



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.....

## School of Woodworking Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5<sup>th</sup> Sem.

1<sup>st</sup> In-Sem. Exam

Course Code: SCS1501

Course Name: Wood and panel manufacturing specialist

Time: 1 Hour

Max. Marks: 20

### Instruction:

- Answer all questions from section A, each question carries one mark.
- Answer all question from section B, each question carries two marks.
- Answer all question from section C, each question carries three marks

### Section A

05X01 = 05 Marks

- Q.1 Ergonomics is related to  
(A) Comfort (B) Safety  
(C) A&B Both (D)None of them
- Q.2 The following subjects is/are related to ergonomics  
(A) Anthropology (B) Physiology  
(C) Psychology (D) All of the above
- Q.3 What are the benefits of ergonomics?  
(A) Ergonomics reduces cost (B) Ergonomics increases cost  
(C) A&B Both (D)None of them
- Q.4 Which one is an ergonomics risk factor?  
(A) High task repetition (B)Forceful exertion  
(C) Repetitive/ Sustained awkward position (D) All of Them
- Q.5 Which one is the type of ergonomics?  
(A) Physical ergonomics (B)Cognitive Ergonomics  
(C) A&B Both (D) None of them

### Section B

03X02 = 06 Marks

- Q.6 What is ergonomics?  
Q.7 What are the benefits of ergonomics?  
Q.8 Classify the ergonomics with flow chart?

### Section C

03X03 = 09 Marks

- Q.9 Explain the term Physical Ergonomics with example.  
Q.10 What are ergonomics control? Discuss any two.  
Q.11 Write down the attributes for designing a comfortable chair.





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### Section A

05X01 = 05 Marks

- Q.1 Ergonomics is related to  
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### Section B

03X02 = 06 Marks

- Q.6 What is ergonomics?  
Q.7 What are the benefits of ergonomics?  
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### Section C

03X03 = 09 Marks

- Q.9 Explain the term Physical Ergonomics with example.  
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Answer Key

## School of Woodworking Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5<sup>th</sup> Sem.

1<sup>st</sup> In-Sem. Exam

*Answer key*

Course Code: SCS1501

Course Name: Wood and panel manufacturing specialist

Time: 1 Hour

Max. Marks: 20

### Instruction:

- Answer all questions from section A, each question carries one mark.
- Answer all question from section B, each question carries two marks.
- Answer all question from section C, each question carries three marks

### Section A

05X01 = 05 Marks

- Q1. Ergonomics is related to  
(A) Comfort (B) Safety  
(C) A&B Both (D)None of them Ans. C
- Q2. The following subjects is/are related to ergonomics  
(A) Anthropology (B) Physiology  
(C) Psychology (D) All of the above Ans. D
- Q3. What are the benefits of ergonomics?  
(A) Ergonomics reduces cost (B) Ergonomics increases cost  
(C) A&B Both (D)None of them Ans. C
- Q4. Which one is an ergonomics risk factor?  
(A) High task repetition (B)Forceful exertion  
(C) Repetitive/ Sustained awkward position (D) All of Them Ans. D
- Q5. Which one is the type of ergonomics?  
(A) Physical ergonomics (B)Cognitive Ergonomics  
(C) A&B Both (D) None of them Ans. C

### Section B

03X02 = 06 Marks

Q6. What is ergonomics?

Ans. Ergonomics is basically composed of two Greek words. The first word is 'ergo' which means work, and second word is 'nomos' which means study or laws.

So, as a combination of these two words we can state the definition of ergonomics as study of the work.

Q7. What are the benefits of ergonomics?

Ans. Ergonomics reduces costs

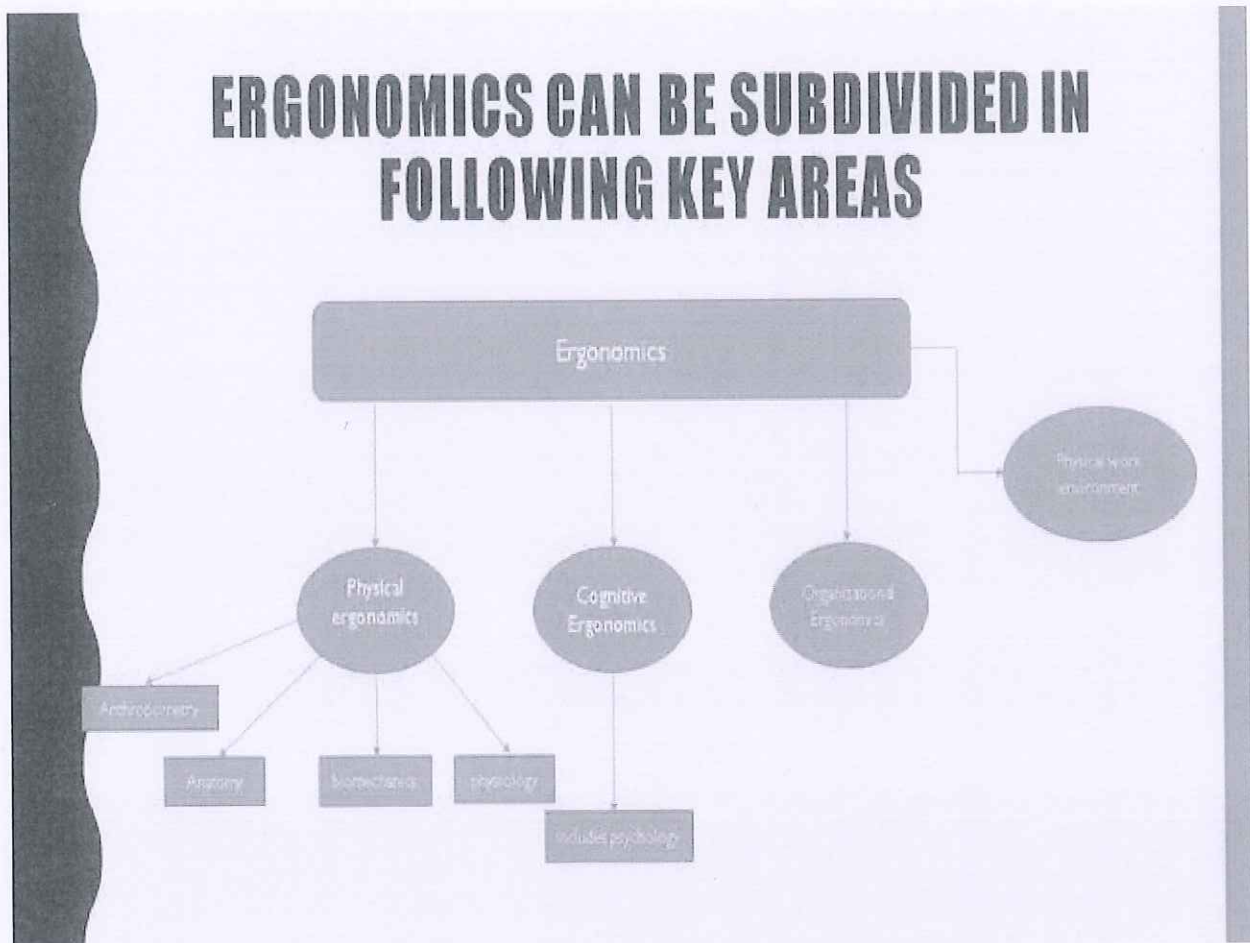




- Ergonomics improves productivity
- Ergonomics improves product quality
- Ergonomics increases employee engagement

Q8. Classify the ergonomics with flow chart?

Ans.



**Section C**

**03X03 = 09 Marks**

Q9. Explain the term Physical Ergonomics with example.

Ans. Physical ergonomics is concerned with the human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to physical activities. So, in a generalized sense, if you perform any work which is of which is related to putting physical efforts; so what are the effects what are the effects of that particular work on your body. So, study of these effects on your body and it is positive and negative effects when we do study that study comes in the physical ergonomics.



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Q10 What are ergonomics control? Discuss any two.

Ans. **Engineering Controls** – Eliminate or reduce awkward postures with ergonomic modifications that seek to maintain joint range of motion to accomplish work tasks within the mid-range of motion positions for vulnerable joints. Proper ergonomic tools should be utilized that allow workers to maintain optimal joint positions.

**Work Practice Controls** – Work procedures that consider and reduce awkward postures should be implemented. In addition, workers should be trained on proper work technique and encouraged to accept their responsibility to use their body properly and to avoid awkward postures whenever possible

Q11. Write down the attributes for designing a comfortable chair.

Ans. Before designing a chair following point must be noted.

- Seat dimensions and height
- Elbow rest height
- Cushion and Upholstery
- Back rest Height etc.





School of Woodworking Skills  
Session: 2020-21 (Summer Semester)  
B. Voc. Program, 5th Semester,  
1<sup>st</sup> In-Sem. Examination

Course Code: SC1505

Course Name: Advance Carpenter Mathematics

Instruction: Calculator is Permitted.

Time: 1 Hour

Max. Marks: 20

Section – A

05X01 = 05 Marks

Q. 1 The science of study of the thermodynamic properties of a mixture of dry air and water vapour in the atmosphere is called?

- a) Refrigeration
- b) Air Conditioning
- c) Psychrometry
- d) None of these.

Q. 2 The value of variable that occurs with greatest frequency in data set called as?

- a) Median
- b) Mode
- c) Mean
- d) None of these.

Q.3 Wet bulb temperature is the temperature of air recorded by a thermometer, when?

- a) it is not affected by the moisture present in the air
- b) its bulb is surrounded by a wet cloth exposed to the air
- c) the moisture present in it begins to condense
- d) None of the above.

Q.4 The temperature at which moisture present in the air is begins to condense is known as?

- (a) Dry bulb temperature
- (b) Wet bulb temperature
- (c) Dew point temperature
- (d) Wet bulb depression

Q.5 The oak wood has a mass of 134 kg and a volume of 194 dm<sup>3</sup> What is the density?

- (a) 1.44 kg/dm<sup>3</sup>
- (b) 0.69 kg/dm<sup>3</sup>
- (c) 0.89 kg/dm<sup>3</sup>
- (d) 1.34 kg/dm<sup>3</sup>

Section – B

03X02 = 06 Marks

Q.6 Briefly explain the following terms: a) Population and sampling b) Discrete variables?

Q.7 Air at a temperature of 85°C, contains an absolute humidity of 210 g/m<sup>3</sup>. what is the relative humidity of air? (Maximum humidity at 85°C is 353 g/m<sup>3</sup>)?

Q.8 The following table gives the height of 350 men. Calculate the mean height of the group?

Height in cm	No of persons
159	1
161	2
163	9
165	48
167	131
169	102
171	40
173	17

Section – C

03X03 = 09 Marks

Q.9 Explain briefly any two major influence of moisture content in the wood product?

Q.10 The floor of a room is 3.50m by 4.50m. The room height is 2.4m. The air has a relative humidity of 75% and a temperature of 18°C. How much water vapor is there in this air?

Q.11 Calculate average of the following by direct method?

Weekly Wages (INR)	Number of labours
11-13	3
13-15	4
15-17	5
17-19	6
19-21	5
21-23	4
23-25	3





School of Woodworking Skills  
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B. Voc. Program, 5th Semester,  
1<sup>st</sup> In-Sem. Examination

Course Code: SC1505

Time: 1 Hour

Course Name: Advance Carpenter Mathematics

Max. Marks: 20

Instruction: Calculator is Permitted.

Section – A

05X01 = 05 Marks

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B. Voc. Program, 5th Semester,  
1<sup>st</sup> In-Sem. Examination

*Answer key*

Course Code: SCS1505

Time: 1 Hour

Course Name: Advance Carpenter Mathematics

Max. Marks: 20

Instruction: Calculator is Permitted.

Section – A

05X01 = 05 Marks

Q.1 The science of study of the thermodynamic properties of a mixture of dry air and water vapour in the atmosphere is called

- a) Refrigeration
- (b) Air Conditioning
- (c) Psychrometry
- (d) None of these. (c)

2) The value of variable that occurs with greatest frequency in data set called as

- (a) Median
- (b) Mode
- (c) Mean
- (d) None of these. (b)

3) Wet bulb temperature is the temperature of air recorded by a thermometer, when

- (a) it is not affected by the moisture present in the air
- (b) its bulb is surrounded by a wet cloth exposed to the air
- (c) the moisture present in it begins to condense
- (d) None of the above. (a)

4) The temperature at which moisture present in the air is begins to condense is known as

- (a) Dry bulb temperature
- (b) Wet bulb temperature
- (c) Dew point temperature
- (d) Wet bulb depression (c)

5) The oak wood has a mass of 134 kg and a volume of 194 dm<sup>3</sup> What is the density?

- (a) 1.44 kg/dm<sup>3</sup>
- (b) 0.69 kg/dm<sup>3</sup>
- (c) 0.89 kg/dm<sup>3</sup>
- (d) 1.34 kg/dm<sup>3</sup> (b)

Section – B

03X02 = 06 Marks

Q. 6 Briefly explain the following terms: a) Population and sampling b) Discrete variables.

(a) Population and sampling: A population includes all members of that target group and the number of people in that population is usually labeled. Its is a collection of all possible individuals, objects, or measurements of interest. A sample is a portion, or part, of the population of interest. The main issue with samples is whether they are representative of a population, whether the subjects in the sample accurately reflect the subjects of the population. The best way to ensure a representative sample is through *random sampling*,



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which involves selecting people from a population at random and without bias. A sample is a **portion**, or **part**, of the population of interest.

(b) Discrete variables: A discrete variable is a variable whose possible values are some or all of the ordinary counting numbers like 0, 1, 2, 3, . . . . As a definition, we can say that a variable is discrete if it has only a countable number of distinct possible values. Some variables, such as the numbers of children in family, the numbers of car accident on the certain road on different days, or the numbers of students taking basics of statistics course are the results of counting and thus these are discrete variables.

Q.7 Air at a temperature of 85°C, contains an absolute humidity of 210 g/m<sup>3</sup>. what is the relative humidity of air? (Maximum humidity at 85°C is 353 g/m<sup>3</sup>)

Solution: Given

Relative humidity ( $\varphi_{rel}$ ) = ?

Absolute humidity ( $\varphi_{abs}$ ) = 210 g/m<sup>3</sup>

$$\varphi_{rel} = \frac{\varphi_{abs} \times 100\%}{\varphi_{Max}}$$

**Ans: 59.49%**

Q.8 The following table gives the height of 350 men. Calculate the mean height of the group.

Height in cm	No of persons
159	1
161	2
163	9
165	48
167	131
169	102
171	40
173	17

Solution:

Height	No of persons	Deviation from assumed mean	Step Deviation	Total deviation
--------	---------------	-----------------------------	----------------	-----------------

<i>in cm (x)</i>	<i>f</i>	<i>167 dx</i>	<i>dx</i>	<i>(fdx)</i>
159	1	-8	-4	-4
161	2	-6	-3	-6
163	9	-4	-2	-18
165	48	-2	-1	-48
167	131	0	0	0
169	102	2	1	102
171	40	4	2	80
173	17	6	3	51

**Ans :**  $X = 167 + \left( \frac{\sum fdx}{\sum f} \times 2 \right) = 167.8$

**Section – C**

03X03 = 09 Marks

Q.9 Explain briefly any two major influence of moisture content in the wood product.

Ans:- Wood is a material that continually absorbs or releases moisture until it reaches a balance with its surroundings. In normal use the moisture content of wood varies between 8% and 25% by weight, depending on the relative humidity of the air. On the other hand, an excess of moisture in wood can cause other problems, including, but not limited to: Preventing adhesives from making a secure bond (Less strength) and Shrinkage as the excess moisture leaves the wood:

Shrinkage occurs as moisture content decreases, while swelling takes place when it increases. Volume change is not equal in all directions. The greatest dimensional change occurs in a direction tangential to the growth rings. Shrinkage from the pith outwards, or radially, is usually considerably less than tangential shrinkage, while longitudinal (along the grain) shrinkage is so slight as to be usually neglected. The longitudinal shrinkage is 0.1% to 0.3%, in contrast to transverse shrinkages, which is 2% to 10%. Tangential shrinkage is often about twice as great as in the radial direction, although in some species it is as much as five times as great. The shrinkage is about 5% to 10% in the tangential direction and about 2% to 6% in the radial direction.

Q.10 The floor of a room is 3.50m by 4.50m. The room height is 2.4m. The air has a relative humidity of 75% and a temperature of 18°C. How much water vapor is there in this air?

Solution:

Given:

Relative humidity: 75%

Maximum humidity at 18 °C is 15.4 g/m<sup>3</sup>

$$\varphi_{\text{absolulte}} = \frac{75\% \times 15.4}{100\%} = 11.55 \text{ g/m}^3$$

$$V = l \times b \times h = 4.5 \times 3.5 \times 2.4 = 37.8 \text{ m}^3$$

Amount of water vapor: 37.8 × 11.55 = 436.59 g/m<sup>3</sup>

**Ans: 436.59 g/m<sup>3</sup>**

Q.11 Calculate average of the following by direct method.

Weekly Wages (INR)	Number of labours
11-13	3
13-15	4
15-17	5
17-19	6
19-21	5
21-23	4
23-25	3

Solution:

**Solution: Direct Method**

**Computation of the average daily wages of labourers**

Wages in Rupees (X)	No. of labourers (f)	Mid-values of the wage groups (mv)	Wages multiplied by the no. of labourers (mf)
11—13	3	12	36
13—15	4	14	56
15—17	5	16	80
17—19	6	18	108
19—21	5	20	100
21—23	4	22	88
23—25	3	24	72
<b>N=30</b>			<b>Σmf=540</b>

$$\text{Arithmetic Mean or } \bar{X} = \frac{\Sigma mf}{N}$$

We get 
$$\bar{X} = \frac{540}{30} = 18 \text{ Rupees}$$

Thus the average daily wages paid to a labourer is Rs. 18.



School of Woodworking Skills  
Session: 2020-21 (Winter Semester)  
B. Voc. Program, 5<sup>th</sup> Semester,  
1<sup>st</sup> In-Sem. Examination

Course Code: SCS1506

Time: 2 Hour

Course Name: CAD 3D Drawing

Max. Marks: 20

**Instruction:**

1. Answer all questions from section A, each question carries one mark.
2. Answer all questions from section B, each question carries two mark.
3. Answer all questions from section C, each question carries six mark.

**Section – A**

04X01 = 04 Marks

Q.1 Which one of the following is not the product of PYTHA?

- |             |                       |
|-------------|-----------------------|
| a) Drawings | b) C Language Scripts |
| c) Nesting  | d) Part List          |

Q.2 Which of the following scales is a reducing scale?

- |         |                       |
|---------|-----------------------|
| (a) 3:1 | (b) 1:3               |
| (c) 1:1 | (d) None of the above |

Q.3 How much faces a Cuboid contain?

- |      |       |
|------|-------|
| a) 6 | b) 4  |
| c) 8 | d) 12 |

Q.4 Which is not a unit of length measurement\_\_\_\_\_?

- |           |                |
|-----------|----------------|
| (a) Yards | (b) Millimeter |
| (c) Grads | (d) Microns    |

**Section – B**

02X2 = 04 Marks

Q.5 What is 3D modelling and specify its four advantages?

Q.6 Define basic need of part list creation and also define any four advantages.

**Section – C**

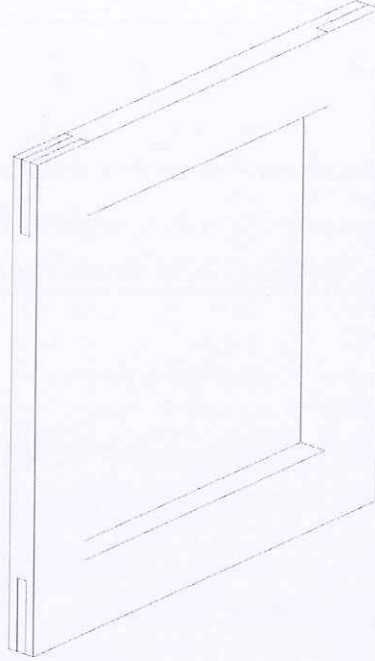
02X06 = 12 Marks

Q.7 Draw all required possible views and show details of a Frame with following aspects-

- a) Length – 400
- b) Depth – 24
- c) Height – 400
- d) Wood material thickness – 60 mm x 24 mm.

e) Note:

- Each corner has wooden Joinery.
- Left Side Top & Bottom Corner – Corner Bridle Joint
- Right Side Top & Bottom Corner – Half Lap Joint



(For Your Reference)

Q.8 Generate part list of drawn objects (Refer to question 7).



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School of Woodworking Skills  
Session: 2020-21 (Winter Semester)  
B. Voc. Program, 5<sup>th</sup> Semester,  
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*Answer key*

Course Code: SCS1506

Course Name: CAD 3D Drawing

Time: 2 Hour

Max. Marks: 20

**Instruction:**

1. Answer all questions from section A, each question carries one mark.
2. Answer all questions from section B, each question carries two mark.
3. Answer all questions from section C, each question carries six mark.

**Section – A**

04X01 = 04 Marks

Q.1 Which one of the following is not the product of PYTHA?

- |             |                       |     |
|-------------|-----------------------|-----|
| a) Drawings | b) C Language Scripts |     |
| c) Nesting  | d) Part List          | (b) |

Q.2 Which of the following scales is a reducing scale?

- |         |                       |     |
|---------|-----------------------|-----|
| (a) 3:1 | (b) 1:3               |     |
| (c) 1:1 | (d) None of the above | (b) |

Q.3 How much faces a Cuboid contain?

- |      |       |     |
|------|-------|-----|
| a) 6 | b) 4  |     |
| c) 8 | d) 12 | (a) |

Q.4 Which is not a unit of length measurement\_\_\_\_\_?

- |           |                |     |
|-----------|----------------|-----|
| (a) Yards | (b) Millimeter |     |
| (c) Grads | (d) Microns    | (c) |

**Section – B**

02X2 = 04 Marks

Q.5 What is 3D modelling and specify its four advantages?

**Ans.** It is used to create virtual three dimensional model of some physical object. A 3D CAD model includes not only x and y coordinates, but also the Z coordinate. A simple 3-D model is a wire frame model consisting only the lines, circles and curves. 3D modelling is used in various industries including video games, 3D printing, computer aided design and manufacturing.

Advantages -

1. Work efficiently and save time.
2. Execute control and accuracy – In 3D model accuracy can be maintained and each component of the product measured and analyzed separately.



3. Avoid costly mistakes-In 3D modelling any flaws can be corrected before finalizing the product thus it avoids costly mistakes.
4. Better for marketing and product approval.

Q.6 Define basic need of part list creation and also define any four advantages.

Ans. Parts list also known as a bill of materials (BOM). It is a tabular list of the items used to make a project. Parts list is usually combined with the assembly drawing, but it is a separate and individual document and can be and provides a complete list of all parts needed to build the complete project. The PYTHA part list compares the parts and groups in a project to each other and analyzes this information in a table. Thereby, elements with the same properties are added. As soon as at least one of its attributes differs from others, the respective part will be listed individually. You can define freely which part properties shall be compared (e.g. the name, article number, the part's dimensions, material etc.). In order to do so, all the attributes, as well as the dimensions, are read out the current project and are therefore always up-to-date with the construction.

Advantages:

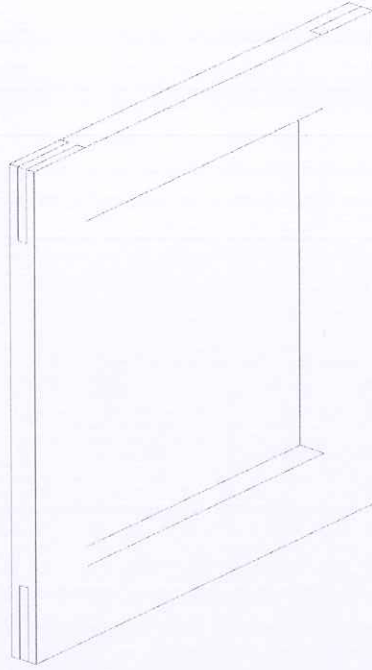
- a) Time saving while drawing reading
- b) Easy material calculation for nesting
- c) Tabular detail of material attributes
- d) Less chance of having mistaken in terms of final cutting

## Section – C

02X06 = 12 Marks

Q.7 Draw all required possible views and show details of a Frame with following aspects-

- a) Length – 400
- b) Depth – 24
- c) Height – 400
- d) Wood material thickness – 60 mm x 24 mm.
- e) Note:
  - Each corner has wooden Joinery.
  - Left Side Top & Bottom Corner – Corner Bridle Joint
  - Right Side Top & Bottom Corner – Half Lap Joint



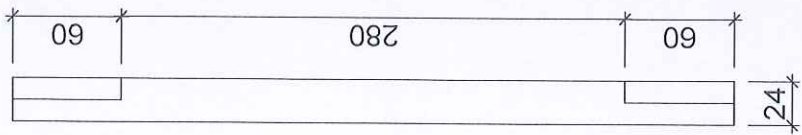
(For Your Reference)

**Ans.** Refer attachment 1 for question 7.

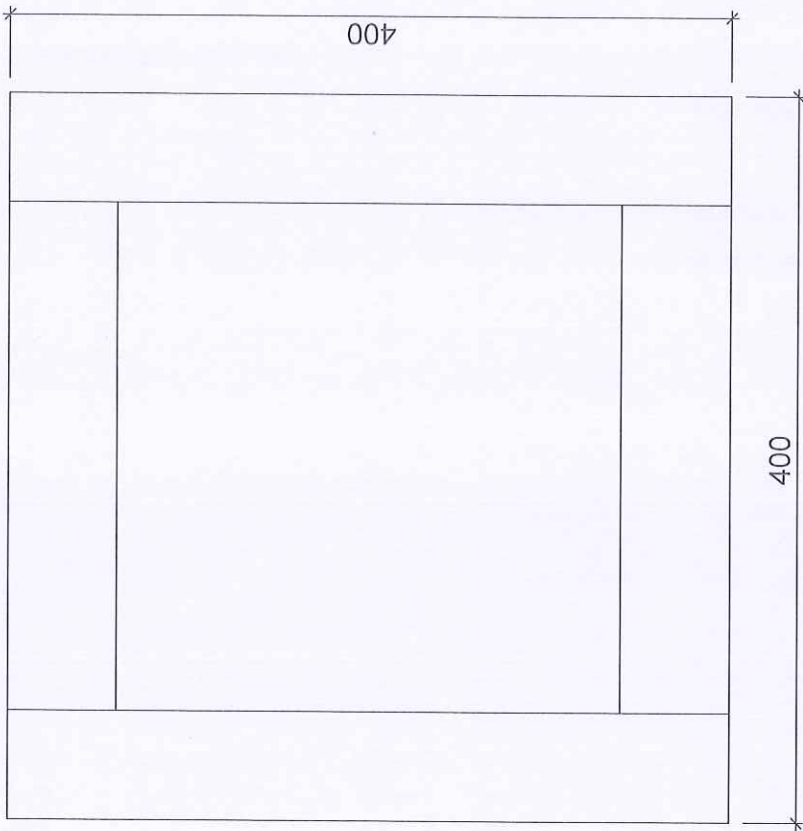
Q.8 Generate part list of drawn objects (Refer to question 7).

**Ans.** Refer attachment 2 for question 8.

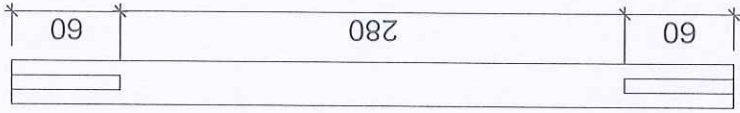
Side View



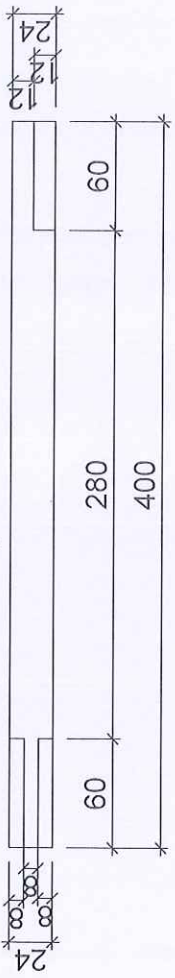
Front View



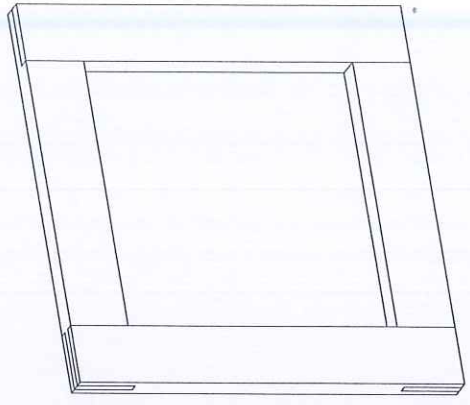
Side View

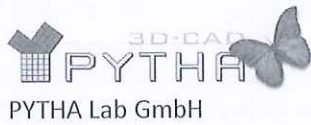


Top View



Axonometry View





Project : Frame

Customer : School of Woodworking Skills

### Part List

<i>Qty.</i>	<i>Name (tree)</i>	<i>Length</i>	<i>Width</i>	<i>Thickness</i>
1	Top	400.0	60.0	24.0
1	Bottom	400.0	60.0	24.0
1	Side -Right	400.0	60.0	24.0
1	Side Left	400.0	60.0	24.0

Submitted By -

Name : XXXXX XXXXXX  
Reg. No. : xxxxxxxxxxxxxx  
Semester : V Sem.  
Title : Frame  
Subject : CAD 3D Drawing  
Sub. Code : SCS1506  
Date : Xx/xx/xxxx  
School : School of Woodworking Skills

