BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

End-Sem. Examination

Set-A

Course Code: SCS1301 **Time: 2 Hours**

Course Name: Advanced Power Tools **Max. Marks: 50**

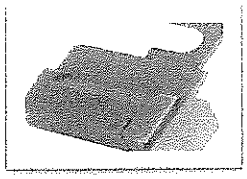
Instruction:

- 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

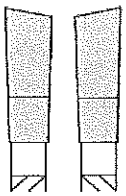
Q.1.Which one of the following is the name of accessory attached below?



(A) Side Stop (B) Guide Rail

(C) Splinter Guard (D) Trim Stop

Q.2.What is the name of tooth shape attached below?



- ATB (B) TCG

(C) Both (A) & (B) (D) None of these

Q.3.Which one of the following is the diameter of Saw Blade in Mitre Saw KAPEX KS 120?

(A) 150 mm (B) 260 mm

(C) 160 mm (D) 250 mm

Q.4.Which one of the following is the maximum depth(std.) of Mitre Saw KAPEX KS 120?

(A) 88 mm (B) 86 mm

(C) 98 mm (D) 90 mm

Q.5. Which one of the following is the maximum depth(tall) of Mitre Saw KAPEX KS 120?

(A) 88 mm (B) 86 mm

(C) 98 mm (D) 120 mm

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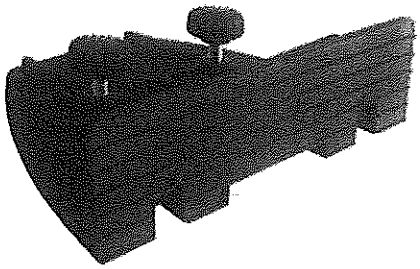
Q.6.What is name of System accessory attached below?



(A) Trim Stop
(B) Additional Stop
(C) Hand rail fence
(D) Cross Stop

Q.7.Which one of the following is the routing depth used while using 4*20 Domino dowels?

(A) 10 mm
(B) 20 mm
(C) 15 mm
(D) 25 mm

Q.8.Which one of the following is the maximum height adjustment in Router OF 1400 EQ?

(A) 50 mm
(B) 60 mm
(C) 70 mm
(D) 75 mm

Q.9. Which one of the following is the maximum Tool/Bit diameter in Router OF 1400 EQ?

(A) 63 mm
(B) 65 mm
(C) 70 mm
(D) 60 mm

Q.10.Which one of the following is the diameter of Cutter in Zeta P2?

(A) 150 mm
(B) 120 mm
(C) 100 mm
(D) 160 mm

Section – B

04X04 = 16 Marks

Q.11.What are the steps for changing the bit in Hand Router?

Q.12.What are the advantages of Zeta P2?

Q.13.What are the types of Hand Circular Saw? Explain it.

Q.14.What is hook angle? Explain with the help of diagram.

Section – C

04X06 = 24 Marks

Q.15.What is Pendulum Router Principle in Domino machine? Also write the steps for changing the bit in Domino machine.

Q.16.What are the types of Tooth shape of Hand Circular Saw? Explain with the help of diagram.

Q.17.What are the six points of routine maintenance of Hand Router?

Q.18.What are the steps for set up of LR 32 System?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

ANSWER KEY

School of Woodworking Skills

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Set-A

Course Code: SCS1301 **Time: 2 Hours**

Course Name: Advanced Power Tools **Max. Marks: 50**

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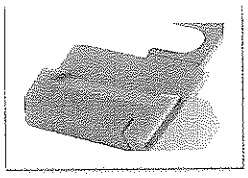
Section – A

10X01 = 10 Marks

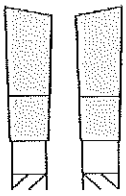
Q.1.Which one of the following is the name of accessory attached below?



(A) Side Stop (B) Guide Rail

(C) Splinter Guard (D) Trim Stop (C)

Q.2.What is the name of tooth shape attached below?



(A) ATB (B) TCG

(C) Both (A) & (B) (D) None of these (A)

Q.3.Which one of the following is the diameter of Saw Blade in Mitre Saw KAPEX KS 120?

(A) 150 mm (B) 260 mm

(C) 160 mm (D) 250 mm (B)

Q.4.Which one of the following is the maximum depth(std.) of Mitre Saw KAPEX KS 120?

(A) 88 mm (B) 86 mm

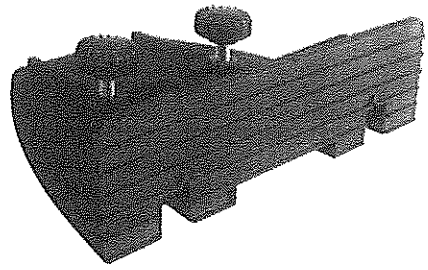
(C) 98 mm (D) 90 mm (A)

Q.5. Which one of the following is the maximum depth(tall) of Mitre Saw KAPEX KS 120?

(A) 88 mm (B) 86 mm

(C) 98 mm (D) 120 mm (D)

Q.6.What is name of System accessory attached below?



(A) Trim Stop (B) Additional Stop

(C) Hand rail fence (D) Cross Stop (B)

Q.7.Which one of the following is the routing depth used while using 4*20 Domino dowels?

(A) 10 mm (B) 20 mm

(C) 15 mm (D) 25 mm (A)

Q.8.Which one of the following is the maximum height adjustment in Router OF 1400 EQ?

(A) 50 mm (B) 60 mm

(C) 70 mm (D) 75 mm (D)

Q.9. Which one of the following is the maximum Tool/Bit diameter in Router OF 1400 EQ?

(A) 63 mm (B) 65 mm

(C) 70 mm (D) 60 mm (C)

Q.10.Which one of the following is the diameter of Cutter in Zeta P2?

(A) 150 mm (B) 120 mm

(C) 100 mm (D) 160 mm (B)

Section – B

04X04 = 16 Marks

Q.11.What are the steps for changing the bit in Hand Router?

ANS: -

1. Unplug the router for safety.
2. Insert the router bit into the collet at least one inch. This will vary with different bits, but most of the shank should be within the collet. Do not exceed two inches.
3. Place the collet wrench on the collet nut.
4. Press the left-hand side of the spindle lock.
6. Remove the wrench from the c

the router. To remove a except press the right-hand side of the spindle lock

5. Tighten the collet nut firmly. Collet nut before starting 7. router bit, follow the same procedure

Q.12.What are the advantages of Zeta P2?

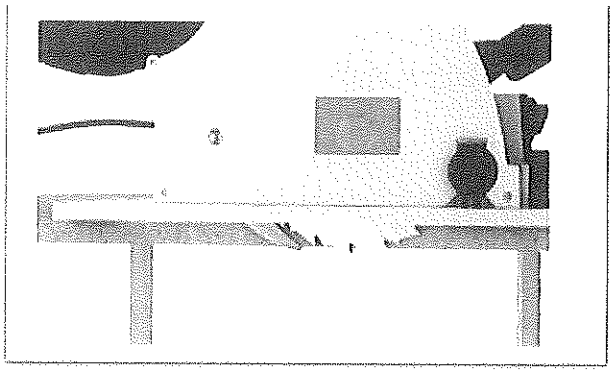
ANS:-

– Zeta P2, the power tool for fast, form-locking anchorage of

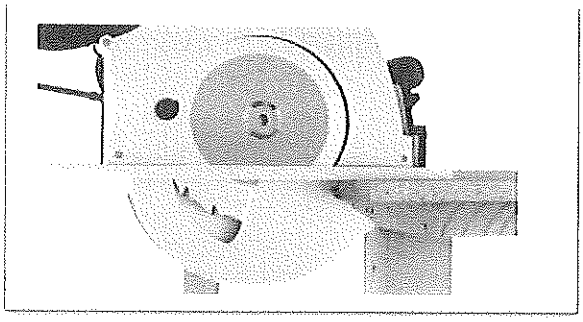
all P-System connectors for wood joints
– The automatic vertical movement creates a profile groove enabling manual insertion of the connectors
– Time saving when installing connectors due to the innovative profile groove concept. Insertion of the connectors by hand, without using glue or screws, greatly reduces labour time while also negating the need for additional fastening materials

Q.13.What are the types of Hand Circular Saw? Explain it.

ANS:- 1.Hand circular saw with dipping saws:- In this type of Hand circular saw,the saw blade is at rest with the table flush.When sawing,the saw blade is lowered by actuating the unlocking mechanism.



2.Hand circular saw with swing protective hood:- In this type of Hand circular saw,sawing protective hood for circular saws with anti-away hood,the lower part of the saw blade is concealed by a movable guard,which is only pushed back by the latter when it penetrates into the workpiece.



Q.14.What is hook angle? Explain with the help of diagram.

ANS: - The hook angle of a sawblade is the angle between the face of a blade tooth with respect to a radial line to the centre of the blade. This is most obvious on ripping blades, where the high hook angle is easily seen. The higher the hook angle, the more aggressive the blade will cut the work piece. This is desired for ripping, but it is not desired for finer cuts, and especially not for vary hard materials.

Section – C

04X06 = 24 Marks

Q.15.What is Pendulum Router Principle in Domino machine? Also write the steps for changing the bit in Domino machine.

ANS: - Unique in manually operated machines and patented by Festool: the DOMINO joining machine routing

Steps for Changing the Bit:-
movement. The simultaneous rotating and pendulum movement of the cutter allows smooth working and holes without scorch marks. Thanks to the pendulum movement the cutters do not overheat, leading to an extremely high service life.

Steps for Changing the bit:-
Always disconnect from the mains to change the cutter. Then raise the unlocking lever using an open ended spanner (included) until it audibly locks in place.
Hold the spindle lock on the motor unit, loosen the cutter using the open ended spanner and screw off. Screw in the new cutter using the open ended spanner, keeping the spindle lock pressed. Then release the spindle lock. Separate the motor unit and guide frame.Before inserting a new cutter, ensure that the machine, the guide frame and the guides are clean and free from chippings.Remove any soiling. Only use sharp, undamaged and clean cutters. Now push the guide frame onto the motor unit until it audibly locks in place.

Q.16.What are the types of Tooth shape of Hand Circular Saw? Explain with the help of diagram.

ANS:- The Alternate Top Bevel (ATB) shape is ideal for clean cutting of wood fibers. The Triple Chip (TC) shape is very robust in holding sharpness in hard or abrasive materials.The alternating points of the ATB blade slice through the wood fibers at the edges of the cut to produce clean and efficient cuts. The lower15° bevel angle of Festool blades allow them to maintain sharpness of the points longer between sharpenings.The trapezoidal shape of the TC blade tooth maintains its sharpness by not having points that could quickly dull. Each trapezoidal tooth initially cuts a little of the center of the cut,and then is followed by a flat-top raker tooth
to finish the cut and clean up the corners. The TC grind is ideally suited for materials that would otherwise quickly dull an ATB blade.

Q.17.What are the six points of routine maintenance of Hand Router?

ANS:-
1.As a general rule, keep the tool clean of all dust and debris. Even soft-wood dust can be abrasive.
2. Examine all moving parts for dust and debris.
3. Keep the plunge posts clean so dust does not get embedded into the bearing surfaces.

Q.18.What are the steps for set up of LR 32 System?

ANS: - 1. The guide plate must firstly be adjusted to the guide rail so that there is no free play.

2. Insert the centring mandrel in the clamping collet of the router.
3. Place the router on the guide plate and centre it by pressing the centring disc into the hole of the guide plate and clamp the router to the guide plate using the knob.Also remove the centring mandel and insert the D 5 mm dowel drill bit.
4. . Before intial use,the side fences must be adjusted.First set the stop flag on 0 using the scale.Then the entire stop is set on the guide rail and the connection from the scale bar and the clamping block is opened with an Allen key.The unit is now moved until the indexing bolt of the stop flag is centred in the recess of the guide plate.This procedure is also to be followed with the second side fence.

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Set-B

Course Code: SCS1301 **Time: 2 Hours**

Course Name: Advanced Power Tools **Max. Marks: 50**

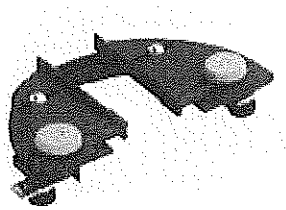
Instruction:

- 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

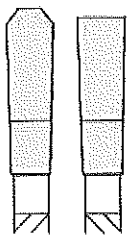
Q.1.Which one of the following is the name of accessory attached below?



(A) Side Stop (B) Guide Rail

(C) Splinter Guard (D) Trim Stop

Q.2.What is the name of tooth shape attached below?



(A) ATB (B) TCG

(C) Both (A) & (B) (D) None of these

Q.3.Which one of the following is the diameter of Saw Blade in Mitre Saw KAPEX KS 120?

(A) 150 mm (B) 260 mm

(C) 160 mm (D) 250 mm

Q.4.Which one of the following is the maximum depth at Max. Depth at 45° Bevel of Miter Saw KAPEX KS 120?

(A) 88 mm (B) 86 mm

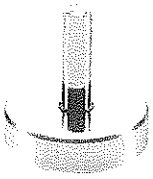
(C) 98 mm (D) 55 mm

Q.5. Which one of the following is the maximum Max. Width at 90° Miter of Miter Saw KAPEX KS 120?

(A) 305 mm (B) 300 mm

(C) 310 mm (D) 320 mm

Q.6.What is name of System accessory attached below?



(A) Trim Stop (B) Additional Stop

(C) Hand rail fence (D) Centring Mandel

Q.7.Which one of the following is the Max. Width at 45° Miter in Mitre Saw?

(A) 200 mm (B) 210 mm

(C) 150 mm (D) 250mm

Q.8.Which one of the following is the maximum height adjustment in Router OF 1010 EQ?

(A) 50 mm (B) 55 mm

(C) 70 mm (D) 75 mm

Q.9. Which one of the following is the diameter of Saw Blade Circular Saw TS 55?

(A) 163 mm (B) 165 mm

(C) 160 mm (D) 170 mm

Q.10.Which one of the following is the maximum depth in Zeta P2?

(A) 15 mm (B) 20 mm

(C) 10 mm (D) 60 mm

Section – B

04X04 = 16 Marks

Q.11.What are the steps for changing the tool in Miter Saw?

Q.12.What are three types of selecting the hole width in Domino DF 500?

Q.13.What are the four parts of Router OF 1400 EQ? Explain it.

Q.14.What are the functions of Guide rail?

Section – C

04X06 = 24 Marks

Q.15.What is Plunge Cutting? Also write the steps for performing the Plunge Cutting.

Q.16.What is MFS Template? Also write the advantages of using MFS Template.

Q.17.What are the six points of routine maintenance of Domino machine?

Q.18.What are the steps for making groove 8*8 mm by Hand Router with the help of Guide rail?

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ANSWER KEY

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Set-B

Course Code: SCS1301 **Time: 2 Hours**

Course Name: Advanced Power Tools **Max. Marks: 50**

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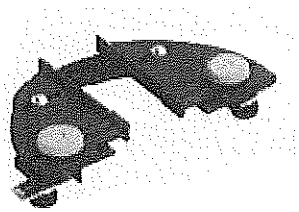
Section – A

10X01 = 10 Marks

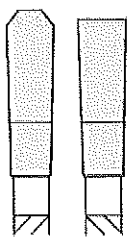
Q.1.Which one of the following is the name of accessory attached below?



(A) Side Stop (B) Guide Rail

(C) Splinter Guard (D) Trim Stop (D)

Q.2.What is the name of tooth shape attached below?



(A) ATB (B) TCG

(C) Both (A) & (B) (D) None of these (B)

Q.3.Which one of the following is the diameter of Saw Blade in Mitre Saw KAPEX KS 120?

(A) 150 mm (B) 260 mm

(C) 160 mm (D) 250 mm (B)

Q.4.Which one of the following is the maximum depth at Max. Depth at 45° Bevel of Miter Saw KAPEX KS 120?

(A) 88 mm (B) 86 mm

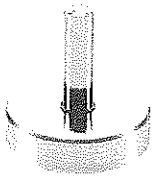
(C) 98 mm (D) 55 mm (D)

Q.5. Which one of the following is the maximum Max. Width at 90° Miter of Miter Saw KAPEX KS 120?

(A) 305 mm (B) 300 mm

(C) 310 mm (D) 320 mm (A)

Q.6.What is name of System accessory attached below?



(A) Trim Stop (B) Additional Stop

(C) Hand rail fence (D) Centring Mandel(D)

Q.7.Which one of the following is the Max. Width at 45° Miter in Mitre Saw?

(A) 200 mm (B) 210 mm

(C) 150 mm (D) 250mm (B)

Q.8.Which one of the following is the maximum height adjustment in Router OF 1010 EQ?

(A) 50 mm (B) 55 mm

(C) 70 mm (D) 75 mm (B)

Q.9. Which one of the following is the diameter of Saw Blade Circular Saw TS 55?

(A) 163 mm (B) 165 mm

(C) 160 mm (D) 170 mm (C)

Q.10.Which one of the following is the maximum depth in Zeta P2?

(A) 15 mm (B) 20 mm

(C) 10 mm (D) 60 mm (B)

Section – B

04X04 = 16 Marks

Q.11.What are the steps for changing the tool in Miter Saw?

ANS:-

1. Push in and rotate the FastFix® arbor lock clockwise. This prevents the arbor from turning and also disables the motor.
2. Loosen the clamping screw on the arbor bolt guard, and rotate the guard away from the arbor bolt. (The combination hex key is stored on the back of the saw by the power cord.)
3. Unscrew the arbor bolt by turning it clockwise. The arbor bolt is a **left-hand thread** and turns the opposite of a standard screw.
4. Without pushing down on the trigger lock, pull up on the trigger to release the blade guard.

5. Raise the blade guard out of the way and remove the outboard arbor flange and sawblade from the arbor.
6. Inspect the friction lining on the two arbor flanges. If the lining is damaged, replace the flanges, as this can cause the sawblade to wobble.

Q.12.What are three types of selecting the hole width in Domino DF 500?

ANS:-. 1 The standard width, corresponding exactly to the dowel width: **13 mm** plus the cutter diameter
2 The average hole width, giving the dowel some clearance (6 mm): **19 mm** plus the cutter diameter
3 The largest hole width, providing a lot of clearance (10 mm): **23 mm** plus the cutter diameter
Please only change the hole width by turning the rotary switch with the motor running, but never while actually routing.

Q.13.What are the four parts of Router OF 1400 EQ? Explain it.

ANS:- a. **Trigger (On/Off Switch).** Used to turn the router On and Off.

b. **Trigger Lock.** This locks the power trigger in the On position.

c. **Speed Control.** This dial is used to change the motor speed of the router. The higher the number, the faster the motor speed.

d. **Depth Stop Post Handle.** The depth stop post is raised or lowered with this handle.

Q.14.What are the functions of Guide rail?

ANS: - A circular saw is a utilitarian workhorse and a useful addition to the toolkit of DIYers. Its most common function is to make cuts in a straight line on pieces of lumber. Knowing its parts makes using a circular saw easier.

- Handle and power trigger: While holding the handle to push the saw forward, squeeze the trigger to start the blade; release it to stop sawing.
- Trigger lock switch: This safety feature prevents the saw from being turned on if the trigger is accidentally squeezed. Deactivate it with your thumb and simultaneously pull the trigger to start the motor.
- Front grip: This secondary handle is for your other hand to help guide the saw along its cutting line.
- Blade guard: A retractable guard covers the circular saw blade when it isn't operating. When the saw is lined up and ready to cut, the guard is lifted using a tab on its side.
- Shoe: Sometimes called the base of the saw, this is the metal rectangle that rests on top of the material being cut.
- Bevel adjustment knob: Loosen to adjust the angle between the shoe and the saw blade.
- Depth lock knob: Loosen this knob to adjust and set the blade depth.
- Power source: Depending on model, this could be a removable battery on cordless models or a power cord connected to an outlet.
- The blade's sharp teeth are measured in TPI, or teeth per inch. A higher TPI gives a smoother cut that requires less sanding. Blades with a lower TPI produce faster cuts that are good for rough work. Multi-purpose circular saw blades are available but specially designed varieties should be used when cutting materials like metal, cement fiber board, ceramic tile or plastic.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – C

04X06 = 24 Marks

Q.15.What is Plunge Cutting? Also write the steps for performing the Plunge Cutting.

ANS:- Plunge cutting is used when the cut does not start at the edge of the work piece. Instead, it starts in the middle of the work piece, and may continue to the end, or may stop short of the end.

1. Using pencil lines, tape, or some other means, mark the beginning and end of the cut.
2. Place the guide rail on the cutline.
3. Place the saw on the guide rail, and position it at the start of the cut.
4. Install the limit stop on the guide rail, slide it up to the back of the saw, and lock it in place.
5. If an optional second limit stop is used, set its position in a similar manner.
6. With the saw firmly seated against the beginning limit stop, start the saw and slowly plunge it down.
7. Advance the saw through the cut until the end is reached.

▶▶Hold the saw fully plunged until the blade comes to a complete stop.

▶▶Never back the saw up, as this can result in a kickback

Q.16.What is MFS Template? Also write the advantages of using MFS Template.

ANS:- Routing operations like open-field inlays, borders, cutouts, mortises, routing circles, curves and arcs are just part of what the MFS system can do. Use the MFS with your Multi Function Table to help square the guide rail with the table, or as a cutting fence. I've even used the profiles as a temple to make cuts with my jigsaw! To understand the full value of this accessory, don't think of it as a "Routing Template". Envision profiles that form templates, squares, fences, stops, story sticks and jigs of every kind, a "Multi-Function Profile" system.

Q.17.What are the six points of routine maintenance of Domino machine?

ANS: - ▶ As a general rule, keep the saw clean of all dust and debris. Even soft-wood dust can be abrasive over time.

▶▶ Examine all moving parts for dust and debris.

▶▶ Keep the bevel hinges clean of dust using compressed air or cotton swabs. If the hinges wear due to abrasive particles, the saw will not perform optimally.

▶▶ Keep the blade area and dust extraction port clean of debris. Debris can cause wear and reduce the effectiveness of the dust extraction system.

▶▶ Periodically remove the blade cover (5 screws), the blade, and the inboard arbor flange; and clean any built up debris from the inside of the saw.

Q.18.What are the steps for making groove 8*8 mm by Hand Router with the help of Guide rail?

ANS:-

1. Clamp the workpiece to a stable surface. 2. Set the router bit depth and firmly tighten the plunge lock knob.

4. Place the router on the workpiece with the router bit positioned slightly ahead of the corner (away from a right-handed operator as shown) and about ½ to 1 inch away from the workpiece.
5. Firmly place your left forearm on the workpiece and grasp the auxiliary handle (plunge lock knob) of the router. Your hand will serve as the pivot point for this operation, so you want to keep it held as firmly in place as possible.
6. Place your right hand on the main handle and start the router.
7. Nibble away at the corner by rocking the router back and forth taking light, controlled cuts. Gradually move your left hand as necessary to cut deeper.
8. Finish routing the rest of the edge as normal.

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Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Set-A

Course Code: SCS1302 **Time: 2 Hours**

Course Name: Advance Stationary Machine **Max. Marks: 50**

Instruction:

- All question from section A, each question carries One mark.
- All question from section B, each question carries Four mark.
- All question from section C, each question carries Six mark.

Section – A

10X01 = 10 Marks

Q.1. Which one of the following is running direction of Scoring Saw ?

(a) Opposite of the main saw (c) Same direction of the main saw

(b) Dawn of the main saw (d) All of them

Q.2. Which one of the following is angle of plastic and aluminium cutting blade ?

(a) Negative rake angle (c) Positive rake angle

(b) Some of negative and positive angle (d) All of them

Q.3. Which one of the following material we use for the table insert in band saw machine ?

(a) Plastic (c) Wood

(b) Iron (d) Rubber

Q.4. Which one of the following is the correct Sanding Process ?

(a) Coarse to fine sanding (c) Fine to coarse sanding

(b) Not required (d) All of them

Q.5. Which one of the following is the fastened position of riving knife ?

(a) Behind of the cutting blade (c) Front of the cutting blade

(b) Top of the cutting blade (d) All of them

Q.6. Which one of the following is controlled in the out feed table of the surface planner ?

(a) Thickness (c) Depth

(b) Angle (d) Depth

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Q.7. Which one the following is the cast iron wheel diameter of band saw ?

(a) 600 mm
(a) 620 mm
(c) 650 mm
(d) 750 mm

Q.8. Which one the following is maximum one time sanding depth of Costa wide belt sander while working with Acacia wood ?

(a) 0.4
(b) 0.6
(c) 0.5
(d) 0.3

Q.9. Which one the following should be the temperature if the time is set to 8 min in hot press ?

(a) 30 C
(b) 120 C
(c) 50 C
(d) 80 C

Q.10. Which of the following machine has a lever for feed speed change ?

(a) Panel saw
(b) Surface planner
(c) Thickness planner
(d) All of them.

Section – B

04X04 = 16 Marks

Q.11. Describe the function of scoring saw.

Q.12. Write down the application of table insert of the band saw.

Q.13. Write down the function of the protection hood on the panel saw.

Q.14. What is the different between edge sanding machine and wide belt sanding machine?

Section – C

04X06 = 24 Marks

Q.15. Briefly explain the sequential steps to change the panel saw blade.

Q.16. Write down the steps to make a rebate using spindle molder machine.

Q.17. Explain the difference between a high and low saw position of the panel saw.

Q.18. Write down the safe and efficient hand position while working on panel saw machine.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

ANSWER KEY

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Set-A

Course Code: SCS1302 **Time: 2 Hours**

Course Name: Advance Stationary Machine **Max. Marks: 50**

Instruction:

- All question from section A, each question carries One mark.
- All question from section B, each question carries Four mark.
- All question from section C, each question carries Six mark.

Section – A

10X01 = 10 Marks

Q.1. Which one of the following is running direction of Scoring Saw ?

(a) Opposite of the main saw (c) Same direction of the main saw

(b) Dawn of the main saw (d) All of them **(a)**

Q.2. Which one of the following is angle of plastic and aluminium cutting blade ?

(a) Negative rake angle (c) Positive rake angle

(b) Some of negative and positive angle (d) All of them **(a)**

Q.3. Which one of the following material we use for the table insert in band saw machine ?

(a) Plastic (c) Wood

(b) Iron (d) Rubber **(c)**

Q.4. Which one of the following is the correct Sanding Process ?

(a) Coarse to fine sanding (c) Fine to coarse sanding

(b) Not required (d) All of them **(a)**

Q.5. Which one of the following is the fastened position of riving knife ?

(a) Behind of the cutting blade (c) Front of the cutting blade

(b) Top of the cutting blade (d) All of them **(a)**

Q.6. Which one of the following is controlled in the out feed table of the surface planner ?

(a) Thickness (c) Depth

(b) Angle (d) Depth **(b)**

Q.7. Which one the following is the cast iron wheel diameter of band saw ?

Manish Kumar

(a) 600 mm (c) 650 mm

(b) 620 mm (d) 750 mm **(a)**

Q.8. Which one the following is maximum one time sanding depth of Costa wide belt sander while working with Acacia wood ?

(a) 0.4 (c) 0.5

(b) 0.6 (d) 0.3 **(c)**

Q.9. Which one the following should be the temperature if the time is set to 8 min in hot press ?

(a) 30 C (c) 50 C

(b) 120 C (d) 80 C **(d)**

Q.10. Which of the following machine has a lever for feed speed change ?

(a) Panel saw (c) Thickness planner

(b) Surface planner (d) All of them. **(c)**

Section – B

04X04 = 16 Marks

Q.11. Describe the function of scoring saw ?

Ans:- Panel saw have a scoring unit, it is depending on the model. The smaller scoring blade cuts the material approx. 1 to 2 mm from below the panel. The main saw blade in the opposite direction separate the material. For perfect saw cut, both saw blades must be precisely aligned and adjusted.

Q.12. Write dawn the application of table insert of the band saw ?

Ans:-

- ✓ Do not touch band saw while idling.
- ✓ The table insert should have as small and opening as possible, but do not touch the band saw and be exactly flush with the table surface.
- ✓ The small opening should prevent small pieces of wood from being pinched and UN even heating of saw blade.
- ✓ The inserts are preferably made of wood.
- ✓ They can thus be replacing and band saw takes no damage when touched.

Q.13. Write dawn the function of the protection hood on the panel saw ?

Ans:- Protective hood function -

Protective hood use protection against contact with the circular saw blade.

- ✓ Preventing a work piece kickback.
- ✓ Protection against splintering wood parts, branches and sawdust extraction of the chips.

Q.14. What is the different between edge sanding machine and wide belt sanding machine ?

Ans:- **Edge Sanding Machine -**

- ✓ Edge sanding machine we used for sanding a solid wood edge.
- ✓ Sanding a round work pieces.
- ✓ Curve work piece.

Wide belt sanding machine -

- ✓ Wide belt sanding machine uses for the calibrate the work pieces, thickness of panel.
- ✓ We can do sanding both material like engineering wood and natural wood.

Section – C

04X06 = 24 Marks

Q.15. Briefly explain the sequential steps to change the panel saw blade ?

Ans:- Changing the saw blade -

- ✓ Press main switch off.
- ✓ Switch on the emergency stop switch.
- ✓ Set the saw to the upper limit setting and cutting angle should be 0 degree.
- ✓ Remove the safety hood.
- ✓ Place the sliding table at upper limit.
- ✓ Open the safety guard, block the circular saw shaft.
- ✓ Unscrew the nut with ring spanner in the clock wise (sawing) direction.
- ✓ Release nut in running direction.
- ✓ Remove the saw blade.
- ✓ Never put the saw blade and machine tools directly on the machine table, other wise cutting teeth could be damaged.
- ✓ Clean the blade holder flange.
- ✓ Select the suitable blade and place in shaft.
- ✓ Fit the flange and nut.
- ✓ Tight the nut against running direction.
- ✓ Release the locking devise.

Q.16. Write down the steps to make a rebate using spindle moulder machine ?

Ans:-

- ✓ Switch on the power supply of machine.
- ✓ Turn on safety button.

- ✓ Change the tool if required.
- ✓ Change the spindle RPM according to the tool.
- ✓ Adjust the height according to operation.
- ✓ Select the piece on which we are going to make the rebate.
- ✓ Adjust all safety guard according to operation.
- ✓ Turn off the safety switch.
- ✓ Switch on the machine.
- ✓ Start the operation and check the width and depth of rebate.
- ✓ Complete the rebate and check the dimension.

Note:-

- ✓ Wear all the safety equipment during the whole process.
- ✓ Check all locks before turning on the machine.
- ✓ Use all safety gears.
- ✓ Check the nobody is standing behind the machine

Q.17. Explain the difference between a high and low saw position of the panel saw ?

Ans:-

Effect	High saw blade position	Low saw blade position
Cut cleanness	If saw blade is in high position,then more chip out will be produce on the bottom side.	If saw blade is in law position then the chip out on the bottom side will be less.
Security	Lower risk of kickback /cutting pressure directed down to the machine table.	Greater risk of kick back / cutting pressure tend to be directed towards the operator
Service life of saw blade	Higher due to shorter cutting path in work piece	Lower due to longer cutting path in work piece and more cutting pressure.

Q.18. Write down the safe and efficient hand position while working on panel saw machine ?

Ans:- Safe and efficient work procedure -

1. **Close hand position.**
2. **Press the work piece against the fences with the heel of hand -**

Reduce the protective hood to the work piece. Trimming solid wood if rough wood are trimmed on the table saw in advance, the hold device on the front of the sliding table enables safe advancement without the moving of the board.

3. **Cutting Narrow work piece -**

When cutting narrow strips with out using the hold dawn device, the protective cover can only be lowered down to the height of the rip fence

4. Cutting wood -

When cutting wood with help of rip fence, the work piece must be guided well to the end. If a tear free quality is required.

5. Crosscutting -

Close hand position.

Use Push stick.

When we are cutting crosscut, work piece should be contact and parallel to the crosscut fence.

Note:- When we are cutting along the rip fence should be 20 mm inside from the cutting saw blade.

6. Miter cutting -

Wide protective hood.

Close hand position.

When the saw blade is inclined, the wide protective hood must be used.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Set-B

Course Code: SCS1302 **Time: 2 Hours**

Course Name: Advance Stationary Machine **Max. Marks: 50**

Instruction:

- All question from section A, each question carries One mark.
- All question from section B, each question carries Four marks.
- All question from section C, each question carries Six marks.

Section – A

10X01 = 10 Marks

Q.1. Which one of the following is the function of protective hood?

(a) It avoids kick back
(c) It keeps the work piece in motion
(b) It makes the cut smooth
(d) All of them

Q.2. Which one of the following is angle of crosscut solid wood blade?

(a) Negative rake angle
(c) Sum of negative and positive angle
(b) Positive rake angle
(d) All of them

Q.3. Which one of the following position of the panel saw blade for cleanness cut?

(a) Blade should below
(c) Blade should be high
(b) Blade should be in middle
(d) It does not matter

Q.4. Which one of the following material we use for the table insert in band saw machine?

(a) Plastic
(c) Iron
(b) Wood
(d) Rubber

Q.5. There are number of teeth in solid wood along grains saw blade?

(a) 96
(c) 28
(b) 48
(d) 72

Q.6. Which one of the following machines is used to make curved work piece?

(a) Panel saw
(c) Spindle molder
(b) Surface planner
(d) None of them

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Q.7. Which one of the following saw blade is used for cutting laminates?

(a) Razor cut
(b) Solid wood cross cut
(c) Universal saw blade
(d) Panel saw blade

Q.8. Which one of the following is maximum one-time depth of cut thickener machine?

(a) 4
(b) 3
(c) 5
(d) 6

Q.9. Which machine is use for rough cutting?

(a) Bend saw
(b) Thickness
(c) Panel saw
(d) Panel saw

Q.10. Which one of the following measuring tool is suitable to take measurement of work piece while sanding with Costa wide belt sander?

(a) Double meter
(b) Steel ruler
(c) Roll meter
(d) Vernier caliper

Section – B

04X04 = 16 Marks

Q.11. Write down the application of riving knife.

Q.12. Difference between main saw and scoring saw.

Q.13. Write down the application of table insert of the band saw machine.

Q.14. Write down important steps and points to make a flat work piece using surface planer.

Section – C

04X06 = 24 Marks

Q.15. Write down the application of hot press machine.

Q.16. Briefly explain the sequential steps to change the panel saw blade.

Q.17. Explain the difference between a high and law position of the panel saw.

Q. 18. Why is it important to follow all the safety instructions and precautions while working on the standard machines?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

ANSWER KEY.

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Set-B

Course Code: SCS1302 **Time: 2 Hours**

Course Name: Advance Stationary Machine **Max. Marks: 50**

Instruction:

- All question from section A, each question carries One mark.
- All question from section B, each question carries Four marks.
- All question from section C, each question carries Six marks.

Section – A

10X01 = 10 Marks

Q.1. Which one of the following is the function of protective hood ?

(a) It avoids kick back
(c) It keeps the work piece in motion
(b) It makes the cut smooth
(d) All of them **(a)**

Q.2. Which one of the following is angle of crosscut solid wood blade ?

(a) Negative rake angle
(c) Sum of negative and positive angle
(b) Positive rake angle
(d) All of them **(a)**

Q.3. Which one of the following position of the panel saw blade for cleanness cut ?

(a) Blade should below
(c) Blade should be high
(b) Blade should be in middle
(d) It does not matter **(a)**

Q.4. Which one of the following material we use for the table insert in band saw machine ?

(a) Plastic
(c) Iron
(b) Wood
(d) Rubber **(b)**

Q.5. There are number of teeth in solid wood along grains saw blade ?

(a) 96
(c) 28
(b) 48
(d) 72 **(c)**

Q.6. Which one of the following machines is used to make curved work piece ?

(a) Panel saw
(c) Spindle moulder
(b) Surface planner
(d) None of them **(c)**

Q.7. Which one of the following saw blade is used for cutting laminates ?

(a) Razor cut (c) Universal saw blade

(b) Solid wood cross cut (d) Panel saw blade **(a)**

Q.8. Which one of the following is maximum one time depth of cut thickener machine ?

(a) 4 (c) 5

(b) 3 (d) 6 **(c)**

Q.9. Which machine are use for rough cutting ?

(a) Bend saw (c) surface planer

(b) Thickness (d) Panel saw **(a)**

Q.10. Which one of the following measuring tool is suitable to take measurement of work piece while sanding with Costa wide belt sander ?

(a) Double meter (c) Roll meter

(b) Steel ruler (d) Vernier caliper **(d)**

Section – B

04X04 = 16 Marks

Q.11. Write dawn the application of riving knife ?

Ans:-

- ✓ The riving knife is fastened behind the saw blade.
- ✓ Its keeps the kerf open in separating cuts.
- ✓ If the riving knife missing, the joint can be closed by the compression in the wood.
- ✓ Riving knife allows the as sending part of the sprocket to grasp the work piece.
- ✓ Riving knife must be thinner than the cutting width (tooth thickness) of the cutting blade.

Q.12. Difference between main saw and scoring saw ?

Ans:-

Main Saw	Scoring Saw
It is used to cut material.	It prevent chip cut.
Second cut made by main saw.	First cut made by scoring saw.
Diameter is 350 mm.	Diameter is 120 mm.
Teeth thickness 3.5	Teeth thickness 3.7
It rotate in clock wise direction.	It rotates in anti clockwise direction.
It will cut entire work piece.	It will cut work piece till certain depth.

Q.13. Write dawn the application of table insert of the band saw machine ?

Ans:-

- ✓ Do not touch band saw while idling.
- ✓ The table insert should have as small and opening as possible, but do not touch the band saw and be exactly flush with the table surface.
- ✓ The small opening should prevent small pieces of wood from being pinched and UN even heating of the saw blade.
- ✓ The insert are preferably made of wood.

Q.14. Write dawn important steps and points to make a flat work piece using surface planer ?

Ans:-

- ✓ Dust collector must be on.
- ✓ Make sure that the fence is set to 90.
- ✓ Turn on the main electrical switch.
- ✓ Press the start button.
- ✓ Set the height of the cutter block according to work piece.
- ✓ Take the depth of cut.
- ✓ Start the trimming and grinding.
- ✓ Trim the work piece in one side and plane it.
- ✓ Now take the plane side as a reference with the fence.
- ✓ One side will become flat with reference to the fence.

Section – C

04X06 = 24 Marks

Q.15. Write dawn the application of hot press machine ?

Ans:-

- ✓ It is used to press laminate with MDF.
- ✓ It is used to press laminate with particleboard.
- ✓ It is used to press veneer with ply board.
- ✓ It is used to press veneer together.
- ✓ It is used for doors.
- ✓ It used for pressing solid wood.

Q.16. Briefly explain the sequential steps to change the panel saw blade ?

Ans:- Changing the saw blade -

- ✓ Press main switch off.
- ✓ Switch on the emergency stop switch.
- ✓ Set the saw to the upper limit setting and cutting angle should be 0 degree.
- ✓ Remove the safety hood.
- ✓ Place the sliding table at upper limit.
- ✓ Open the safety guard, block the circular saw shaft.
- ✓ Unscrew the nut with ring spanner in the clock wise (sawing) direction.
- ✓ Release nut in running direction.
- ✓ Remove the saw blade.
- ✓ Never put the saw blade and machine tools directly on the machine table, other wise cutting teeth could be damaged.
- ✓ Clean the blade holder flange.
- ✓ Select the suitable blade and place in shaft.
- ✓ Fit the flange and nut.
- ✓ Tight the nut against running direction.
- ✓ Release the locking devise.

Q.17. Explain the difference between a high and law position of the panel saw ?

Ans:-

Effect	High saw blade position	Low saw blade position
Cut cleanness	If saw blade is in high position,then more chip out will be produce on the bottom side.	If saw blade is in law position then the chip out on the bottom side will be less.
Security	Lower risk of kickback /cutting pressure directed down to the machine table.	Greater risk of kick back / cutting pressure tend to be directed towards the operator
Service life of saw blade	Higher due to shorter cutting path in work piece	Lower due to longer cutting path in work piece and more cutting pressure.

Q. 18. Why is it important to follow all the safety instructions and precautions while working on the standard machines ?

- ✓ Ans:- It will keep you and others safe.
- ✓ Chances of accidents will be minimized.
- ✓ There will be no work place hazards.
- ✓ Working environment will be safe and secure.

- Machines will last long and be safe.
- ✓ Machine parts and tool will be safe.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I Semester,

End-Sem. Examination

Set - A

SCS1303

Set - A

Course Code: SCS1304

Time: 2 Hours

Advanced.

Course Name: Assembly and Fitting

Max. Marks: 50

Instruction:

1. All questions from section A, each question carries one mark.
2. All questions from section B, each question carries Four marks.
3. All questions from section C, each question carries six marks.

Section – A

10X01 = 10 Marks

Q.1. Which one of the following lock is not permanently attached to anything else?

(A) mortise Lock (B) cam lock

(C) pad lock (D) knob lock

Q.2. Which one of the following is a function of the runner?

(A) used to facilitate fluid motion during opening and closing.

(B) it is produce friction

(C) it provide hard opening

(D) none of them

Q.3. Which one is an standard size of lamelo biscuit?

(A) ten (B) six

(C) twelve (D) eight

Q.4. Which machine is used to make lamello biscuit joint?

(A) domino (B) classic-x

(C) Zeta P2 (D) Router

Q.5. Which one of the following is a function of hinge?

(A) connect two solid object (B) slide parts together

(C) it is self-closing (D) none of them

Q.6. Which one of the following sign is helpful in assembly?

(A) snake line (B) circle mark

(C) Cross sign (D) None of these

Q.7. Which one out of these is a ideal depth for one time stroke while using router?

(A) 0mm (B) 2mm

(C) 3mm (D) None of these

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Q.8. which one of the following machine is used to make chamfer on edge of work piece?

(A) Jig saw
(B) Edge router
(C) Circular saw
(D) Domino

Q.9. Which one of the following Concealed hinge is used for single door cabinets?

(A) half overlay hinge
(B) full overlay hinge
(C) inset hinge
(D) b and c

Q.10. Which one of the following is measure diameter of cam in knock down fitting?

(A) 5 mm
(B) 10
(C) 20 mm
(D) 15 mm

Section – B

04X04 = 16 Marks

Q.11. Explain butt joint with its advantage and disadvantage.

Q.12. What are the reinforced connections? Explain its advantage and disadvantage.

Q.13. Explain any three type of screws.

Q.14. What is a furniture fitting? Write down the application of runner and hinge.

Section – C

04X06 = 24 Marks

Q.15. Describe the work steps how to install drawer runner.

Q.16. What is RTA Fittings? Explain with a neat sketch.

Q.17. What is but hinge? Briefly explain the sequential steps how to install but hinge.

Q.18. What is concealed hinge? Briefly explain the full overlay hinge, half overlay hinge and inset hinge with figure.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking skills

Session: 2020-21 (Summer Semester)

Answer key

B. Voc. Program, I Semester,

End-Sem. Examination

Set-A

Course Code: SCS1104 1303 Advanced

Course Name: Assembly and Fittings

Time: 2 Hours

Max. Marks: 50

Instruction:

- All questions from section A, each question carries one mark.
- All questions from section B, each question carries Four marks.
- All questions from section C, each question carries six marks.

Section – A

10X01 = 10 Marks

Q.1. Which one of the following lock is not permanently attached to anything else? (B)

(A) mortise Lock (B) cam lock

(C) pad lock (D) knob lock

Q.2. Which one of the following is a function of the runner? (A)

(A) used to facilitate fluid motion during opening and closing.

(B) it is produce friction

(C) it provide hard opening

(D) none of them

Q.3. Which one is an standard size of lamelo biscuit? (A)

(A) ten (B) six

(C) twelve (D) eight

Q.4. Which machine is used to make lamello biscuit joint? (B)

(A) domino (B) classic-x

(C) Zeta P2 (D) Router

Q.5. Which one of the following is a function of hinge? (D)

(A) connect two solid object (B) slide parts together

(C) it is self-closing (D) none of them

Q.6. Which one of the following sign is helpful in assembly? (D)

(A) snake line (B) circle mark

(C) Cross sign (D) None of these

Q.7. Which one out of these is a ideal depth for one time stroke while using router? (D)

(A) 0mm (B) 2mm

(C) 3mm (D) None of these

Manish Kumar

Q.8. which one of the following machine is used to make chamfer on edge of work piece? (B)

(A) Jig saw
(B) Edge router
(C) Circular saw
(D) Domino

Q.9. Which one of the following Concealed hinge is used for single door cabinets? (B)

(A) half overlay hinge
(B) full overlay hinge
(C) inset hinge
(D) b and c

Q.10. Which one of the following is measure diameter of cam in knock down fitting? (D)

(A) 5 mm
(B) 10
(C) 20 mm
(D) 15 mm

Section – B

04X04 = 16 Marks

Q.11. Explain butt joint with its advantage and disadvantage.

Ans.

Butt Joint –

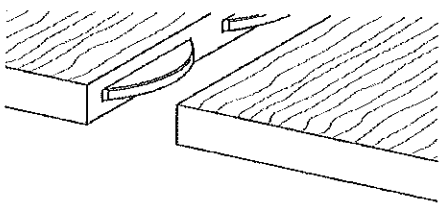
- A butt joint is a technique in which two pieces of material are joined by simply placing their ends together without any special shaping.
- The butt joint is the simplest joint to cutting the wood to the appropriate length and butting them together by glue with holding together.
- The parts must be precisely equal in order to achieve good joint. Generally used to make board wider.
- It can be stronger if we are using some fasteners screws, nails, dowels etc.
- Advantage – Fast and easy joining
- Disadvantage – Limited strength
  The work parts slip easily when pressing parts.

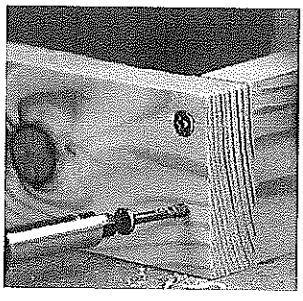
Q.12. What are the reinforced connections? Explain its advantage and disadvantage.

Ans.

Reinforced Connections –

- Biscuits, dowels, nails, screws, dominos are the reinforced connections and can be used to strengthen butt joint.
- Advantage – Large adhesive area with wooden consumables
  Can be produced quickly and efficiently
- Disadvantage – No continuous joints and connections

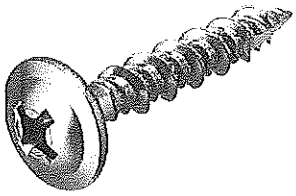




Q.13. Explain any three type of screws.

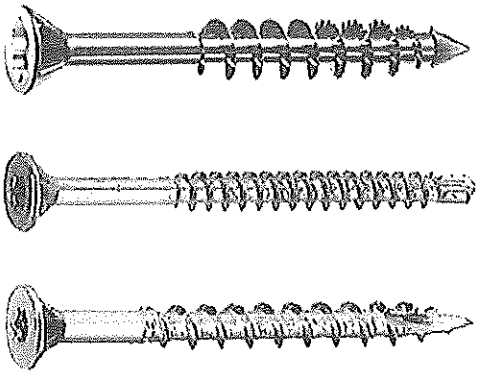
Ans.

1. Universal Screw – For the tighten of chipboards and solid wood materials.
   - Required Pre drilling for screw mounting.



2. Chipboard Screws – For screw connections of chipboard, they had special sharp thread.
   - Required Pre drilling for screw mounting.
   - They had hard bonding by wood by sharp threads

3. Self-Drilling/Self-Tapping Screws – For tear free connections without pre drilling and countersinking.
   - They had taper shape in head as well as tip.
   - By head they had pleasure equal surface and by tip they are able to digging in wood.



Q.14. What is a furniture fitting? Write down the application of runner and hinge.

Ans. Furniture hardware are those products that are used to support the furniture look, design and durability. Furniture hardware products include furniture frames, furniture legs, furniture arms, windows, doors, and cabinets etc. Common examples include hinges, handles.

- Hardware is commonly available in brass, steel, aluminium, stainless steel, and iron material.
- The products that are used to make cabinets working come under cabinet hardware like cabinet fasteners, brackets, latches, hinges, pulls, locks, etc. Cabinet hardware are small components that make cabinets functional. These products are made of materials like plastics, metals and may be glasses.

Window hardware does not include window itself rather they are smaller components that are used to install, fix and protect windows, such as window extrusions, fasteners, handles, hinges, locks and many more.

Section – C

04X06 = 24 Marks

Q.15. Describe the work steps how to install drawer runner.

Ans.

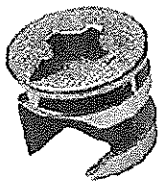
1. First collect all tools that are required like screw driver, Cordless drill, screw according to the cabinet wall and measuring instruments.
2. Take the measurement of the cabinet and drawer.
3. According to the measurement of the drawer and cabinet select drawer runner. Runner length must be shorter than the length of drawer.
4. Bearing runner are generally attached to the bottom of drawer because it gives more load capacity.
5. Marking on cabinet walls and attach the half part of runner with screw on wall.
6. Now start marking other half part of the runner, while marking maintain the distance of runner from front part.
7. Attach the other half part on bottom of drawer runner with screw.
8. After that insert runner inside with force, after complete assembly we can adjust the height of rawer with the help of screws.

Q.16. What is RTA Fittings? Explain with a neat sketch.

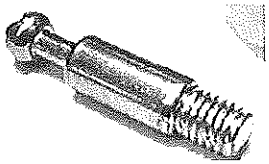
Ans.

Ready To Assembly fitting (RTA) - It is ready to assemble fitting which is also known as knock down fitting, it become with the assembly of three parts,

- **Cam -** The disk fits into a recess in the first side of the cabinet. It rotates by inserting a screwdriver into the slot in its side. The shaft is screwed into the second side of the cabinet. The collar of the shaft is passed through the hole in the second slot in the disk. When the disk rotates the shaft is locked in position. This keeps both sides of the cabinet locked together.



- **Connecting Screw** – Connecting screw is a cylindrical screw which one end inserts in the socket and another and inserts in the cam. It is used to connect joint and to give strength to it.



- **Socket** – Socket is assembling in second part of assembly. It is used to provide grip to the connecting screw.

Q.17. What is but hinge? Briefly explain the sequential steps how to install but hinge.

Ans.

Butt Hinge -

The hinge is mortised into the edge of the door and the cabinet, Only the knuckle of the hinge is visible when the door is shut. This hinge is Mainly used on inset doors.

These are also called Mortise Hinge. Usually three or four number of these is mortised into the door and its frame. Hinges for use in the interior doors, windows, cabinets and almost all furniture these are the most commonly used type of hinges. These are made of steel mostly, while when used for exterior doors one needs to take care of the risk of corrosion, so brass or stainless steel hinge are more appropriate for Interior design projects.

Process to Install -.

1.First we have to select the mating parts by hinges and accordingly no of hinges we have to decide.

2.Mark the dimension on work piece according to the hinge plate thickness, width and length on door as well as frame.

3.Measure the knuckle & hinge plate thickness and make routing according to that for material removing in both parts.

4.Check the slot depth and insert hinge in both groove and mark screw position and drilling as screw dimensions.

5.After that we have to assemble mating parts with hinges with screws. Check the required functioning requirement.

Q.18. What is concealed hinge? Briefly explain the full overlay hinge, half overlay hinge and inset hinge with figure.

Ans.

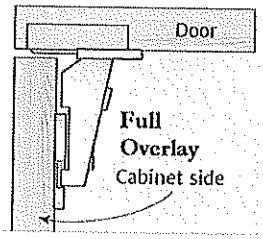
Concealed hinges -

Concealed hinges are fully concealed behind the cabinet door, so they're not visible when the door is closed. They're self-closing and usually easily adjustable. They are the most

common used of the cabinet door hinges. The mounting plate is fitted to the cabinet and a special bit is used to drill out the back of the door to take the cup hinge.

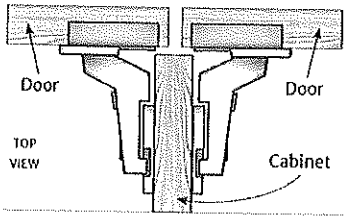
Full overlay hinge –

This hinge is the type of Concealed hinge, overlay doors do exactly what the name implies: They cover the cabinet opening completely, overlapping the cabinet case or face frame on all sides

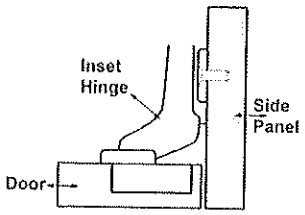


Half overlay hinge –

Half overlay hinges are intended for pairs of doors in the middle of a run of cabinets, where two doors have their hinges mounted on opposite sides of a shared middle partition.



Inset hinge – This hinge is the type of Concealed hinge, inset doors fit entirely within the cabinet opening and sit flush with the cabinet sides or face frames when in the closed position



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I Semester,

End-Sem. Examination

Set-B

Course Code: SCS1104 1303 Advanced

Course Name: Assembly & Fittings

Time: 2 Hours

Max. Marks: 50

Instruction:

1. All question from section A, each question carries One mark.
2. All question from section B, each question carries Four mark.
3. All question from section C, each question carries Six mark.

Section – A

10X01 = 10 Marks

Q 1. Which one of the following is the use of magnet catchers?

(a) For keeping door open (c) For keeping door close

(b) For soft closing (d) None of these

Q 2. Which one of the following hinges we can use when two doors need to be installed on one partition?

(a) Full overlay hinge (c) Half Overlay Hinge

(b) Both of these (d) None of these

Q 3. Which one of the following value is standard distance between two holes in adjustable shelf of a cabinet?

(a) 30 mm (c) 32 mm

(b) 37mm (d) 33 mm

Q.4.Which one of the following is measure diameter of cam in knock down fitting?

(a) 5 mm (c) 10mm

(b) 20 mm (d) 15 mm

Q.5. Which one of the following fitting is permanent fitting?

(a) Clamex P – 14 (c) Clamex P - 15

(b) Lamello (d) Knock down fitting

Q.6. Which one of the following is a function of runner?

(a) used to facilitate fluid motion during opening and closing.

(b) it is produce friction

(c) it is keep in ideal condition

(d) none of them

Q.7.Which one of the following function of stopper in the sliding doors?

(a) it gives motion (c) it keeps in ideal motion

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(b) it works like breaker (d) none of them

Q.8. Which one of the following is continuous hinge?

(a) piano hinge (c) full overlay hinge

(b) inset hinge (d) but hinge

Q.9. Which one of the following process is not the part of protective layers?

(a) Oiling (c) Waxing

(b) Painting (d) Levelling

Q.10. Which one of the following is a function of hinge?

(a) connect two solid object (c) it is keep in ideal condition

(b) it is self-closing (d) none of them

Section – B

04X04 = 16 Marks

Q.11. Explain Bridle joint with a neat sketch.

Q.12. What is a furniture fitting? Write down the application of runner and hinge.

Q.13. Explain Half overlay hinge with a suitable sketch.

Q.14. List 3 types of different hinges and explain them.

Section – C

04X06 = 24 Marks

Q.15. What is concealed hinge? Briefly explain the full overlay hinge, half overlay hinge and inset hinge.

Q.16. Briefly explain the flush hinge, barrel hinge, double warp hinge and continuous hinge.

Q 17. Describe the procedure of making 32 system hole at the sides of cabinet by using Router and Guide Rail.

Q 18. Describe lemello and Clamex fitting used in Assembly of carpentry.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

ANSWER KEY

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I Semester,

End-Sem. Examination

Set-B

Course Code: SCS~~104~~ 1303 Advanced **Time: 2 Hours**

Course Name: Assembly and Fittings **Max. Marks: 50**

Instruction:

1. All question from section A, each question carries One mark.
2. All question from section B, each question carries Four mark.
3. All question from section C, each question carries Six mark.

Section – A

10X01 = 10 Marks

Q 1. Which one of the following is the use of magnet catchers?

(a) For keeping door open (c) For keeping door close (c)

(b) For soft closing (d) None of these

Q 2. Which one of the following hinges we can use when two doors need to be installed on one partition?

(a) Full overlay hinge (c) Half Overlay Hinge (c)

(b) Both of these (d) None of these

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(a) 30 mm (c) 32 mm (c)

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(a) used to facilitate fluid motion during opening and closing. (a)

(b) it is produce friction

(c) it is keep in ideal condition

(d) none of them

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(a) it gives motion (c) it keeps in ideal motion (b)

(b) it brack (d) none of them

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(a) piano hinge (c) full overlay hinge (a)

(b) inset hinge (d) but hinge

Q.9. Which one of the following process is not the part of protective layers?

(a) Oiling (c) Waxing

(b) Painting (d) Levelling (d)

Q.10. Which one of the following is a function of hinge?

(a) connect two solid object (c) it is keep in ideal condition (d)

(b) it is self-closing (d) none of them

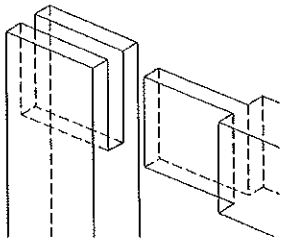
Section – B

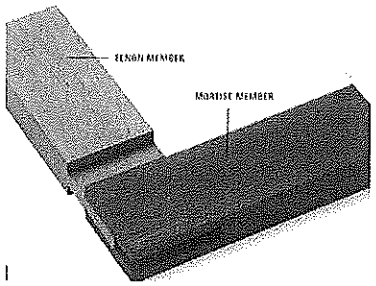
04X04 = 16 Marks

Q.11. Explain Bridle joint with a neat sketch.

Ans. A bridle joint is a woodworking joint, similar to a mortise and Tenon, in that a Tenon is cut on the end of one member and a mortise is cut into the other to accept it.

- The difference feature is that the Tenon and the mortise are cut to the full width of the Tenon member.
- The corner bridle joint joins two members at their respective ends, forming a corner.
- The bridle joint is very popular in workbench construction.
- This joint is very decorative and very stable for window frames





Q.12. What is a furniture fitting? Write down the application of runner and hinge.

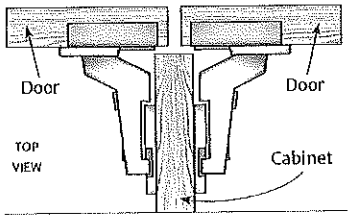
Ans. Furniture hardware are those products that are used to support the furniture look, design and durability. Furniture hardware products include furniture frames, furniture legs, furniture arms, windows, doors, and cabinets etc. Common examples include hinges, handles.

- Hardware is commonly available in brass, steel, aluminium, stainless steel, and iron material.
- The products that are used to make cabinets working come under cabinet hardware like cabinet fasteners, brackets, latches, hinges, pulls, locks, etc. Cabinet hardware are small components that make cabinets functional. These products are made of materials like plastics, metals and may be glasses.

- Window hardware does not include window itself rather they are smaller components that are used to install, fix and protect windows, such as window extrusions, fasteners, handles, hinges, locks and many more.

Q.13. Explain Half overlay hinge with a suitable sketch.

Ans. Half overlay hinges are intended for pairs of doors in the middle of a run of cabinets, where two doors have their hinges mounted on opposite sides of a shared middle partition



Q.14. List 3 types of different hinges and explain them?

Ans. Butt Hinge: - The hinge is mortised into the edge of the door and the cabinet, Only the knuckle of the hinge is visible when the door is shut. This hinge is Mainly used on inset doors

Flush hinges or non mortis hinge: - Flush hinges are Used similar to butt hinges, except they are not mortised into the door or cabinet. Easier to fit than the butt hinge but the load capacity of this hinge is less than butt hinge.

Concealed hinges: - Concealed hinges are fully concealed behind the cabinet door, so they're not visible when the door is closed. They're self-closing and usually easily adjustable. They are the most common used of the cabinet door hinges. The mounting plate is fitted to the cabinet and a special bit is used to drill out the back of the door to take the cup hinge. There are many types to suit most applications, both for frameless cabinets and face-frame cabinets

1. Full overlay hinge
2. Half overlay hinge
3. Inset hinge

Section – C

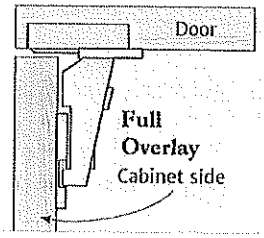
04X06 = 24 Marks

Q.15. What is concealed hinge? Briefly explain the full overlay hinge, half overlay hinge and inset hinge.

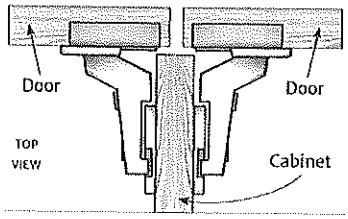
Ans. Concealed hinges - Concealed hinges are fully concealed behind the cabinet door, so they're not visible when the door is closed. They're self-closing and usually easily adjustable. They are the most common used of the cabinet door hinges. The mounting plate is fitted to the cabinet and a special bit is used to drill out the back of the door to take the cup hinge. Full overlay hinge

a. Half overlay hinge
b. Inset hinge

Full overlay hinge –This hinge is the type of Concealed hinge, overlay doors do exactly what the name implies: They cover the cabinet opening completely, overlapping the cabinet case or face frame on all sides



Half overlay hinge – Half overlay hinges are intended for pairs of doors in the middle of a run of cabinets, where two doors have their hinges mounted on opposite sides of a shared middle partition.



Q.16. Briefly explain the flush hinge, barrel hinge, double warp hinge and continuous hinge.

Ans. Flush hinges or non mortis hinge -

Flush hinges are Used similar to butt hinges, except they are not mortised into the door or cabinet.

Easier to fit than the butt hinge but the load capacity of this hinge is less than butt hinge.

These are smaller hinges that take less space than butt hinges as they allow one leaf to fit inside the other

Couple of advantages of using the flush hinges are that they do not require a corner to be cut in the door on which they are installed and don't leave any space or gap between frame and the door, giving a very clean consistent look.

Barrel hinge -

Appearing similar to a barrel, this hinge is easy to install as the joint is simply a hole that is drilled into the work piece.

Application:

These are generally used for gates and applications having low loads on the radius.

Double Wrap hinge -

A Double Wrap hinge is constructed from a folded over sheet of metal. A typical use might be on school locker doors, subject to very high loads and twisting.

Continuous Hinge -

Continuous Hinges are generally marked by how one hinge runs the length of the door, as opposed to butt hinges in which multiple hinges are placed at intervals.

Q 17. Describe the procedure of making 32 system hole at the sides of cabinet by using Router and Guide Rail.

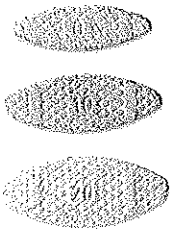
Ans. To make machine in center while doing drilling at the side of the cabinet machine needs to set on the center of the drilling template.

1. Place centering mandrel in machine collet.
2. Push machine down and set it in between the hole and lock machine there.
3. Now set machine straight on the template and lock it on template from four of the sides.
4. Now unlock machine take out centering mandrel and set required drill bit.
5. Set machine on drilling template and now we can start work.

Q 18. Describe lemello and Clamex fitting used in Assembly of carpentry.

Ans. 1. Lamello biscuits - A biscuit joiner is a wood working tool used to join two pieces of wood together. A biscuit joiner uses a small circular saw blade to cut a crescent-shaped hole (called the mouth) in the opposite edges of two pieces of wood or wood composite panels.

- They have size accuracy, optimum glue distribution and form stability & generally made of beech wood provides quick and simple application, stable and high-quality connections.
- An oval-shaped, highly dried and compressed wooden biscuit is covered with glue, or glue is applied in the slot. The biscuit is immediately placed in the slot, and the two boards are clamped together.
- The wet glue expands the biscuit, further improving the bond.
- General sizes of Biscuits are –
  - i. Lamello 0 – 47 x 15 x 4 mm
  - ii. Lamello 10 – 53 x 19 x 4 mm
  - iii. Lamello 20 – 56 x 23 x 4 mm



2. Clamax – These are the detachable connecting fittings.

- Clamex P is a detachable furniture fitting on the basis of the P-System is connected with a lever.
- Clamex P is not required glue
- Practically wear-free knock down fitting
- General sizes of Biscuits are –
  - iv. Clamex P 10 – 52 x 19 x 9.7 mm
  - v. Lamello 10 – 66 x 27 x 9.7 mm

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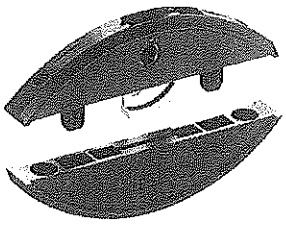

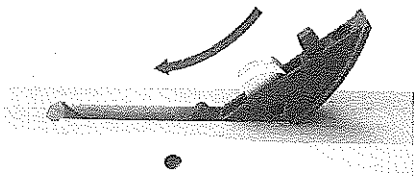

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skill

Session: 2019-20 (Summer / Winter Semester)

B. Voc. / M. Voc. Program, 3rd Semester,

End-Sem. Examination

Course Code: SC1304 **Time: 2 Hours**

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

Instruction: (if any) Scientific calculator is permitted.

Section – A

10X01 = 10 Marks

1) If a share of NV of Rs 100 is selling at Rs 80 then:

(a) the share is at a premium of Rs 20 (b) discounted at Rs. 20 (c) at par (d) None of these.

2) Amount required for buying 50 shares, Rs 75 quoted at Rs 71.50.

(a) 3750/- (b) 3575/- (c) 3475/- (d) 5363/-

3) General notation of spherical coordinates system is:

(a) (x,y,z) b) (r,θ,z) c) (r,θ,∅) d) None of these

4) Location of the point (-10, 4) and (-7, -8) in cartesian coordinates:

(a) I, II quadrants (b) III, IV quadrants (c) II, III quadrants (d) II, IV quadrants

5) cosec(90-A) is

(a) sin A b) tan A c) sec A d) None

6) $\frac{tan26}{cot64^{\circ}} =$

(a) 2 b) 1 c) 0 d) None

7) The area of a rhombus is 240 cm2 and one of the diagonals is 16 cm. The length of another diagonal is

a) 15 cm b) 30 cm c) 32 cm d) 12 cm

8) The lateral surface area of cone is

a) πrl b) $2\pi rl$ c) πr d) πl

9) The property of material by virtue of which it can beaten or rolled up in sheets

a) Ductility b) Hardness c) Malleability d) Stiffness

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

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

Manish

Section – B

04X04 = 16 Marks

11) Write short notes on: a) Relative and specific humidity b) Hardness and stiffness.

12) Michael buys shares of face value $ 50 of a company which pays 10 % dividend. At what price did he buy each share from the market if his profit is 16 % on his investment?

13) Identify the surface generated by following equation:

$$r^2-4r\cos\theta=14$$

14) Prove that $\frac{\sin\theta-\cos\theta+1}{\sin\theta+\cos\theta-1} = \frac{1}{\sec\theta-\tan\theta}$ using identity $sec^2\theta = 1 + tan^2\theta$

Section – C

04X06 = 24 Marks

15) Explain the any three (03) essential mechanical properties required for wood-based products.

16) Divide Rs 29184 into two parts such that if one part is invested in 12%, Rs 100 shares at 4% discount and the other in 15%, Rs 100 shares at 8% premium, the annual incomes are equal.

17) Prove that $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta\,\mathrm{cosec}\,\theta$

18) It costs Rs 2200 to paint the inner curved surface of a cylindrical vessel 10 m deep. If the cost of painting is at the rate of Rs 20 per m2, find

(i) inner curved surface area of the vessel,
(ii) radius of the base,
(iii) capacity of the vessel.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY Answer key

Registration No.: .....

School of Woodworking Skill

Session: 2019-20 (Summer / Winter Semester)

B. Voc. / M. Voc. Program, 3rd Semester,

End-Sem. Examination

Answer key

Course Code: SC1304 **Time: 2 Hours**

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

Instruction: (if any) Scientific calculator is permitted.

Section – A

10X01 = 10 Marks

1) If a share of NV of Rs 100 is selling at Rs 80 then:

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2) Amount required for buying 50 shares, Rs 75 quoted at Rs 71.50.

(a) 3750/- (b) 3575/- (c) 3475/- (d) 5363/-

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4) Location of the point (-10, 4) and (-7, -8) in cartesian coordinates:

(a) I, II quadrants (b) III, IV quadrants (c) II, III quadrants (d) II, IV quadrants

5) cosec(90-A) is

(a) sin A b) tan A **c) sec A** d) None

6) $\frac{tan26}{cot64^{\circ}} =$

(a) 2 b) 1 c) 0 d) None

7) The area of a rhombus is 240 cm2 and one of the diagonals is 16 cm. The length of another diagonal is

a) 15 cm b) 30 cm c) 32 cm d) 12 cm

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

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

Manish Kumar

Section – B

04X04 = 16 Marks

11) Write short notes on: a) Relative and specific humidity b) dry and wet bulb temperature.

Solution:

a) Humidity: It is the mass of water vapour present in 1 kg of dry air, and is generally expressed in terms of gram per kg of dry air (g/kg of dry air). It is also called specific humidity or humidity ratio.
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 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) Michael buys shares of face value $ 50 of a company which pays 10 % dividend. At what price did he buy each share from the market if his profit is 16 % on his investment?

Solution:

Let the market value (M.V.) of each share be x.

The dividend is calculated on nominal value.

The dividend on one share = 10% of $ 50 = $ 5.

Therefore, he earned $ 5 on an investment of x.

A profit of 16 % on x = $\frac{16}{100} \times x = \frac{4x}{25}$

Therefore, $\frac{4x}{25} = \$ 5$

$\Rightarrow x = \$\frac{25 \times 5}{4}$

$\Rightarrow x = \$\frac{125}{4}$

$\Rightarrow x = \$ 31.25$

Ans: $ 31.25

13) Identify the surface generated by following equation:

$$r^2-4r\cos\theta=14$$

Solution:

To identify this equation (and you do know what it is!) let's complete the square on the X part of the equation.

$$x^2 - 4x + y^2 = 14$$
$$x^2 - 4x + 4 + y^2 = 14 + 4$$
$$(x-2)^2 + y^2 = 18$$

So, we can see that this is a cylinder whose central axis is a vertical line parallel to the Z -axis and goes through the point (2, 0) in the xy -plane and the radius of the cylinder is $\sqrt{18}$

14) Prove that $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$ using identity $\sec^2\theta = 1 + \tan^2\theta$

Solution:

$$\text{LHS} = \frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{\tan\theta - 1 + \sec\theta}{\tan\theta + 1 - \sec\theta}$$

$$= \frac{(\tan\theta + \sec\theta) - 1}{(\tan\theta - \sec\theta) + 1} = \frac{\{(\tan\theta + \sec\theta) - 1\}(\tan\theta - \sec\theta)}{\{(\tan\theta - \sec\theta) + 1\}(\tan\theta - \sec\theta)}$$

$$= \frac{(\tan^2\theta - \sec^2\theta) - (\tan\theta - \sec\theta)}{\{\tan\theta - \sec\theta + 1\}(\tan\theta - \sec\theta)}$$

$$= \frac{-1 - \tan\theta + \sec\theta}{(\tan\theta - \sec\theta + 1)(\tan\theta - \sec\theta)}$$

$$= \frac{-1}{\tan\theta - \sec\theta} = \frac{1}{\sec\theta - \tan\theta},$$

Hence proved.

Section – C

04X06 = 24 Marks

15) Explain the any three (03) essential mechanical properties required for wood-based products.

Solution:

Ans: Explanation of any three in following: strength, stiffness, hardness, resilience and fatigue.

Strength: deals with the behavior of solid objects subject to stresses and strains

Tensile strength: The tensile strength of wood parallel to the grain depends upon the strength of the fibers and is affected not only by the nature and dimensions of the wood elements but also by their arrangement.

Compressive strength: It is very closely related to hardness and transverse shear. There are two ways in which wood is subjected to stress of this kind, namely, (1) with the load acting over the entire area of the specimen, and (2) with a load concentrated over a portion of the area.

Stiffness: Stiffness is the extent to which an object resists deformation in response to an applied force. Stiffness relates to how a component bends under load while still returning to its original shape once the load is removed. Since the component dimensions are unchanged after load is removed, stiffness is associated with elastic deformation.

Hardness: The term hardness is used in two senses, namely: (1) resistance to indentation, and (2) resistance to abrasion or scratching □In the latter sense hardness combined with toughness is a measure of the wearing ability of wood and is an important consideration in the use of wood for floors, paving blocks, bearings, and rollers.

Resilience: It is the amount of work done upon a body in deforming it. Within the elastic limit it is also a measure of the potential energy stored in the material and represents the amount of work the material would do upon being released from a state of stress.

Toughness: Wood that is difficult to split is said to be tough. Toughness includes flexibility and is the reverse of brittleness, in that tough woods break gradually and give warning of failure. Toughness is dependent upon the strength, cohesion, quality, length, and arrangement of fiber, and the pliability of the wood

16) Divide Rs 29184 into two parts such that if one part is invested in 12%, Rs 100 shares at 4% discount and the other in 15%, Rs 100 shares at 8% premium, the annual incomes are equal.

Solution:

Let the investment in 12%, Rs 100 shares at 4% discount be Rs = x

Then, investment in 15%, Rs 100 shares at 8% premium be= Rs (29184-x)

MV of Rs 100 shares at 4% discount= Rs (100-4% of 100) = Rs 96

Annual income on 1 share of Rs 96=Rs (12% of 100) = Rs 12

Annual income on Rs x=(12x/96)=Rs x/8

MV of Rs 100 shares at 8% premium= Rs (100+8% of 100) = Rs 108

Annual income on 1 share of Rs 108=Rs (15% of 100) = Rs 15

Annual income on $Rs\ (29184 - x) = Rs\ \frac{15(29184 - x)}{108} = Rs\ \frac{5(29184 - x)}{36}$

$\therefore \frac{x}{8} = \frac{5(29184 - x)}{36}$

$\Rightarrow \frac{x}{8} + \frac{5x}{36} = \frac{12160}{3}$

So, $x = 15360$

So, the first part is Rs 15360.

Second part= Rs (29184-15360) = Rs 13824

Ans : 13824

17) Prove that $\frac{tan\theta}{1-cot\theta}+\frac{cot\theta}{1-tan\theta}=1+sec\theta cosec\theta$

Solution:

$$\text{LHS} = \frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}$$

$$= \frac{\frac{\sin\theta}{\cos\theta}}{1-\frac{\cos\theta}{\sin\theta}}+\frac{\frac{\cos\theta}{\sin\theta}}{1-\frac{\sin\theta}{\cos\theta}}$$

$$= \frac{\sin\theta\times\sin\theta}{\cos\theta(\sin\theta-\cos\theta)} + \frac{\cos\theta\times\cos\theta}{\sin\theta(\cos\theta-\sin\theta)}$$

$$= \frac{\sin^2\theta}{\cos\theta(\sin\theta-\cos\theta)} - \frac{\cos^2\theta}{\sin\theta(\sin\theta-\cos\theta)}$$

$$= \frac{\sin^3\theta-\cos^3\theta}{\cos\theta\sin\theta(\sin\theta-\cos\theta)}$$

$$= \frac{(\sin\theta-\cos\theta)\left(\begin{matrix}\sin^2\theta+\cos^2\theta\\+\sin\theta\cos\theta\end{matrix}\right)}{\cos\theta\sin\theta(\sin\theta-\cos\theta)}$$

$$= \frac{\sin^2\theta+\cos^2\theta+\sin\theta\cos\theta}{\cos\theta\sin\theta}$$

$$= \frac{\sin\theta\cos\theta+1}{\cos\theta\sin\theta}$$

$$= \frac{\sin\theta\cos\theta}{\cos\theta\sin\theta}+\frac{1}{\cos\theta}\times\frac{1}{\sin\theta}$$

$$= 1+\frac{1}{\cos\theta}\frac{1}{\sin\theta}$$

$$= 1 + \sec\theta\,\text{cosec}\,\theta = \text{RHS}.$$

Hence, **proved.**

18) It costs Rs 2200 to paint the inner curved surface of a cylindrical vessel 10 m deep. If the cost of painting is at the rate of Rs 20 per m2, find

(i) inner curved surface area of the vessel,

(ii) radius of the base,

(iii) capacity of the vessel.

Solution:

(i) Total cost of painting = Rs. 2200

Cost of painting of area 1 m^2 = Rs. 20

Total cost

$$\therefore \text{Area} = \frac{\text{Total cost}}{\text{Cost of painting of area } 1\,m^2}$$

$$= \frac{2200}{20} = 110\,m^2$$

∴ Inner curved surface area of the vessel

= 110 m^2

(ii) Let r be the base radius of the cylindrical vessel.

Curved surface area of a cylinder = $2\pi rh$

$$\therefore 2\pi rh = 110 \Rightarrow 2\times\frac{22}{7}\times r\times 10 = 110$$

[Height (h) = 10 m]

$$\Rightarrow r = \frac{110\times7}{2\times22\times10}\,m = \frac{7}{4}\,m$$

$$\Rightarrow r = 1.75\ m$$

∴ The required radius of the base = 1.75 m

(iii) Since, volume of a cylinder = $\pi r^2 h$

⇒ Volume (capacity) of the vessel

$$= \frac{22}{7}\times\left(\frac{7}{4}\right)^2\times10\,m^3 = \frac{22}{7}\times\frac{7}{4}\times\frac{7}{4}\times10\,m^3$$

$$= \frac{11\times7\times5}{4}\,m^3 = \frac{385}{4}\,m^3 = 96.25\,m^3$$

Since, 1 m^3 = 1000000 cm^3 = 1000 litres = 1 kl

∴ 96.25 m^3 = 96.25 kl

Thus, the required volume = 96.25 kl

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skill

Session: 2019-20 (Summer / Winter Semester)

B. Voc. / M. Voc. Program, 3rd Semester,

End-Sem. Examination

Course Code: SC1304 **Time: 2 Hours**

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

Instruction: (if any) Scientific calculator is permitted.

Section – A

10X01 = 10 Marks

1) If a share of NV of Rs 10 is selling at Rs 16 then:

(a) the share is at a premium of Rs 6 b) discounted at Rs. 6 c) at par (d) None of these.

2) Amount required for buying 275 shares, Rs 60 shares at a discount of Rs 10.

(a) 13750/- (b) 12300/- (c) 11400/- (d) 11750/-

3) The plane which consists of two number lines that intersect each other at right angle is called:

(a) Functional plane (b) Cartesian plane (c) Ordinate plane (d) Dimensional plane

4) The a relation between x and y if the point (x , y) is equidistant from the points (7, 1) and (3, 5).

(a) x-y=5 (b) x-y=2 (c) x+y=2 (d) x+y=5

5) General notation for cylindrical coordinates system is:

(a) (x,y,z) b) $(r, \theta, \emptyset)$ c) (r, θ, z) d) None of these

6) $9\sec^2 A - 9\tan^2 A$ is

a) 1 b) 9 c) 8 d) 0

7) A flooring tile has the shape of a parallelogram whose base is 24 cm and the corresponding height is 10 cm. How many such tiles are required to cover a floor of area 1080 m^2?

a) 15000 b) 30000 c) 45000 d) 12000

8) The lateral surface area of sphere is

a) $4\pi r^2$ b) $4\pi r$ c) $2\pi r^2$ d) πr^2

9) The property of material by virtue of which it can resist the abrasion and scratches

a) Ductility b) Hardness c) Malleability d) Stiffness

10) The oak wood has a mass of 134 kg and a volume of 194 dm3 What is the density?

(a) 1.44 kg/dm3 (b) 0.69 kg/dm3 (c) 0.89 kg/dm3 (d) 1.34 kg/dm3

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Section – B

04X04 = 16 Marks

11) Write short notes on: a) Dry and wet bulb temperature b) tensile and compressive strength.

12) Mukul invests Rs 9000 in a company paying a dividend of 6% per annum when a share of NV Rs 100 stands at Rs 150. What is his annual income? If he sells 50% of his shares when the price rises to Rs 200, what is his gain in this transaction?

13) Show that the points (1, 7), (4, 2), (–1, –1) and (– 4, 4) are the vertices of a square.

14) Prove that $\left(\frac{sin\theta - 2sin^3\theta}{2cot^3\theta - cos\theta}\right) = tan\theta$

Section – C

04X06 = 24 Marks

15) Explain the influence of moisture on mechanical properties of wood-based products.

16) Robert bought shares of 6% $ 100 shares at $ 120. Adrian bought shares of 8% $ 20 shares at $ 30. Whose investment was better?

17) Prove that $\left(\frac{1+tan^2A}{1+cot^2A}\right) = \left(\frac{1-tanA}{1-cotA}\right)^2 = \mathbf{tan^2A}$

18) In a building there are 24 cylindrical pillars. The radius of each pillar is 28 cm and height is 4 m. Find the total cost of painting the curved surface area of all pillars at the rate of INR 8 per m^2.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skill

Session: 2019-20 (Summer / Winter Semester)

B. Voc. / M. Voc. Program, 3rd Semester,

End-Sem. Examination

Answer key

Course Code: SC1304 **Time: 2 Hours**

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

Instruction: (if any) Scientific calculator is permitted.

Section – A

10X01 = 10 Marks

1) If a share of NV of Rs 10 is selling at Rs 16 then:

(a) the share is at a premium of Rs 6 b) discounted at Rs. 6 c) at par (d) None of these.

2) Amount required for buying 275 shares, Rs 60 shares at a discount of Rs 10.

(a) 13750/- (b) 12300/- (c) 11400/- (d) 11750/-

3) The plane which consists of two number lines that intersect each other at right angle is called:

(a) Functional plane (b) Cartesian plane (c) Ordinate plane (d) Dimensional plane

4) The a relation between x and y if the point (x , y) is equidistant from the points (7, 1) and (3, 5).

(a) x-y=5 (b) x-y=2 (c) x+y=2 (d) x+y=5

5) General notation for cylindrical coordinates system is:

(a) (x,y,z) b) $(r, \theta, \emptyset)$ c) (r, θ, z) d) None of these

6) $9\sec^2 A - 9\tan^2 A$ is

a) 1 b) 9 c) 8 d) 0

7) A flooring tile has the shape of a parallelogram whose base is 24 cm and the corresponding height is 10 cm. How many such tiles are required to cover a floor of area 1080 m^2?

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8) The lateral surface area of sphere is

a) $4\pi r^2$ b) $4\pi r$ c) $2\pi r^2$ d) πr^2

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10) The oak wood has a mass of 134 kg and a volume of 194 dm3 What is the density?

(a) 1.44 kg/dm^3 (b) 0.69 kg/dm^3 (c) 0.89 kg/dm^3 (d) 1.34 kg/dm^3

Manish Kumar

Section – B

04X04 = 16 Marks

11) Write short notes on: a) Dry and wet bulb temperature b) tensile and compressive strength.

Solution:

a) 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.

b) Tensile strength :The tensile strength of wood parallel to the grain depends upon the strength of the fibers and is affected not only by the nature and dimensions of the wood elements but also by their arrangement. Compressive or crushing strength :Is very closely related to hardness and transverse shear. There are two ways in which wood is subjected to stress of this kind, namely, (1) with the load acting over the entire area of the specimen, and (2) with a load concentrated over a portion of the area.

12) Mukul invests Rs 9000 in a company paying a dividend of 6% per annum when a share of NV Rs 100 stands at Rs 150. What is his annual income? If he sells 50% of his shares when the price rises to Rs 200, what is his gain in this transaction?

Solution:

No. of shares bought by Mukul $((Investment)/MV)$=**9000/150=60**

His annual income on 1 share=6% of NV=6% of Rs 100= Rs 6

His total annual income= (60 × Rs 6) = Rs 360

Since, 50% of shares= 50% of 60 =30

Money received on selling these shares =(30 ×Rs 200)=**Rs 6000**

Also, cost of these shares=(30 ×Rs 150)=**Rs 4500**

Therefore, Mukul's gain= Rs (6000-4500) = **Rs 1500**

13) Show that the points (1, 7), (4, 2), (–1, –1) and (– 4, 4) are the vertices of a square.

Solution:

Let A(1, 7), B(4, 2), C(–1, –1) and D(– 4, 4) be the given points. One way of showing that ABCD is a square is to use the property that all its sides should be qual and both its digonals should also be equal. Now,

$$AB = \sqrt{(1-4)^2 + (7-2)^2} = \sqrt{9+25} = \sqrt{34}$$
$$BC = \sqrt{(4+1)^2 + (2+1)^2} = \sqrt{25+9} = \sqrt{34}$$
$$CD = \sqrt{(-1+4)^2 + (-1-4)^2} = \sqrt{9+25} = \sqrt{34}$$
$$DA = \sqrt{(1+4)^2 + (7-4)^2} = \sqrt{25+9} = \sqrt{34}$$
$$AC = \sqrt{(1+1)^2 + (7+1)^2} = \sqrt{4+64} = \sqrt{68}$$
$$BD = \sqrt{(4+4)^2 + (2-4)^2} = \sqrt{64+4} = \sqrt{68}$$

Since, AB = BC = CD = DA and AC = BD, all the four sides of the quadrilateral ABCD are equal and its diagonals AC and BD are also equal. **Therefore, ABCD is a square.**

14) Prove that $\left(\frac{sin\theta - 2sin^3\theta}{2cot^3\theta - cos\theta}\right) = tan\theta$

Solution:

$$L.H.S = \frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta}$$

Taking Sin θ and Cos θ common in both numerator and denominator respectively.

$$= \frac{\sin\theta(1 - 2\sin^2\theta)}{\cos\theta(2\cos^2\theta - 1)}$$

By Identity $\sin^2 A + \cos^2 A = 1$ hence, $\cos^2 A = 1 - \sin^2 A$ and substituting this in the above equation,

$$= \frac{\sin\theta(1 - 2\sin^2\theta)}{\cos\theta\{2(1 - \sin^2\theta) - 1\}}$$

$$= \frac{\sin\theta(1 - 2\sin^2\theta)}{\cos\theta(1 - 2\sin^2\theta)}$$

$$= \frac{\sin\theta}{\cos\theta} = \tan\theta$$

Section – C

04X06 = 24 Marks

15) Explain the influence of moisture on mechanical properties of wood-based products.

Solution:

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.

16) Robert bought shares of 6% $ 100 shares at $ 120. Adrian bought shares of 8% $ 20 shares at $ 30. Whose investment was better?

Solution:

6% $ 100 shares at $ 120

i.e., the annual income from 1 share of nominal value $ 100 is $ 6,
investment for 1 share being $ 120.

Therefore, profit percentage = $\frac{6}{120} \times 100\ \% = 5\%$

Therefore, Robert's shares give him a profit of 5%

8 % $ 20 shares at $ 30

i.e., the annual income from 1 share of nominal value $ 20 is $ $\frac{8\times20}{100} = \$\ \frac{8}{5}$,
investment for 1 share being $ 30.

Profit percentage = $\frac{\$\frac{8}{5}}{\$30} \times 100\ \%$

$= \frac{16}{3}\ \%$

$= 5\frac{1}{3}\%$

Therefore, Adrian's shares give him a profit of $5\frac{1}{3}\%$

Therefore, Adrian's investment was better.

17)) Prove that $\left(\frac{1+tan^2A}{1+cot^2A}\right) = \left(\frac{1-tanA}{1-cotA}\right)^2 = \tan^2 A$

Solution:

$$\text{LHS} = \frac{1+\tan^2 A}{1+\cot^2 A} = \frac{\sec^2 A}{\operatorname{cosec}^2 A} = \frac{\frac{1}{\cos^2 A}}{\frac{1}{\sin^2 A}}$$

$$= \frac{\sin^2 A}{\cos^2 A} = \tan^2 A.$$

$$\text{RHS} = \left(\frac{1-\tan A}{1-\cot A}\right)^2 = \left(\frac{1-\frac{\sin A}{\cos A}}{1-\frac{\cos A}{\sin A}}\right)^2$$

$$= \left(\frac{\frac{\cos A-\sin A}{\cos A}}{\frac{\sin A-\cos A}{\sin A}}\right)^2$$

$$= \frac{(\cos A-\sin A)^2 \times \sin^2 A}{(\sin A-\cos A)^2 \times \cos^2 A}$$

$$= \frac{(\sin A-\cos A)^2 \times \sin^2 A}{(\sin A-\cos A)^2 \times \cos^2 A}$$

$$= \frac{\sin^2 A}{\cos^2 A} = \tan^2 A.$$

$\because$ LHS = RHS Hence, **proved.**

18) In a building there are 24 cylindrical pillars. The radius of each pillar is 28 cm and height is 4 m. Find the total cost of painting the curved surface area of all pillars at the rate of INR 8 per m².

Solution:

Radius of cylindrical pillar, $r = 28$ cm $= 0.28$ m

height, $h = 4$ m

curved surface area of a cylinder $= 2\pi rh$

curved surface area of a pillar $= 2 \times \frac{22}{7} \times 0.28 \times 4 = 7.04$ m²

curved surface area of 24 such pillar $= 7.04 \times 24 = 168.96$ m²

cost of painting an area of 1 m² = ₹ 8

Therefore, cost of painting 1689.6 m² $= 168.96 \times 8 =$ ₹ 1351.68

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

End-Sem. Examination

Set-A

Course Code: SCS1305 **Time: 2 Hours**

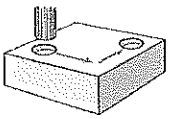
Course Name: Wood Working CNC Machines **Max. Marks: 50**

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 type of the Path mode given in fig.? 

(A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.2.Series hole is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.3.Wooden figures is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.4.Which one of the following is the required compressed air for connections in CNC Router?

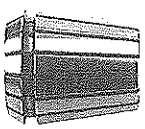
(A) 9-10 bar (B) 2-7 bar

(C) 6-7 bar (D)10-11 bar

Q.5. Which type of CNC machine is installed in our workshop?

(A) Boom type (B) Moving Gentry

(C) Both (A) & (B) (D) None of these

Q.6.What is name of System accessory given in figure? 

(A) Hydro Feed (B) Collect chuck

(C) Heat-Shrink fit chucks (D) Cross Stop

Q.7.All the programs cab be started from_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch

Manish Kumar

Q.8.The working order of the individual programs cab be defined in list form from_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch

Q.9.When tooling has been sharped the data must be updated in_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch

Q.10.Which one of the following axis is known as 4^{th} axis?

(A) X axis (B) Y axis

(C) Z axis (D) C axis

Section – B

04X04 = 16 Marks

Q.11.Why it is necessary to warm up the CNC Router?

Q.12.What is control mode in CNC? Explain the types of control modes.

Q.13.What are the requirements for connections and buildings of CNC Router?

Q.14.What are the types of CNC Machine? Explain it.

Section – C

04X06 = 24 Marks

Q.15.Explain the program overview of CNC Router with the help of block diagram.

Q.16.What are the functions of CNC board and Techno Manager?

Q.17.Explain the vacuum clamping in CNC Router?

Q.18.What are the points we must pay attention when running a CNC machine?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

ANSWER KEY

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

End-Sem. Examination

Set-A

Course Code: SCS1305 **Time: 2 Hours**

Course Name: Wood Working CNC Machines **Max. Marks: 50**

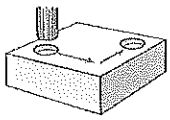
Instruction:

- 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 type of the Path mode given in fig.?



(A) Point control (B) 2D path control

(C) 3D path control (D) None of these (A)

Q.2.Series hole is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these (B)

Q.3.Wooden figures is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these (C)

Q.4.Which one of the following is the required compressed air for connections in CNC Router?

(A) 9-10 bar (B) 2-7 bar

(C) 6-7 bar (D)10-11 bar (C)

Q.5. Which type of CNC machine is installed in our workshop?

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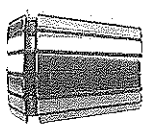
(C) Both (A) & (B) (D) None of these (A)

Q.6.What is name of System accessory given in figure?



(A) Hydro Feed (B) Collect chuck

(C) Heat-Shrink fit chucks (D) Cross Stop (B)

Q.7.All the programs cab be started from_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch (A)

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Q.8.The working order of the individual programs cab be defined in list form from_____?

(A) CNC Board (B) Techno Manager

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Q.9.When tooling has been sharped the data must be updated in_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch (B)

Q.10.Which one of the following axis is known as 4th axis?

(A) X axis (B) Y axis

(C) Z axis (D) C axis (D)

Section – B

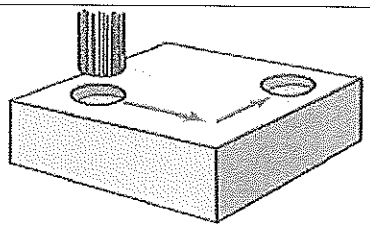
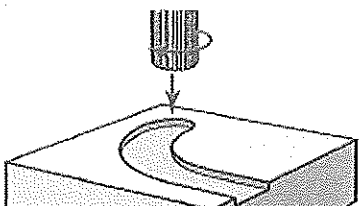
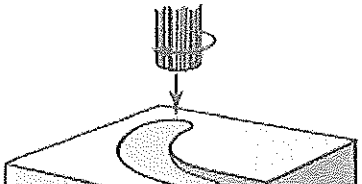
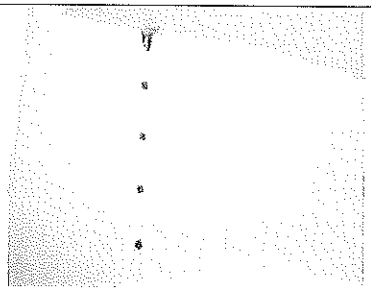
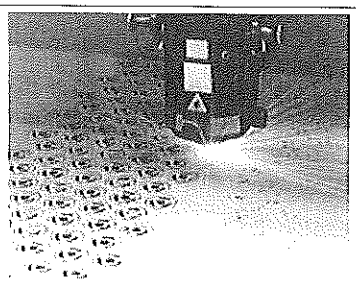
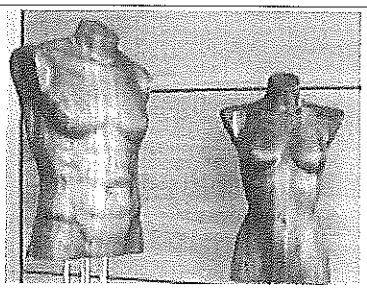
04X04 = 16 Marks

Q.11.Why it is necessary to warm up the CNC Router?

ANS:- It needs a little bit of a warm up before working at full speed. This distributes lubrication oil evenly, which reduces wear on your CNC machine and increases its life. As you know, heat can also cause your machine and its tools to expand, even if ever-so-slightly. But, you don't even want a little expansion because that affects the precision of your cutting. Warming your machine up keeps it operating at a stable temperature so you don't have to worry about that.

Q.12.What is control mode in CNC? Explain the types of control modes.

ANS:- The type of control describes the way how the axes of a CNC Machine is controlled and moved and how the tool Material processed.

point control	2D path control	3D path control
		
		
Series hole	**laser cutting**	**Wooden figures**

Tool edited only after the Positioning in one Direction	Two axes will be simultaneously synchronous controlled	Three or more axles be at the Processing in time synchronous controlled

Q.13.What are the requirements for connections and buildings of CNC Router?

ANS:- Requirements for connections and buildings:

1. Electrical connection value, 20 to 30 kW
2. Compressed air, 7bar
3. Suction power, 4000 to 5000 m / h
4. Floor load, 2000 kg / m2
5. Sufficient floor space

Q.14.What are the types of CNC Machine? Explain it.

ANS:- **Boom type:**

The cantilever type requires comparatively little space, is one light and rather inexpensive CNC machine. Likewise, she can be fed without restriction from the front. This CNC machine is mostly used for plane-shaped parts.

Moving Gentry Design:

The term << gantry »is a subspecies of Portal design, where the Sub frame built over the machine table and thus on both sides is guided and held. Compared to the classic portal design does not move the table, but the portal. This design is low-vibration and to accommodate heavy auxiliary equipment suitable.

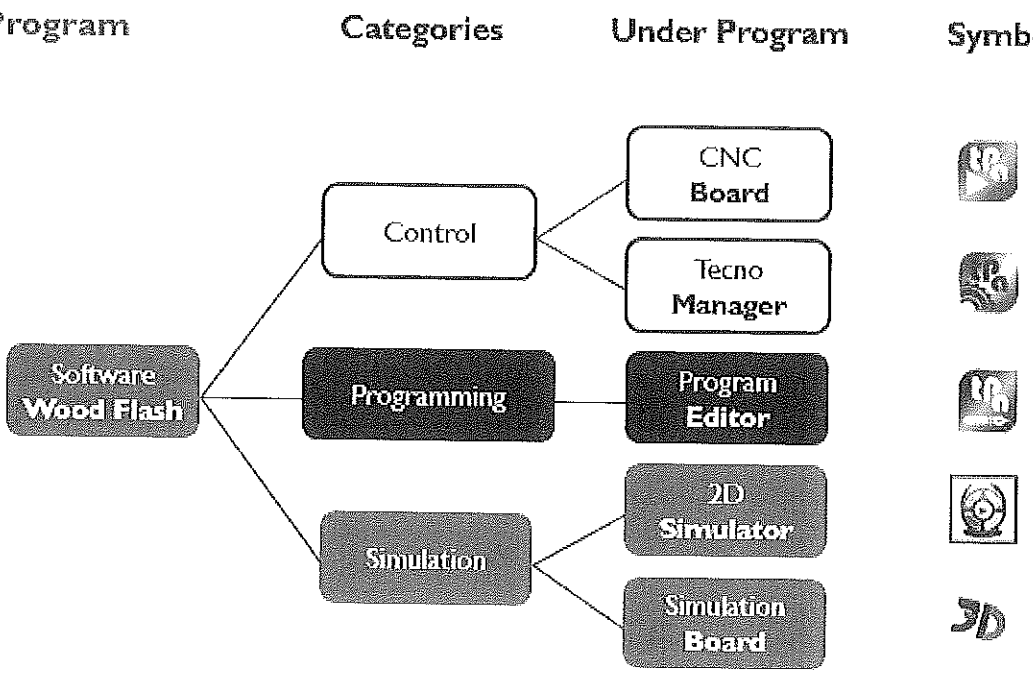
Section – C

04X06 = 24 Marks

Q.15.Explain the program overview of CNC Router with the help of block diagram.

ANS:-

The program is divided into different categories, machine operation, work piece programming and simulation.



Q.16.What are the functions of CNC board and Techno Manager?

ANS:- CNC Board:-

> Main menu, all the programs can be started from here

> Display of CNC working fields, consoles and vacuum pods

> The working order of the individual programs is here defined in list form

Techno Manager: -

> The machine will be loaded with the tooling that where entered into the Tool

Parameters program

> Each tool is placed in one of the free tool loading positions on the machine

Q.17.Explain the vacuum clamping in CNC Router?

ANS:- On the machine bed various movable structures are attached. The driving speed with which this mass is moved causes high forces. A stable machine bed is the prerequisite for precise milling work. With a sturdy machine bed, it is possible to produce sophisticated operations, such as thick hardwood or wood-based materials, without leaving chatter marks, resulting in less grinding and cost savings. Welded steel structures or cast machine stands made of mineral cast iron are available. The cast machine bed is less prone to vibration and is used on heavier CNC machines with considerable mass movement and large feeds. The tool life is much longer due to the lower vibrations

Q.18.What are the points we must pay attention when running a CNC machine?

ANS:-

1. Never dismantle the dust extraction covers, they protect against wood and tool splinters.
2. The work pieces must be well stretched. Check this before every program start.
3. The stop cams for the work pieces must be lowered at the start of the program so that the tool does not travel into the stops.
4. Before the milling, the positioning of the suction cups has to be checked.
5. Offcuts must not be jammed.
6. The minimum as well as the maximum speeds must be observed. The maximum speed must be stored in the machine control.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

End-Sem. Examination

Set-B

Course Code: SCS1305 **Time: 2 Hours**

Course Name: Wood Working CNC Machines **Max. Marks: 50**

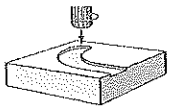
Instruction:

- 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 type of the Path mode given in fig.?



(A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.2.Laser Cutting is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.3.Wooden figures is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.4.Which one of the following is the required Suction Power for connections in CNC Router?

(A) 4000 to 5000 m/h (B) 3000 to 4000 m/h

(C) 2000 to 3000 m/h (D) 5000 to 6000 m/h

Q.5.32 mm drill system is the example of_____control mode?

(A) Point control (B) 2D path control

(C) 3D path control (D) None of these

Q.6.What is name of System accessory given in figure?

(A) Hydro Feed (B) Collect chuck

(C) Heat-Shrink fit chucks (D) Cross Stop

Q.7.Display of CNC Working fields, consoles and vacuum pods are shown in_____?

(A) CNC Board
(B) Techno Manager
(C) Program Editor
(D) Tool Arch

Q.8.The working order of the individual programs cab be defined in list form from_____?

(A) CNC Board
(B) Techno Manager
(C) Program Editor
(D) Tool Arch

Q.9.All the tooling data has been found in_____?

(A) CNC Board
(B) Techno Manager
(C) Program Editor
(D) Tool Arch

Q.10.Which one of the following is the face where machining is not possible?

(A) Face 1
(B) Face 2
(C) Face 3
(D) Face 4

Section – B

04X04 = 16 Marks

Q.11.What are the major axes in CNC Router? Explain it.

Q.12.Define the term CNC and WOP.

Q.13.What are the functions of Suction Cup?

Q.14.Briefly describe the faces of work piece used for a program in CNC Router with the help of a diagram.

Section – C

04X06 = 24 Marks

Q.15.Briefly describe the Absolute dimension and Relative dimensioning.

Q.16.What are the functions of 2D Simulator and 3D Simulator?

Q.17.Explain the vacuum clamping in CNC Router?

Q.18.What are the safety points when running a CNC machine?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

ANSWER KEY

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

End-Sem. Examination

Set-B

Course Code: SCS1305 **Time: 2 Hours**

Course Name: Wood Working CNC Machines **Max. Marks: 50**

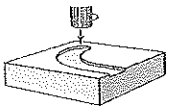
Instruction:

- 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 type of the Path mode given in fig.?



(A) Point control (B) 2D path control

(C) 3D path control (D) None of these (B)

Q.2.Laser Cutting is the example of _____control mode?

A) Point control (B) 2D path control

(C) 3D path control (D) None of these (B)

Q.3.Wooden figures is the example of _____control mode?

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Q.4.Which one of the following is the required Suction Power for connections in CNC Router?

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(C) 2000 to 3000 m/h (D) 5000 to 6000 m/h (A)

Q.5.32 mm drill system is the example of_____control mode?

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Q.6.What is name of System accessory given in figure?

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Q.7.Display of CNC Working fields, consoles and vacuum pods are shown in_____?

(A) CNC Board (B) Techno Manager

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Q.8.The working order of the individual programs cab be defined in list form from_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch (A)

Q.9.All the tooling data has been found in_____?

(A) CNC Board (B) Techno Manager

(C) Program Editor (D) Tool Arch (B)

Q.10.Which one of the following is the face where machining is not possible?

(A) Face 1 (B) Face 2

(C) Face 3 (D) Face 4 (B)

Section – B

04X04 = 16 Marks

Q.11.What are the major axes in CNC Router? Explain it.

ANS: - **Main axes X, Y, Z**
With the three main axes of movement, every point in the room can be approached. However, the tool is always perpendicular to an axis. Thus, for example, no oblique holes or saw cuts in any angle possible.

Rotary axes a, b, c
In order to programmatically perform inclined drilling and bevel cuts with saw blade, further controlled axes are used with corresponding angle gears. Widely used is the so-called C-axis, which, for example, can turn a saw blade around the Z-axis so that angle cuts are possible.

Q.12.Define the term CNC and WOP.

ANS: - **CNC (Computerized Numerical Control):** - CNC machines are machine tools that, thanks to the use of Computer-controlled measuring and coordinate systems, are able to automatically produce work pieces with high precision, even for complex shapes. They outperform mechanically controlled machines in terms of precision and speed.

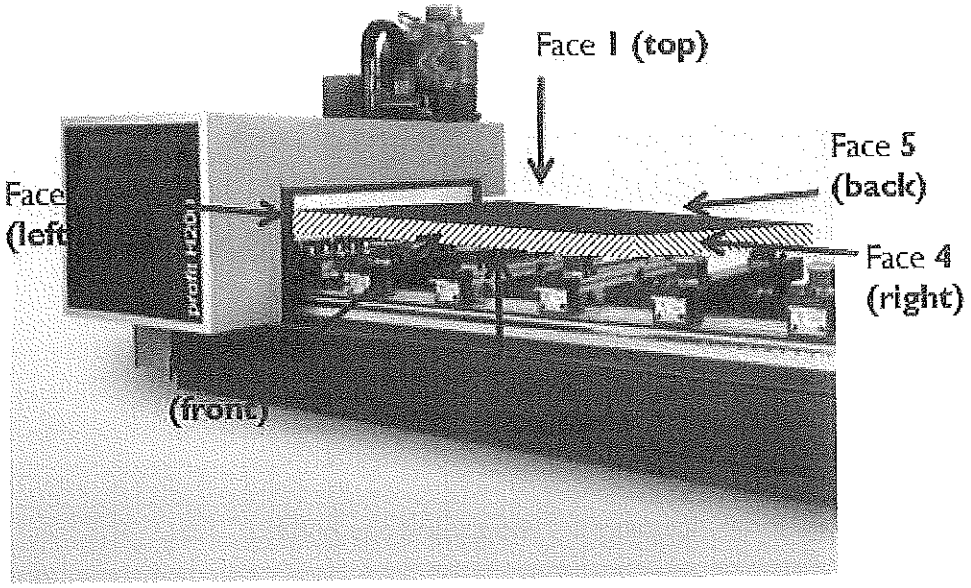
WOP (Workshop-oriented programming): - Most machine suppliers sell their machines with a WOP.These CAD-like programs simplify programming for the operator and represent the work piece with the machining graphically.

Q.13.What are the functions of Suction Cup?

ANS: - Tables with brackets, on which vacuum cups are placed arbitrarily, are used to clamp work pieces. Due to the adjustability of the brackets in the X-axis and the adjustability of the suction cups in the Y-axis different sized work pieces can be tensioned. Falling chips fall between the consoles and so hinder the operation a little. There are also plain tables with the corresponding vacuum blocks, grid tables and clamping templates.

Q.14.Briefly describe the faces of work piece used for a program in CNC Router with the help of a diagram.

ANS:-



Section – C

04X06 = 24 Marks

Q.15.Briefly describe the Absolute dimension and Relative dimensioning.

ANS:- **Absolute dimension**

The absolute dimension refers to a zero point and is therefore also called reference.
Absolute dimensioning is the basis for the CNC program creation particularly suitable. It is easy to interpret and can be easily converted into a program. Similarly, edits can easily be compared and controlled with the plan.

Relative dimensioning:

The measures always refer to the previously measured point. If you change the dimensions of the previous point, all other points will be moved automatically. This can lead to errors, but is also very handy for edits that need to be moved together. For example, in a series hole drilling, if the first hole is moved, all the other holes should also be moved. The relative dimensioning is also known as chain or incremental.

Q.16.What are the functions of 2D Simulator and 3D Simulator?

ANS:- The working time can be simulated here.

> Adjustable speed from 1/256- to 256-times the real speed.

> The working order of a program can be checked and changed

The working time can be simulated here.

> Adjustable speed from 1/256- to 256-times the real speed.

> The working order of a program can be checked and changed

Q.17.Explain the vacuum clamping in CNC Router?

ANS:- Tables with brackets, on which vacuum cups are placed arbitrarily, are used to clamp work pieces. Due to the adjustability of the brackets in the X-axis and the adjustability of the suction cups in the Y-axis different sized work pieces can be tensioned. Falling chips fall between the consoles and so hinder the operation a little. There are also plain tables with the corresponding vacuum blocks, grid tables and clamping templates.

Q.18.What are the safety points when running a CNC machine?

ANS:- Never bridge or disassemble the existing safety devices.

1. Never dismantle the dust extraction covers, they protect against wood and tool splinters.
2. The work pieces must be well stretched. Check this before every program start.
3. The stop cams for the work pieces must be lowered at the start of the program so that the tool does not travel into the stops.
4. Before the milling, the positioning of the suction cups has to be checked.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Course Code: SCS1307 **Time: 2 Hours**

Course Name: Advanced Carpenter Materials (SET A) **Max. Marks: 50**

Instruction: All the questions are compulsory.

Section – A

10X01 = 10 Marks

Q1. In which direction the maximum wood shrinkage takes place?

(a) Tangential (b) Radial

(c) Cross-sectional (d) Equal in all directions

Q2. Which component of the wood acts as a binding material?

(a) Cellulose (b) Lignin

(c) Resins (d) Starches

Q3. Veneers that are not visible and are glued to the carrier boards

(a) Blind veneer (b) Covering veneer

(c) Burl (d) None

Q4. Adhesive that sets two components through a chemical reaction

(a) Dispersion adhesive (b) Hot melt adhesive

(c) Reaction adhesive (d) Contact adhesive

Q5. Which process is not used for changing the wood colour?

(a) Bleaching (b) Patinate

(c) Pickling (d) Equalize

Q6. Which of the following is not a property of glass?

(a) Glass can take up a high polish

(b) Glass can absorb and refract light

(c) Glass has a definite crystalline structure

(d) Glass is available in many beautiful colours

Q.7. When material absorb the energy of force or load imposed on it, characteristic is called

a) Impact b) Hardness c) Resilience d) None

Q8. The property of wood depends upon the strength of the fibers

a) Strength b) Hardness c) Resilience d) None

Q9. Carborundum is

a) Adhesive b) Abrasive c) Resin d) Cleaning agent

Q10. In HGF Laminate, F stands for

(a) Finish product (b) Fire retardant

(c) Fungi resistive (d) None

Section – B

04X04 = 16 Marks

Q11. Explain the working of reaction adhesives. Write their working instructions also.

Q12. Write in detail about the soundproof insulating glass and thermal insulation glass.

Q13. Define any four major properties of HP laminate.

Q14. Explain the selection criteria of abrasive.

Section – C

04X06 = 24 Marks

Q15. Explain all the drying level of the wood with diagram.

Q16. Discuss the following terms in reference to surface finishing: Resinify, Equalize and Stain removal.

Q17 (a). Describe the slicing method of veneer manufacturing. Write its advantages and disadvantages also.

Q 17 (b)Write short note on plastic films and Edge materials.

Q18. Explain the construction of HP laminate.

Answer Key

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Course Code: SCS1307 **Time: 2 Hours**

Course Name: Advanced Carpenter Materials (SET A) **Max. Marks: 50**

Instruction: All the questions are compulsory.

Section – A

10X01 = 10 Marks

Q1. In which direction the maximum wood shrinkage takes place?

(a) Tangential (b) Radial

(c) Cross-sectional (d) Equal in all directions (a)

Q2. Which component of the wood acts as a binding material?

(a) Cellulose (b) Lignin

(c) Resins (d) Starches (b)

Q3. Veneers that are not visible and are glued to the carrier boards

(a) Blind veneer (b) Covering veneer

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Q4. Adhesive that sets two components through a chemical reaction

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Q6. Which of the following is not a property of glass?

(a) Glass can take up a high polish

(b) Glass can absorb and refract light

(c) Glass has a definite crystalline structure

(d) Glass is available in many beautiful colours (c)

Manish Kumar

Q.7. When material absorb the energy of force or load imposed on it, characteristic is called

a) Impact

b) Hardness

c) Resilience

d) None (c)

Q8. The property of wood depends upon the strength of the fibers

a) Strength

b) Hardness

c) Resilience

d) None (a)

Q9. Carborundum is

a) Adhesive

b) Abrasive

c) Resin

d) Cleaning agent (b)

Q10. In HGF Laminate, F stands for

(a) Finish product (b) Fire retardant

(c) Fungi resistive (d) None (b)

Section – B

04X04 = 16 Marks

Q11. Explain the working of reaction adhesives. Write their working instructions also.

Ans.

Reactive adhesives - PUR adhesives

Polyurethane adhesives are isocyanate adhesives that set through a chemical reaction. There are 1-component and 2-component PUR adhesives. The 1-component PUR adhesives set by absorbing moisture from the air and from the material. The 2-component PUR adhesives set through a reaction that is triggered by mixing the two components. A large number of different types are available with shorter and longer open times. The set adhesive layer is an elastomer in both cases and is constantly moisture and heat resistant up to over 100 ° C!

Work instructions

Since 1-component adhesives bind with moisture, the wood moisture should always be checked when gluing wood. The wood moisture should be at least 9%. Particularly in the heating season, the workshops are very dry and the wood moisture can be lower than usual. Lower wood moisture definitely requires additional moistening of the adhesive film with a water spray. However, the open time becomes shorter.

Visible moisture and moisture in wood over 18% do not result sufficient adhesion of the PUR adhesive.

- 1-component PUR adhesives foam during the setting process but 2-component PUR adhesives are not.
- 2-component PUR adhesives bind within the pot life after mixing the two components. These adhesives need a minimum temperature for good reaction.
- A rough guideline for the pressing time is that at +20 ° C and a humidity of approx. 65% the specified open time of a product multiplied by three results in the minimum pressing time. In the winter months it is partly necessary due to the lower humidity and the mostly low temperatures to prolong the pressing time.
- After removing the adhesive from a container these are tightly closed again, as otherwise inflowing air or air humidity will cause the adhesive in the container to react.
- The adhesive manufacturers have developed PUR adhesives with "fibers" for construction situations that can bridge joints up to 0.3 mm with high strength.

Q12. Write in detail about the soundproof insulating glass and thermal insulation glass.

Ans.

Soundproof insulating glass

Growing road traffic and increasing demands for comfort place high demands on noise protection. The type of sound insulation is determined by the outside noise and the use of space. In addition to the choice of glass, the window frame and its tightness are of crucial importance.

The required sound insulation value is regulated in SIA 181 and in the SAWAL's noise protection ordinance. The sound insulation level is given in decibels. When it comes to sound insulation, it is important to distinguish between the evaluated laboratory value Rw and the R'w measured on the building. The R'w value evaluates on-site losses and is therefore the decisive factor for the effect on the object.

Thermal insulation glass

Replacing old windows is one of the most effective measures to save energy. Even in winter when the sky is overcast, solar energy comes through the window into the house free of charge. Depending on the quality of the glass, some of the energy is lost through the window. This ratio of solar energy gain and loss is called the energy balance. The wafer-thin layers of thermal protection (2 layers with triple insulating glass) on the pane surface of the thermal insulation glass ensure that most of the solar energy gained remains in the room. The sun is also heating up.

Feeling of comfort - Good thermal insulation glass increases the feeling of comfort in the living room because the surface temperature of the inner pane can be increased compared to bad glass. This significantly reduces the feeling of cold and the feeling of drafts near the window.

Warm room air cools down due to the much lower temperature of the inner pane on the pane surface. This creates a cool air flow that is wrongly perceived as drafts in the vicinity of the pane.

Q13. Define any four major properties of HP laminate.

Ans:

1. HPL boards are insensitive to all normal household chemicals.
2. They are heat-resistant up to about 150 ° C, for short-term exposure in dry heat.
3. They are water resistant. Standing wet under parked However, objects can stain.
4. The change in shape in the longitudinal and transverse directions is less different. The decisive factor is the direction of the paper, which is usually identical to the grinding direction on the back of the plate. The shrinkage mass in the longitudinal direction is max. 2% o and in the transverse direction max. 4% o. This depends on the prevailing indoor climate.

Q14. Explain the selection criteria of abrasive.

Ans:

Selection of the Abrasive

The selection of a particular abrasive is determined by its action for the type of function to be performed on the material to be processed. The effect of an abrasive material depends on three

key characteristics: a.

Particle shape. The shape of an abrasive may be angular, blocky, semi-round or spherical. Angular particles cut and strip away surface material on impact. Spherical particles do not have any cutting edges and are used to pound or peen a surface. Grain shape is important as rounded and angular grains behave differently when they impact a substrate such as steel. Angular, sharp particles produce the greatest cutting action and the deepest profile. Round or semi-round particles will cut much more slowly and will produce a more shallow profile.

b. **Hardness**. The hardness of an abrasive is measured using the Mohs scale. Harder particles will be more aggressive in removing surface material.

c. **Particle size.** A larger particle removes material faster and it tends to produce a heavier texture or rougher surface on the base material.

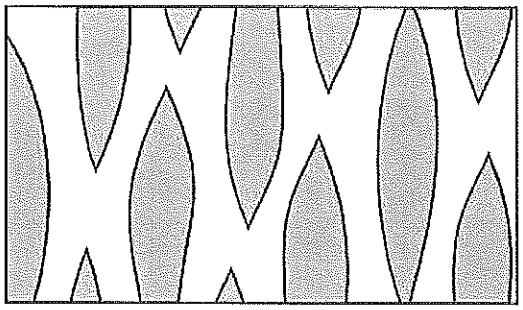
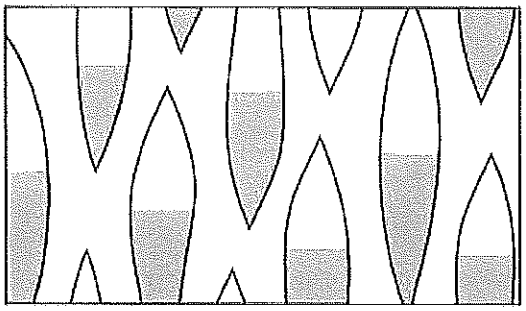
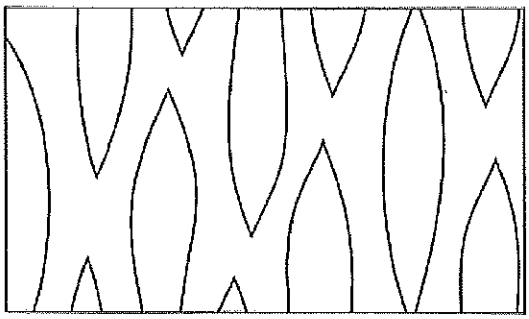
Section – C

04X06 = 24 Marks

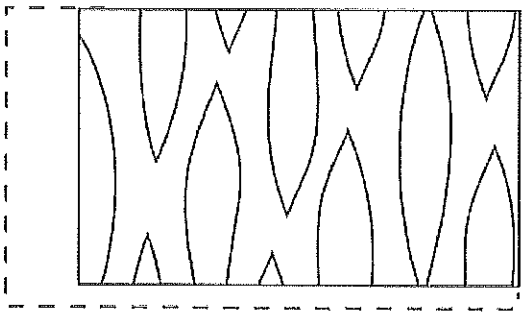
Q15. Explain all the drying level of the wood with diagram.

Ans. The drying levels of the wood

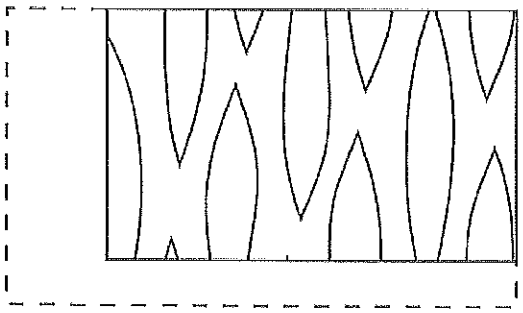
One of the special properties of woods is their ability to change their volume by absorbing or releasing water. This "working of the wood" occurs as soon as air humidity and wood moisture are not in balance, regardless of whether the wood is freshly installed or whether it has been in place for many years. The following drying levels are important for water absorption and release:

		Radial section
1. Water saturation	The cell cavities and the cell walls are filled with water.	
2. Fresh from the forest	There is bound water in the cell wall. Part of the free water has evaporated.	
3. Fiber saturation	The free water has evaporated. The cell walls are still completely saturated with bound water.	

4. Air dry — Part of the bound water has also evaporated in the cell walls. The moisture content of the wood is in balance with the air humidity.
Water content: 12 to 15% for use, in wood trade values up to 20% are considered to be air dry. The dimensions of the wood have become smaller.



5. Dry dry — Absolutely anhydrous wood. This state can only be achieved in the drying process and is used to determine the water content. Darr mass = 100%.
When dry, the wood reaches the smallest possible dimension.



Q16. Discuss the following terms in reference to surface finishing: Resinify, Equalize and Stain removal.

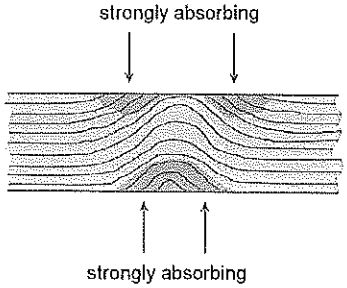
Ans.

Resinify

Many softwoods have a more or less large proportion of resin. These resins are water-insoluble, water-repellent and incompatible with aqueous stains and varnishes. Because resins are not evenly distributed in the wooden surface, the stained area would appear stained. The resin is only removed after the last sanding. During resin removal, the resin is either washed out with acetone on the surface or chemically decomposed with alkaline substances.

Equalize

Because the wood fibers do not always run parallel to the wood surface, it is not equally absorbent everywhere. The absorbency of the wood is somewhat balanced with a leveler. Such solutions are available on the market or can also be manufactured yourself. It is mainly leveled with carpentry work that is stained, for example in the case of whitewash, end grain sections, as well as with differently absorbent surfaces (veneered / solid).



Stain removal

Removing stains is tedious and only partially successful. Therefore, great care should be taken to prevent stains.

Stain removal options:

- Weak dirt and grease stains can be removed with hot soapy water by brushing
- Oil and grease stains are best removed with solvents (acetone)
  - Rinsing with clean water over the entire surface is essential in any case, otherwise discoloration can occur because the dirt is only dissolved and distributed

Q17 (a). Describe the slicing method of veneer manufacturing. Write its advantages and disadvantages also.

Ans. Sliced veneers

The sliced veneer process was developed at the beginning of the 19th century. The veneers are cut like a plane with a knife across the grain of the trunk. Before this is possible, the veneer trunks are separated into quarters or flitches and steamed in large steaming pits at 130°C for several days. In the plastic state, the wood is soft and can be sliced. The veneer sheets are then dried and tied into bundles in the correct order and labeled. The label is important because it provides information about veneer thickness, quantity and master number.

Advantages

- Low cutting loss (only 20 mm rest board)
- Surface image exactly matches the one below
- Symmetrical images by falling over the veneers
- Cutting thicknesses from 0.5 to 4 mm
- Great cutting performance

Disadvantage

- With thin veneers there is a risk of adhesive penetration
- Steaming can cause color changes
- The side of the knife shows small cracks
- This side is called the left side
- The knife process is used primarily to cut precious woods to veneer on deck

Q17 (b)Write short note on: i) plastic films ii) Edge materials

Ans: i) Plastic films made of different materials are available on the market, such as. B. Carrying bags, construction foils, vapor barriers and brakes as well as roof seals etc. Foils are 0.2 to 2mm thick, flexible plastic sheets. The printed PVC foils are of particular importance for the carpenter. This plastomeric plastic is heated and in a drawing and Embossing process (calendaring process) to thin, flexible foils rolls. Depending on the use, these foils have different thicknesses and different degrees of flatness. Most are made of the same material throughout. However, there are foils with reinforcements made of paper and fabric etc. in order to increase the adhesion of the coating and / or the resistance.

Application

- in series furniture construction
- in interior fittings for doors
- for edges for coated workpiece

ii) **Edge materials** serve to coat the narrow surfaces of chipboard, which represent a wide range of applications in the furniture industry. All cut edges on the fronts and on the body are covered with edge materials. This involves locking the furniture components to protect them from environmental influences such as, for example, dirt, water ingress or impact loads, etc. In addition, modern edging materials guarantee optimal design options for the piece of furniture due to their variety of materials and designs. Living spaces are becoming more and more individual, every detail is important. The narrow surface and edge as a design element are becoming increasingly important.

Q18. Explain the construction of HP laminate.

Ans:

Construction

Essentially, the decorative laminate (HPL) consists of more than 60% paper. The remaining 30 to 40% consist of hardened phenol formaldehyde resin for the core and melamine formaldehyde resin for the surface layers.

Top layer

The approximately 15 to 80g / m2 thin paper, impregnated with melamine resin, is applied to the printed decorative paper to increase the abrasion resistance.

Decorative layer

The decorative layer consists of melamine resin impregnated, printed paper with a thickness of 50 to 160 g / m2, which is usually colored through. Thin wood veneers or metal foils impregnated with melamine resin are also used.

Barrier layer

White cellulose paper impregnated with melamine resin is used used with light decorative layers for color blocking.

Core papers

The cellulose kraft paper with a strength of 80 to 300 g / m2 is not uncommon bleaches for use and is impregnated with phenolic resins. The number Core papers determine the thickness of the laminate.

The decorative layer consists of melamine resin impregnated, printed paper with a thickness of 50 to 160 g / m2, which is usually colored through. Thin wood veneers or metal foils impregnated with melamine resin are also used.

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Registration No.: .....

School of Woodworking Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

End-Sem. Examination

Course Code: SCS1307 **Time: 2 Hours**

Course Name: Advanced Carpenter Materials (SET B) **Max. Marks: 50**

Instruction: All the questions are compulsory.

Section – A

10X01 = 10 Marks

Q1. Which part of the trunk is known as growth tissue (forms new cells through cell division)?

(a) Core (b) Sapwood

(c) Cambium (d) Bast

Q2. Where is Sapwood located in the structure of softwood stem?

(a) Between cambium and core (b) Between bast and bark

(c) Between pith and core (d) Between cambium and bast

Q3. Veneers that are visible on the finished work-piece are known as

(a) Blind veneer (b) Covering veneer

(c) Deck veneer (d) Barrier veneer

Q4. Adhesive that sets through evaporation of water

(a) Dispersion adhesive (b) Hot melt adhesive

(c) Reaction adhesive (d) Contact adhesive

Q5. Which of the following is not used as a coating material in woodworking?

(a) Varnish (b) Glaze

(c) Oil (d) Water

Q 6. Thermal insulation glass is a kind of

(a) Safety Glass (b) Functional Glass

(c) Ornamental Glass (d) Decorative Glass

Q7. In HGP laminate, P stands for

(a) Pressurized b) Post formed

(c) Preprocessed (d) Penetrated

Manish Kumar

Q8. European or commonly used grade for laminate is

(a) EN 532 (b) EN 338

(c) EN 438 (d) None

Q9.The Aluminum Oxide used for wood working as

(a) adhesive (b) cleaning agent

(c) abrasive (d) None

Q 10. The property of wood that resists abrasion and scratches

a) Strength

b) Hardness

c) Resilience

d) None

Section – B

04X04 = 16 Marks

Q11. Write in detail about the hot melt adhesives, their types and working instructions.

Q12. Write in detail about the decorative glasses.

Q13. What are the advantages of Linoleum?

Q14. Write short note on bonded and coated abrasive.

Section – C

04X06 = 24 Marks

Q15. Explain the storage of Water content in the wood with diagram.

Q16. Explain the bleaching and pickling processes used for changing the wood colour.

Q17 (a). Write the instructions for veneer storage in detail.

(b) Explain the processing of HP laminate.

Q18) Explain major characteristics of Laminate.

Answer Key

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Section – B

04X04 = 16 Marks

Q11. Write in detail about the hot melt adhesives, their types and working instructions.

Ans.

Hot melt adhesives

The edge gluing machine and the hot melt glue gun work with hot melt adhesives, which cause the workpieces to glue by solidifying the adhesive. For this purpose, the adhesives are melted at over 100 ° C, applied to the workpieces and cooled by the ambient temperature. Two common hot melt adhesive groups are available on the market.

EVA hot melt adhesive made of plastomeric plastics for the univer use that become soft again when exposed to heat.

Reactive PUR hotmelt adhesives which have an initial strength after the adhesive mass has solidified. In addition, the macromolecules cross-link over time, forming elastomeric plastic layers. These cannot be melted again.

EVA hot melt adhesives

EVA hot melt adhesives were manufactured for their universal use in edge glue machines. The most important properties are the low viscosity and the good wetting of the edge materials. A tight adhesive joint with a high final strength is created, which can be veneered. The disadvantages of EVA edge joints are visibility on the surface and releasability when exposed to heat, such as in the vicinity of ovens or the like.

PUR hot melt adhesives

These adhesives were developed for high resistance to solvents, water, steam, heat and cold. Polyurethane hot melt adhesive is a reactive adhesive that, in addition to the physical setting, i.e. H. by cooling, additionally sets chemically. The necessary initial strength when leaving the machine is achieved through the normal physical setting process. Thereupon a chemical cross-linking of the molecules starts in the following days due to moisture.

Work instructions

Checking the correct temperature at the time of applying is very important. This must remain constant during the gluing process until the parts are pressed together. Drafts can lead to incorrect bonding because the temperature drops sharply. The perfect fit of the joint is essential for a perfect joint pattern. Panel material cut at right angles is absolutely necessary for a flawless production process.

Q12. Write in detail about the decorative glasses.

Ans.

Decorative glasses

Decorative glasses enable attractive designs in the kitchen, living room and office space with great individuality and a long service life. Decorative glasses combined with light also achieve a unique material effect. They can be offered mirrored by means of enamelling in a wide range of colors or customized with high-quality screen printing.

Colored glasses (enamelled glass)

Glass cladding made of colored glass allows for attractive design options in the interior. Seamless wall coverings are practical, hygienic and easy to maintain. There is a large color collection to choose from. The glass plates are enamelled on the underside with colors. During the tempering process, the ceramic colors permanently fuse with the glass, thereby gaining strength and intensity.

A thickness of 12mm is normally preferred for the realization of the worktops. A glass thickness of 6mm is sufficient for rear walls and cladding.

Screen printed glasses

Using screen printing technology, any motifs such as photos or graphics can be printed directly on the glass and permanently melted as enamelled glass. The motifs can subsequently be brought to bear using various methods.

Silver plating - With the two versions "silvering" and "partial silvering", the glass can be processed with unique specular reflections to create glamorous unique glass pieces.

Translucent - In this version, too, the colored motif is first coated transparently on the back of the glass and then backed with an additional white coating. The light scattering is thus diffuse

and is partially or fully permeable. The parts of the picture that shine through are specially staged. Optimal light sources are LED panels or fluorescent tubes. The translucent version is particularly recommended for wall cladding, counters, advertising spaces and decorative elements.

Covering - The back glass side is coated with a motif absolutely opaque. This solution is mostly used for kitchen rear walls, wall cladding, furniture fronts and murals.

Backlit glasses - With backlit glass, an absolutely evenly illuminated surface is expected. The translucent colored or white coating on the back and the velvety glass surface make this claim a reality. This technology is ideal for wall cladding in interior design, kitchen construction, furniture construction, in shop and trade fair construction as well as for illuminated and advertising boards.

Q13. What are the advantages of Linoleum?

Ans:

- Environmentally, linoleum has a great deal going for it. The product is made primarily from minimally processed natural ingredients.
- It contains almost no petroleum-based chemicals and no chlorinated chemicals. The resources used are renewable or plentiful. It is fully biodegradable.
- From a life-cycle cost standpoint, the lower maintenance requirements will result in significant savings over time.
- Linoleum is a warm material
- Linoleum is a natural material
- There is no electrostatic charge on linoleum
- Linoleum is resistant to a wide range of chemicals
- Linoleum inhibits bacterial growth, which is why it is used in buildings used as a floor covering with increased hygiene requirements becomes.

Q14. Write short note on bonded and coated abrasive.

Ans:

A bonded abrasive is composed of an abrasive material contained within a matrix, although very fine aluminium oxide abrasive may comprise sintered material. This matrix is called a binder and is often a clay, a resin, a glass or a rubber. This mixture of binder and abrasive is typically shaped into blocks, sticks, or wheels. The most common abrasive used is aluminium oxide. Also common are silicon carbide, tungsten carbide and garnet. Another examples of bonded abrasive is grinding wheel.

A coated abrasive is an abrasive grain bonded to a flexible base like paper, cloth, vulcanised fibre or plastic film. Sand paper is an excellent example. Such abrasives come in various grit sizes, ranging from a very coarse 2mm grain to ultra fine grains of less than a millimetre in

diameter. As you can imagine some abrasives are better for certain jobs than others, some are

designed for working by hand and others specifically for use with machines like an orbital sander, belt sander or drum sander.

Section – C

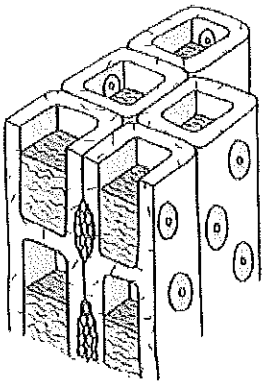
04X06 = 24 Marks

Q15. Explain the storage of Water content in the wood with diagram.

Ans. Water content of the wood

Wood can contain water in two different ways. If the cell walls are saturated with water, the cell cavities fill with water. This water is called free or capillary water. The proportion of this unbound water is usually very high, but is relatively easy to remove. The water that is bound in the cell walls is called bound water. This is difficult to remove, and this explains the drying speed as the degree of dryness of the wood increases. The area in which there is no free water in the wood is called the fiber saturation area. Depending on the type of wood, it is between 22 and 35% wood moisture.

When moisture is absorbed or released below this area, the wood swells or shrinks, while changes in wood moisture above the fiber saturation area cause changes in shape only to a very small extent.



Schematic representation:
free and bound water in the wood

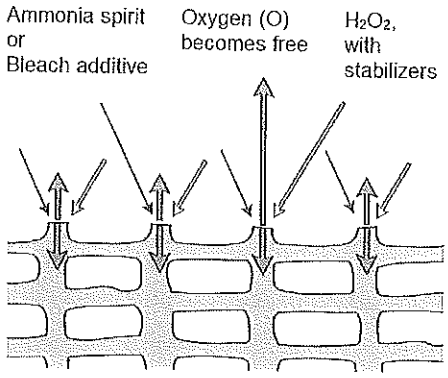
Q16. Explain the bleaching and pickling processes used for changing the wood colour.

Ans.

Bleaching

Today hydrogen peroxide is mostly used as a bleach. 5 to 10% ammonia spirit is added to the amount of hydrogen peroxide and then diluted with water to the desired bleaching effect. The more concentrated you work, the faster the solution begins to "boil". After boiling, the bleaching

solution is ineffective and must be disposed of. By adding ammonia spirit, the hydrogen peroxide solution quickly breaks down into oxygen and water. The released oxygen causes the wood to bleach.



Caution

- Protective measures: Wear gloves, safety glasses and headgear. The bleaching solution attacks metal parts and thus causes discoloration in the wood
- Equipment must be washed out well, as rags, sponges and brushes soaked with bleaching solution can ignite themselves
- The used rags must be kept in non-flammable containers in non-flammable places
- After bleaching, allow a drying time of at least 24 hours. If staining is carried out after bleaching, a drying time of 48 hours should be planned. The bleached areas must then be washed with warm water so that the remaining bleach residues can be removed safely. Bleach residues can otherwise lead to cracks or blisters in the lacquer layer and to bleaching.

Pickling

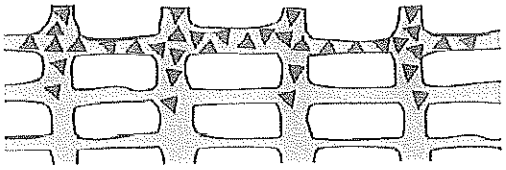
Disambiguation: The word "stain" was originally used to refer to colorations that were made with metal salts or ammonia. These reacted with the ingredients of the woods.

Later, dyes dissolved in solvents were added, which were assigned to the word "dye". The development increasingly produced different dyes and pigments, which in turn were dissolved in different solvents and achieved different effects. At the same time, the original stains were used less and less. However, the name “stain” and the activity “stain” are firmly anchored in everyday professional life, even if these terms can no longer be clearly assigned from a technical point of view using the methods that are common today. The two processes of the chemical reaction and the physical setting process usually take place in combination in modern products.

Pickling with dissolved dyes: Stains with dissolved dyes penetrate deeper into the wood. They convey "depth" to the pickling pattern. Water and a mixture of different solvents are suitable as solvents.

- Water stain with dissolved dyes

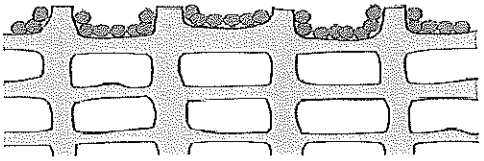
Solvent stain with dissolved dyes



Color substance on the cellulose in the wood

Pickling with undissolved dyes: Due to the size of the undissolved dyes, these stains tend to lie on the wood surface. The penetration is inhibited, the dyes therefore have a covering and balancing effect.

- Water stain with undissolved dyes
- Solvent stain with undissolved dyes



Color pigments

Q17 (a). Write the instructions for veneer storage in detail.

Ans. Veneer Storage

Veneers are expensive and easily vulnerable if stored improperly. Therefore, the following instructions for storage must be observed:

- Veneers must be stored in dark or darkened rooms or covered with cloths (risk of yellowing under the influence of light). UV rays cause a change in the wood component lignin, which leads to yellowing of the wood.
- Veneers are very brittle when completely dry. The storage climate should therefore correspond to a wood moisture content of 8 to 10% (relative air humidity of 65 to 75%, i.e. in unheated rooms).
- The climate in the camp should remain as constant as possible. Fluctuations in humidity and temperature cause the veneers to shrink and swell, which can lead to cracking.
- Veneers, separated by type of wood, must be stored on racks. Repositioning the veneers too often leads to cracks.
- Newly purchased veneers are to be entered on the inventory list, used veneers are debited.

Q17 (b). Explain the processing of HP laminate.

Ans: The processing involves following steps:

Storage

The plates should be protected from moisture, as moisture causes swelling and consequently leads to a long acclimatization time in the workshop

- The optimal indoor climate is 18 to 23 ° C and 40 to 65% relative humidity
- To prevent scratches, the decor side should be on the decor side be stored
- The protective film should only be removed during final assembly
- The panels must lie flat and over their entire surface. If possible plate or lying in an inclined position must be covered to prevent pollution or harmful light to prevent.

Air conditioning

Before processing, core and laminate boards should be stored in the same room for three to ten days. The different shrinkage mass of the carrier and the laminate boards require this, since otherwise stresses arise and curved workpieces could result. When gluing, care must be taken that all materials are matched to the climate at the place of use, so that the workpiece is exposed to the smallest possible climate fluctuations.

Transport

- Transport individual panels hanging or rolled up with the decorative side inwards. Attention: with the smallest notches in the edge of the panel there is a great risk of tearing.
- In the case of individual deliveries, the plates are often rolled in a box box packed. During the cold season the material is to acclimatize to the indoor climate before unpacking it can be.

Edge cleanliness

Since laminate sheets that have not yet been glued are relatively brittle, the following basic requirements apply when cutting cleanliness: on the one hand, a very sleek carbide or diamond-tipped tool is to be used; the cut edge, which often triggers larger and deeper cracks and breakouts during further processing.

Q18) Explain major characteristics of Laminate.

Ans.

1. HPL boards are insensitive to all normal household chemicals.
2. They are heat-resistant up to about 150 ° C, for short-term exposure in dry heat.
3. They are water resistant. Standing wet under parked However, objects can stain.
4. The change in shape in the longitudinal and transverse directions is less different. The decisive factor is the direction of the paper, which is usually identical to the grinding

direction on the back of the plate. The shrinkage mass in the longitudinal direction is max. 2% o and in the transverse direction max. 4% o. This depends on the prevailing indoor climate.

5. HPL boards have good abrasion resistance, which however Normal HPL sheets can only be bent to a limited extent. For tight Radii are available in postforming plates.
6. The HPL boards are hard and brittle, so they are very cracked and sensitive to impact.