Code: A-02   Subject: ENGINEERING GRAPH

Time: 4 Hours   Max. Marks: 1
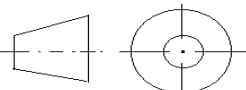
| June 2003 |

NOTE:

1. **This question paper has eight questions. These are grouped into 4 sections i.e. A,B,C and D.**
2. **Sections A and B are compulsory and contain one question each.**
3. **Questions of section A are to be answered on the question paper it self. Detach first sheet (Pages 1 & 2) and attach it to the main drawing sheet.**
4. **All other questions of sections B,C and D are to be answered on the drawing sheet.**
5. **Retain all construction lines. All lines should be sharp and clearly visible. Construction lines, normal lines and section lines should be of distinct thickness / intensity.**
6. **All dimensions are in mm. Any missing dimension/information may be suitably assumed if necessary and stated.**

| **Roll No………………………..** |

SECTION A (Compulsory) – Marks – 16

Note : - Answer this on the question paper itself and annex with the drawing sheet.

Q.1.A.Fill in the blanks with suitable word / words: **(2 x 8 = 16)**

(i) The [symbol] symbol shows the projection in _____.

   (A) first angle.   **(B)** second angle.
   (C) third angle.   **(D)** fourth angle.

(ii) To get the idea of shape if a part one should draw it in _____ projection.

   (A) orthographic.   **(B)** isometric.
   (C) perspective.   **(D)** None of these.

(iii)Drawings of big parts of an equipment like car can be drawn on drawing sheet (A_0) by using _____ scale.

   (A) enlarged   **(B)** reduction
   (C) full scale   **(D)** None of these.

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|
| **Signature of Suptd./Invigilator** |

1

(iv) Minimum clearance between shaft ϕ 20 h_7 & hub ϕ 20 H_7 is _____.

    (A) -20 micron.   **(B)** +20 micron.
    (C) zero micron.   **(D)** None of these.

(v) Two main types of dimensioning are 1) _____ 2) Location.

    (A) longitudinal   **(B)** cross
    (C) size   **(D)** overall

(vi) _____ is a curve traced by a point in a straight line which rolls without slippage along a circle or polygon.

    (A) Ellipse   **(B)** Parabola
    (C) Hyperbola   **(D)** In volute

(vii) A cone is cut by a plane, perpendicular to base and passing through vertex, the section will be _____.

    (A) triangle.   **(B)** circle.
    (C) ellipse.   **(D)** parabola.

(viii) When a line is parallel to H.P. & inclined to V.P. it has _____ trace.

    (A) horizontal   **(B)** vertical
    (C) both **(A)** & **(B)**   **(D)** no

SECTION B (Compulsory) – Marks – 36

Q.2 Figure 1 (on Page 4) shows a Bracket. Draw with dimensions.
  (i)   Front view in direction of 'A'.   **(10)**
  (ii)   Sectional side view through X – X .   **(16)**
  (iii)   Top view.   **(10)**

SECTION C (Marks – 2 x 16 = 32)
Attempt any two questions from this section.

Q.3 A line AB 50 mm long has its end A in both H.P. and V.P. The line is inclined at 40^0 to V.P. and H.P. Draw its projections.

Q.4 A tetrahedron of 60 mm long edges is resting on the ground on one of its faces with an edge of that face parallel to V.P. Draw its projections and measure the distance of its apex from the ground.

Q.5 A right circular cone has its base in H.P. and is cut by a plane perpendicular to V.P. and 45^0 to H.P. The section plane passes through the mid-height of the cone. Draw its elevation and sectional plan. Take base dia 50 mm & height 60 mm.

Q.6 A square prism of 40 mm side of base, height 90 mm rests with its base on H.P. such that one of its rectangular faces in inclined at 30^0 to V.P. A section plane perpendicular to V.P. is inclined at 60^0 to H.P. passes through a point on the axis at a height of 30 mm. Draw Front, sectional and top views.

SECTION D (Marks – 1 x 16 = 16)
Attempt any one question from this section.

Q.7 Draw an involute of a square of side 25 mm.

Q.8 A circular plate 50 mm dia and of negligible thickness is inclined at 30^0 to the ground. The diameter through the point on which the plate rests on ground makes an angle of 60^0 to V.P. in top view. Draw the projections.

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Code: A-02   Subject: ENGINEERING GRAP...
Time: 4 Hours   Max. Marks: 1...

December 2003

NOTE:
1. **This question paper has eight questions. These are grouped into 4 sections i.e. A,B,C and D.**
2. **Sections A and B are compulsory and contain one question each.**
3. **Question 1 of section A is to be answered on the question paper it self. Detach first sheet (Pages 1 & 2) and attach it to the main drawing sheet.**
4. **All other questions of sections B, C and D are to be answered on the drawing sheet.**
5. **Retain all construction lines. All lines should be sharp and clearly visible. Construction lines, normal lines and section lines should be of distinct thickness/ intensity.**
6. **All dimensions are in mm. Any missing dimension/information may be suitably assumed if necessary and stated.**

Roll No………………………..

SECTION A (Compulsory) – Marks – 18

Note : - Answer this on question paper itself and annex with the drawing sheet.

Q1. Choose the correct or best alternative in the following: (2 x 9 = 18)

QUESTIONS   **ANSWER HERE**

a   The locus of a point equidistant from the sides of a given angle
    is the _____ of that angle.   _____

b   The double ordinate through the focus of a conic is called the

    _____.   _____

c   _____ are the points in which the line, produced if necessary,
    intersects the H.P. and V.P.   _____

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d   A regular dodecahedron is a solid bounded by twelve equal
    faces, each is a regular _____.   _____

e   When a solid is cut by an auxiliary inclined plane, for the
    true shape of section, on _____ projection is necessary
    on a plane parallel to section plane.   _____

f   When the development of a cone is a semi – circle of 120 mm
    diameter, then dimension of the base of cone _____
    radius and that of slant height _____.   _____

g   If d is the diameter of rivet in mm and t the thickness of plate
    also in mm, then in practice empirical rule for calculating the
    diameter of rivet is _____.   _____

h   The feather keys are _____ keys.   _____

i   When the shafts are slightly misaligned then the most suitable
    coupling to connect them is _____.   _____

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SECTION B (Compulsory) – Marks – 40

Q.2   Figure 1 on page no. 4 shows the isometric view of a CASTING.
        Draw to scale full size the following views in First Angle Projection :-
        (A) Sectional front view at R – S looking in the direction of arrow –
        X.   **(16)**
        (B) Sectional side view at P – Q looking in the direction of arrow –
        Y.   **(16)**
        N.B.   (i)   Give dimensions.   **(5)**
                (ii) Print title (CASTING), scale and projection symbol.   **(3)**

SECTION C

- **Attempt any TWO question from this section. Each question carries 14 marks.**
- **Do not rub off construction lines.**
- **Provide adequate labeling and dimensioning in a neat clear manner.**

Q.3   A line AB, 80 mm in length, is inclined at $60°$ to the H.P. and $30°$ to
        the V.P. Its end A is in the H.P. and the end B is in the V.P. Draw
        (i)   its projections and
        (ii)   find out its H.T. and V.T.   **(14)**

Q.4   A pentagonal prism of base side 30 mm and axial height 60 mm has
        one of its rectangular faces in the H.P. with the axis inclined at $45°$ to
        the V.P. Draw the projections of the solid.   **(14)**

Q.5   A square pyramid base 40 mm side, axis 66 mm long has its base in
        the H.P. with all the edges of base equally inclined to the V.P. It is
        cut by a plane perpendicular to the V.P. and inclined at $45°$ to the
        H.P. in the middle of the axis. Draw front view, sectional top view,
        true shape of section and also the development of the remaining
        solid.   **(14)**

Q.6   Figure 2 on page 4 shows the orthographic views of an object. Draw
        these views and also its isometric view with actual dimensions,
        looking in the direction of arrow 'P'.   **(14)**

_____

SECTION D
Answer any ONE Question from this section. Each question carries 14 marks.

Q.7   A straight line AB of 60 mm length rotates clockwise about its end A for one complete revolution and during this period a point P moves along the straight line from A to B and return back to point A. If rotary motion of the straight line about point A and linear motion of the point P along AB are both uniform, draw the path of the point P.**(14)**

Q.8   Keeping the axes of rods horizontal draw sectional front view and side view of a socket and spigot cotter joint for 25 mm diameter rods. Give proportionate dimensions.   **(14)**

Code: A-02   Subject: ENGINEERING GRAPH
Time: 4 Hours   Max. Marks:

JUNE 2004

NOTE:
1. **This question paper has eight questions. These are grouped into 4 sections i.e. A,B,C and D.**
2. **Sections A and B are compulsory and contain one question each.**
3. **Question 1 of section A is to be answered on the question paper it self. Detach first sheet (Pages 1 & 2) and attach it to the main drawing sheet.**
4. **All other questions of sections B,C and D are to be answered on the drawing sheet.**
5. **Retain all construction lines. All lines should be sharp and clearly visible. Construction lines, normal lines and section lines should be of distinct thickness/ intensity.**
6. **All dimensions are in mm. Any missing dimension/information may be suitably assumed if necessary and stated.**

Roll No………………………..

SECTION A (Compulsory) – Marks – 18

Note : - Answer this on question paper itself and annex with the drawing sheet.

Q1. Choose the correct or best alternative in the following: (2 x 9 = 18)
           QUESTIONS   **ANSWER HERE**

a   A triangular pyramid is cut by a section plane parallel to its base, the sectioned surface will be
    (A) Square
    (B) Triangle
    (C) Parallelogram
    (D) Rectangle   _____

b   Second angle projection is not used because
    (A) plan is above XY line
    (B) both the views overlap each other
    (C) elevation is above XY
    (D) views are small in size   _____

    cIf a square plane is inclined to H.P. and perpendicular to V.P., its front view is a
    (A) square
    (B) rectangle
    (C) line
    (D) rhombus   _____

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d   Ample margin is provided in a riveted joint beyond the axis of
     hold upto edge of plate so that the joint
     (A) is leak proof
     (B) facilitates handling
     (C) looks good
     (D) is safe   _____

e   Taper is provided on one side of a cotter used for a cotter joint
      because

      (A) it consumes less material
      (B) it helps to maintain the joint tight
      (C) it is easy to manufacture
      (D) its cost is low   _____

fWhat   type   of   coupling   is   required   when   the   axes   of   two
     shafts are slightly inclined to each other?

     (A) Rigid flanged coupling
     (B) Muff coupling
     (C) Split muff coupling
     (D) Flexible coupling   _____

g   A $M24 \times 3$ represents a bolt having

     (A) nominal bolt diameter of 24 mm and threads of pitch 3 mm.
     (B) core diameter of 24 mm and a depth of 3 mm of threads.
     (C) outside diameter of bolt 24 mm and 3 threads per cm.
     (D) mean diameter of bolt 24 mm and threads of pitch 3 mm._____

h   A hexagonal bolt and nut is usually preferred to other types
     of bolts and nuts because it can be tightened in a space which
     allows the spanner to be moved by

     (A) $30°$ rotation   **(B)** $45°$ rotation

     (C) $60°$ rotation   **(D)** $90°$ rotation   _____

i   V – thread is commonly used for screw fastenings because it is

     (A) very efficient.   **(B)** less costly.
     (C) easier to tighten.   **(D)** easier to loosen.   _____

9

SECTION B (Compulsory) – Marks – 40

Q.2   Figure 1 on page no. 4 shows the details of a socket and spigot cotter
joint. Draw to full size, the following views of the assembly
  (A) Front elevation with top half in section
  (B) Full sectional top view
  (C) Side view.
   Give all the dimensions. Print the title and draw the projection
symbol.   **(15+10+10+3+1+1)**

SECTION C
- **Attempt any TWO question from this section. Each question
carries 14 marks.**
- **Do not rub off construction lines.**
- **Provide adequate labeling and dimensioning in a neat and clear
manner.**

Q.3   A line CD is 85 mm long and has its end C 15 mm above H.P. and 30
mm in front of V.P. Its plan is 75 mm long and elevation is 60 mm
long. Draw the projections of the line and determine its inclination
with H.P. and V.P.   **(14)**

Q.4   A cone has a base of 50 mm diameter and its axis is 70 mm long. It
is resting on its base on H.P. It is cut by two section planes

(i)   One section plane inclined at $45°$ to H.P. and perpendicular to
V.P.
(ii)   Another section plane parallel to H.P. and perpendicular to
V.P.

Both the section planes passes through the mid point of the axis of
cone. Draw the sectional plan, elevation and true shape of the
sections adjoining each other.   **(14)**

Q.5   Draw an involute of circle of diameter 25mm. Draw the tangent and
normal at a point on the involute 65 mm distance from the center of
the circle.   **(14)**

Q.6   A hexagonal prism of base side 30 mm and axis 60 mm long is

resting in H.P. on one of its base side with the axis inclined at $40°$ to

H.P. and $30°$ to V.P. Draw its projections.   **(14)**

_____
SECTION D
**Answer any ONE Question from this section. Each question carries 14
marks.**

Q.7   Draw a schematic sketch showing zero line, lower and upper
deviation for shaft, shaft tolerance, lower and upper deviation for
hole and hole tolerance.   **(14)**

Q.8 Draw two views of a hexagonal headed bolt with a washer and square nut having a nominal diameter of 30 mm and shank length of 100 mm.

(14)

SOCKET AND SPIGOT COTTER JOINT
FOR ROUND RODS (DETAILS)
FIG-1

All Dimensions are in mm.
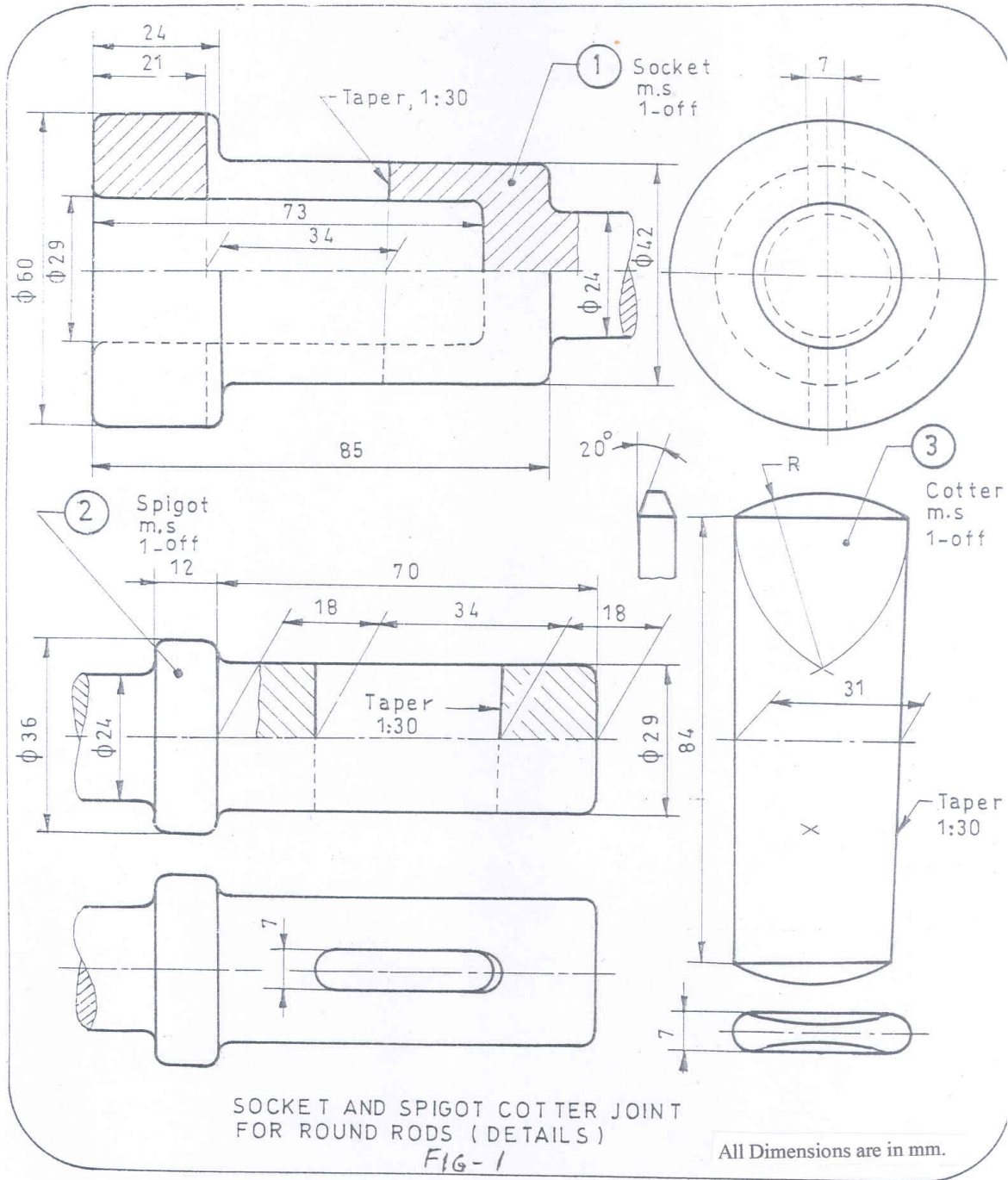
Code: A-02   Subject: ENGINEERING GRAPHICS

Time: 4 Hours   Max. Marks:

> December 2004

NOTE:

(a) **This question paper contains SEVEN questions. These are arranged in three Sections A, B and C.**

(b) **Sections A and B are compulsory and contain one question each. Answer any THREE questions from Section C.**

(c) **Section A carries 16 marks and Section B carries 42 marks. All other questions carry 14 marks each.**

(d) **Detach this sheet from the question paper and write answers on this sheet only on Pages 1 & 2. Attach it to the main drawing sheet. Remaining questions are to be answered on the main drawing sheet.**

(e) **All dimensions given are in mm. Use suitable values of any missing and mismatching dimensions.**

(f) **Use BIS Code: SP: 46-1988 for all drawings and do not rub off construction lines.**

Roll No………………………..

SECTION A (Compulsory) – Marks – 16

Note : - Answer this on question paper itself and annex with the drawing sheet.

Q1. Choose the correct or best alternative in the following: **(2 x 8 = 16)**

         QUESTIONS   **ANSWER HERE**

a   The hidden edge of an object is shown by:

     (A) Thick line

     (B) Thin line

     (C) Thick dotted line

     (D) Chain thin line   _____

b   If 5mm represents 1 km on a map, the representative fraction is

     (A) $\dfrac{1}{200}$

     (B) $\dfrac{1}{2000}$

     (C) $\dfrac{1}{20000}$

     (D) $\dfrac{1}{200000}$ _____

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c When a section plane is inclined to the axis of a cone and is parallel
   to any one of the generators, the shape of the section is
   (A) circle
   (B) ellipse
   (C) parabola
   (D) hyperbola   _____

d A Lewis bolt is a
   (A) foundation bolt
   (B) tap bolt
   (C) eye bolt
   (D) stud bolt   _____

e A cotter joint is provided for joining two rods which can transmit

   (C) axial force
   (D) rotating force
   (C) combination of axial and rotation force
   (D) normal force   _____

f A rigid coupling is used for joining two shafts which

   (A) are inclined to each other.
   (B) have axes offset but parallel to each other.
   (C) have axes offset and also inclined to each other.
   (D) are in perfect alignment.   _____

g Square headed bolts are used for fixing the cap of a Plummer block
   to the body

   (A) because there is no space for a hexagonal head.
   (B) because of ease of tightening with two different wrenches.
   (C) because of ease of tightening with one wrench only.
   (D) because such bolts are cheaper.   _____

h If the height of a cone is equal to the diameter of the base circle, the
   shape of development of the cone is

   (A) circle.
   (B) semicircle
   (C) right angled sector
   (D) triangle   _____

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SECTION B

Q.2 The details of a Plummer block are shown in Fig.1. Draw:
    (i)   Front view with left half in section.
    (ii)   Left side view.
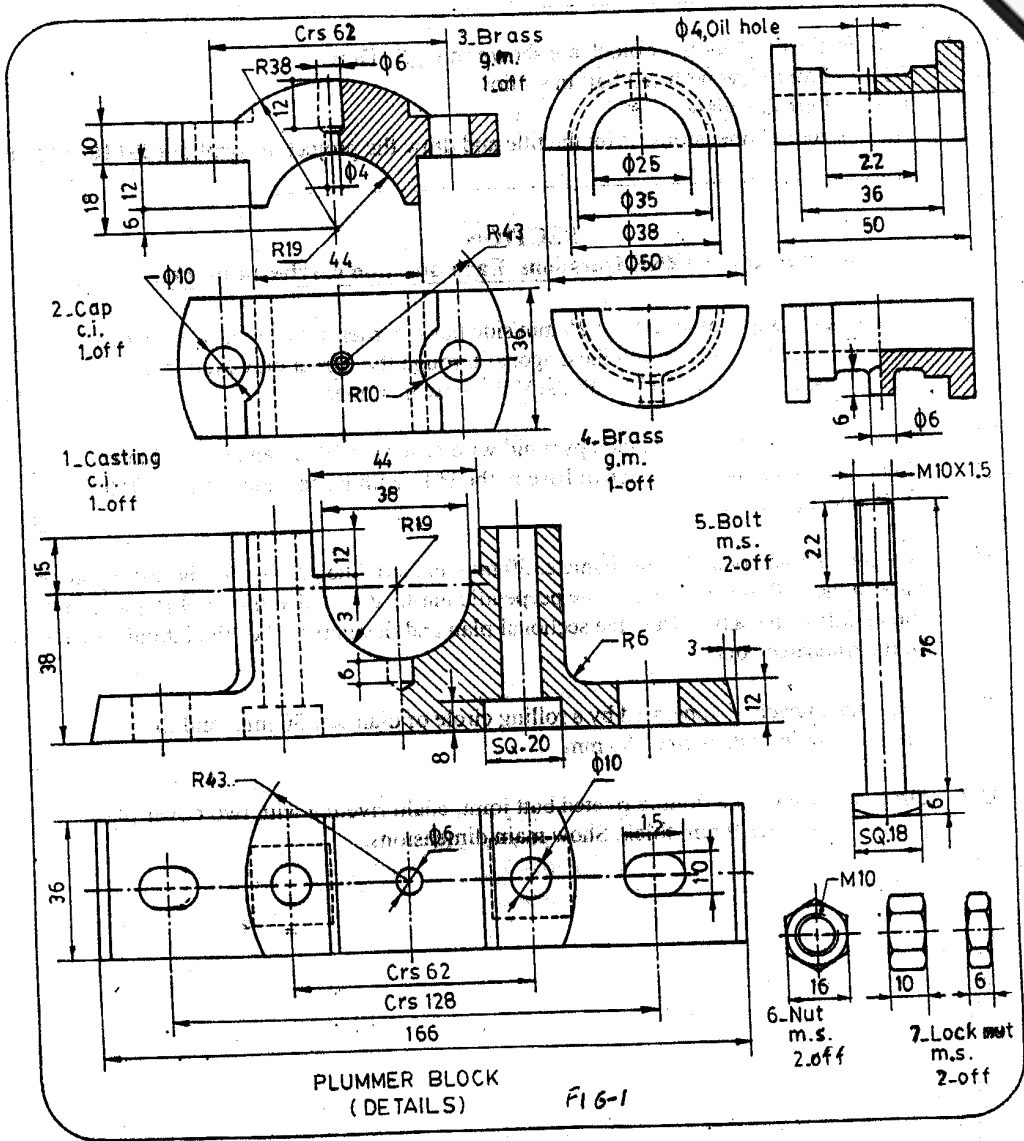   Show overall dimensions. Print the title and draw the projection symbol.

(25+10+5+1+1=42)

_____

SECTION C
Answer any THREE Questions. Each question carries 14 marks.

Q.3 A regular hexagonal lamina of 25 mm side has a corner in the H.P. Its surface is
inclined at 30º with H.P. and the diagonal through the corner on which it rests on
H.P., makes an angle of 45º with the V.P. Draw its projection. **(14)**

Q.4 Draw the projection of a square pyramid with base side 30mm and axis 60 mm
long resting on one of its edge of base in the H.P. with its axis inclined at 60º to
V.P. and 25º to H.P. **(14)**

Q.5 A right circular cone of base diameter 50 mm and axial height 70 mm. is resting on its
base in the H.P. It is cut by a plane peependicular to V.P. and at 60º to H.P. through
the middle of the axis. Draw the sectional plan and development of the lateral surface
of the truncated cone. **(14)**

Q.6 Draw an epicycloid generated by a rolling circle of diameter 30 mm. and the
directing circle of diameter 150 mm. **(14)**

Q.7 Draw two views of a double riveted butt joint, chain riveting with two
cover plates for joining two plates 9 mm thick. Show main
dimensions. **(14)**

PLUMMER BLOCK
(DETAILS) F16-1

15