BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registartion No. .....

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Sem.

2nd In-Sem. Examination

Course Code: SCS1501 **Time: 1 Hour**

Course Name: Wood and panel manufacturing specialist

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 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. 2 What is the Production cost?

(A) Direct labour cost (B) Ordering cost

(C) Holding cost (D) All of the above.

Q. 3 How many levels are in production planning?

(A) 1 (B) 2

(C) 3 (D)None of them

Q. 4 Ergonomics is related to

(A) Comfort (B) Safety

(C) A&B Both (D)None 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 production planning? Discuss briefly.

Q. 7 What is ergonomics?

Q. 8 Write down the attributes for designing a comfortable chair.

Section C

03X03 = 09 Marks

Q. 9 What is the production control? Draw the diagram of closed loop control system.

Q. 10 What is break even analysis and explain the various effects of increasing the cost and sales revenue in it.

Q.11 From the following particulars,

Fixed factory overhead cost- Rs 60000

Fixed selling overhead cost- Rs 12000

Variable manufacturing cost per unit- Rs 12

Variable selling cost per unit- Rs 3

calculate:

(i) Break-even point in terms of sales value and in units.

(ii) Number of units that must be sold to earn a profit of Rs. 90,000.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer Key

School of Woodworking Skills

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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 Scheduling helps in

(A) Planning for the project (B) Financial control of project

(C) Carrying out project in orderly manner (D)All of them Ans. C

Q. 2 What is the Production cost?

(A) Direct labour cost (B) Ordering cost

(C) Holding cost (D) All of the above Ans. A

Q. 3 How many levels are in production planning?

(A) 1 (B) 2

(C) 3 (D)None of them Ans. C

Q. 4 Ergonomics is related to

(A) Comfort (B) Safety

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

Q. 5 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

Q. 6 What is production planning? Discuss briefly.

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

- Demand
- Machine breakdown etc.

Q. 7 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.

Q. 8 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.

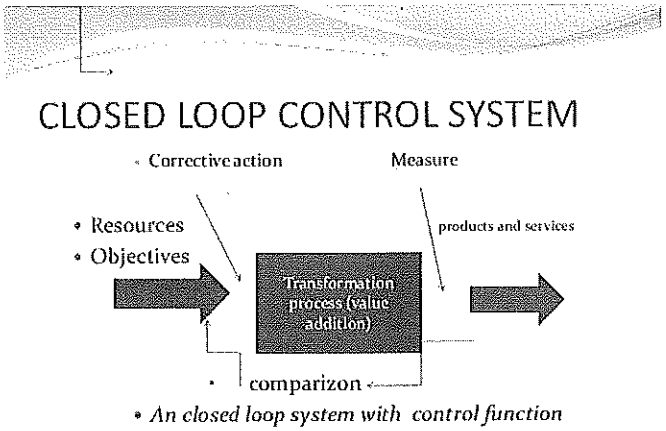
Section C

03X03 = 09 Marks

Q. 9 What is the production control? Draw the diagram of closed loop control system.

Ans. Production control - It is used to monitor the execution of the plan it has several important function

- Production start at planned place at plan time
- Observing progress of the operation.
- Analyze the recorded data with plan.
- Take the feedback from manufacturing department and accordingly take the needful action.



An closed loop system with control function

Q. 10 What is break even analysis and explain the various effects of increasing the cost and sales revenue in it.

Ans. A break-even analysis is a financial tool which helps a company to determine the stage at which the company, or a new service or a product, will be profitable. In other words, it is a financial calculation for determining the number of products or services a company should sell or provide to cover its costs (particularly fixed costs)

Effect of an increase in fixed costs

An increase in fixed cost possibly due to the purchase of new machines increases the total costs and thus shifts BEP towards Right Hand Side(RHS). This causes the decrease in profit for the same output and vice-versa.

Effect of an increase in variable costs An increase in variable cost and therefore in the total cost possibly due to increase in labour cost would shift the BEP towards Right Hand Side(RHS). This causes the decrease in profit for the same output and vice-versa.

Effect of an increase in Sales revenue If the price of an item (goods) increase a new sales revenue will be drawn with a greater slopes. This will shift the BEP towards Left Hand Side(LHS). This causes the increase in profit for the same output and vice-versa. E

Q.11 From the following particulars,

Fixed factory overhead cost- Rs 60000

Fixed selling overhead cost- Rs 12000

Variable manufacturing cost per unit- Rs 12

Variable selling cost per unit- Rs 3

calculate:

(i) Break-even point in terms of sales value and in units.

(ii) Number of units that must be sold to earn a profit of Rs. 90,000.

Ans.

(i) ***Break–even point*** $= \dfrac{\text{Fixed Cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$

Variable Cost per unit $= ₹\ 12 + 3 = ₹\ 15$

Total Fixed Cost $= ₹\ 60{,}000 + 12{,}000 = ₹\ 72{,}000$

B.E.P. $= \dfrac{72{,}000}{24 - 15} = 8{,}000$ units

B.E.P. (in sales values) $= 8{,}000 \times 24 = ₹\ 1{,}92{,}000$

(ii) ***Number of units that must be sold to earn profit of ₹90,000***

$$= \frac{\text{Fixed Cost} + \text{Profit}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{72{,}000 + 90{,}000}{24 - 15} = \frac{1{,}62{,}000}{9} = 18{,}000 \text{ units.}$$

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

1st In-Sem. Examination

Course Code: SCS1506 **Time: 1 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 three mark.

Section – A

05X01 = 05 Marks

Q.1 An arbitrary point say 'B' is above horizontal plane and behind Vertical plane, the point lies in-

(a) 3rd quadrant (b) 2nd quadrant

(c) 1st quadrant (d) 4th quadrant

Q.2 The internal angle of regular pentagon is-

(a) 72^0 (b) 90^0

(c) 120^0 (d) 108^0

Q.3 Which one of the following is not a Boolean operation in PYTHA?

(a) Union (b) Subtract

(c) Intersection (d) Difference

Q.4 Which one of the following could be an PYTHA drawing file?

a) Dwg.pytha b) Dwg.pth

c) Project.poy d) Plan.pyo

Q.5 Which one of the following is the short key for Cylinder function?

a) Ctrl+Y b) Y

c) C d) Ctrl+C

Section – B

03X02 = 06 Marks

Q.6 What is the difference between drawing and modeling?

Q.7 What do you understand by product design?

Q.8 What do you understand by CAD and how CAD improves productivity in wood working?

Section – C

03X03 = 09 Marks

Q.9 What is the 3D modeling and specify any four advantages of 3D modeling?

Q.10 Define CAM and also write any four advantages of CAM.

Q.11 What is project planning and what do you understand by BOM explain?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer Key

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

1st In-Sem. Examination

Course Code: GEN1506 **Time: 1 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 three mark.

Section – A

05X01 = 05 Marks

Q.1 An arbitrary point say 'B' is above horizontal plane and behind Vertical plane, the point lies in-

(a) 3rd quadrant (b) 2nd quadrant

(c) 1st quadrant (d) 4th quadrant (b)

Q.2 The internal angle of regular pentagon is-

(a) 72^0 (b) 90^0

(c) 120^0 (d) 108^0 (d)

Q.3 Which one of the following is not a Boolean operation in PYTHA?

(a) Union (b) Subtract

(c) Intersection (d) Difference (b)

Q.4 Which one of the following could be an PYTHA drawing file?

a) Dwg.pytha b) Dwg.pth

c) Project.poy d) Plan.pyo (d)

Q.5 Which one of the following is the short key for Cylinder function?

a) Ctrl+Y b) Y

c) C d) Ctrl+C (b)

Section – B

03X02 = 06 Marks

Q.6 What is the difference between drawing and modeling?

Ans. Modeling three-dimensional solid features often begins with creating a two-dimensional sketch that defines a portion of the shape of your part. Sketching involves the creation of lines, arcs, circles, and dimensions. They are familiar steps to anyone who has created a drawing in a CAD product. In the 2D design world, it is possible to create geometry in any sequence because you are responsible for tracking the meaning of the geometry. The 3D modeling sequence resembles the creation of the physical part and the creation of one feature usually depends on a previous feature. This feature

hierarchy allows the computer to track the meaning of the geometry. For example, when creating a 2D drawing, first create a circle that represents a hole followed by a rectangle that represents the stock in which the hole is placed. This sequence does not work while modeling in 3D because to place the hole, you must first have a model into which you plan to place the hole.

Q.7 What do you understand by product design?

Ans. A product is designed to meet certain functional requirements, and to satisfy the customer needs. At the same time product must be aesthetically appealing to the customer. New technology and new materials currently available will also be explored during the product design stage. A product consists of assemblies, sub-assemblies and component parts. If the product is to manufactured to customer's specification, the design is provided by the manufacturer's as per demand by customer.

Q.8 What do you understand by CAD and how CAD improves productivity in wood working?

Ans. Auto CAD is a computer added design and drafting software used in architecture, construction and manufacturing to prepare engineering drawing in terms of 2D and 3D by electronic method. This CAD is time saving process to drawing. Saved file we can transfer easily where we want by electronic method. It is also easy in PDF file which they can open to view and print.

CAD offers time saving process in drawing. As per high technology we can draft a drawing with help of different predefined library from this library we can use a lots of shapes, material, accessories of joinery etc. We can also set a template file in which we can fix our all drawing settings as well as some materialistic objects. Saved file we can transfer easily where we want by electronic method. It is also easy in PDF file which they can open to view and print.

Section – C

03X03 = 09 Marks

Q.9 What is the 3D modeling and specify any four advantages of 3D modeling?

Ans. A 3D CAD model includes not only x and y coordinates, but also the Z coordinate. It is used to create virtual three dimensional model of some physical object. A simple 3-D model is a wire frame model consisting only the lines, circles and curves. For cabinets, wardrobes etc. we need sculptured surface. Such surface and many other analytic surfaces (e.g. a spherical surface, a conical surface, a revolved surface etc.) can't be represented by lines, circles and curves. In drafting, a sculptured surface can be representing by its cross section.

By designing in 3D, the designers can also review a design using the 3D walkthrough software with the end user. 3-D Modeling for design allows designer to see what they would not see when designing in 2D. it gives the designer the ability to visualize and also improve project efficiency and accuracy.

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.10 Define CAM and also write any four advantages of CAM.

Ans. Computer aided manufacturing (CAM) - It can be defined as the use of computer systems to plan, manage and control the operations of a manufacturing plant through either direct or indirect computer

interface with the plant's production resources. It is an application technology that uses compute software and machinery to facilitate and automate manufacturing processes.

Advantages-

1. Improves machining capabilities for example when manufacturer takes up a 3 axis machinin task, they rely on the combination software to create tool path for machining projects such a modeling. Thus improve machining capabilities.
2. Helps to improve productivity of CNC machines- CAD-CAM systems provide high spee machine tool paths, which helps manufacturers to minimize the cycle time reduce tool an machine wear.
3. Helps to remove material wastage- CAM software involves simulation features that helps t inspect machining process thus eliminate mistakes and material wastage.
4. Improve client accessibility –CAM software allows manufacturer to receive CAD file fro customer after this they create tool path and simulation and calculate cycle time. Thus improv accessibility.

Q.11 What is project planning and what do you understand by BOM explain?

Ans. Project planning - It is a discipline for stating how to complete a project within a certain timefram usually with defined stages, and with designated resources. Project planning divides the activity into:

- Setting objectives (these should be measurable).
- Identifying deliverables.
- Planning the schedule.
- Making supporting plans.

Bill of material (BOM) - A bill of material is comprehensive inventory of the raw materials, assemblie subassemblies, parts and components, as well as quantities of each needed to manufacture th product. A well-defined BOM helps companies:

- Plan purchase of raw materials.
- Estimate material cost.
- Gain inventory control.
- Maintain accurate records.
- Ensure supply robustness and reduce waste.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2021-22 (Summer)

B. Voc. Program, 5th Semester,

2nd In-Sem. Examination

Course Code: SCS1505 **Time: 1 Hour**

Course Name: Advanced Carpenter Mathematics **Max. Marks: 20**

Instruction: All questions are compulsory. Calculator without storage is permitted.

Section – A

05X01 = 05 Marks

Q1) Which of the following is not used for transmitting power:

a) Belt drive b) Chain drive

c) Gear drive d) Electric Motor.

Q2) Power transmitted from belt drive is given by

a) Torque × Force b) Torque × Tension

c) Torque × Speed d) Tension × Mass

Q3) The prediction of future value of product is called as

a) JIT b) Scheduling

c) Forecasting d) None of the above.

Q4) 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

Q5) EOQ is

a) Enterprise order quantity b) Enterprise order quality

c) Economic order quantity d) Economic order quality

Section – B

03X02 = 06 Marks

Q6) A new motor is installed for a band saw. This engine runs at 740 rpm and has a pulley with a diameter of 220mm. How big must the pulley for the band saw be if the band saw reel should have a speed of 920 per min?

Q7) 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?

Q8) Define a) Demand forecasting b) MRP

Section – C 03X03 = 09 Marks

Q9) Explain the major principles of Just in Time technique.

Q10) 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.

Q11) Explain the factor required to be consider before selecting the belt drive.

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Answer key

School of Woodworking Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

2nd In-Sem. Examination

Course Code: SC1505 **Time: 1 Hour**

Course Name: Advance Carpenter Mathematics **Max. Marks: 20**

Instruction: All question compulsory. Calculator without storage is permitted.

Section – A

05X01 = 05 Marks

Q1)Which of the following is not used for transmitting power:

a) Belt drive b) Chain drive c) Gear drive d) Electric Motor.

Ans: d)

Q2) Power transmitted from belt drive is given by

a) Torque × Force

b) Torque × Tension

c) Torque × Speed

d) Tension × Mass

Ans:c)

Q3) The prediction of future value of product is called as

a) JIT

b) Scheduling

c) Forecasting

d) None of the above.

Ans: c)

Q4) 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

Ans: a)

Q5) EOQ is

(a) Enterprise order quantity

(b) Enterprise order quality

(c) Economic order quantity

(d) Economic order quality

Ans: c)

Section – B

03X02 = 06 Marks

Q6) A new motor is installed for a band saw. This engine runs at 740 rpm and has a pulley with a diameter of 220mm. How big must the pulley for the band saw be if the band saw reel should have a speed of 920 1 / min?

Solution: $d_2 = \frac{d_1 \times n_1}{n_2}$ Ans: 176.95

Q7) 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:

$$n_2 = \frac{z_1 \times n_1}{z_2}$$

$$i = \frac{z_2}{z_1}$$

Ans: 1003.8 rpm, and 1.4:1

Q8) Define a) Demand forecasting b) MRP

Ans: 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.

Ans: b) Material Requirements Planning is primarily related to the inventory of raw materials and components which are required to produce the products in a facility. Their demand is usually termed as secondary demand that totally depends upon the demand of finished product. MRP is a time phased priority-planning technique that estimates material requirements and schedules supply to meet demand across all products and parts in one or more plants. Now- a- days, information technology plays a major role in designing and implementing Material Requirements Planning systems and processes as it

provides information about manufacturing needs (linked with customer demand) as well as information about inventory levels.

Section – C 03X03 = 09 Marks

Q9) Explain the major principles of Just in Time technique.
Ans:

a) Elimination of waste
b) Waste of overproduction
c) Waste of waiting
d) Waste of movement
e) Waste of inventories
f) Waste of making defects

Q10) 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:

1. *When there is no slip*

We know that $\frac{N_4}{N_1} = \frac{d_1 \times d_3}{d_2 \times d_4}$ or $\frac{N_4}{150} = \frac{750 \times 900}{450 \times 150} = 10$

$\therefore$ $N_4 = 150 \times 10 = 1500$ r.p.m. Ans.

2. *When there is a slip of 2% at each drive*

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

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

$\therefore$ $N_4 = 150 \times 9.6 = 1440$ r.p.m. Ans.

Q11) Explain the factor required to be consider before selecting the belt drive.

Ans:

1. Amount of power to be transmitted
2. Peripheral and angular speeds
3. Speed ratio
4. Efficiency
5. Centre distance between staffs
6. Space available
7. Working environment