BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration no.----------

Set A.

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 5th Semester,

End Sem. Examination

Course Code: SCS1501 **Time: 2 Hour**
Course Name: Wood and Panel Manufacturing Specialist **Max. Marks: 50**
Instruction:

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

Section A

10X01 = 10 Marks

Q. 1 Which one of the following be the function of emergency button?
(A) press any time (B) press while machine has to stop
(C) press at the need of emergency (D) None of these.

Q. 2 Which one of the following is controlled on the outfeed table of the surface planner?
(A) Thickness (B) Angle
(C) depth (D)None of them

Q. 3 Which one of the following is the function of protective hood?
(A) it keeps the kerf open (B) it avoid kick back
(C) Down the main saw (D) All of these

Q. 4 Scheduling helps in
(A) Planning for the project (B) Financial control of project
(C) Carrying out project in orderly manner (D)All of them

Q. 5 Loading may be defined as

(A) Sending the raw material to the machine
(B) Sending the finished material to the store
(C) Assign the work to the facilities

(D) Uploading a software in machine control panel

Q. 6 The Bill of material does not consist of

(A) Part number
(B) Specifications of part
(C) Name of the part
(D) Price of the part

Q. 7 What are the functions of production planning and control.

(A) Loading (B) Scheduling
(C) A & B Both (D)) None of them

Q. 8 What is CNC?

(A) Computer Numerical Control (B) Numerical Control
(C) A & B Both (D) None of them

Q. 9 Ergonomics is related to

(A) Human Comfort (B) Safety
(C) Both A & B (D) None of them

Q. 10 The safe exposure limit of noise level for working 8 hours per day

(A) 120 dBA (B) 90 dBA
(C) 115 dBA (D) All of them

Section B

04X04 = 16 Marks

Q. 11 What do you mean by production planning and control? Explain.

Q. 12 Classify the ergonomics .

Q. 13 What do you understand by closed loop control system? Explain with diagram.

Q. 14 What do you mean by break even analysis

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Section C

04X06 = 24 Marks

Q. 15 What is Economic Order Quantity? Derive the expression for calculating EOQ?

Q. 16 Write the short note on following Inventory cost?

a) Purchase Cost
b) Ordering Cost/Set-up Cost

Q. 17 The following details are available regarding a project:

Activity	Predecessor Activity	Duration (Weeks)
A	-	3
B	A	5
C	A	7
D	B	10
E	C	5
F	D,E	4

Determine the critical path, the critical activities and the project completion time.

Q. 18 A furniture making unit uses EOQ logic to determine the order quantity for purchasing MDF and planning its orders. The Annual consumption is 100,000 units, Cost to place one order is Rs. 1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ, No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory.

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Answer Key

Set A.

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

Course Code: SCS1501 **Time: 2 Hour**
Course Name: Wood and Panel Manufacturing Specialist **Max. Marks: 50**
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Section A

10X01 = 10 Marks

Q. 1 Which one of the following be the function of emergency button?
(A) press any time (B) press while machine has to stop
(C) press at the need of emergency (D) None of these. Ans. C

Q. 2 Which one of the following is controlled on the outfeed table of the surface planner?
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(C) depth (D)None of them Ans. B

Q. 3 Which one of the following is the function of protective hood?
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(C) Down the main saw (D) All of these Ans. B

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(A) Part number
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(C) Name of the part
(D) Price of the part Ans. D

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(B) Scheduling
(C) A & B Both
(D)) None of them
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(A) Computer Numerical Control
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(A) Human Comfort
(B) Safety
(C) Both A & B
(D) None of them
Ans. C

Q. 10 The safe exposure limit of noise level for working 8 hours per day

(A) 120 dBA
(B) 90 dBA
(C) 115 dBA
(D) All of them
Ans. B

Section B

04X04 = 16 Marks

Q. 11 What do you mean by production planning and control? Explain.

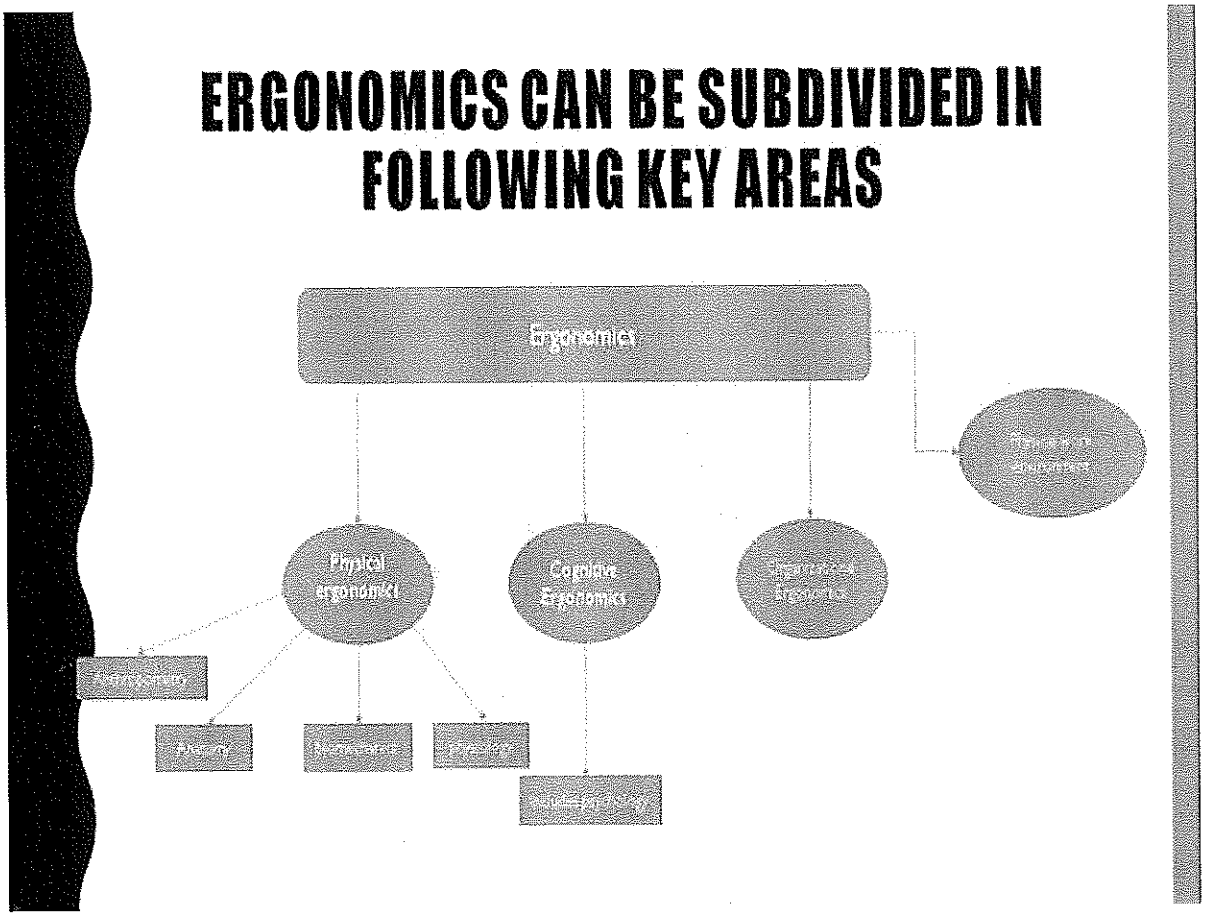
Ans. Production planning- It is a managerial function which mainly concerned with the following issues

- What facilities are required?
- How these facilities should be laid out in space available for production?
- How these facilities should be used to produce the desired product?

Thus Production planning is dynamic in nature and always remain in fluid state as the plan has to be changed depend upon

Q. 12 Classify the ergonomics .

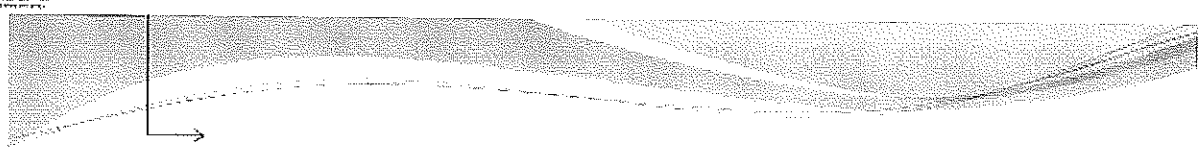
Ans.

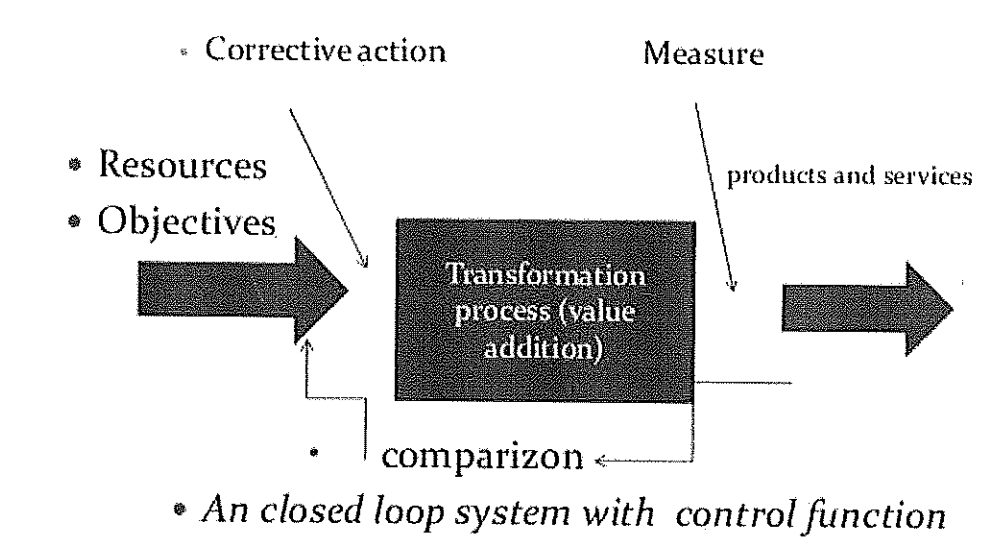


Q. 13 What do you understand by closed loop control system? Explain with diagram.

Ans. Closed-Loop Control System-

The closed-loop control system can be defined as the output of the system that depends on the input of the system. This control system has one or more feedback loops among its input & output. This system provides the required output by evaluating its input. This kind of system produces the error signal and it is the main disparity between the output and input of the system.





Q. 14 What do you mean by break even analysis

Ans. One of the technique to study the total cost , total revenue and output relationship is known as **Break Even Analysis.**

Hence, Break Even Analysis is the study of cost, volume of production and profit relationship.

It is an analysis to study the point where neither profit nor loss is occurred. This pint is known as **Break Even Poi**nt. This break Even Analysis can be done in two ways:

1.Algebraic method

2.Graphical method

But, usually a Break Even Analysis is done graphically

Section C

04X06 = 24 Marks

Q. 15 What is Economic Order Quantity? Derive the expression for calculating EOQ?

Ans- The economic order quantity, or EOQ, is a calculation designed to find the optimal order quantity for businesses to minimize logistics costs, warehousing space, stock outs, and overstock costs.

Calculating the EOQ for our business offers several benefits that impact our bottom line. It's a great way to grasp how much product needs to be purchased to maintain an

efficient ecommerce supply chain while keeping costs down. The formula for economic order quantity is:
EOQ = square root of: [2SD] / H
S = Setup costs (per order, generally including shipping and handling)
D = Demand rate (quantity sold per year)
H = Holding costs (per year, per unit)

Q. 16 Write the short note on following Inventory cost? n.

a) Purchase Cost
b) Ordering Cost/Set-up Cost

Ans.- Inventory Costs: For deciding the best suitable inventory policy, the top most criteria used is the cost function. This inventory analysis has four major components:

- Purchase Cost
- Ordering Cost/Set-up Cost
- Carrying Cost
- Stockout Cost:

• Purchase Cost: This is basically the nominal cost of an inventory. It is the cost incurred in buying from the outside sources, and it would be known as production cost if the items are produced within the organization. The cost is constant for a unit but may vary according to the quantity purchased increases or decreases. For example, the unit price is Rs.20 for up to 100 units and Rs.19.50 for more than 100 units. If a unit cost is constant, the control decisions would not have any affect because whether all the requirements are produced just once or made in installments the total amount of money involved would be the same.

• Ordering Cost/Set-up Cost: This occurs whenever the stock replenishes. It associates with the processing and chasing the purchased order, transportation, and inspection for quality. It is also called procurement cost. The parallel of ordering cost when the units are produced within the organization is the set-up cost. It refers to cost incurred in relation to developing production schedules. The ordering cost and set-up cost are taken to be independent to the order size. So the unit ordering/set-up cost decreases as the purchase order increases.

• Carrying Cost: Carrying cost is also known as holding cost and it refers to the cost that is associated with storing an item in the inventory. It is proportional to the amount of inventory and the time taken to hold that inventory. The elements of carrying cost include opportunity cost, obsolescence cost, deterioration cost. The carrying cost is expressed in terms of rate per unit or as a percentage of the inventory value.

• Stock out Cost: Stock out cost is the cost, which incurs when customers are not being served. These costs imply shortages. If stock out is internal, that means that some production is lost internally

Q. 17 The following details are available regarding a project:

Activity	Predecessor Activity	Duration (Weeks)
A	-	3
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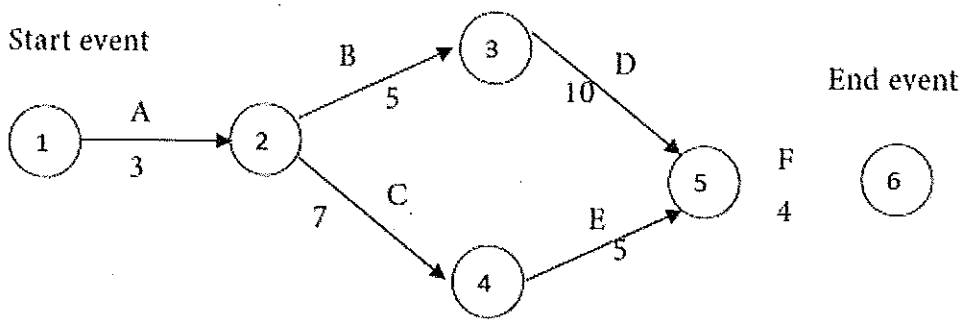
D	B	10
E	C	5
F	D,E	4

Determine the critical path, the critical activities and the project completion time.

Ans.



Q 18. A furniture making unit uses EOQ logic to determine the order quantity for purchasing MDF and planning its orders. The Annual consumption is 80,000 units, Cost

to place one order is Rs. 1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ, No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory.

Solution

1. Economic Order Quantity

$$EOQ = \sqrt{\frac{2 * RU * OC}{UC * CC\%}}$$

$$EOQ = \sqrt{\frac{2 * 80{,}000 * 1{,}200}{50 * 6\%}}$$

EOQ =8000 Units

2. Number of Order Per Year

No of order per year = Annual Requirements / EOQ

No of order per year = 80,000 / 8,000

No of order per year = 10 Orders per year

3. Ordering Cost

*Ordering Cost = Fixed ordering cost (F) * Number of Order per year N*

Ordering Cost = 1,200 * 10

Ordering Cost = 12,000 Rupees

4. Carrying Cost

Carrying Cost = Carrying Cost (C) EOQ/2*

Carrying Cost =50*0.06* 8,000/2

Carrying Cost =12,000 Rupees

5. Total Inventory Cost

Total Inventory Cost = Ordering cost + Carrying Cost

Total Inventory Cost = 12,000 + 12,000

Total Inventory Cost = 24,000 Rupees

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration no----------

Set B.

School of Woodworking Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5th Semester,

End Sem. Examination

Course Code: SCS1501 **Time: 2 Hour**
Course Name: Wood and Panel Manufacturing Specialist **Max. Marks: 50**
Instruction:

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

Section A

10X01 = 10 Marks

Q. 1 Which one of the following is controlled on the outfeed table of surface planner

(A) Height (B) Thickness
(C) Angle (D) All of them

Q. 2 Ergonomics is related to
(A) Human Comfort (B) Safety
(C) Both A & B (D) None of them

Q. 3 Activity in a network diagram is represented by

(A) Rectangle (B)Arrow
(C) Square (D) Circle

Q. 4 Scheduling helps in

(A) Planning for the project (B) Financial control of project
(C) Carrying out project in orderly manner (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

Q. 6 What are the inventory costs?

(A) Purchase cost
(B) Ordering cost
(C) Holding cost
(D) All of the above

Q. 7 What happens when a project is scheduled by CPM?

A. A project is divided into various activities
B. Required time for each activity is established
C. A sequence of various activities is made according to their importance
D. All of the above

Q. 8 How many levels are in production planning?

(A) 1
(B) 2
(C) 3
(D)None of them

Q. 9 A Network diagram includes

(A) Activity
(B) Node
(C) Event
(D) All of them

Q.10 What is the optimum depth of cut in thickness planner?

(A) 12 mm
(B) 4 mm
(C) 8mm
(D) 1mm

Section B

04X04 = 16 Marks

Q. 11 Explain the open Control System with Diagram.

Q. 12 Explain the following terms

a) planning
b) Scheduling

Q. 13 What are the attributes for making a work bench?

Q14. Draw the network Diagram of following project

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Activity	Predecessor Activity
A	-
B	A
C	A
D	B
E	C
F	D,E

Section C

04X06 = 24 Marks

Q. 15 What is Economic order quantity? Explain with proper graph.

Q. 16 ABC Ltd. uses EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs. 1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ, No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory.

Q. 17 Write down short note on following
a) Carrying Cost
b) Stockout Cost

Q. 18 Explain the Break -even analysis with proper diagram

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer Key

Set B.

School of Woodworking Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 5th Semester,

End Sem. Examination

Course Code: SCS1501 **Time: 2 Hour**
Course Name: Wood and Panel Manufacturing Specialist **Max. Marks: 50**
Instruction:

- Answer all questions from section A, each question carries one mark.
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Section A

10X01 = 10 Marks

Q1. Which one of the following is controlled on the outfeed table of surface planner

(A) Height (B) Thickness
(C) Angle (D) All of them Ans. A

Q2. Ergonomics is related to

(A) Human Comfort (B) Safety
(C) Both A & B (D) None of them Ans. C

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A. A project is divided into various activities

B. Required time for each activity is established
C. A sequence of various activities is made according to their importance
D. All of the above

Ans. D

Q8. How many levels are in production planning?

(A) 1 (B) 2
(C) 3 (D)None of them

Ans. C

Q9. A Network diagram includes

(A) Activity (B) Node
(C) Event (D) All of them

Ans. D

Q.10 What is the optimum depth of cut in thickness planner?
(A) 12 mm (B) 4 mm
(C) 8mm (D) 1mm

Ans. B

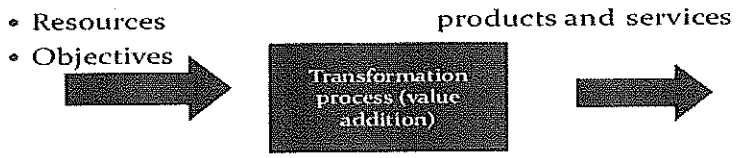
Section B

04X04 = 16 Marks

Q11. Explain the open Control System with Diagram.

Ans. Open Loop Control System-
In this kind of control system, the output doesn't change the action of the control system otherwise; the working of the system which depends on time is also called the open-loop control system. It doesn't have any feedback. It is very simple, needs low maintenance, quick operation, and cost-effective. The accuracy of this system is low and less dependable. The example of the open-loop type is shown below. The main advantages of the open-loop control system are easy, needs less protection; operation of this system is fast & inexpensive and the disadvantages are, it is reliable and has less accuracy.

OPEN LOOP CONTROL SYSTEM



• *An open loop system with no control*

Q12. Explain the following terms

a) planning

b) Scheduling

Ans. **Planning**

This is the first and the most important element of production planning and control. Planning refers to deciding in advance what is to be done in future. A separate planning department is established in the organization which is responsible for the preparation of policies and plans with regard to production to be undertaken in due course.

Scheduling

Scheduling in simple words means fixation of time and date when each operation is to be commenced and completed. It is an important part of production control as all future

Production Planning and Control process of production is based on it. Scheduling lays down ground work for all subsequent.

Q13. What are the attributes for making a Work Bench?

Ans. Attributes

- Material Quality
- Height of the Top of work bench also must be ensure it should be at the elbow of the worker
- Material should have a good strength to bear impact while hammering.
- Overall dimensions (length width and thickness) of all the parts.
- Wood must be properly seasoned.
- Joint must be perfectly made also have a good strength.
- Use of good quality glue.

Q14. Draw the network Diagram of following project

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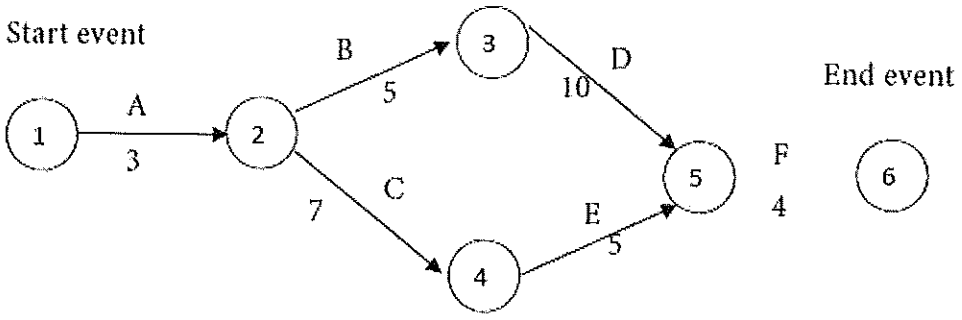
Activity	Predecessor Activity
A	-
B	A
C	A
D	B
E	C
F	D,E

Ans



Section C

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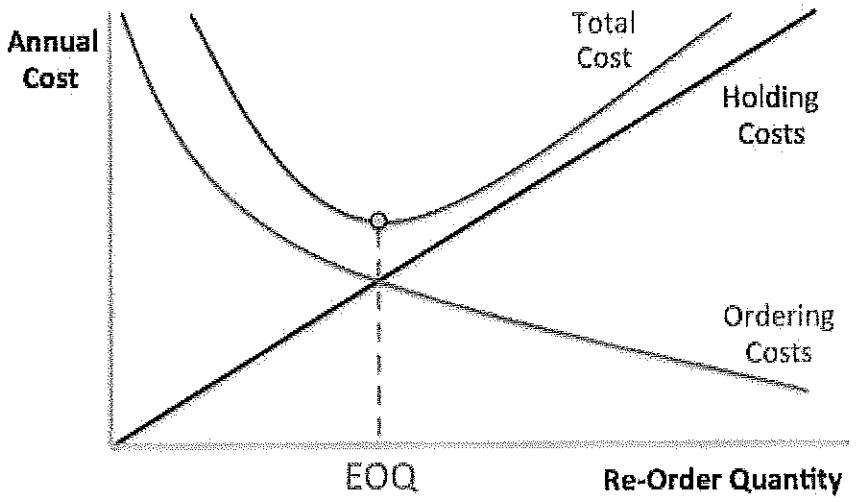
Calculating the EOQ for our business offers several benefits that impact our bottom line. It's a great way to grasp how much product needs to be purchased to maintain an efficient ecommerce supply chain while keeping costs down.



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Ordering Cost = 12,000 Rupees

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Carrying Cost =50*0.06* 8,000/2

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Total Inventory Cost = Ordering cost + Carrying Cost

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• Stock out Cost: Stock out cost is the cost, which incurs when customers are not being served. These costs imply shortages. If stock out is internal, that means that some production is lost internally

Q. 18 Explain the Break -even analysis with proper diagram

Ans. One of the technique to study the total cost , total revenue and output relationship is known as **Break Even Analysis.**

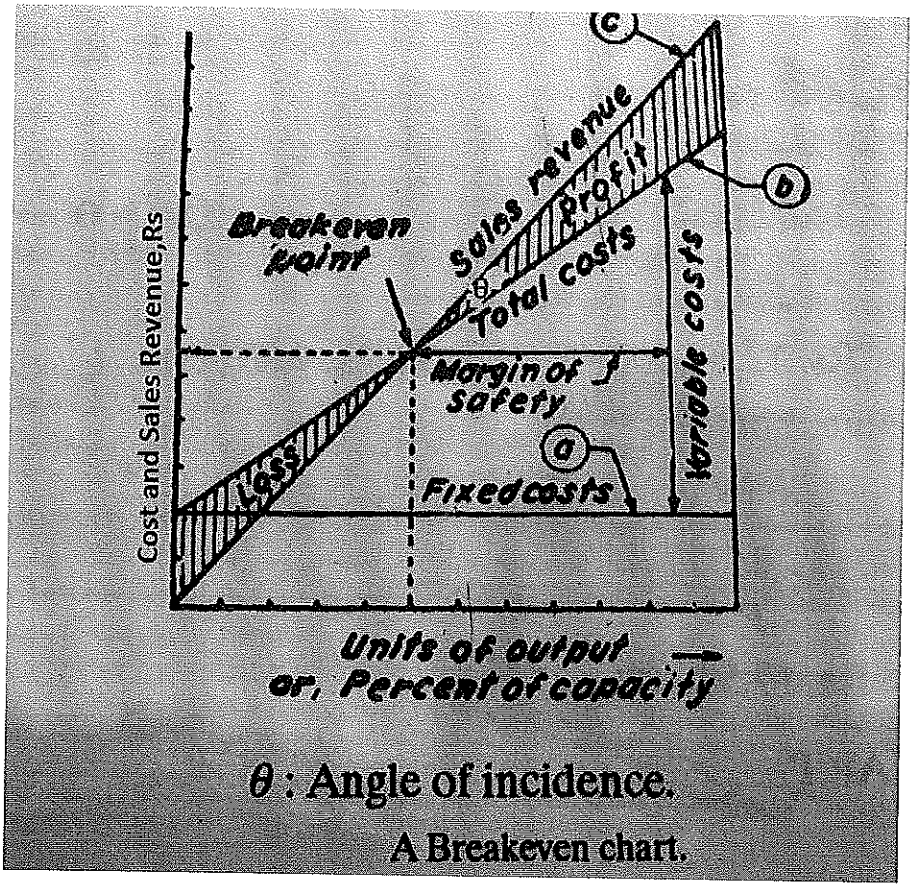
Hence, Break Even Analysis is the study of cost, volume of production and profit relationship.

It is an analysis to study the point where neither profit nor loss is occurred. This pint is known as **Break Even Point**. This break Even Analysis can be done in two ways:

1.Algebraic method

2.Graphical method

But, usually a Break Even Analysis is done graphically.



θ : Angle of incidence.

A Breakeven chart.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer key...

School of Woodworking Skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: SC1505 **Time: 2 Hours**

Course Name: Advance Carpenter Mathematics (Set A) **Max. Marks: 50**

Instruction: (if any) Scientific calculator is permitted.

Section – A

10X01 = 10 Marks

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

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

2) A variable having a countable number for distinct value is called as

a) Continuous b) **Discrete** c) Specific d) None

3) The specific humidity is the mass of water vapour present in

(a) one cubic meter of wet air (b) one cubic meter of dry air (c) one kg of wet air (d) **one kg of dry air**

4) The ratio of the actual specific humidity to the specific humidity when the air is saturated at the same dry bulb temperature is called

(a) Humidity ratio (b) **Relative humidity** (c) Absolute humidity (d) Degree of saturation

5) Air at 26 °C, one cubic meter of air contains 11 grams of steam. What is the relative humidity? (Maximum humidity at 26 C is 24.4 g/m3)

a) 44. 3% b) 55.3% c) **45.08%** d) 42.5%

6) Power transmitted from belt drive is given by

a) Torque × Force b) Torque × Tension c) **Torque × Speed** d) Tension × Mass

7)In a machine, the drive motor has a pulley with a diameter of 220 mm. The speed is specified at 1480 rpm. How big must the pulley be on the working shaft if it is to run at 2680 rpm?

a) **121.49** b) 398.37 c) 1480 d) None

8) A circular saw blade has a diameter of 400mm and a speed of 3000 1 / min. How big is its cutting speed?

a) **62.8 m/s** b) 226 m/s c) 62.8 mm/s d) 226 mm/s

9) The prediction of future value of product is called as

a) JIT b) Scheduling c) **Forecasting** d) None of the above.

10) Depreciation of asset stands for

a) Temporary decline b) **Permanent decline** c) scrap value of the product d) None

Section – B

04X04 = 16 Marks

11) Write short notes on: a) Absolute and relative b) Dry and Wet bulb temperature.

Solution:

a) **Absolute humidity**: It is the mass of water vapour present in 1 m3 of dry air, and is generally expressed in terms of gram per cubic metre of dry air (g /m3 of dry air). It is also expressed in terms of grains per cubic metre of dry air. Mathematically, one kg of water vapour is equal to 15 430 grains.

Relative humidity: It is the ratio of actual mass of water vapour in a given volume of moist air to the mass of water vapour in the same volume of saturated air at the same temperature and pressure. It is briefly written as RH(φ)

b) Dry and Wet bulb temperature: **Dry bulb temperature** It is the temperature of air recorded by a thermometer, when it is not affected by the moisture present in the air. The dry bulb temperature (briefly written as DBT) is generally denoted by td or tdb.

Wet bulb temperature It is the temperature of air recorded by a thermometer, when its bulb is surrounded by a wet cloth exposed to the air. Such a thermometer is called *wet bulb thermometer. The wet bulb temperature (briefly written as WBT) is generally denoted by tw or twb.At 100% relative humidity, the wet-bulb temperature is equal to the air temperature (dry-bulb temperature) and is lower at lower humidity

12) What are the steps for failure analysis of any wooden product?

Solution:

1) Understanding of design
2) Understanding of loads or forces acting on product
3) Evaluation of forces and loads
4) Defining the of failure criteria
5) Examination of failure type

13) RJ Machines Ltd has purchased a machine for 100,000 INR with an estimated scrap value of 20,000 INR and a useful life of 5 years. Calculate depreciation amount and rate using straight line method.

Solution:

The straight line depreciation for the machine would be calculated as follows:

1.Cost of the asset: INR 100,000

2.Cost of the asset – Estimated scrap value: INR 100,000 – INR 20,000 = INR 80,000 total depreciable cost

3.Useful life of the asset: 5 years

4.Divide step (2) by step (3): INR 80,000 / 5 years = **INR 16,000 annual depreciation amount**

Therefore, Company A would depreciate the machine at the amount of INR 16,000 annually for 5 years. The depreciation rate can also be calculated if the annual depreciation amount is known. The depreciation rate is the annual depreciation amount / total depreciable cost. In this case, the machine has a straight-line depreciation rate of INR 16,000 / INR 80,000 = **20%.**

14) A gearwheel with 36 teeth sits on the shaft of a motor. The driven wheel has 52 teeth. The engine speed is specified at 1450 rpm (n,). Find speed of driven gear wheel and gear ratio.

a) What speed does the circular saw shaft reach?

b) What is the drive ratio?

Solution:

$$n_2 = \frac{d_1 n_1}{d_2} = \frac{36 \times 1450}{52} = 240.41\ mm$$

$$i = \frac{z_2}{z_1} = \frac{52}{36} = 1.4$$

Section – C

04X06 = 24 Marks

15) What are the steps for data analysis or measuring the central tendency of data?

Solution:

Measure of understanding the nature of data is called as central tendency of data. The most important measure of central tendency is: Mean, Median and Mode. Fig represents the step involved in data analysis and to measure the central tendency of the data. Descriptive measures that indicate where the center or the most typical value of the variable lies in collected set of measurements are called measures of center. Measures of center are often referred to as averages. The median and the mean apply only to quantitative data, whereas the mode can be used with either quantitative or qualitative data. The sample mode of a qualitative or a discrete quantitative variable is that value of the variable which occurs with the greatest frequency in a data set

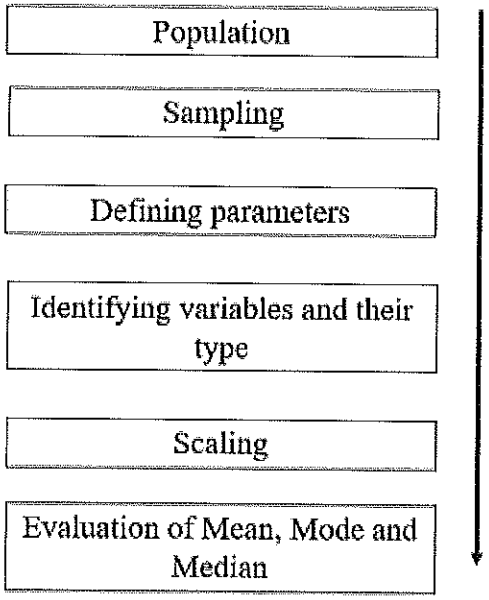


Fig. Steps of data analysis or Measure of Central tendency in descriptive statistics.

16) 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? (Maximum humidity at 18°C is 15.4 g/m³.)

Solution:

$\varphi_{Max} = 15.4\ g/m^3$

$\varphi_{rel} = 75\%$

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

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

$V = l \times b \times h = 37.8\ m^3$

Ans: Amount of water vapour = $11.55 \times 37.8 = 436.59$ gm

17) The market with 168 operating firms has the following distribution of average number of workers in various income group. Find the average salary paid.

Income group	150-300	300-500	500-800	800-1200	1200-1800
No of firms	40	32	26	28	42
Average no of workers	8	12	7.5	8.5	4

Solution:

Computation of Average Salary Paid

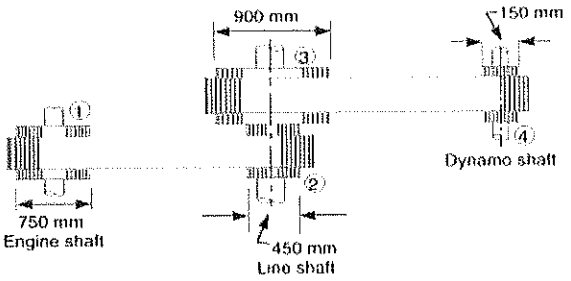
Income-group X	Midvalues m	No. of firms	Average No. of workers	Frequency (f)	mf
(1)	($m.v$) (2)	(3)	(4)	(3×4) (5)	(2×5) (6)
150—300	225	40	8	320	72,000
300—500	400	32	12	384	1,53,600
500—800	650	26	7.5	195	1,26,750
800—1,200	1,000	28	8.5	238	2,38,000
1,200—1,800	1,500	42	4	168	2,52,000
				N = 1,305	Σmf = 8,42,350

$$\text{Mean} = \bar{X} = \frac{\Sigma mf}{N} = \frac{8,42,350}{1305} = 645.4789 \text{ rupees}$$

Ans: 645.4789

18) An engine run at 150 rpm drives a line shaft by means of a belt. The engine pulley is 750mm diameter and pulley of line shaft 450 mm. A 900 mm diameter pulley on a line shaft drives a 150 mm diameter pulley keyed to dynamo shaft. Find the speed of dynamo shaft. When 1. there is no slip 2 there is slip of 2% at each drive.

Solution:



When no slip

$$\frac{N_4}{N_1} = \frac{d_1 \times d_3}{d_2 \times d_4} \quad \text{or} \quad \frac{N_4}{150} = \frac{750 \times 900}{450 \times 150} = 10$$

Ans: 1500 rpm

With slip

$$\frac{N_4}{N_1} = \frac{d_1 \times d_3}{d_2 \times d_4}\left(1 - \frac{s_1}{100}\right)\left(1 - \frac{s_2}{100}\right)$$

$$\frac{N_4}{150} = \frac{750 \times 900}{450 \times 150}\left(1 - \frac{2}{100}\right)\left(1 - \frac{2}{100}\right) = 9.6$$

Ans: 1440 rpm

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: SCS1505 **Time: 2 Hours**

Course Name: Advance Carpenter Mathematics (Set A) **Max. Marks: 50**

Instruction: (if any) Scientific calculator is permitted.

Section – A

10X01 = 10 Marks

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

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

2) A variable having a countable number for distinct value is called as

a) Continuous b) Discrete c) Specific d) None

3) The specific humidity is the mass of water vapour present in

(a) one cubic meter of wet air (b) one cubic meter of dry air (c) one kg of wet air (d) one kg of dry air

4) The ratio of the actual specific humidity to the specific humidity when the air is saturated at the same dry bulb temperature is called

(a) Humidity ratio (b) Relative humidity (c) Absolute humidity (d) Degree of saturation

5) Air at 26 °C, one cubic meter of air contains 11 grams of steam. What is the relative humidity? (Maximum humidity at 26 C is 24.4 g/m3)

a) 44. 3% b) 55.3% c) 45.08% d) 42.5%

6) Power transmitted from belt drive is given by

a) Torque × Force b) Torque × Tension c) Torque × Speed d) Tension × Mass

7)In a machine, the drive motor has a pulley with a diameter of 220 mm. The speed is specified at 1480 rpm. How big must the pulley be on the working shaft if it is to run at 2680 rpm?

a) 121.49 b) 398.37 c) 1480 d) None

8) A circular saw blade has a diameter of 400mm and a speed of 3000 1 / min. How big is its cutting speed?

a) 62.8 m/s b) 226 m/s c) 62.8 mm/s d) 226 mm/s

9) The prediction of future value of product is called as

a) JIT b) Scheduling c) Forecasting d) None of the above.

10) Depreciation of asset stands for

a) Temporary decline b) Permanent decline c) scrap value of the product d) None

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Section – B

04X04 = 16 Marks

11) Write short notes on: a) Absolute and relative b) Dry and Wet bulb temperature.

12) What are the steps for failure analysis of any wooden product?

13) RJ Machines Ltd has purchased a machine for 100,000 INR with an estimated scrap value of 20,000 INR and a useful life of 5 years. Calculate depreciation amount and rate using straight line method.

14) A gearwheel with 36 teeth sits on the shaft of a motor. The driven wheel has 52 teeth. The engine speed is specified at 1450 rpm (n,). Find speed of driven gear wheel and gear ratio.

a) What speed does the circular saw shaft reach?

b) What is the drive ratio?

Section – C

04X06 = 24 Marks

15) What are the steps for data analysis or measuring the central tendency of data?

16) 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?
(Maximum humidity at 18°C is 15.4 g/m^3.)

17) The market with 168 operating firms has the following distribution of average number of workers in various income group. Find the average salary paid.

Income group	150-300	300-500	500-800	800-1200	1200-1800
No of firms	40	32	26	28	42
Average no of workers	8	12	7.5	8.5	4

18) An engine run at 150 rpm drives a line shaft by means of a belt. The engine pulley is 750mm diameter and pulley of line shaft 450 mm. A 900 mm diameter pulley on a line shaft drives a 150 mm diameter pulley keyed to dynamo shaft. Find the speed of dynamo shaft. When 1. there is no slip 2 there is slip of 2% at each drive.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skill

Session: 2021-22 (Summer Semester)

B. Voc. 5th Semester,

End-Sem. Examination

Course Code: SCS1505 **Time: 2 Hours**

Course Name: Advance Carpenter Mathematics (Set B) **Max. Marks: 50**

Instruction: (if any) Calculator permitted.

Section – A

10X01 = 10 Marks

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

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

2) A variable having a countable number for distinct value is called as

a) Continuous b) Discrete c) Specific d) None

3) The ratio of the actual specific humidity to the specific humidity when the air is saturated at the same dry bulb temperature is called

(a) Humidity ratio (b) Relative humidity (c) Absolute humidity (d) Degree of saturation

4) The moisture content of wood product generally lies between:

(a) 8-25% (b) 20-45% (c) 60-80% (d) Depends on climatic conditions

5) Which of following is a power transmitting device

(a) Engine b) Electric motor c) Gear d) None of these

6) The electric energy can be converted to mechanical energy with the help of

a) Engine b) Turbine c) Electric motor d) Belt drive

7) A planer shaft runs at 4200 rpm and has 4 knives. How big is the step when the feed is 16m / min?

a) 0.95mm b) 0.88 mm c) 0.16 mm d) 0.70 mm

8) Power transmitted from belt drive is given by

a) Torque × Force b) Torque × Tension c) Torque × Speed d) Tension × Mass

9)In a machine, the drive motor has a pulley with a diameter of 220 mm. The speed is specified at 1480 rpm. How big must the pulley be on the working shaft if it is to run at 2680 rpm?

a) 121.49 b) 398.37 c) 1480 d) None

10) A circular saw blade has a diameter of 400mm and a speed of 3000 1 / min. How big is its cutting speed?

a) 62.8 m/s b) 226 m/s c) 62.8 mm/s d) 226 mm/s

Section – B

04X04 = 16 Marks

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

12) Write short notes on: a) Demand forecasting b) shrinkage and swelling.

13) What are the objectives of Production planning and control?

14) The motor of a circular saw runs at 1460 rpm. The engine pulley has a diameter of 180 mm. The diameter of the pulley at the circular saw is 150 mm. a) What speed does the circular saw shaft reach? b) What is the drive ratio?

Section – C

04X06 = 24 Marks

15) The following table gives the height of 350 men. Calculate the mean height of the group.

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

16) Calculate average of the following by direct method.

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

17) A fixed asset having a useful life of 3 years is purchased on 1 January 2013. Cost of the asset is $2,000 whereas its residual value is expected to be $500. Calculate depreciation expense for the years ending 30 June 2013 and 30 June 2014.

18) Compare belt, chain and gear drive used for power transmission.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer key...

School of Woodworking Skill

Session: 2020-21 (Summer Semester)

B. Voc. 5th Semester,

End-Sem. Examination

Course Code: SCS1505 **Time: 2 Hours**

Course Name: Advance Carpenter Mathematics **(Set B)** **Max. Marks: 50**

Instruction: (if any) Calculator permitted.

Section – A

10X01 = 10 Marks

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

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

2) A variable having a countable number for distinct value is called as

a) Continuous b) Discrete c) Specific d) None

3) The ratio of the actual specific humidity to the specific humidity when the air is saturated at the same dry bulb temperature is called

(a) Humidity ratio (b) Relative humidity (c) Absolute humidity (d) Degree of saturation

4) The moisture content of wood product generally lies between:

(a) 8-25% (b) 20-45% (c) 60-80% (d) Depends on climatic conditions

5) Which of following is a power transmitting device

(a) Engine b) Electric motor c) Gear d) None of these

6) The electric energy can be converted to mechanical energy with the help of

a) Engine b) Turbine c) Electric motor d) Belt drive

7) A planer shaft runs at 4200 rpm and has 4 knives. How big is the step when the feed is 16m / min?

a) 0.95mm b) 0.88 mm c) 0.16 mm d) 0.70 mm

8) Power transmitted from belt drive is given by

a) Torque × Force b) Torque × Tension c) Torque × Speed d) Tension × Mass

9)In a machine, the drive motor has a pulley with a diameter of 220 mm. The speed is specified at 1480 rpm. How big must the pulley be on the working shaft if it is to run at 2680 rpm?

a) 121.49 b) 398.37 c) 1480 d) None

10) A circular saw blade has a diameter of 400mm and a speed of 3000 1 / min. How big is its cutting speed?

a) 62.8 m/s b) 226 m/s c) 62.8 mm/s d) 226 mm/s

Section – B

04X04 = 16 Marks

11) Air at a temperature of 85°C, contains an absolute humidity of 210 g/m³. what is the relative humidity of air? (Maximum humidity at 85C is 353 g/m³)

Solution:

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

$$\frac{100\ \% \cdot 210\ g/m^3}{353\ g/m^3} = 59{,}49\ldots\ \%$$

Ans: 59.49 %

12) **Write short notes on: a) Demand forecasting b) shrinkage and swelling.**

Solution:

a) **Demand forecasting** is the art and science of forecasting customer demand to drive holistic execution of such demand by corporate supply chain and business management. It involves techniques including both informal methods, such as educated guesses, and quantitative methods, such as the use of historical sales data and statistical techniques or current data from test markets. Demand forecasting may be used in production planning, inventory management, and at times in assessing future capacity requirements, or in making decisions on whether to enter a new market.It is use for predicting future demand for the product. In other words it refers to the prediction of probable demand for a product or a service on the basis of the past events and prevailing trends in the present.

b) 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.

13) What are the objectives of Production planning and control?

Solution:

The objectives of PPC are as follows:

- to ensure safe and economical production process

- to effectively utilize plant to maximize productivity
- to maximize efficiency by proper coordination in production process
- to ensure proper delivery of goods
- to place the right man for the right job, at right time for right wages.
- to minimize labor turnover
- to reduce the waiting time

14) **The motor of a circular saw runs at 1460 rpm. The engine pulley has a diameter of 180 mm. The diameter of the pulley at the circular saw is 150 mm. a) What speed does the circular saw shaft reach? b) What is the drive ratio?**

Solution:

$$n_2 = \frac{d_1 n_1}{d_2} = \frac{180 \times 1460}{150} = 240.41$$

$$i = \frac{n_2}{n_1} = \frac{2500}{1460} = 1.714$$

Ans: 240.41 rpm and 1.714

Section – C

04X06 = 24 Marks

15) 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 in cm (x)	*No of persons f*	*Deviation from assumed mean 167 dx*	*Step Deviation dx*	*Total deviation (fdx)*
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 : $X=167+(\frac{157}{350}\times 2)=167.8$

16) **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:

Weekly Wages (INR)	Number of labours *(f)*	Mid Values *dx*	*fdx*
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
Total	**30**		**540**

$$X=\frac{540}{30}=18$$

Ans: 18

17) A fixed asset having a useful life of 3 years is purchased on 1 January 2013. Cost of the asset is $2,000 whereas its residual value is expected to be $500. Calculate depreciation expense for the years ending 30 June 2013 and 30 June 2014.

Solution:

Calculate depreciation expense for the years ending 30 June 2013 and 30 June 2014.

Depreciation expense per annum shall be: = ($2000 – $500)/ 3 years = $500 p.a.

Depreciation expense for the year ended 30 June 2013:

Ans: $500 x 6/12 = $250

As $500 calculated above represents the depreciation cost for 12 months, it has been reduced to 6 months equivalent to

reflect the number of months the asset was actually available for use.

Depreciation expense for the year ended 30 June 2014:

Ans: $500 x 12/12 = $500

As the asset was available for the whole period, the annual depreciation expense is not apportioned

18) **Compare belt, chain and gear drive used for power transmission.**

BELT DRIVE	CHAIN DRIVE	GEAR DRIVE
Main element Pulleys, belt	Main element Sprockets, chain	Main element Gears
Slip may occur	No-slip	No-slip
Suitability For the large center distance	Suitability For the moderate center distance	Suitability For the short center distance
Large Space requires	Moderate Space requires	Less Space requires
Simplest Design, manufacturing, complexity	Simplest Design, manufacturing, complexity	Complicated Design, manufacturing, complexity
Failure of the belt does not cause the further damage of machine	Failure of a chain may not seriously damage the machine.	Failure of gear may cause serious break down in the machine.
Less Life	Moderate Life	Long Life
Lubrication Not required	Lubrication required	Requires proper lubrication
Less Installation cost	Moderate Installation cost	More Installation cost
Used For low-velocity ratio	Used For moderate velocity ratio	Used For high velocity ratio

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

Set – A

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: SWS1506 **Time: 3 Hours**

Course Name: CAD 3D Drawing **Max. Marks: 50**

Instruction:

1. Answer all questions from section A, each question carries one mark.
2. Answer all questions from section B, each question carries five marks.
3. Answer all questions from section C, each question carries ten marks.

Section – A

05X01 = 05 Marks

Q.1 The auxiliary lines tool is located on the _____ tool bar.

(a) Auxiliary Lines (b) Workshop

(c) Main tool Bar (d) Profile

Q.2 Which one of the following is the short key for Cylinder function?

a) Ctrl+Y b) Y

c) C d) Ctrl+C

Q.3 Where we can change the line thickness for Wire frame model production?

a) Project setting b) Tool 1

c) Edge Tool d) Tool 2

Q.4 Which one of the following is not from Parts function?

a) Cone b) Cylinder

c) Cube d) Auxiliary Line

Q.5 Which one of the following function is toggled on/off by F6 key?

a) Axonometry b) 4 views

c) Zoom d) Solid

Section – B

03X05 = 15 Marks

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

Q.7 Define the need of Auxiliary lines in PYTHA, and list out any six-line parameter from Auxiliary Menu.

Q.8 Define Part Menu and explain any two standard shapes.

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Section – C

03X10 = 30 Marks

Q.9 Draw all possible views required and show details of an Open Cabinet with following aspects-

a) Length – 500
b) Depth – 421
c) Height – 820
d) Board material thickness – 17 mm & 8 mm (back wall)
e) Follow 32 hole drilling system for shelves
f) 2 shelves inside cabinet
g) Shelves depth is 10 mm short (less) from front edge of side wall
h) Back wall placement from back edge should be 12 mm
i) 8 mm groove in sides for back wall fixing
j) Diameter of drills is 5 mm & depth 12 mm.

Q.10 Generate part list and final drawing output file of drawn objects (Refer to question 09).

Q.11 Draw all possible views of corner bridle joint with 200x60x24 mm dimensions for both arms.

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Answer Key

Set – A

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: SWS1506 **Time: 3 Hours**

Course Name: CAD 3D Drawing **Max. Marks: 50**

Instruction:

1. Answer all questions from section A, each question carries one mark.
2. Answer all questions from section B, each question carries five marks.
3. Answer all questions from section C, each question carries ten marks.

Section – A

05X01 = 05 Marks

Q.1 The auxiliary lines tool is located on the _____ tool bar.

(a) Auxiliary Lines (b) Workshop

(c) Main tool Bar (d) Profile (c)

Q.2 Which one of the following is the short key for Cylinder function?

a) Ctrl+Y b) Y

c) C d) Ctrl+C (b)

Q.3 Where we can change the line thickness for Wire frame model production?

a) Project setting b) Tool 1

c) Edge Tool d) Tool 2 (a)

Q.4 Which one of the following is not from Parts function?

a) Cone b) Cylinder

c) Cube d) Auxiliary Line (d)

Q.5 Which one of the following function is toggled on/off by F6 key?

a) Axonometry b) 4 views

c) Zoom d) Solid (a)

Section – B

03X05 = 15 Marks

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 an 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

Q.7 Define the need of Auxiliary lines in PYTHA, and list out any six-line parameter from Auxiliary Menu.

Ans. For 2D construction and for the support of the 3D Modelling PYTHA offers you auxiliary lines. These are much easier tools to use. The functioning is similar to constructing at a drafting board, with thin pencil lines (the auxiliary lines) you draft the object and trace it. Tracing the auxiliary lines you directly create common PYTHA objects like chains of edges, faces or 3D parts. With the help auxiliary lines you can also produce points of intersection.

PYTHA auxiliary lines are a virtual drawing board that, aside from **lines** and circles, features all types of geometric constructions such as subdivision of angles, perpendicular and vertical center **line**, parallel, tangent and circles constructed within the parameters of two tangents.

Lines created in Auxiliary lines menu have an infinite length, circles have no segments but are real round circles. There are no isolated points but only poins of intersection of two elements or as centers of arcs. When drawing a new element, the points of intersection of the new element with all existing elements are calculated. If you delete an element, the points of intersection are also deleted.

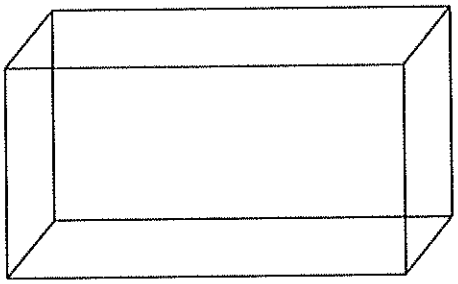
Types of Auxiliary Lines –

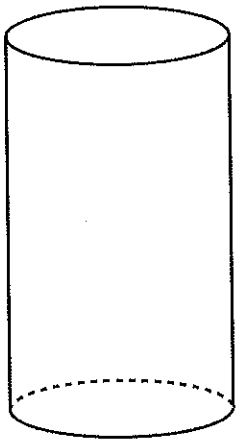
a) Horizontal
b) Vertical
c) Line + Angle
d) Parallel
e) Equidistant
f) Circle

Q.8 Define Part Menu and explain any two standard shapes.

Ans. Parts are three-dimensional objects in PYTHA which can be constructed in various ways. For objects with a predefined shape as block, cylinder, sphere, etc. you only enter the measurements. Objects with a free shape as profiles, rotational sweeps, freeform objects, etc. are derived from two-dimensional cross-sections.

1. **Block** - The block is of the parts most frequently used. He can be created in any user-defined measurements by any length, depth and height. Its edges run parallel to the coordinate axes. The major point (initial point) is used to define its position in the three dimensional space.





2. The Cylinder - The cylinder is the most frequently used rotational symmetric object. Its axis can be parallel to one of the three axes among X, Y, Z or go through two existing points. The degree of segmentation (number of segments and number of partitions) of a cylinder can be freely chosen.

Section – C

03X10 = 30 Marks

Q.9 Draw all possible views required and show details of an Open Cabinet with following aspects-

a) Length – 500
b) Depth – 421
c) Height – 820
d) Board material thickness – 17 mm & 8 mm (back wall)
e) Follow 32 hole drilling system for shelves
f) 2 shelves inside cabinet
g) Shelves depth is 10 mm short (less) from front edge of side wall
h) Back wall placement from back edge should be 12 mm
i) 8 mm groove in sides for back wall fixing
j) Diameter of drills is 5 mm & depth 12 mm.

Ans. Refer the attachment 01

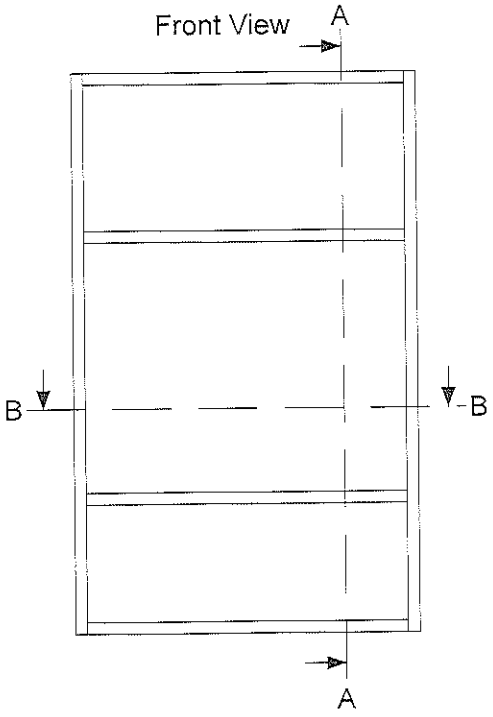
Q.10 Generate part list and final drawing output file of drawn objects (Refer to question 09).

Ans. Refer the attachment 02

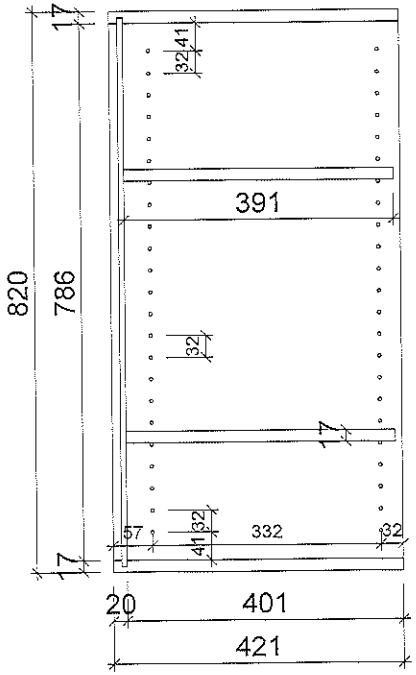
Q.11 Draw all possible views of corner bridle joint with 200x60x24 mm dimensions for both arms.

Ans. Refer the attachment 03

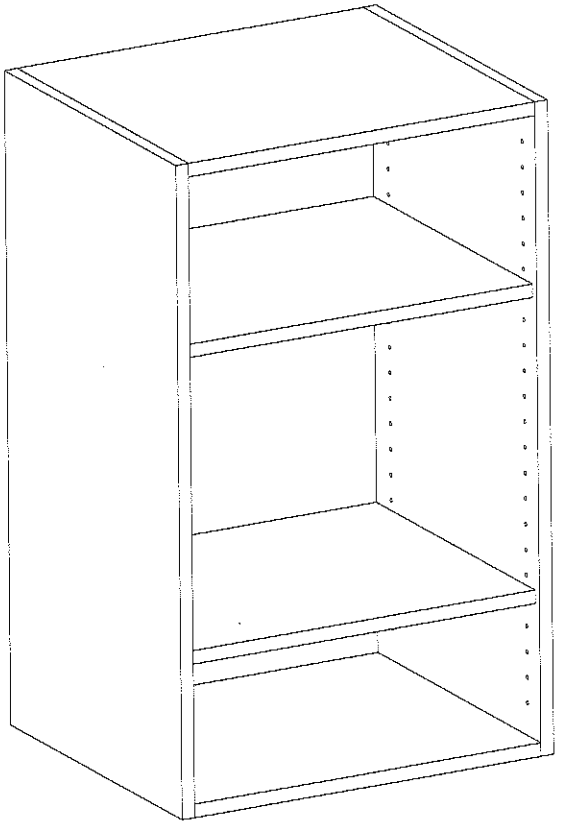
Front View



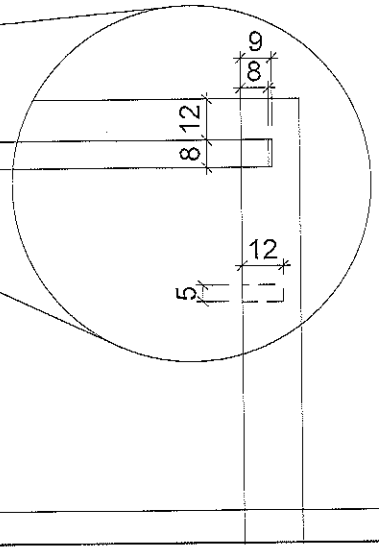
Section A-A



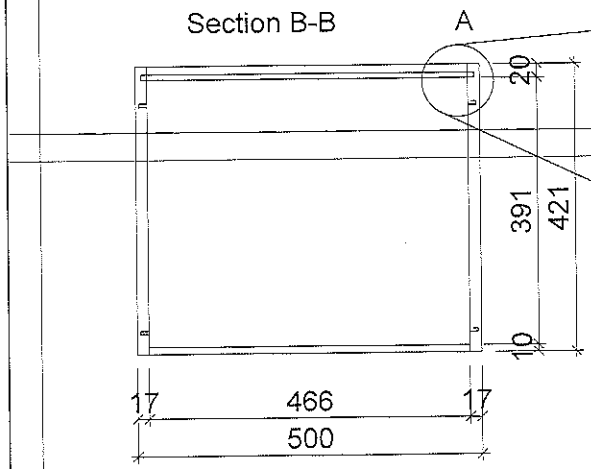
Axonometry view



Detal A



Section B-B



Name	: XXXXX XXXXXX
Reg. No.	: xxxxxxxxxxxx
Semester	: V Sem.
Title	: Open Cabinet
Scale	: 1:10 / 1:2
Subject	: CAD 3D Drawing
Sub. Code	: SCS1506
Date	: Xx/xx/xxxx
School	: School of Woodworking Skills

Attachment - 2

PYTHA Lab GmbH

Project : **Open Cabinet**

Customer : **School of Woodworking Skills**

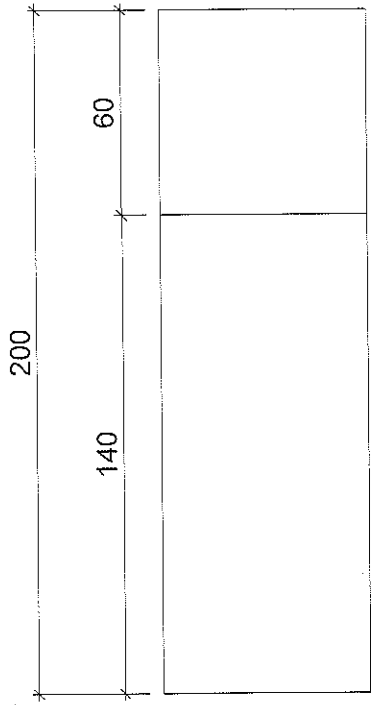
Part List

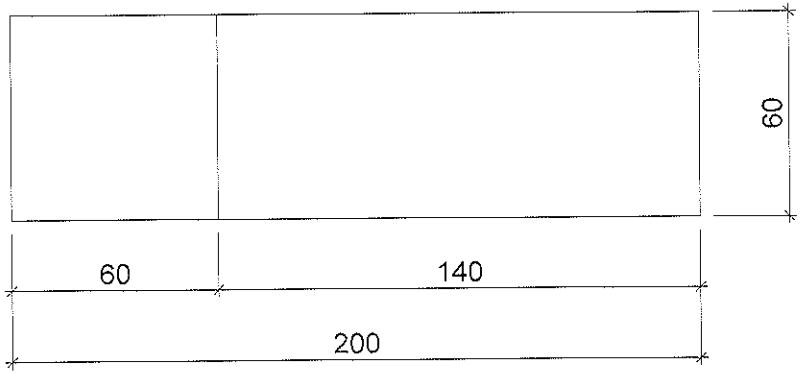
Qty.	*Name (tree)*	*Length*	*Width*	*Thickness*
1	Back Panel	802.0	482.0	8.0
1	Bottom	466.0	421.0	17.0
1	Shelf 1	466.0	391.0	17.0
1	Shelf 2	466.0	391.0	17.0
1	Side - Left	820.0	421.0	17.0
1	Side - Right	820.0	421.0	17.0
1	Top	466.0	421.0	17.0

Submitted By -

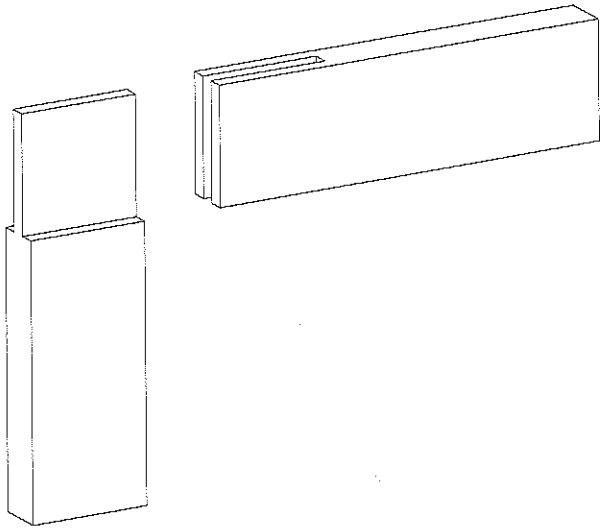
Name : XXXXX XXXXXX
Reg. No. : xxxxxxxxxxxx
Semester : V Sem.
Title : Open Cabinet
Scale : 1:10 / 1:2
Subject : CAD 3D Drawing
Sub. Code : SCS1506
Date : Xx/xx/xxxx
School : School of Woodworking Skills

Front View

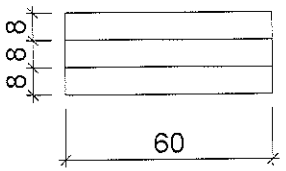


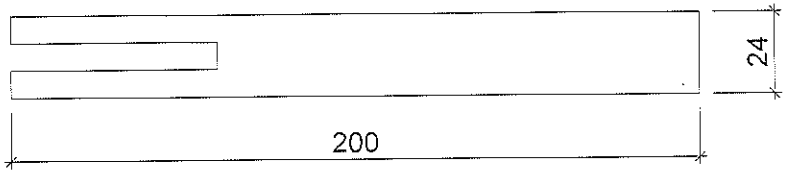


Axonometry view



Top View





Name	:	XXXXX XXXXXX
Reg. No.	:	xxxxxxxxxxxxx
Semester	:	V Sem.
Title	:	Open Cabinet
Scale	:	1:10 / 1:2
Subject	:	CAD 3D Drawing
Sub. Code	:	SCS1506
Date	:	Xx/xx/xxxx
School	:	School of Woodworking Skills

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

Set – B

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: SWS1506 **Time: 3 Hours**

Course Name: CAD 3D Drawing **Max. Marks: 50**

Instruction:

1. Answer all questions from section A, each question carries one mark.
2. Answer all questions from section B, each question carries five marks.
3. Answer all questions from section C, each question carries ten marks.

Section – A

05X01 = 05 Marks

Q.1 To create a hole through a 3-dimensional box, the drafter can place a 3-dimesnional cylinder into the box and subtract it.

(a) True (b) Error occurred

(c) False (d) None of these

Q.2 The cylinder tool is found on the _____ tool bar.

(a) Parts (b) Edge

(c) Face (d) Profile

Q.3 Which one of the following is not the product of PYTHA?

a) Drawings b) C Language Scripts

c) Nesting d) Part List

Q.4 Which one of the following function is used for 2D & 3D production?

a) Radiolab b) Model

c) Module d) Central

Q.5 Which one of the following function is toggled on/off by F5 key?

a) Axonometry b) 4 views

c) Solid d) Zoom

Section – B

03X05 = 15 Marks

Q.6 Define the need of nesting function in terms of production.

Q.7 Explain vertex, edge and face with neat sketch.

Q.8 Explain Following –

a) Menu Bar b) Icon Bar c) Graphics Bar

d) Input Prompt e) Title Bar f) Project Setting

Section – C

03X10 = 30 Marks

Q.9 Draw all possible views required and show details of an Open Cabinet with following aspects-

a) Length – 500
b) Depth – 421
c) Height – 820
d) Board material thickness – 17 mm & 8 mm (back wall)
e) Follow 32 hole drilling system for shelves
f) 2 shelves inside cabinet
g) Shelves depth is 10 mm short (less) from front edge of side wall
h) Back wall placement from back edge should be 12 mm
i) 8 mm groove in sides for back wall fixing
j) Diameter of drills is 5 mm & depth 12 mm.

Q.10 Generate part list and final drawing output file of drawn objects (Refer to question 09).

Q.11 Draw all possible views of corner bridle joint with 200x60x24 mm dimensions for both arms.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer Key

Set – B

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: SWS1506 **Time: 3 Hours**

Course Name: CAD 3D Drawing **Max. Marks: 50**

Instruction:

1. Answer all questions from section A, each question carries one mark.
2. Answer all questions from section B, each question carries five marks.
3. Answer all questions from section C, each question carries ten marks.

Section – A

05X01 = 05 Marks

Q.1 To create a hole through a 3-dimensional box, the drafter can place a 3-dimesnional cylinder into the box and subtract it.

(a) True (b) Error occurred

(c) False (d) None of these (a)

Q.2 The cylinder tool is found on the _____ tool bar.

(a) Parts (b) Edge

(c) Face (d) Profile (a)

Q.3 Which one of the following is not the product of PYTHA?

a) Drawings b) C Language Scripts

c) Nesting d) Part List (b)

Q.4 Which one of the following function is used for 2D & 3D production?

a) Radiolab b) Model

c) Module d) Central (b)

Q.5 Which one of the following function is toggled on/off by F5 key?

a) Axonometry b) 4 views

c) Solid d) Zoom (b)

Section – B

03X05 = 15 Marks

Q.6 Define the need of nesting function in terms of production.

Ans. This tool arranges elements on a face with minimum requirement of space, in such a way that they can be cut out in the work shop with minimal waste. The outstanding feature of PYTHA 's nesting algorithm is that it is not

restricted to rectangular faces but can be applied to arbitrarily shaped parts to cut and supply. You can use 3 different methods of nesting: "Saw optimization", "Rectangular nesting", "Polygon nesting". The nesting optimization can be applied directly on the 3D construction of a piece of furniture, as well as on elements that have already been "laid flat".

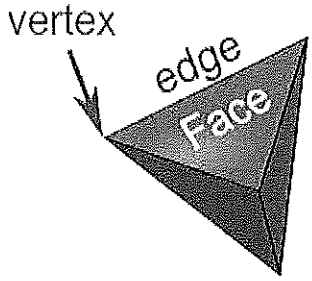
In order to be able to optimize the parts' positions, you need to draw the existing supply (raw slabs), too. This supply should mimic exactly the supply that is available in reality. The supply is always drawn in the XY plane, using the PYTHA functions Rectangle, Block, an arbitrary Polygon or Profile parts. The supply can be drawn either in 2D or in 3D. If you do not want to take the supply's material into consideration, you do not need any further preparations. If you do, however, want to take the material and the supply's thickness into account, you need to match further criteria: -

If the **supply is drawn in 3D** you need to - Carefully draw the supply's thickness. A cabinet's side that has been constructed with a thickness of 19 mm will not be positioned on a supply that has a thickness of 20 mm.

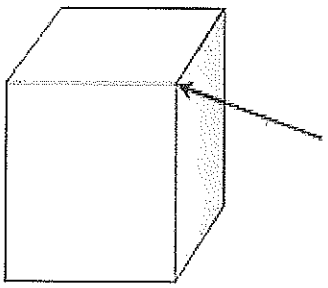
If the **supply is drawn in 2D** you need to- Assign a material to the parts you want to align on the supply. Assign a name to the supply that first specifies the supply's material, followed by the material's thickness which is surrounded by brackets.

Q.7 Explain vertex, edge and face with neat sketch.

Ans. A solid figure can be defined by the number and combination of certain parts as – Faces, Edges, Vertex. A vertex is a **point** where two or more line segments meet, it will be a corner or end and start of lines. For any geometrical shape an **edge** is a line segment on the boundary joining one vertex (corner point) to another. A **face** is any of the individual flat surfaces of a solid object.

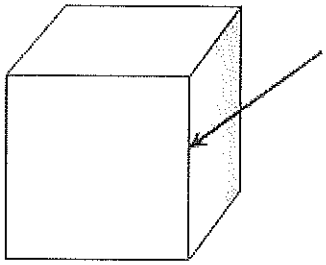


Vertex - A vertex is a point where several planes meet in a point. The arrow here is pointing to a vertex of this cube. Many solids have more than one vertex. A point is defined by its coordinates in a right-handed, orthogonal, Cartesian coordinate system in X, Y and Z direction.

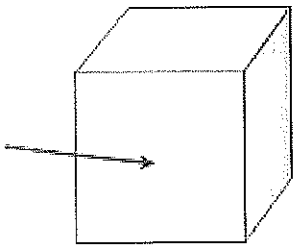


Edges - An edge is the line segment where two faces meet. The arrow here is pointing to a edge of this cube that the faces intersect in a line. Many solid figures have more than one edge. Edges are one dimensional geometric objects. They are not only connecting their initial- and endpoint, they also connect two neighboured faces. PYTHA has two types of edges - the "natural" and the "artificial" edge.

Natural edges are created where a face forms or two faces are connected to each other. Artificial edges have no direct connection to faces, they are created manually by the user and are used as e.g. a grid, hatch or as a 2D ornament on a face.



Faces - A face is any kind of plane shape mean by any closed, flat, two-dimensional shape. The arrow here is pointing to a face of this cube. All plane shapes have a face, because you can trace the shape of all plane shapes. The flat surface that makes the front of this cube is called a face. Many solid figures have more than one face. Faces are two dimensional geometric objects. Faces are only defined by the numbers of their sides and by their orientation.



e.g. A triangle has a triangle face, a rectangle has a rectangle face, a diamond has a diamond face and a circle has a circle face.

Q.8 Explain Following –

a) Menu Bar
b) Icon Bar
c) Graphics Bar
d) Input Prompt
e) Title Bar
f) Project Setting

Ans.

a) **Menu Bar –** This menu bar are located in the head board of PYTHA interface. This bar contains a pull down menus and these menu contains all available program functions.
b) **Icon Bar –** This icon bar are located in the head board of PYTHA interface. Headboard gives quick aces via icons to all main menus. The icons are grouped in containers according to their functionality which we can move in desktop.
c) **Graphics Bar –** The graphics bar contains similar to the icon bar buttons on head board. By this bar we can control 3D view of your scene with respect to model. It contains as XY, YZ, ZX, Axo, Persp, Zoom and Edge view.
d) **Input Prompt –** If you select a tool or function, then we need to feed some measurements and values for desired application. Then we use input prompt to feed these values.
e) **Title Bar –** If PYTHA dongle is plugged in correctly, then central's will show some details in addition on top header. These details contain, customer name, file name and dongle no.
f) **Project Setting –** Here we can select the required measuring unit (mm, cm, m, inches) for your project. We can define scale values for printing output. We can configure the layers as per requirement with draw attributes.

Section – C

03X10 = 30 Marks

Q.9 Draw all possible views required and show details of an Open Cabinet with following aspects-

a) Length – 500
b) Depth – 421
c) Height – 820
d) Board material thickness – 17 mm & 8 mm (back wall)

e) Follow 32 hole drilling system for shelves
f) 2 shelves inside cabinet
g) Shelves depth is 10 mm short (less) from front edge of side wall
h) Back wall placement from back edge should be 12 mm
i) 8 mm groove in sides for back wall fixing
j) Diameter of drills is 5 mm & depth 12 mm.

Ans. Refer the attachment 01

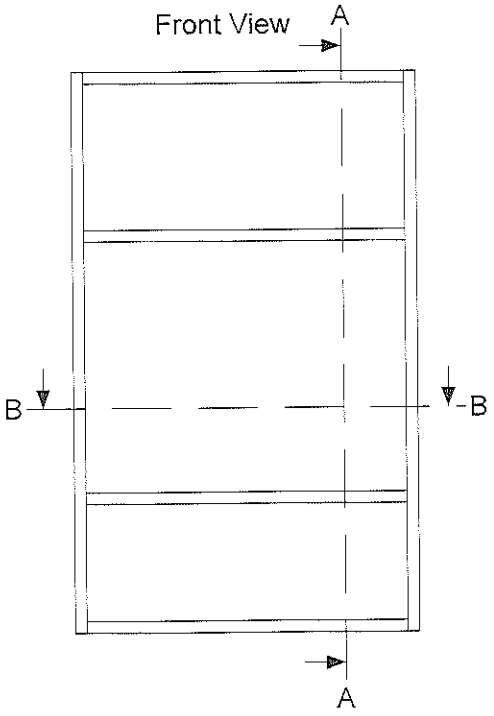
Q.10 Generate part list and final drawing output file of drawn objects (Refer to question 09).

Ans. Refer the attachment 02

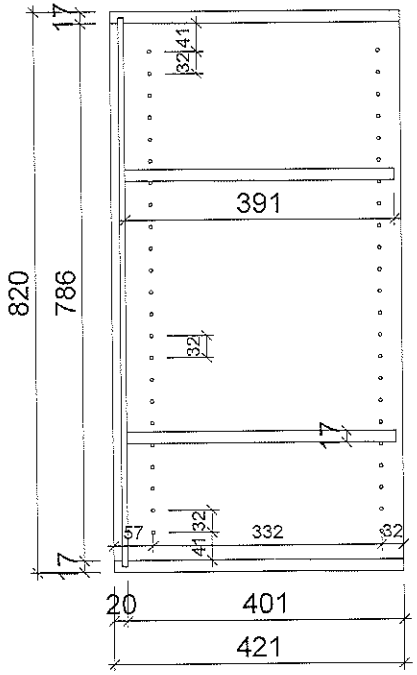
Q.11 Draw all possible views of corner bridle joint with 200x60x24 mm dimensions for both arms.

Ans. Refer the attachment 03

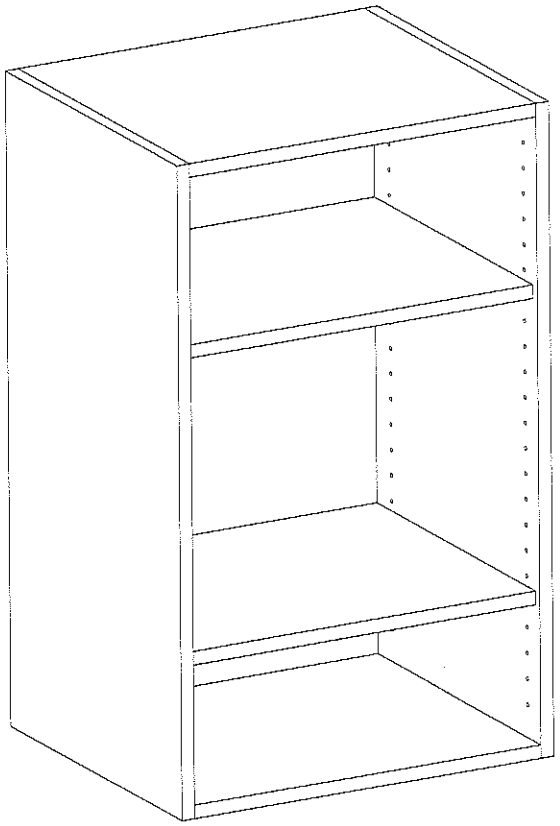
Front View



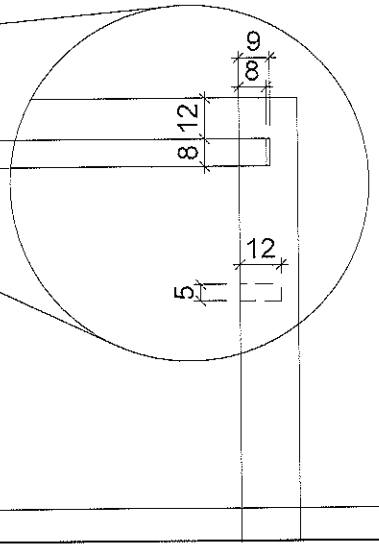
Section A-A



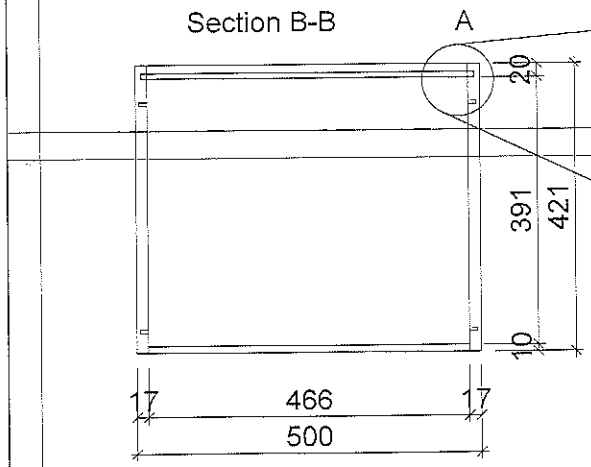
Axonometry view



Detal A



Section B-B



Name	: XXXXX XXXXXX
Reg. No.	: xxxxxxxxxxxx
Semester	: V Sem.
Title	: Open Cabinet
Scale	: 1:10 / 1:2
Subject	: CAD 3D Drawing
Sub. Code	: SCS1506
Date	: Xx/xx/xxxx
School	: School of Woodworking Skills

Attachment - 2

PYTHA Lab GmbH

Project : **Open Cabinet**

Customer : **School of Woodworking Skills**

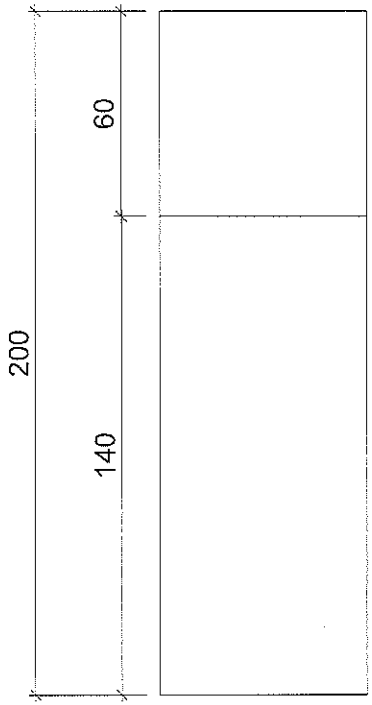
Part List

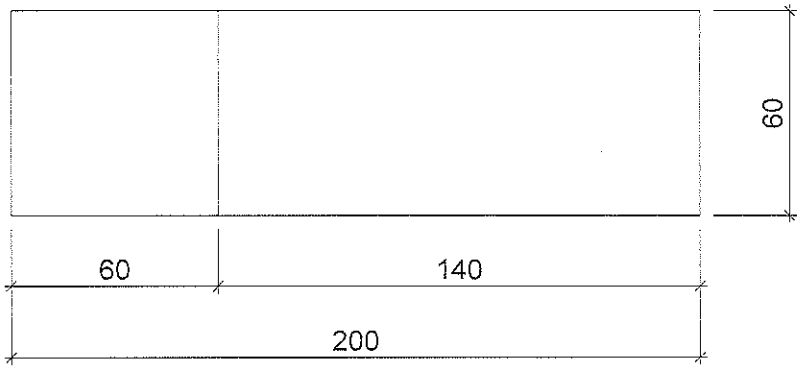
Qty.	*Name (tree)*	*Length*	*Width*	*Thickness*
1	Back Panel	802.0	482.0	8.0
1	Bottom	466.0	421.0	17.0
1	Shelf 1	466.0	391.0	17.0
1	Shelf 2	466.0	391.0	17.0
1	Side - Left	820.0	421.0	17.0
1	Side - Right	820.0	421.0	17.0
1	Top	466.0	421.0	17.0

Submitted By -

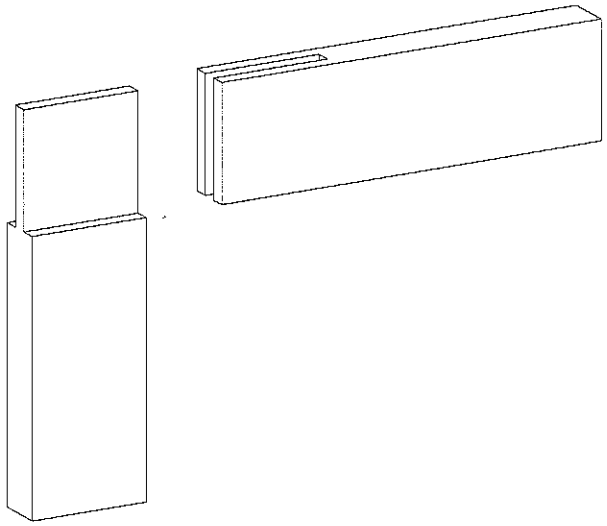
Name : XXXXX XXXXXX
Reg. No. : xxxxxxxxxxxx
Semester : V Sem.
Title : Open Cabinet
Scale : 1:10 / 1:2
Subject : CAD 3D Drawing
Sub. Code : SCS1506
Date : Xx/xx/xxxx
School : School of Woodworking Skills

Front View

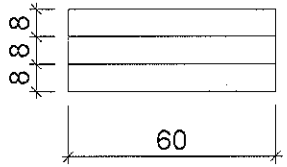


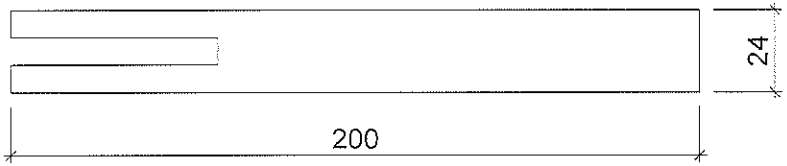


Axonometry view



Top View





Name	:	XXXXX XXXXXX
Reg. No.	:	xxxxxxxxxxxx
Semester	:	V Sem.
Title	:	Open Cabinet
Scale	:	1:10 / 1:2
Subject	:	CAD 3D Drawing
Sub. Code	:	SCS1506
Date	:	Xx/xx/xxxx
School	:	School of Woodworking Skills