CBCS Scheme

USN | | | | | | | | | | |

15AEL48

Fourth Semester B.E. Degree Examination, June/July 2017
(AE)
COMPUTER AIDED AIRCRAFT DRAWING

Time: 3 Hours | Max. Marks: 80

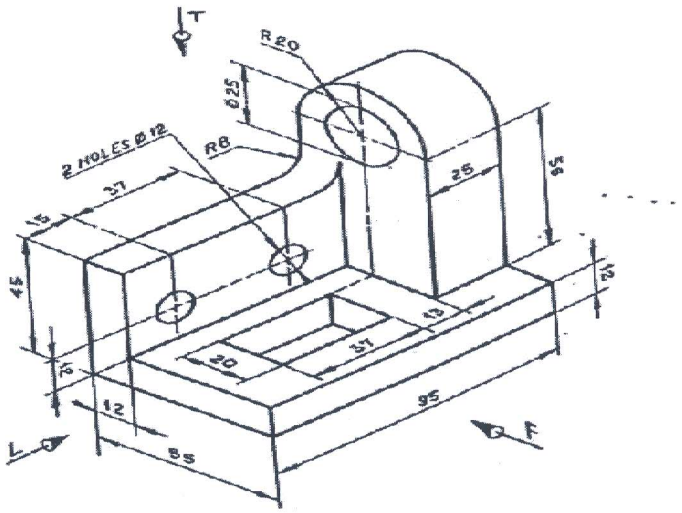
Note:

1. Answer any ONE question from each of the parts A, B & C
2. Use **FIRST ANGLE** projection only
3. Missing data if any may suitable may assumed
4. All the calculation should be on answer sheet supplied
5. All the dimensions are in mm
6. **Part C** assembled view should be in 3D and other 2 views in 2D

Part A

1. A pentagonal pyramid of 20mm edge of base and 40mm high stands vertically with its base on HP and an edge of the base perpendicular to VP. A section plane perpendicular to HP and inclined 30^0 to VP cuts the pyramid such that it passes through the pyramid at a shortest distance of 5 mm from its axis and in front of it. Draw its sectional front view and auxiliary view showing the true shape of section. **15 Marks**

2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



Part B

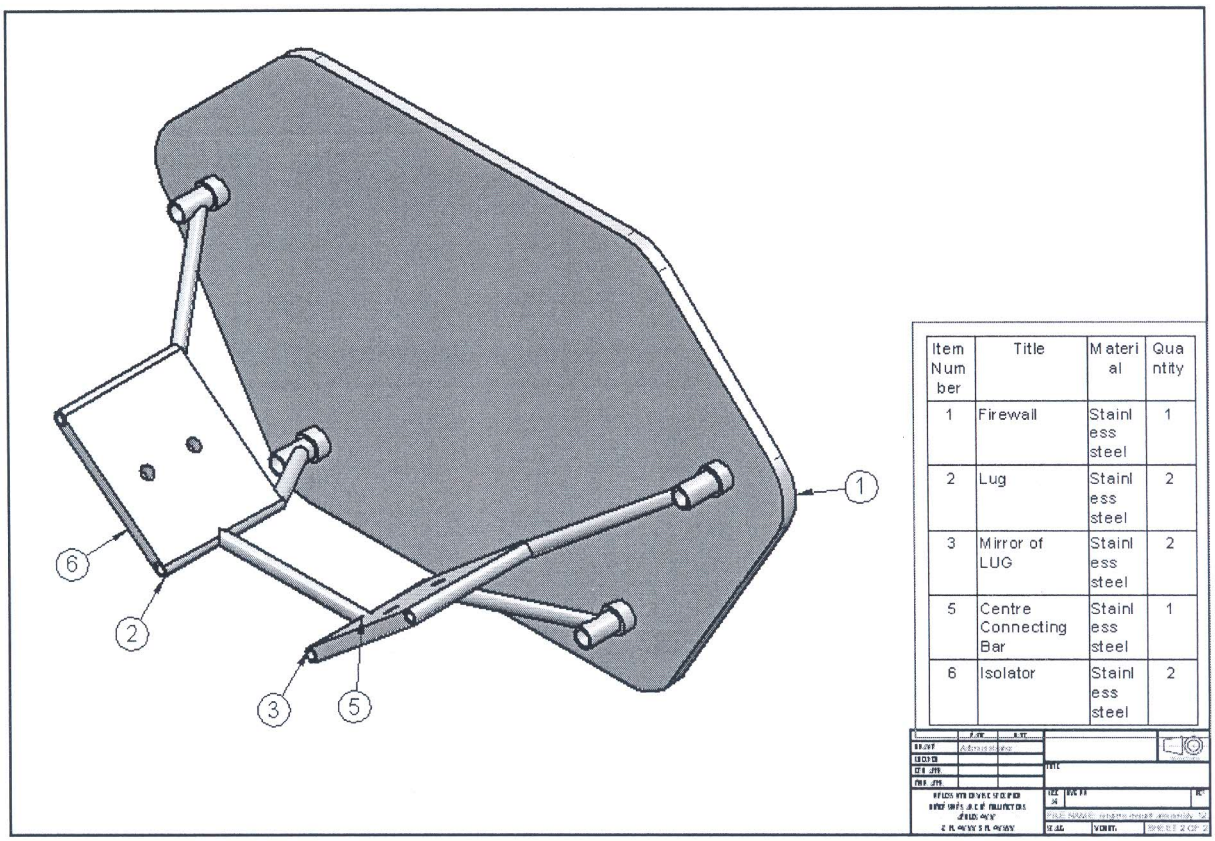
3. Draw 2 views of Square headed bolt with Nut for a 24 mm diameter bolt. Take length of bolt 120 mm. **15 Marks**

4. Draw the BSW thread having pitch 50mm. Show at least 3 threads in section. **15 Marks**

Part C

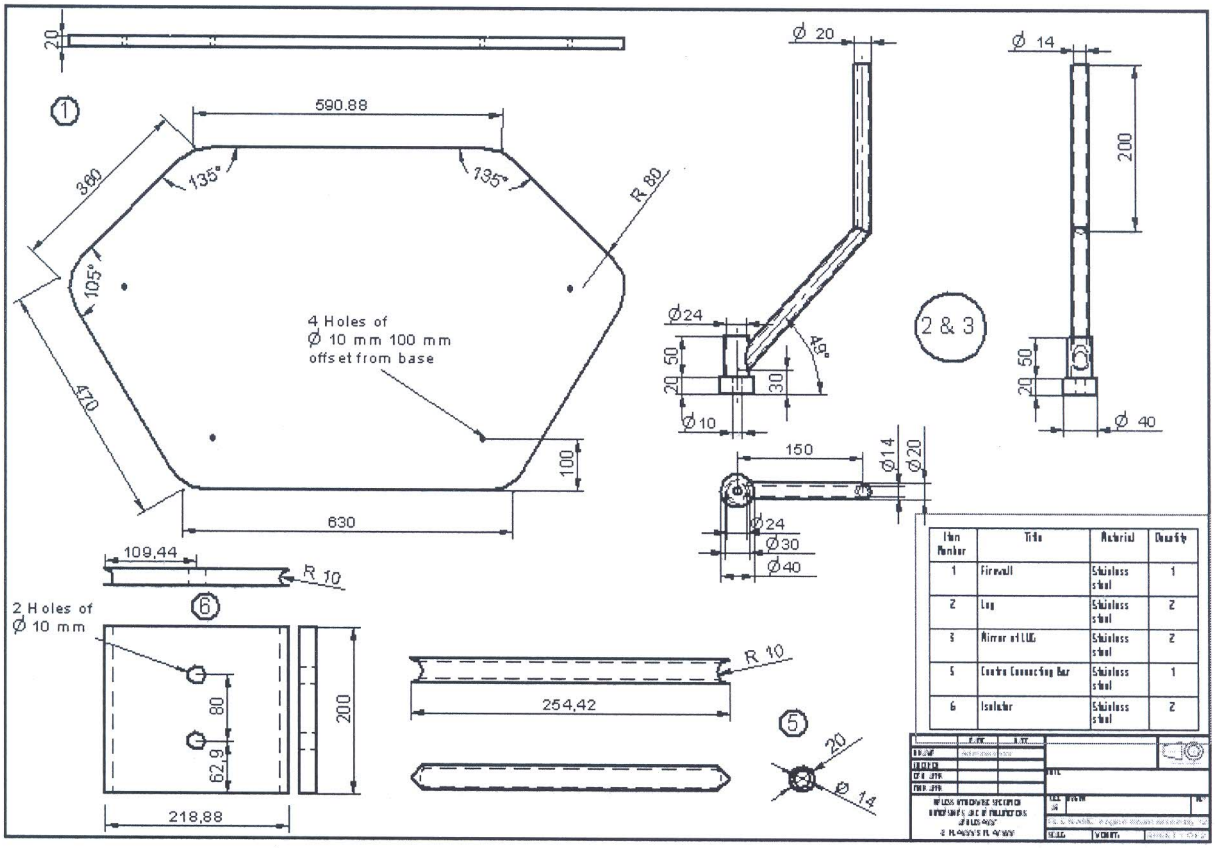
5. The details of an ENGINE MOUNT ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly
   a. Front View b. Top view c. Left view **50 Marks**

6. The details of a DESIGN OF WING ASSEMBLY are shown in Fig. 2. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**

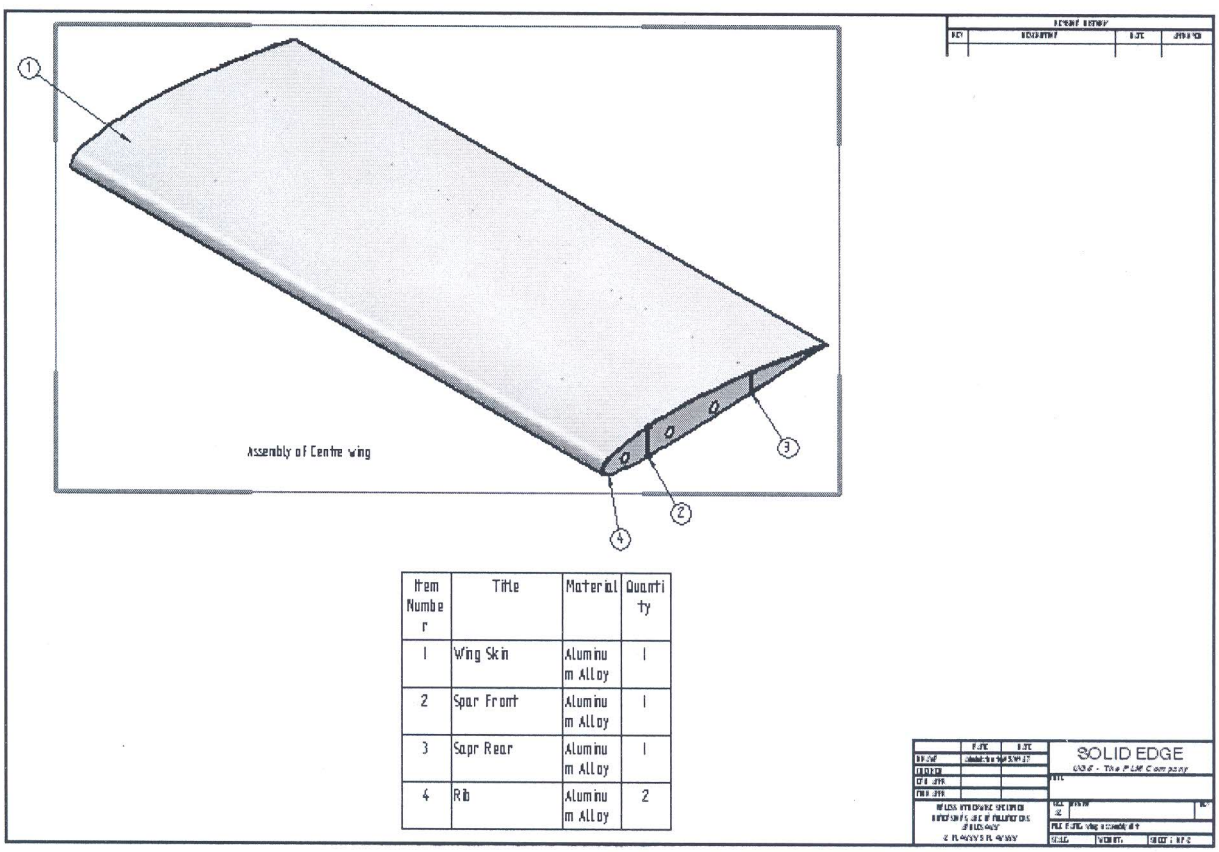


Item Number	Title	Material	Quantity
1	Firewall	Stainless steel	1
2	Lug	Stainless steel	2
3	Mirror of LUG	Stainless steel	2
5	Centre Connecting Bar	Stainless steel	1
6	Isolator	Stainless steel	2

Fig 1

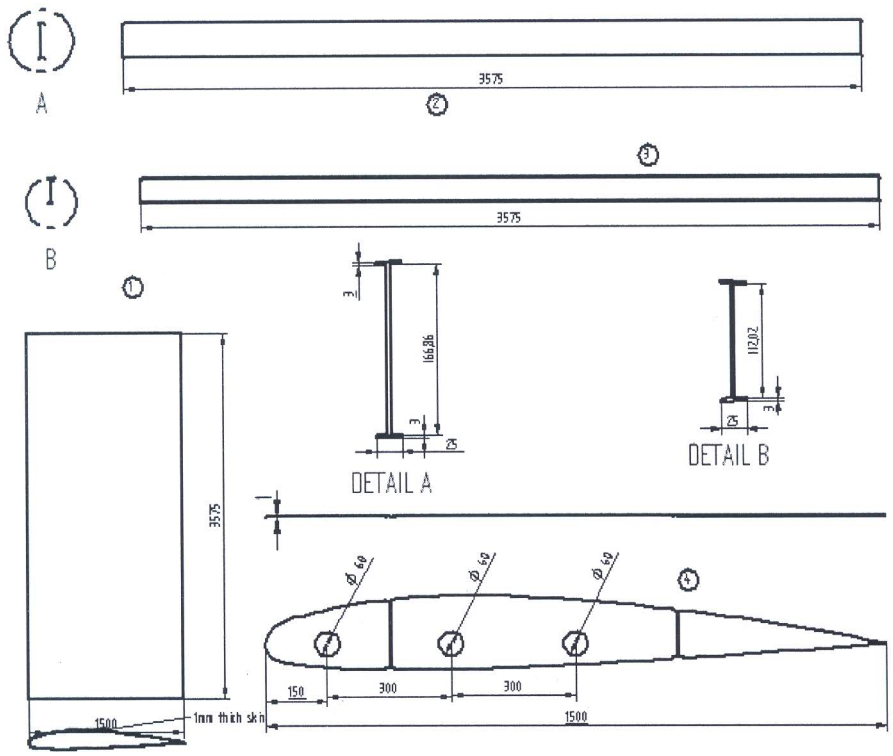


Item Number	Title	Material	Quantity
1	Firewall	Stainless steel	1
2	Leg	Stainless steel	2
3	Mirror of LLG	Stainless steel	2
5	Centre Connecting Bar	Stainless steel	1
6	Isolator	Stainless steel	2



Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Sapr Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2

Fig 2



Airfoil Co-ordinate Details-2412		
X	Y	Z
1	0	0.0013
0.95	0	0.0114
0.8	0	0.0375
0.6	0	0.0636
0.4	0	0.078
0.25	0	0.0767
0.15	0	0.0661
0.075	0	0.0496
0.025	0	0.0299
0	0	0
0.025	0	-0.0227
0.075	0	-0.0346
0.15	0	-0.041
0.25	0	-0.0422
0.4	0	-0.038
0.6	0	-0.0276
0.8	0	-0.015
0.95	0	-0.0048
1	0	-0.0013

Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2

ACHARYA INSTITUTE OF TECHNOLOGY
Bangalore - 560090

CBCS Scheme

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15AEL48

Fourth Semester B.E. Degree Examination, June/July 2017
(AE)
COMPUTER AIDED AIRCRAFT DRAWING

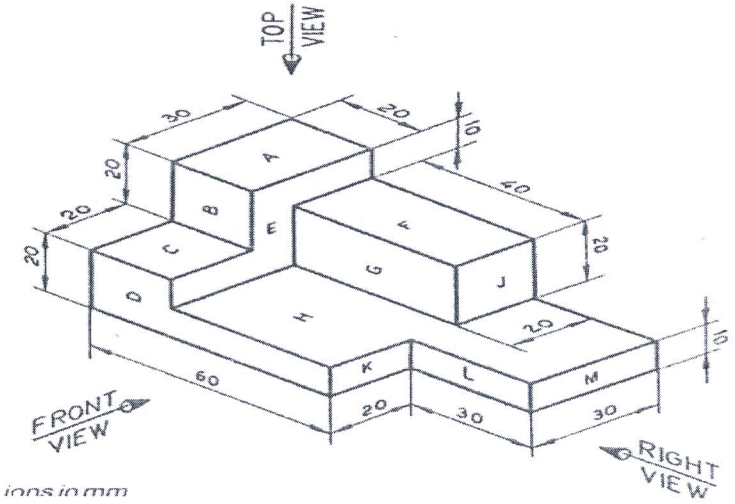
Time: 3 Hours **Max. Marks: 80**

Note:

1. Answer any ONE question from each of the parts A, B & C
2. Use **FIRST ANGLE** projection only
3. Missing data if any may suitable may assumed
4. All the calculation should be on answer sheet supplied
5. All the dimensions are in mm
6. **Part C** assembled view should be in 3D and other 2 views in 2D

Part - A

1. A cone diameter of base 60 mm and axis 70 mm long is resting on its base on HP. It is cut by a section plane perpendicular to both VP and HP and is located at a distance of 10mm right of the axis. Draw the sectional right view, front view, top view and True shape of section. **15 Marks**
2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



ions in mm

Part - B

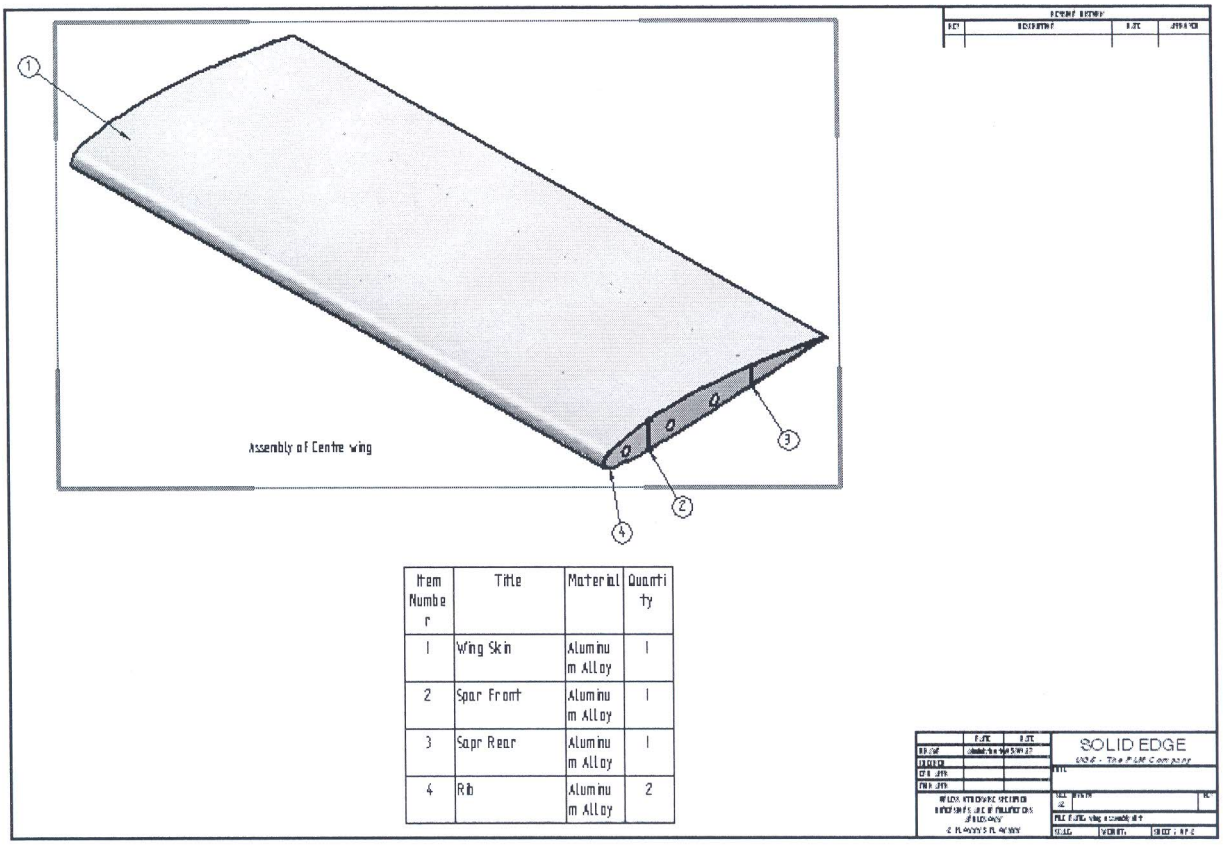
3. Draw 2 views of Hexagonal headed bolt with nut for a 24 mm diameter bolt. Length of the bolt 100 mm. **15 Marks**

4. Drawthe top and front views of a double riveted Lap joint with zig-zag riveting. The thickness of the plate is 14 mm. Show at least three rivets in each row. Indicate all the dimensions. **15 Marks**

Part - C

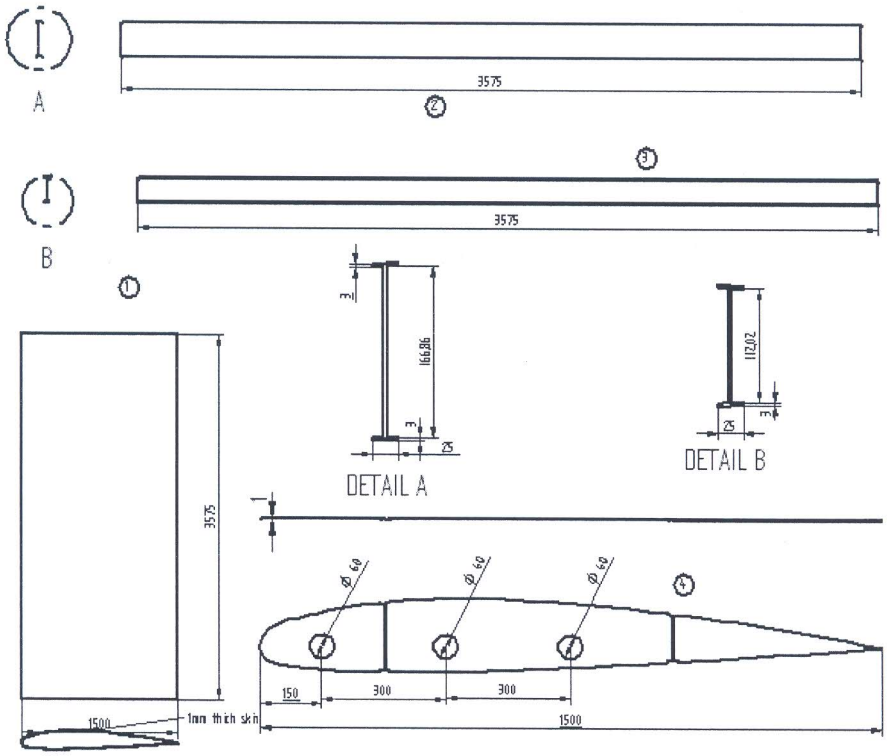
5. The details of a DESIGN OF WING ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**

6. The details of a DESIGN OF LANDING GEAR ASSEMBLY are shown in Fig. 2. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**



Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2

Fig 1



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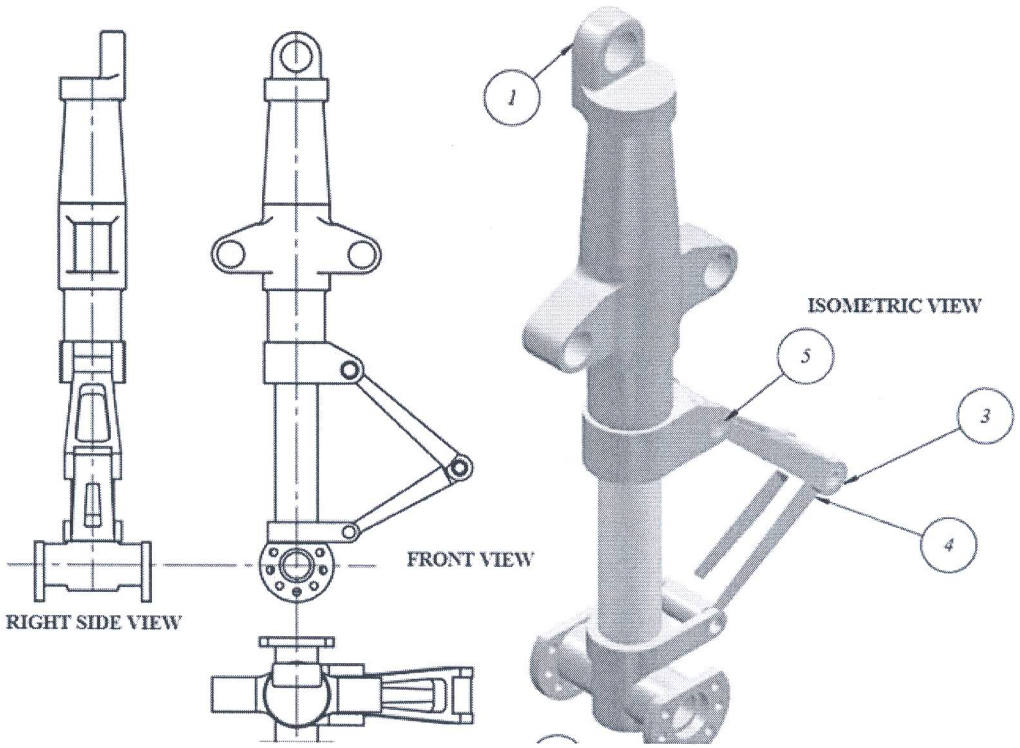
0.075	0	0.0496
0.025	0	0.0299
0	0	0
0.025	0	-0.0227
0.075	0	-0.0346
0.15	0	-0.041
0.25	0	-0.0422
0.4	0	-0.038
0.6	0	-0.0276
0.8	0	-0.015
0.95	0	-0.0048
1	0	-0.0013

Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2



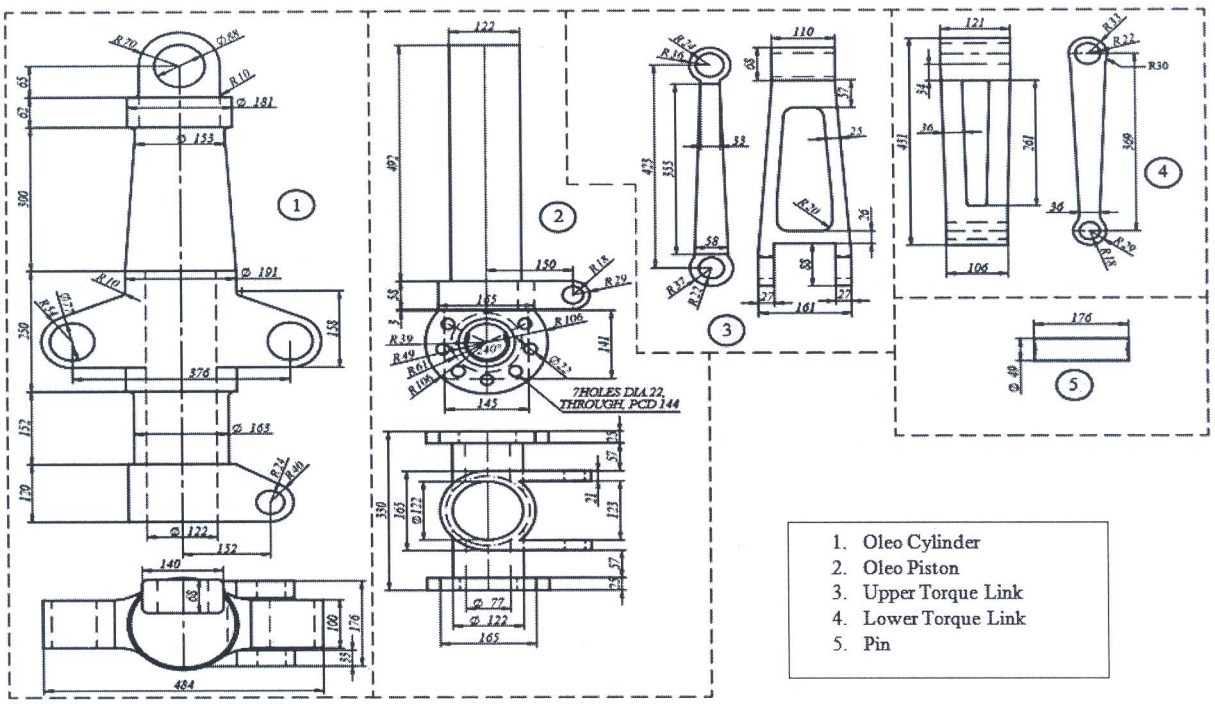

1. Oleo Cylinder
2. Oleo Piston
3. Upper Torque Link
4. Lower Torque Link
5. Pin
7HOLES DIA 22, THROUGH, PCD 144

Fig 2

CBCS Scheme

USN | | | | | | | | | | |

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Time: 3 Hours **Max. Marks: 80**

Note:

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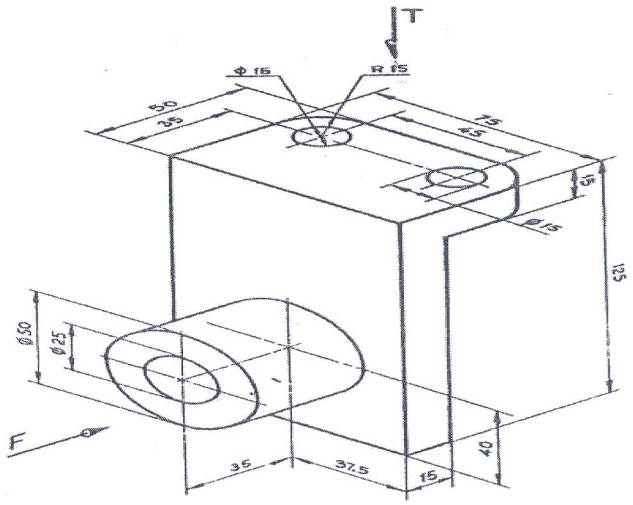
Part - A

1. A cone diameter of base 60 mm and axis 70 mm long is resting on its base on HP. It is cut by a section plane perpendicular to both VP and HP and is located at a distance of 10mm right of the axis. Draw the sectional right view, front view, top view and True shape of section. **15 Marks**

2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



Part - B

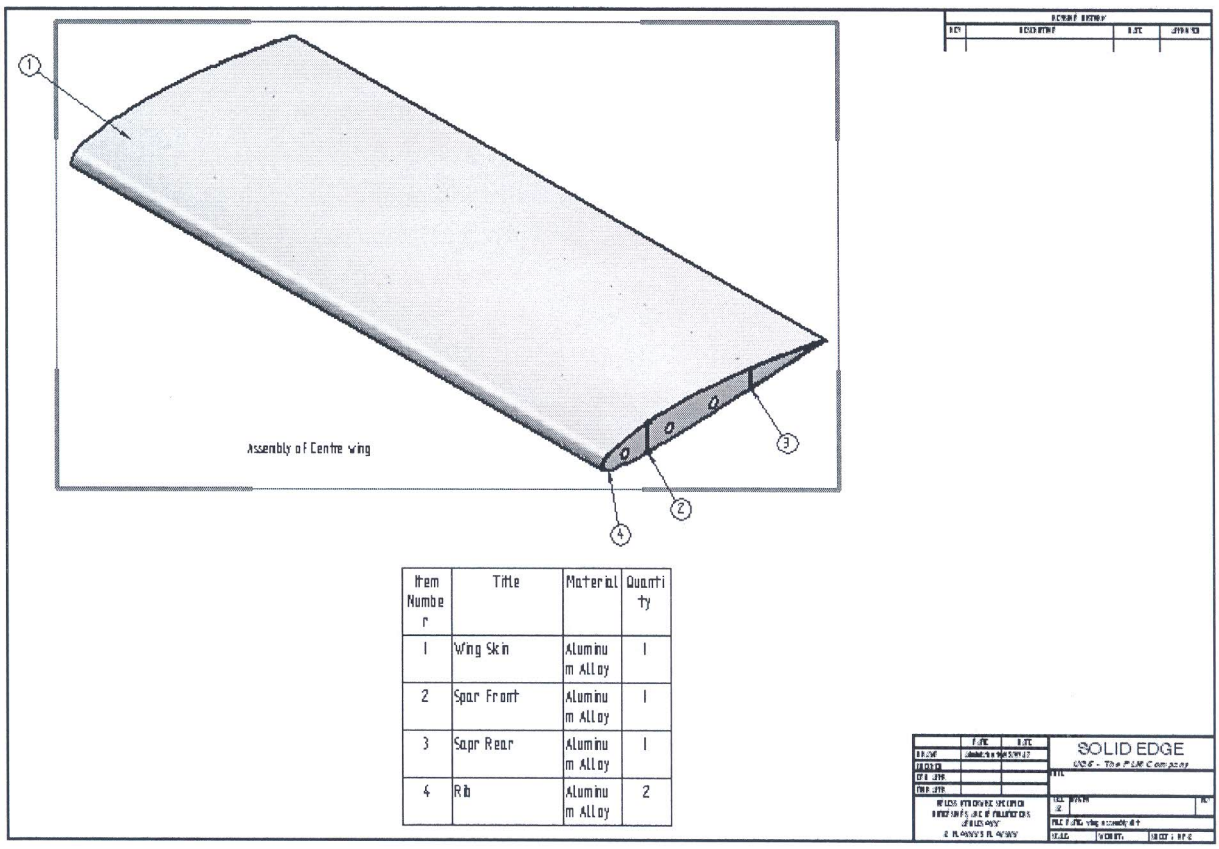
3. Draw 2 views of Hexagonal headed bolt with nut for a 20mm dia bolt. Take length of bolt 100mm. **15 Marks**

4. Draw Socket & Spigot cotter joint, used to join two rods of dia 20mm. Give following views (i) Full sectional front view. (ii) Side view looking from socket end. **15 Marks**

Part - C

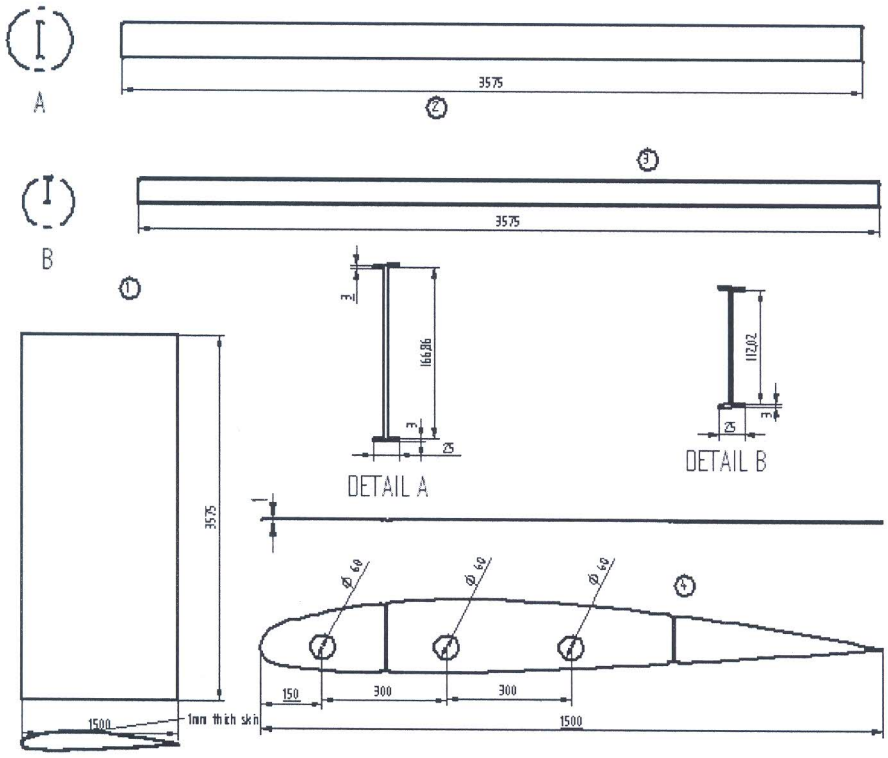
5. The details of a DESIGN OF WING ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**

6. The details of a DESIGN OF PROPELLER AND HUB ASSEMBLY are shown in Fig. 2. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**



Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2

Fig. 1



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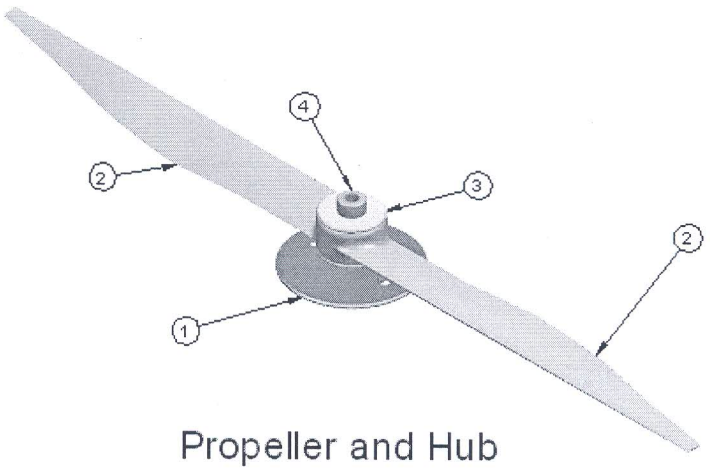
0.15	0	0.0661
0.075	0	0.0496
0.025	0	0.0299
0	0	0
0.025	0	-0.0227
0.075	0	-0.0346
0.15	0	-0.041
0.25	0	-0.0422
0.4	0	-0.038
0.6	0	-0.0276
0.8	0	-0.015
0.95	0	-0.0048
1	0	-0.0013

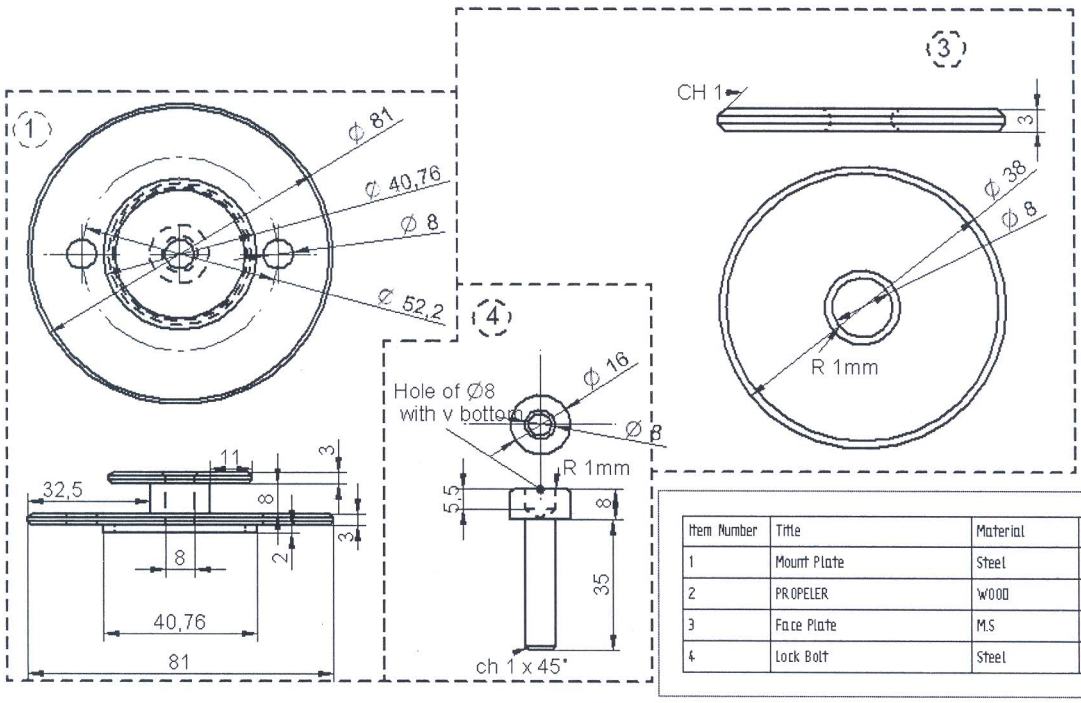
Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2



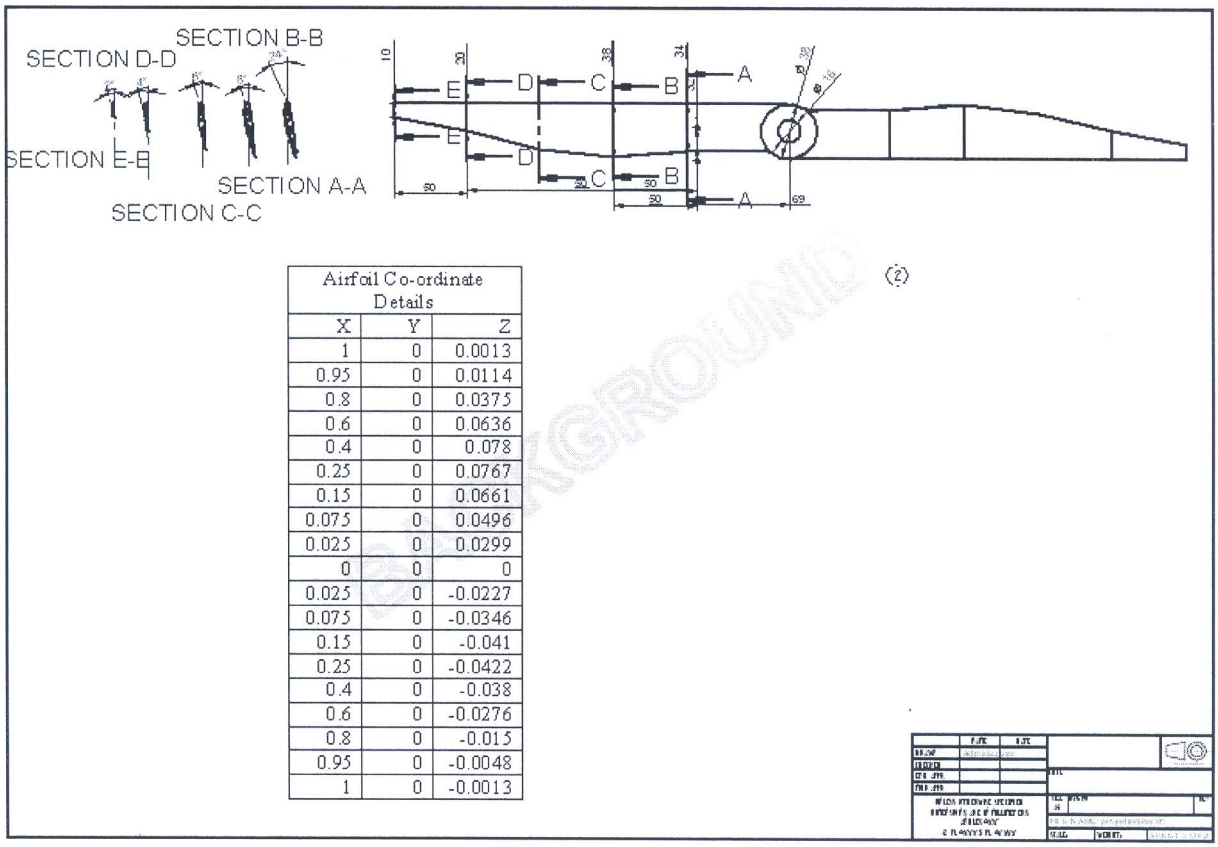
Propeller and Hub assembly (Iso View)

Item Number	Title	Material	Quantity
1	Mount Plate	Steel	1
2	PROPELER	WOOD	1
3	Face Plate	M.S	1
4	Lock Bolt	Steel	1

Fig 2



Item Number	Title	Material	Quantity
1	Mount Plate	Steel	1
2	PROPELER	WOOD	1
3	Face Plate	M.S	1
4	Lock Bolt	Steel	1



Airfoil Co-ordinate Details		
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0.075	0	0.0496
0.025	0	0.0299
0	0	0
0.025	0	-0.0227
0.075	0	-0.0346
0.15	0	-0.041
0.25	0	-0.0422
0.4	0	-0.038
0.6	0	-0.0276
0.8	0	-0.015
0.95	0	-0.0048
1	0	-0.0013

CBCS Scheme

USN | | | | | | | | | | |

15AEL48

Fourth Semester B.E. Degree Examination, June/July 2017
(AE)
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Time: 3 Hours **Max. Marks: 80**

Note:

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2. Use **FIRST ANGLE** projection only
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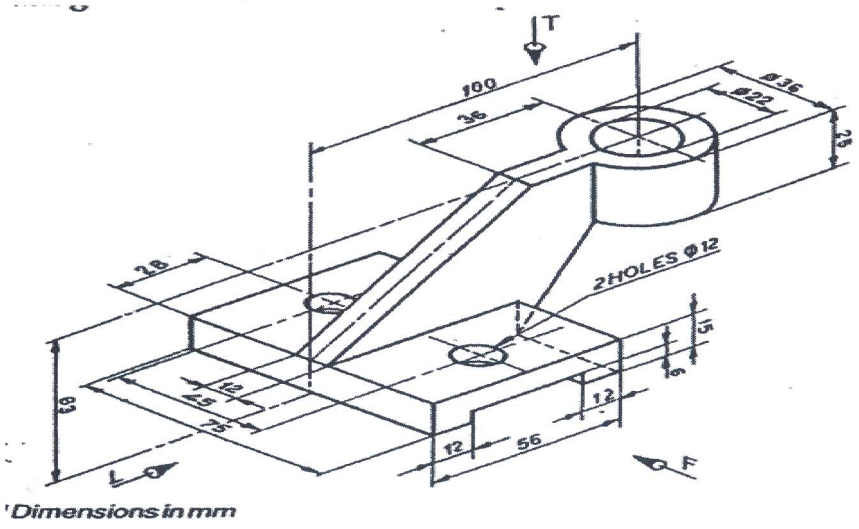
4. All the calculation should be on answer sheet supplied
5. All the dimensions are in mm
6. **Part C** assembled view should be in 3D and other 2 views in 2D

Part - A

1. A cube of 40 mm edges rests with one of its square faces on HP such that one of its vertical square faces is inclined at 30^0 to VP. A section plane parallel to VP and perpendicular to HP passes through it at a distance of 10mm from its vertical axis and in front of it. Draw its top view and sectional front view. **15 Marks**

2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



Dimensions in mm

Part - B

3. Draw two views of Square headed bolt with nut for a 24mm diameter bolt. Take length of the bolt as 100mm. **15 Marks**

4. Draw the top and front views of a single riveted butt joint with single cover plate. The thickness of the plate is 10 mm. Show at least three rivets in each row. Indicate all the dimensions. **15 Marks**

Part - C

5. The details of an ENGINE MOUNT ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly
   a. Front View b. Top view c. Left view **50 Marks**

6. The details of a DESIGN OF MAIN ROTOR BLADE ASSEMBLY OF HELICOPTER are shown in Fig. 2. Draw the following views of the assembly
   a. Front View b. Top view c. Left view **50 Marks**

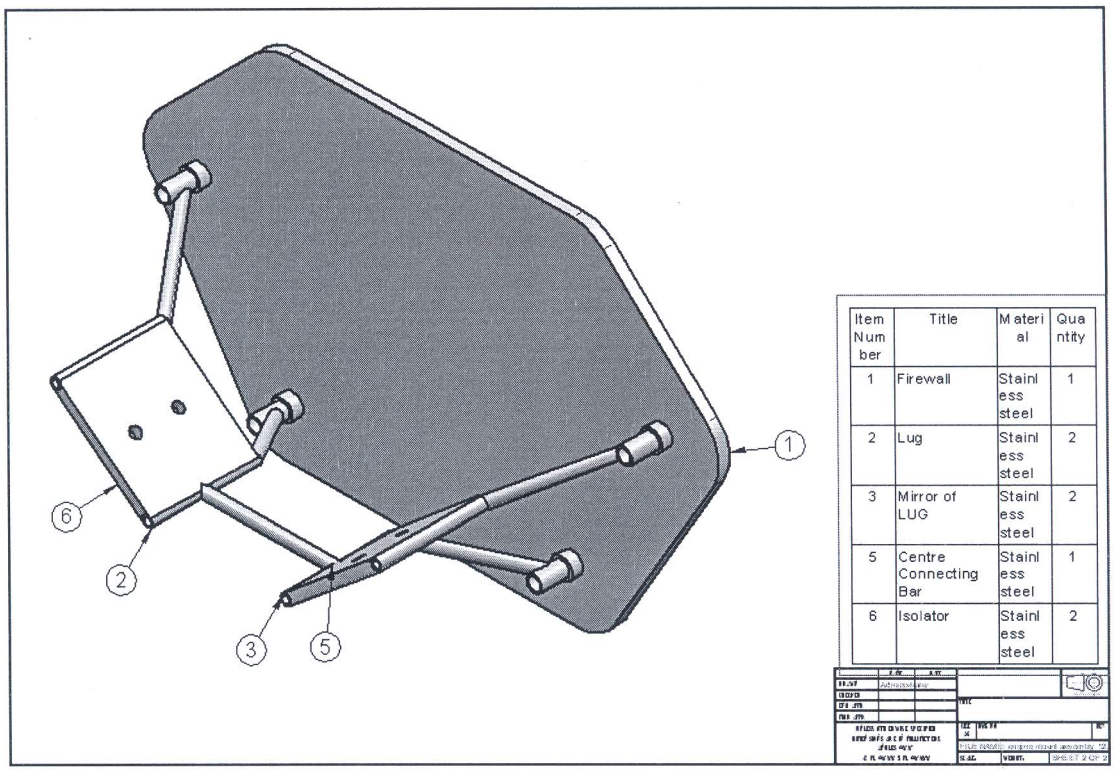
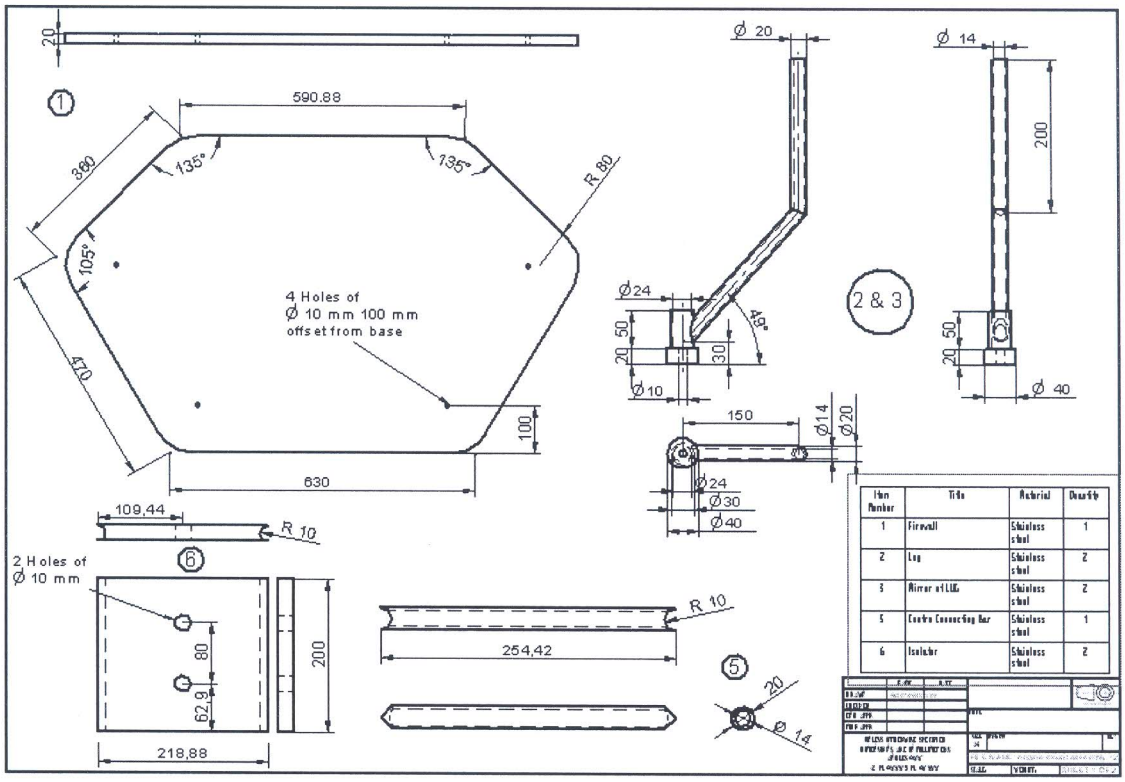
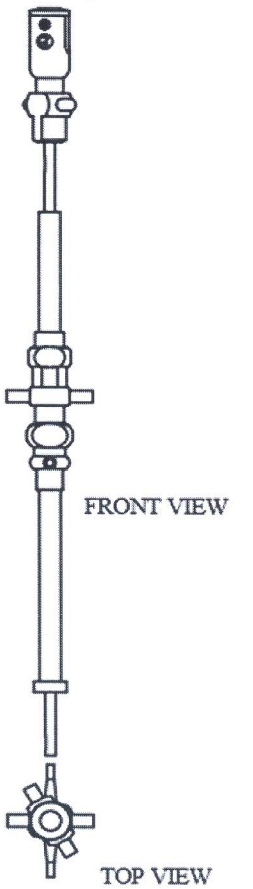
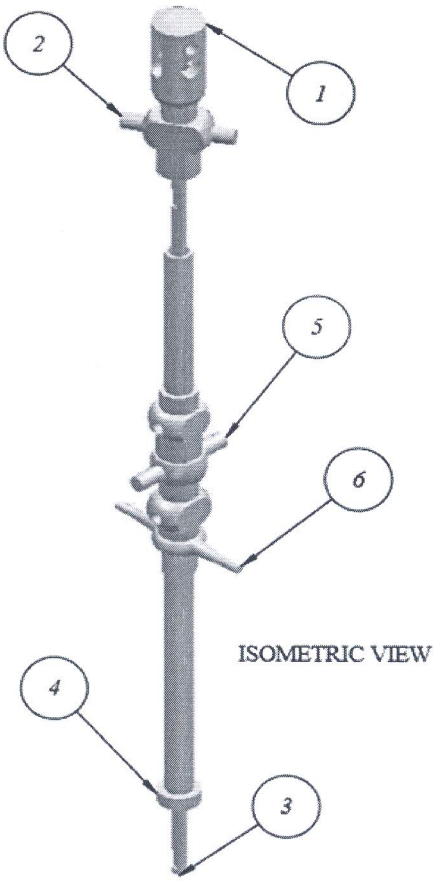


Fig. 1


20
590.88
360
135°
135°
R 80
105°
470
4 Holes of
Ø 10 mm 100 mm
offset from base
100
630
109,44
R 10
2 Holes of
Ø 10 mm
80
62,9
200
218,88
254,42
R 10
20
Ø 14
Ø 20
Ø 14
200
Ø24
20
50
30
Ø10
45°
2 & 3
20
50
Ø 40
150
Ø14
Ø20
Ø24
Ø30
Ø40
Item Number
Title
Material
Quantity
1
Firewall
Stainless steel
1
2
Leg
Stainless steel
2
3
Mirror at LEG
Stainless steel
2
5
Centre Connecting Bar
Stainless steel
1
6
Isolator
Stainless steel
2


FRONT VIEW
TOP VIEW


2
1
5
6
4
3
ISOMETRIC VIEW

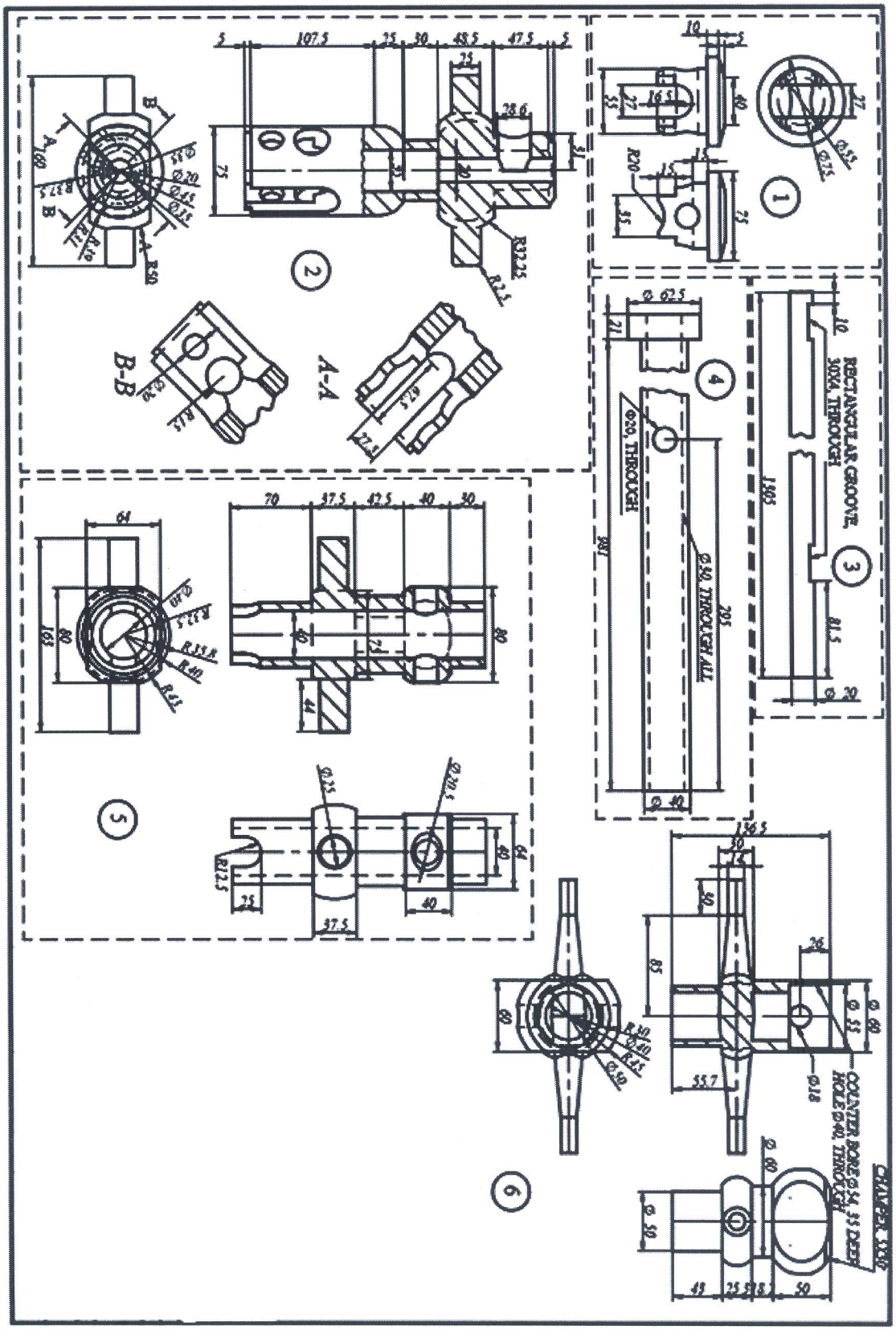

RECTANGULAR GROOVE, 30X4, THROUGH
Φ20, THROUGH
Φ50, THROUGH ALL
COUNTER BORE Φ54, 55 DEEP
HOLE Φ40, THROUGH
CHAMFER, 5X60
B-B
A-A
1
2
3
4
5
6

Fig. 2

CBCS Scheme

USN | | | | | | | | | | |

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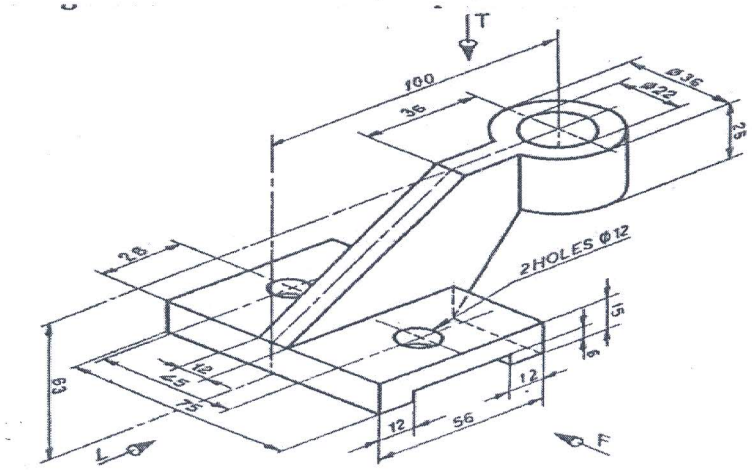
3. Missing data if any may suitable may assumed
4. All the calculation should be on answer sheet supplied
5. All the dimensions are in mm
6. **Part C** assembled view should be in 3D and other 2 views in 2D

Part - A

1. A cone base 60 mm dia and axis 70 mm stands vertically with its base on HP. A section plane perpendicular to VP and parallel to one of its end generator of cone passes at a distance of 15 mm from it. Draw the sectional top view and true shape of section. **15 Marks**

2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



Dimensions in mm

Part - B

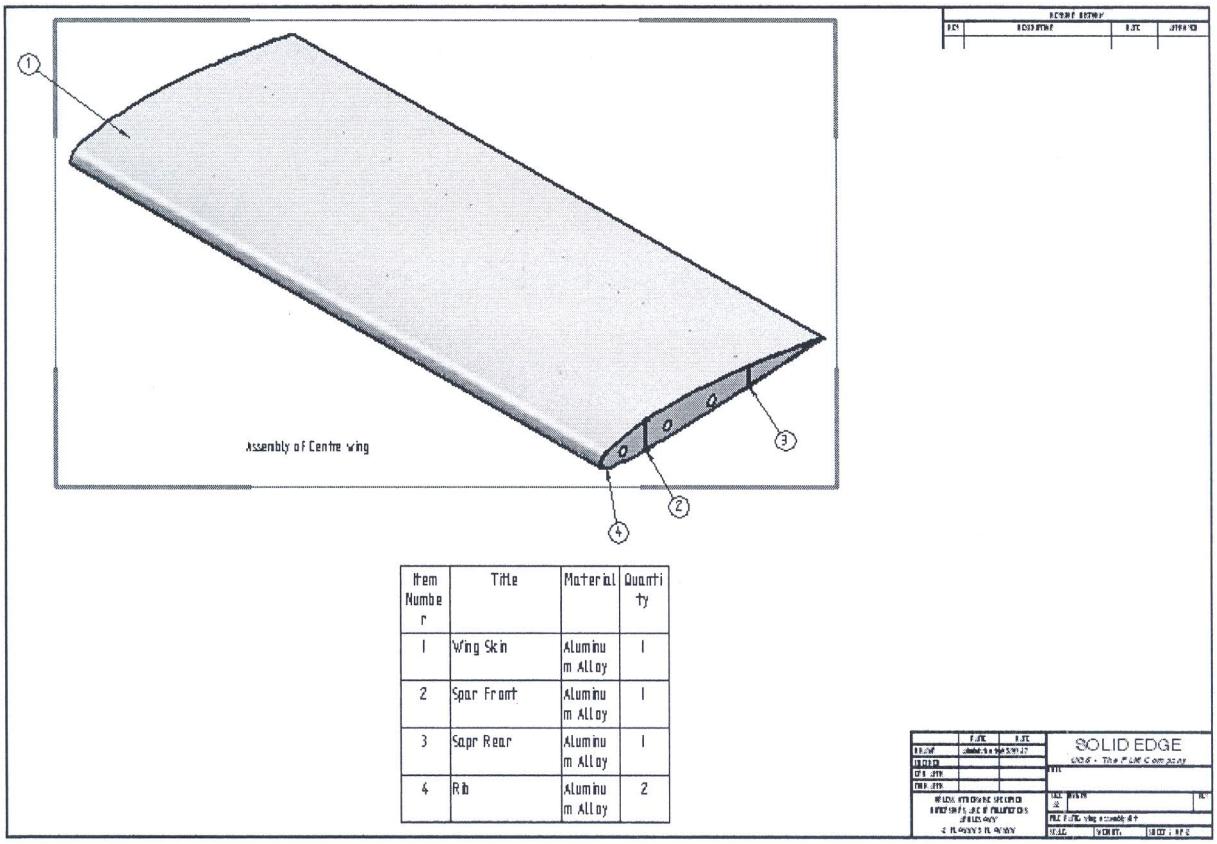
3. Draw 2 views of Hexagonal headed bolt with nut for a 24 mm diameter bolt. Length of the bolt 100 mm. **15 Marks**

4. Draw KNUCKLE Joint to connect 2 rods of 20mm diameter when the PIN is in Horizontal Position. Draw sectional front and simple Top view. **15 Marks**

Part - C

5. The details of a DESIGN OF WING ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**

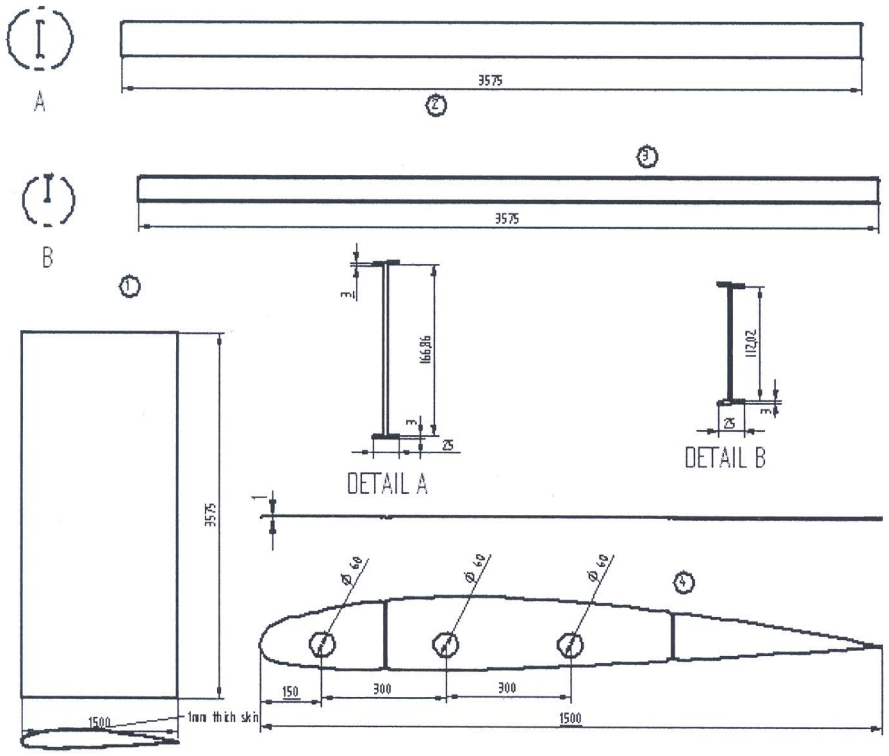
6. The details of a DESIGN OF MAIN ROTOR BLADE ASSEMBLY OF HELICOPTER are shown in Fig. 2. Draw the following views of the assembly
   a. Front View b. Top view c. Left view **50 Marks**



Item Number	Title	Material	Quantity
1	Wing Skin	Aluminum Alloy	1
2	Spar Front	Aluminum Alloy	1
3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2

SOLID EDGE

Fig. 1



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0.4	0	0.078
0.25	0	0.0767
0.15	0	0.0661
0.075	0	0.0496
0.025	0	0.0299
0	0	0
0.025	0	-0.0227
0.075	0	-0.0346
0.15	0	-0.041
0.25	0	-0.0422
0.4	0	-0.038
0.6	0	-0.0276
0.8	0	-0.015
0.95	0	-0.0048
1	0	-0.0013

Item Number	Title	Material	Quantity
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3	Spar Rear	Aluminum Alloy	1
4	Rib	Aluminum Alloy	2

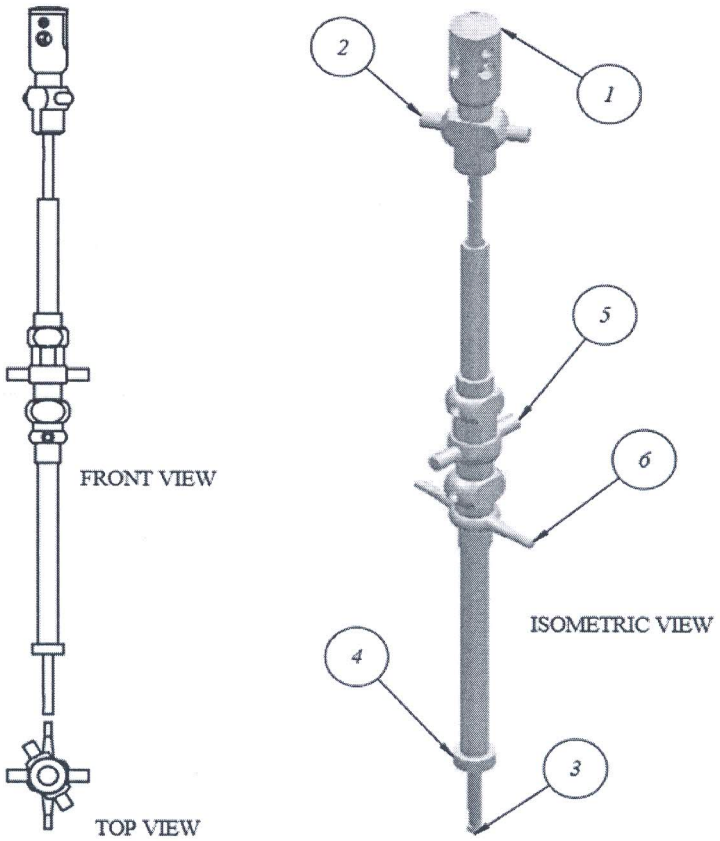
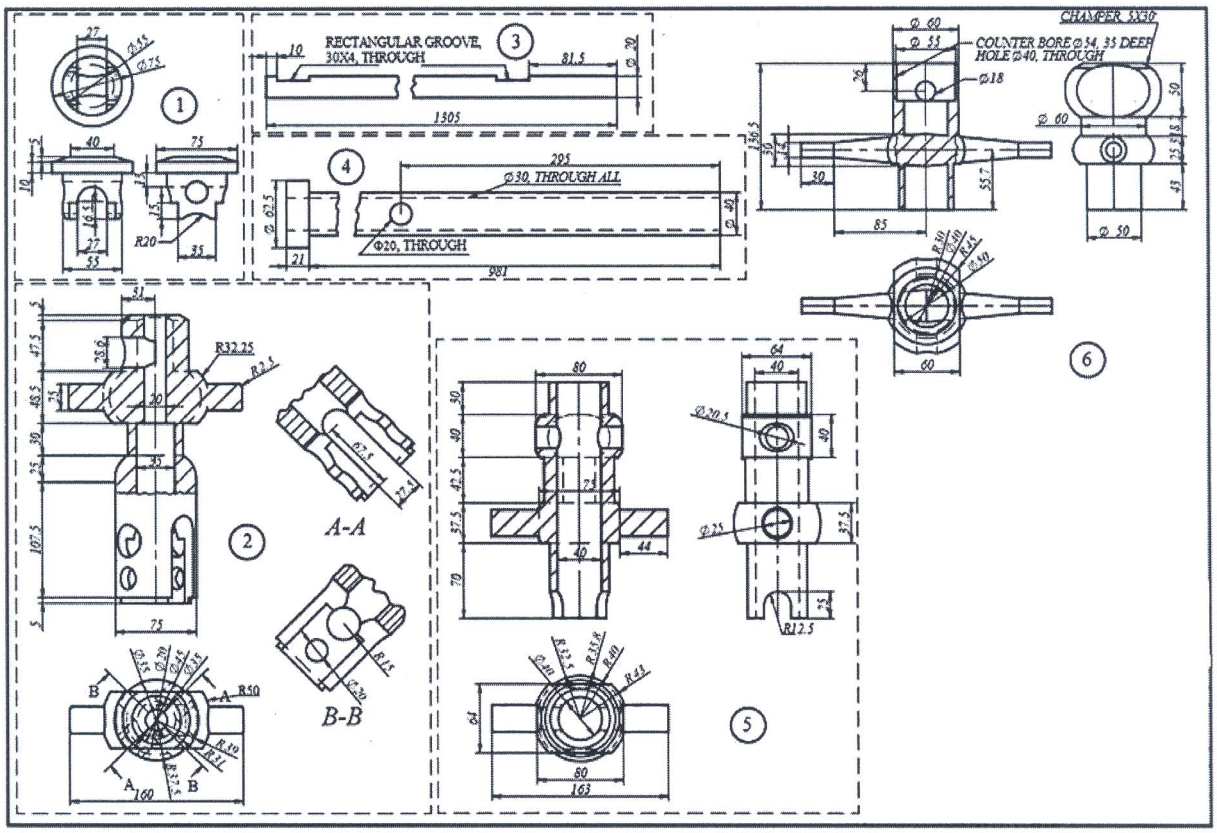


Fig. 2


RECTANGULAR GROOVE, 30X4, THROUGH
CHAMFER 5X30
COUNTER BORE Ø54, 35 DEEP
HOLE Ø40, THROUGH
Ø30, THROUGH ALL
Φ20, THROUGH
A-A
B-B
1
2
3
4
5
6

CBCS Scheme

USN | | | | | | | | | | |

15AEL48

Fourth Semester B.E. Degree Examination, June/July 2017
(AE)
COMPUTER AIDED AIRCRAFT DRAWING

Time: 3 Hours **Max. Marks: 80**

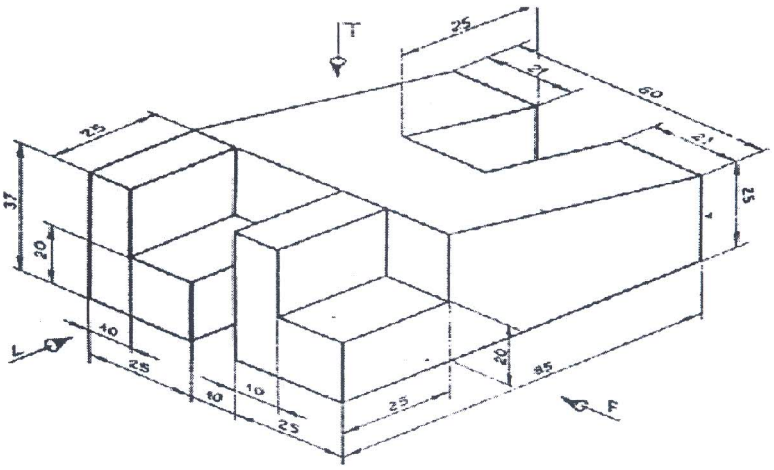
Note:

1. Answer any ONE question from each of the parts A, B & C
2. Use **FIRST ANGLE** projection only
3. Missing data if any may suitable may assumed
4. All the calculation should be on answer sheet supplied
5. All the dimensions are in mm
6. **Part C** assembled view should be in 3D and other 2 views in 2D

Part - A

1. A square prism of 45 mm side of base and height 90 mm rests with its base on HP such that one of the rectangular face is inclined at 30^0 to VP and nearer to it. A section plane perpendicular to VP and inclined at 60^0 to HP passes through a point on the axis at a height of 70mm. Draw the front view and sectional top view. Project an auxiliary view on an auxiliary plane parallel to the section plane. **15 Marks**

2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



All Dimensions in mm

Part - B

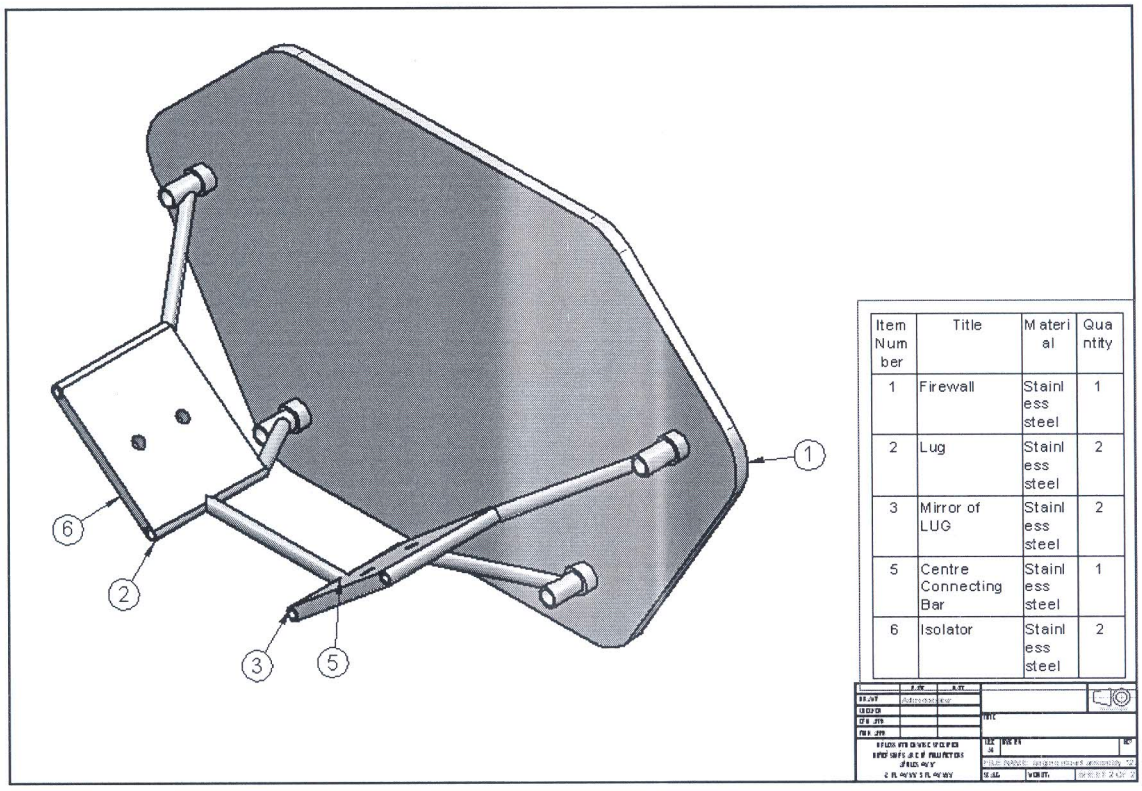
3. Draw two views of Square headed bolt with nut for a 24mm diameter bolt. Take length of the bolt as 100mm. **15 Marks**

4. Draw half sectional front view and side view of a protected type flanged coupling to connect 2 shafts of 20mm dia. Indicate all proportions and dimensions. **15 Marks**

Part - C

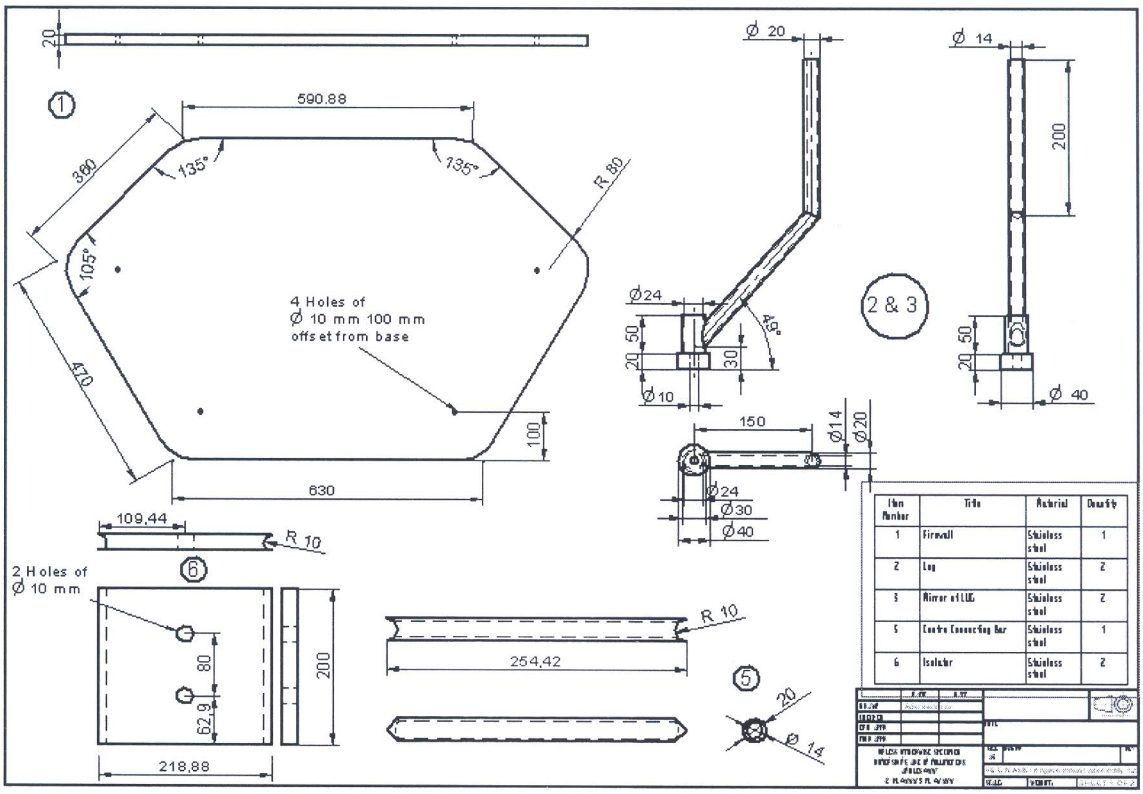
5. The details of an ENGINE MOUNT ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly
   a. Front View b. Top view c. Left view **50 Marks**

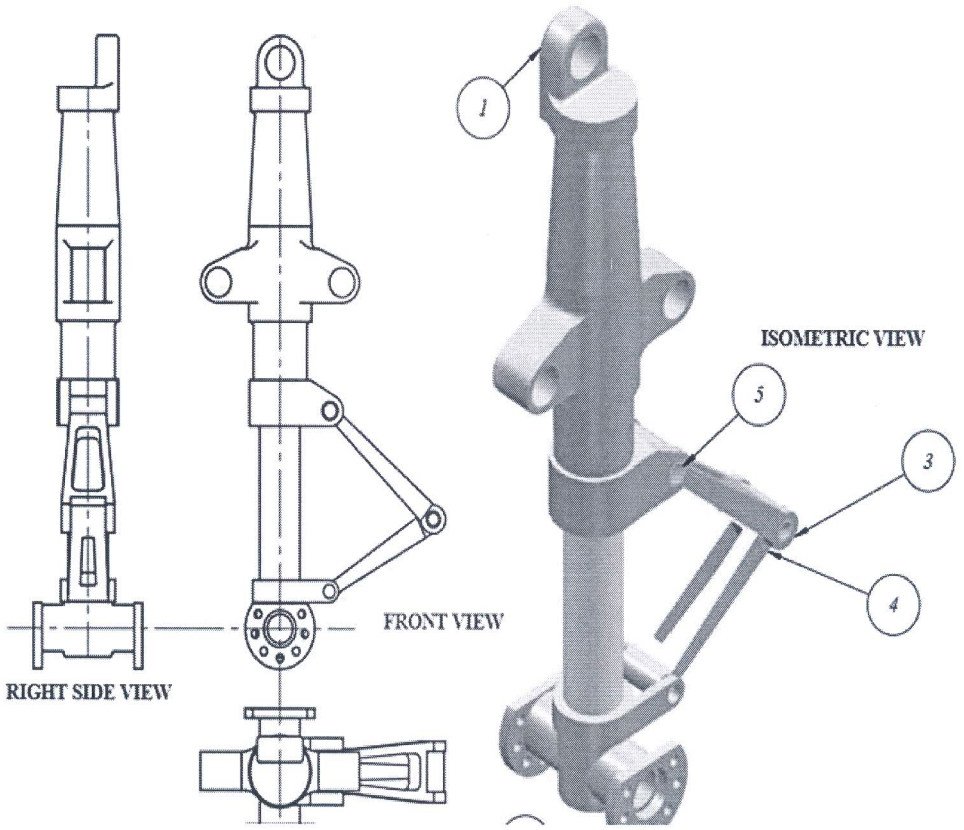
6. The details of a DESIGN OF LANDING GEAR ASSEMBLY are shown in Fig. 2. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**



Item Number	Title	Material	Quantity
1	Firewall	Stainless steel	1
2	Lug	Stainless steel	2
3	Mirror of LUG	Stainless steel	2
5	Centre Connecting Bar	Stainless steel	1
6	Isolator	Stainless steel	2

Fig 1


20
590.88
390
135°
135°
R 80
105°
470
4 Holes of
Ø 10 mm 100 mm
offset from base
100
630
109,44
R 10
2 Holes of
Ø 10 mm
80
62,9
200
218,88
254,42
R 10
Ø 20
Ø 14
200
Ø24
50
20
30
49°
Ø 10
2 & 3
Ø 14
200
20
50
Ø 40
150
Ø14
Ø20
Ø24
Ø30
Ø40
5
20
Ø 14
6
Item Number
Title
Material
Quantity
1
Firewall
Stainless steel
1
2
Leg
Stainless steel
2
3
Mirror of LEG
Stainless steel
2
5
Centre Connecting Bar
Stainless steel
1
6
Isolator
Stainless steel
2


RIGHT SIDE VIEW
FRONT VIEW
ISOMETRIC VIEW
1
5
3
4

15AEL48

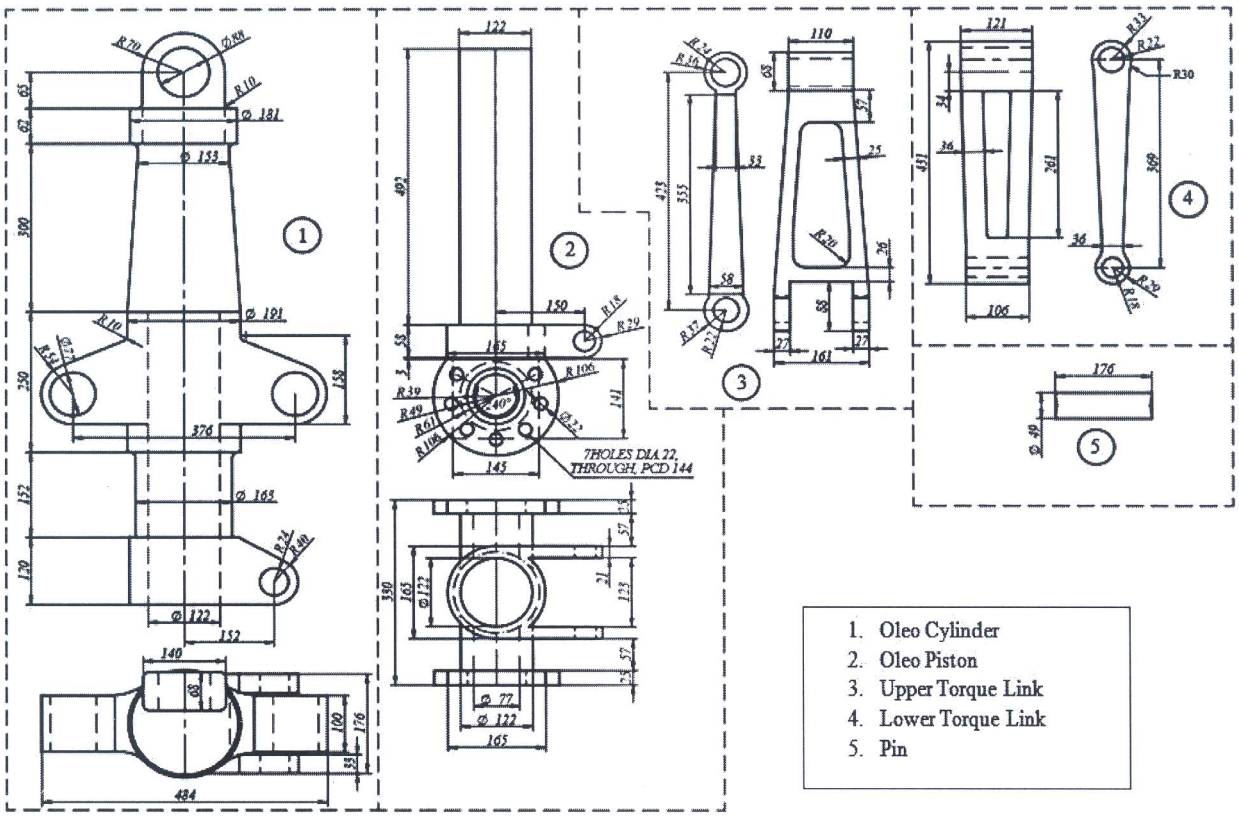

1. Oleo Cylinder
2. Oleo Piston
3. Upper Torque Link
4. Lower Torque Link
5. Pin

Fig 2

CBCS Scheme

USN | | | | | | | | | | |

15AEL48

Fourth Semester B.E. Degree Examination, June/July 2017
(AE)
COMPUTER AIDED AIRCRAFT DRAWING

Time: 3 Hours | Max. Marks: 80

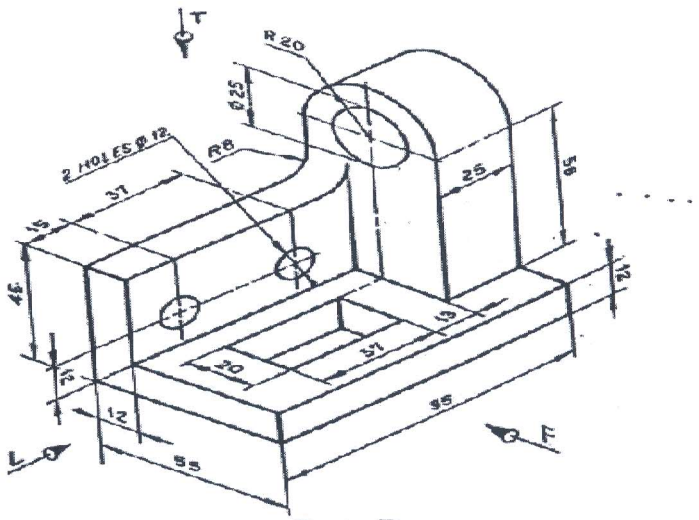
Note:

1. Answer any ONE question from each of the parts A, B & C
2. Use **FIRST ANGLE** projection only
3. Missing data if any may suitable may assumed
4. All the calculation should be on answer sheet supplied
5. All the dimensions are in mm
6. **Part C** assembled view should be in 3D and other 2 views in 2D

Part - A

1. A triangular pyramid of 30 mm side of base and axis 45 mm long is placed with its base on HP such that an edge of the base is parallel to VP and nearer to it. A cutting plane inclined at 60^0 to HP and perpendicular to VP bisects the axis of the pyramid. Draw the top and profile views in section. Also add the true shape of section. **15 Marks**

2. For the object shown below draw the front, top and right views. Show all the dimensions. **15 Marks**



Part - B

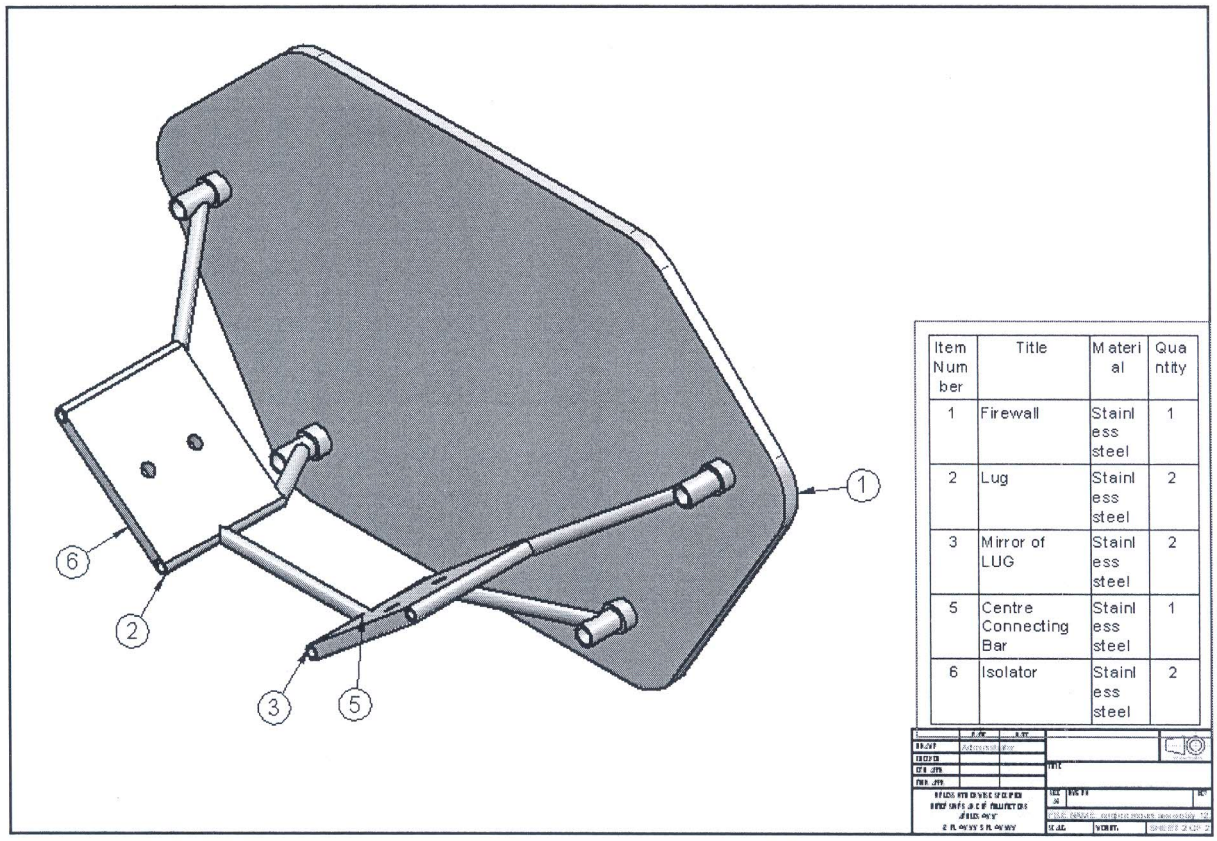
3. Draw 2 views of Square headed bolt with Nut for a 24 mm diameter bolt. Take length of bolt 120 mm. **15 Marks**

4. Draw the top and front views of a double riveted butt joint with double cover plates and zig-zag riveting. The thickness of the plate is 14 mm. Show at least three rivets in each row and two rivets in adjoining row. Indicate all the dimensions. **15 Marks**

Part - C

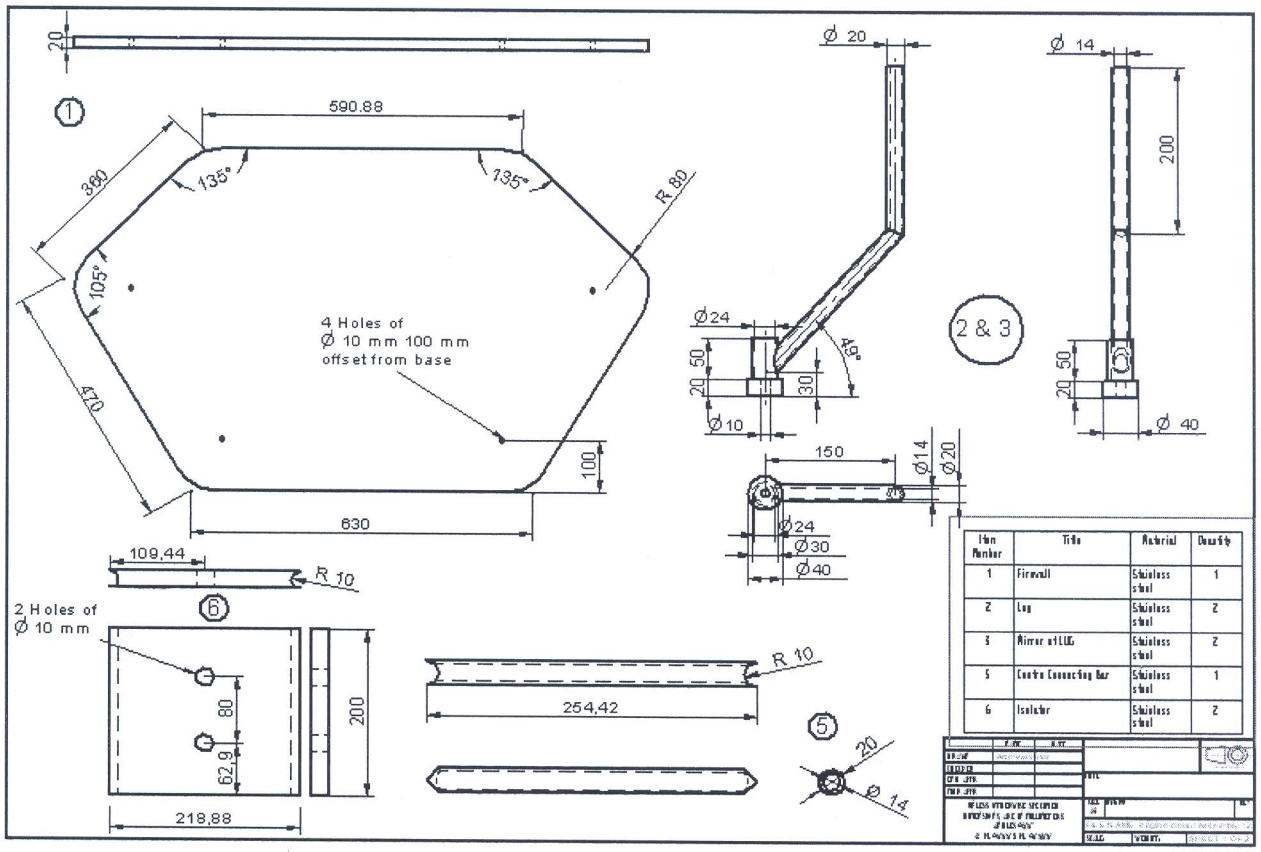
5. The details of an ENGINE MOUNT ASSEMBLY are shown in Fig. 1. Draw the following views of the assembly
   a. Front View b. Top view c. Left view **50 Marks**

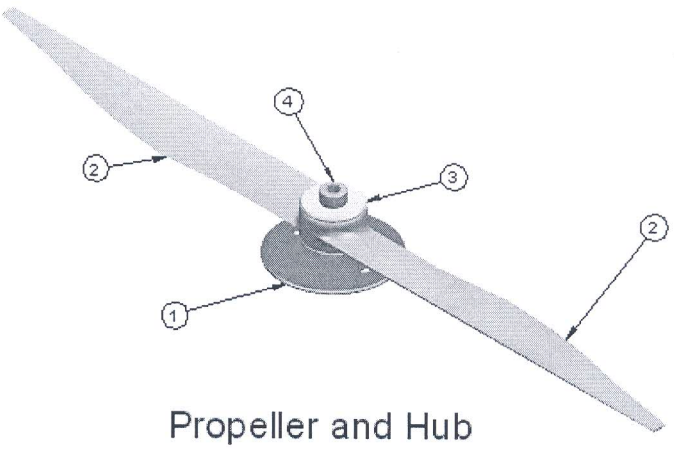
6. The details of a DESIGN OF PROPELLER AND HUB ASSEMBLY are shown in Fig. 2. Draw the following views of the assembly.
   a. Front View b. Top view c. Left view **50 Marks**



Item Number	Title	Material	Quantity
1	Firewall	Stainless steel	1
2	Lug	Stainless steel	2
3	Mirror of LUG	Stainless steel	2
5	Centre Connecting Bar	Stainless steel	1
6	Isolator	Stainless steel	2

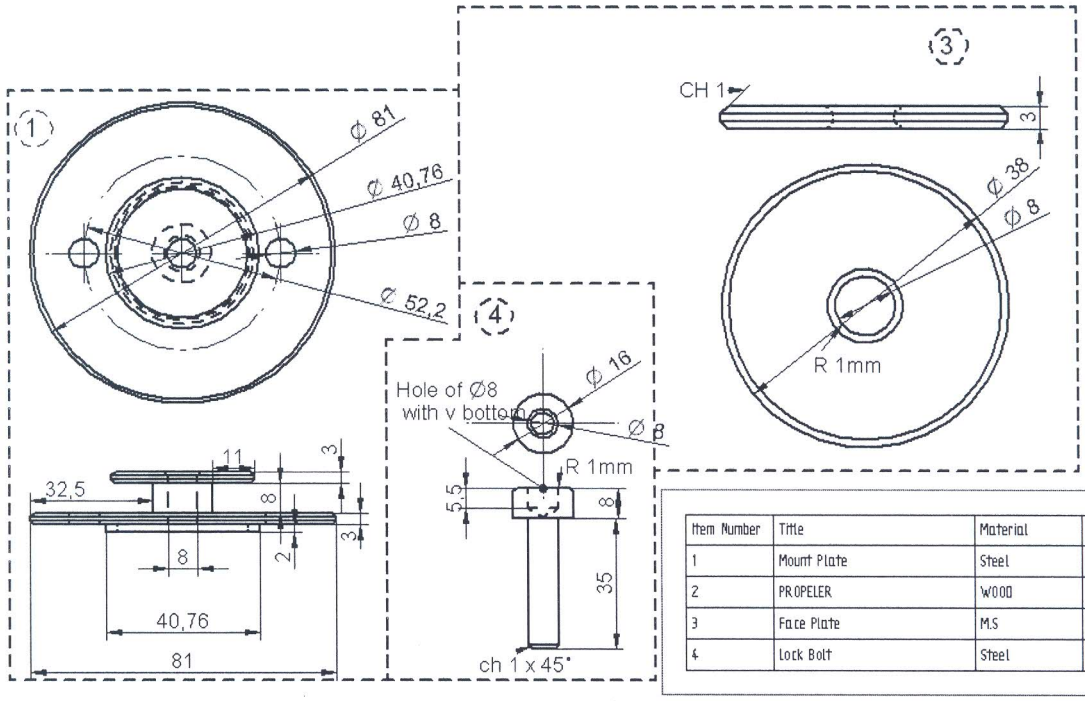
Fig 1



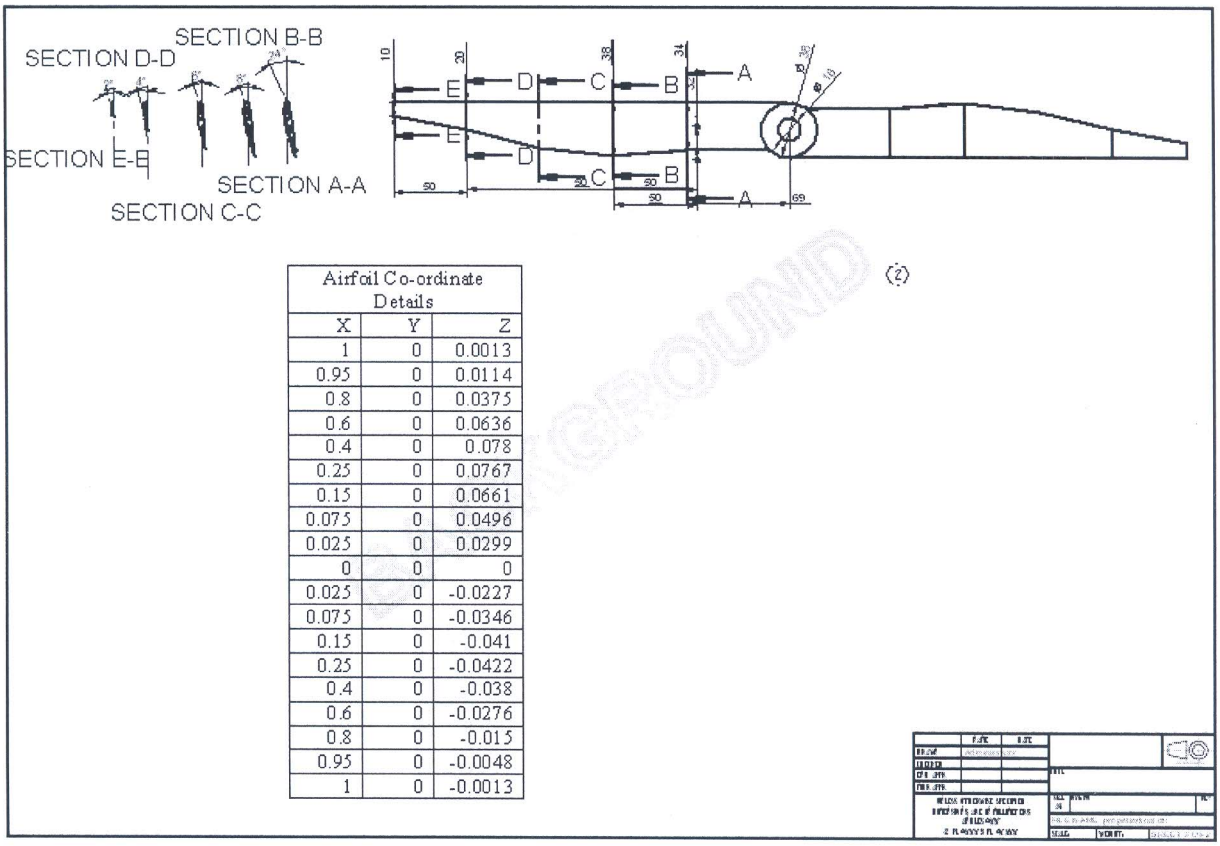


Propeller and Hub assembly (Iso View)

Item Number	Title	Material	Quantity
1	Mount Plate	Steel	1
2	PROPELER	WOOD	1
3	Face Plate	MS	1
4	Lock Bolt	Steel	1



Item Number	Title	Material	Quantity
1	Mount Plate	Steel	1
2	PROPELER	WOOD	1
3	Face Plate	M.S	1
4	Lock Bolt	Steel	1



Airfoil Co-ordinate Details		
X	Y	Z
1	0	0.0013
0.95	0	0.0114
0.8	0	0.0375
0.6	0	0.0636
0.4	0	0.078
0.25	0	0.0767
0.15	0	0.0661
0.075	0	0.0496
0.025	0	0.0299
0	0	0
0.025	0	-0.0227
0.075	0	-0.0346
0.15	0	-0.041
0.25	0	-0.0422
0.4	0	-0.038
0.6	0	-0.0276
0.8	0	-0.015
0.95	0	-0.0048
1	0	-0.0013

Fig. 2