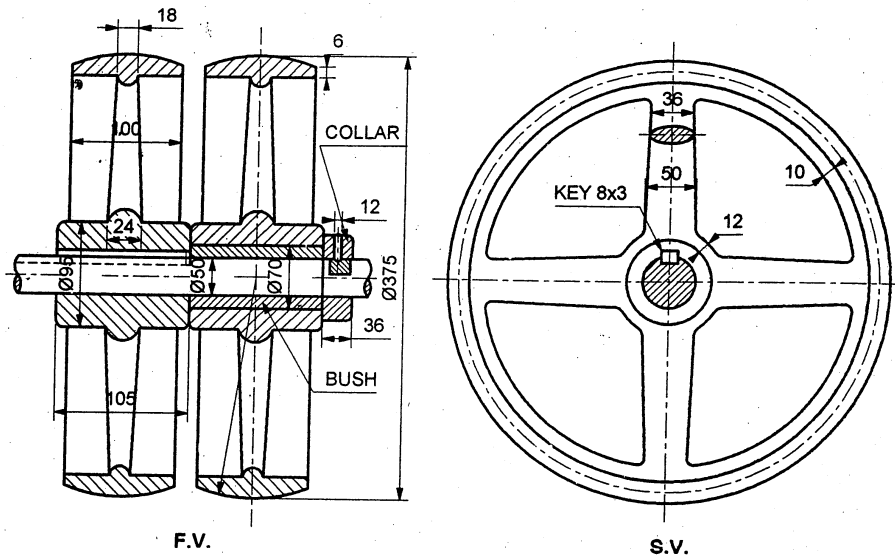| 20H7/g6	CLEARANCE FIT

Fig. 5

b) Fig. 6 shows an assembly of fast and loose pulleys.

Fig. 6.

Draw the following orthographic views of the parts :

i) Loose pulley – Sectional F. V. and side view. **10**

ii) Shaft – F. V. and end view. **4**

iii) Bush – F. V. and side view. **2**

iv) Collar – Sectional F. V. and side view. **4**

Also show appropriate dimensional tolerance, tolerance grade etc. on part if required.

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