



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration no.....

School of Woodworking Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, 5th Semester
2nd In-Sem. Examination

Course Code: SCS1501
Course Name: Wood and panel manufacturing specialist

Time: 1 Hour

Max. Marks: 20

Instruction:

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

Section A

05X01 = 05 Marks

- Q.1 Scheduling helps in
- | | |
|--|----------------------------------|
| (a) Planning for the project | (b) Financial control of project |
| (c) Carrying out project in orderly manner | (d) All of them |
- Q.2 What are the inventory costs?
- | | |
|-------------------|----------------------|
| (a) Purchase cost | (b) Ordering cost |
| (c) Holding cost | (d) All of the above |
- Q.3 How many levels are in production planning?
- | | |
|-------|------------------|
| (a) 1 | (b) 2 |
| (c) 3 | (d) None of them |
- Q.4 What are the forms of production control?
- | | |
|---------------------|------------------|
| (a) Quality control | (b) Cost control |
| (c) A&B Both | (d) None of them |
- Q.5 Which one is the type of ergonomics?
- | | |
|-------------------------|--------------------------|
| (a) Physical ergonomics | (b) Cognitive Ergonomics |
| (c) A&B Both | (d) None of them |

Section B

03X02 = 06 Marks

- Q.6 What is production planning? Discuss briefly ?
- Q.7 What is the production control? Draw the diagram of closed loop control system ?
- Q.8 During one week of production a plant produced 100 units of product its historic best utilization is 120 units per week. What is the plant capacity utilization rate ?



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Section C

03X03 = 09 Marks

Q.9 What are the different level in production planning? Explain with example ?

Q.10 In Basic EOQ model if demand of a product is 1200 unit per month, ordering cost is Rs 120 unit per order holding cost is Rs 0.1 per unit per month Calculate economic order size ?

Q.11 The following details are available regarding a project ?

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

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



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Section A

05X01 = 05 Marks

- Q.1 Scheduling helps in
(a) Planning for the project (b) Financial control of project
(c) Carrying out project in orderly manner (d) All of them Ans. C
- Q.2 What are the inventory costs?
(a) Purchase cost (b) Ordering cost
(c) Holding cost (d) All of the above Ans. D
- Q.3 How many levels are in production planning?
(a) 1 (b) 2
(c) 3 (d) None of them Ans. C
- Q.4 What are the forms of production control?
(a) Quality control (b) Cost control
(c) A&B Both (d) None of them Ans. C
- Q.5 Which one is the type of ergonomics?
(a) Physical ergonomics (b) Cognitive Ergonomics
(c) A&B Both (d) None of them Ans. C

Section B

03X02 = 06 Marks

- Q.6 What is production planning? Discuss briefly ?
Ans. Production planning- It is a managerial function which mainly concerned with the following issues
- What facilities are required?
 - How these facilities should be laid out in space available for production?
 - How these facilities should be used to produce the desired product?
- Thus Production planning is dynamic in nature and always remain in fluid state as the plan has to be changed depend upon
- Demand

- Machine breakdown etc.

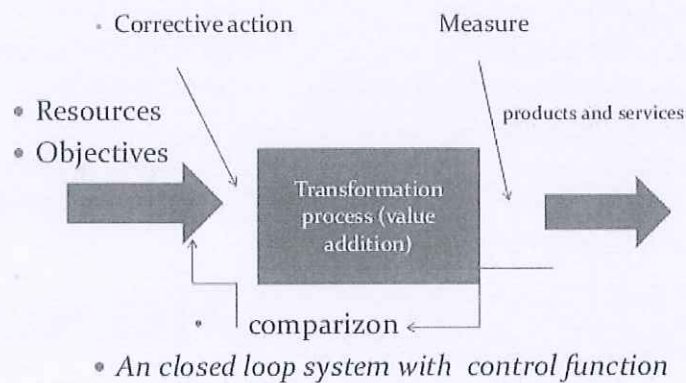
Q.7 What is the production control? Draw the diagram of closed loop control system ?

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

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



CLOSED LOOP CONTROL SYSTEM



Q.8 During one week of production a plant produced 100 units of product its historic best utilization is 120 units per week. What is the plant capacity utilization rate ?

Ans. **Capacity utilization rate** = $\frac{\text{Capacity used}}{\text{Best operating Level}}$

$$\frac{100}{120} = 5/6 = 83.33\%$$



Section C

03X03 = 09 Marks

Q.9 What are the different level in production planning? Explain with example ?

Ans. Production planning- It has three levels

- Long term upto 5 year and ahead.
 - Medium term upto 2 year and ahead.
 - Short term (Operational planning)
1. Long term upto 5 year and ahead.
 - a. Used in big industries like automobile industry.
 - b. Helps in generating the sufficient revenues and budget
 2. Medium term upto 2 year and ahead.
 - a. How the demand met with available resources?
 - b. Maximum utilization of the resources.
 3. Short term (Operational planning)
 - a. For monitoring and correction of day to day activity
 - b. How the production must be scheduled?

Q.10 In Basic EOQ model if demand of a product is 1200 unit per month, ordering cost is Rs 120 unit per order holding cost is Rs 0.1 per unit per month Calculate economic order size ?

Ans.

EOQ Formula

$$EOQ = \sqrt{\frac{2DP}{C}}$$

- D = Demand in units for specified period
- P = Relevant ordering costs per PO
- C = Relevant carrying costs of one unit in stock for the time period used for D

$$EOQ = 1200 \text{ units}$$

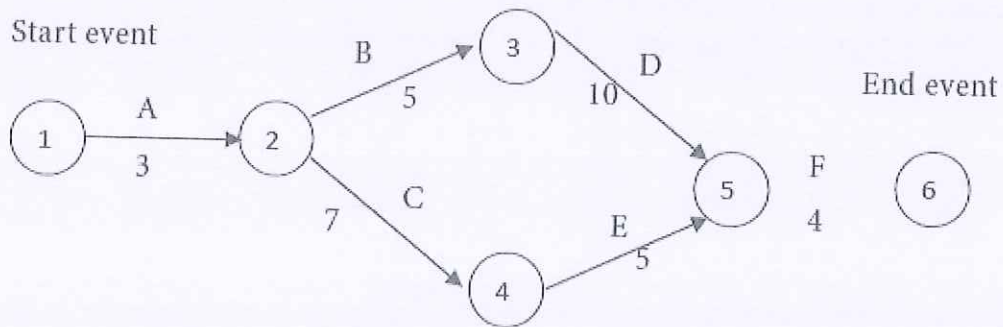
Q.11 The following details are available regarding a project ?



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Activity	Predecessor Activity	Duration (Weeks)
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Determine the critical path, the critical activities and the project completion time.

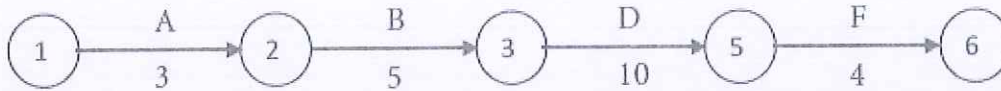


Ans.

Consider the paths, beginning with the start node and stopping with the end node. There are two such paths for the given project. They are as follows:

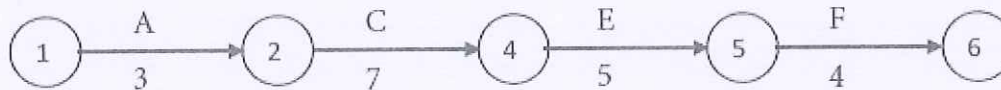


Path I



with a time of $3 + 5 + 10 + 4 = 22$ weeks.

Path II



with a time of $3 + 7 + 5 + 4 = 19$ weeks.

Compare the times for the two paths. Maximum of $\{22, 19\} = 22$. We see that path I has the maximum time of 22 weeks. Therefore, path I is the critical path. The critical activities are A, B, D and F. The project completion time is 22 weeks.

We notice that C and E are non-critical activities.

Time for path I - Time for path II = $22 - 19 = 3$ weeks.

Therefore, together the non-critical activities can be delayed upto a maximum of 3 weeks, without delaying the completion of the whole project.



School of Woodworking Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, 5th Semester
2nd In-Sem. Examination

Course Code: SCS1505

Time: 1 Hour

Course Name: Advance Carpenter Mathematics

Max. Marks: 20

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

Section – A

05X01 = 05 Marks

Q.1 Which of following is a power transmitting device ?

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

Q.2 Power transmitted from belt drive is given by ?

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

Q.3 A planer shaft runs at 4200 rpm and has 4 knives. How big is the step when the feed is 16m / min ?

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

Q.4 A circular saw blade has a diameter of 400mm and a speed of 3000 1 / min. How big is its cutting speed ?

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

Q.5 JIT stands for ?

- a) Just in time
b) Joint information technology
c) Japan instant technology
d) None of these

Section – B

03X02 = 06 Marks

Q.6 A new motor is installed for a band saw. This engine runs at 740 rpm and has a pulley with a diameter of 220mm. How big must the pulley for the band saw be if the band saw reel should have a speed of 920 1 / min ?



Q.7 Two pulleys with the diameters 280mm and 160mm are connected by a plastic flat belt. The larger, driving disc has a speed of 2980. How many revolutions does the smaller, driven disk make per minute? (Without considering a belt slip) ?

Q.8 Define the terms in the context of Production, Planning and control: a) Scheduling b) Dispatching ?

Section – C

03X03 = 09 Marks

Q.9 Explain the advantages and disadvantage of Just in Time technique ?

Q.10 An engine run at 150 rpm drives a line shaft by means of a belt. The engine pulley is 750mm diameter and pulley of line shaft 450 mm. A 900 mm diameter pulley on a line shaft drives a 150 mm diameter pulley keyed to dynamo shaft. Find the speed of dynamo shaft. When 1) there is no slip 2) there is slip of 2% at each drive ?

Q.11 Compare belt, chain and gear drive used for power transmission ?



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Max. Marks: 20

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

Section – A

05X01 = 05 Marks

Q.1 Which of following is a power transmitting device

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

Ans: c)

Q.2 Power transmitted from belt drive is given by

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

Ans: c)

Q.3 A planer shaft runs at 4200 rpm and has 4 knives. How big is the step when the feed is 16m / min?

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

Ans: a)

Q.4 A circular saw blade has a diameter of 400mm and a speed of 3000 1 / min. How big is its cutting speed ?

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

Ans: (a)

Q.5 JIT stands for ?

- a) Just in time
b) Joint information technology
c) Japan instant technology
d) None of these

Ans: a)

Section – B

03X02 = 06 Marks

Q.6 A new motor is installed for a band saw. This engine runs at 740 rpm and has a pulley with a diameter of 220mm. How big must the pulley for the band saw be if the band saw reel should have a speed of 920 1 / min?

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

Q.7 Two pulleys with the diameters 280mm and 160mm are connected by a plastic flat belt. The larger, driving disc has a speed of 2980. How many revolutions does the smaller, driven disk make per minute? (Without considering a belt slip)

Solution:

$$n_2 = \frac{d_1 \cdot n_1}{d_2} = \frac{2980 \frac{1}{\text{min}} \cdot 280\text{mm}}{160\text{mm}}$$

Ans: 5215 rpm

Q.8 Define the terms in the context of Production, Planning and control: a) Scheduling b) Dispatching.

Ans: a) scheduling ensure that parts and sub-assemblies and finished goods are completed as per required delivery dates. It provides a timetable for manufacturing activities.

Purpose of scheduling:

- To prevent unbalance use of time among work and centers and department.
- To utilize labour such a way that output is produced within established lead time or cycle time so as to deliver the products on time and complete production in minimum total cost.

Ans: b) This is concerned with the execution of the planning functions. It gives necessary authority to start a particular work which has already planned under routing and scheduling functions. Dispatching is release of orders and instructions for starting of production in accordance with routing sheet and scheduling charts.

Section – C

03X03 Marks

Q.9 Explain the advantages and disadvantage of Just in Time technique ?

Ans: Companies like to use JIT as it is seen as a more cost efficient method of holding stock. Its purpose is to minimize the amount of goods you hold at any one time, and this has numerous advantages:

- **Less space needed:** With a faster turnaround of stock, you don't need as much warehouse or storage space to store goods. This reduces the amount of storage an organization needs to rent or buy, freeing up funds for other parts of the business.
- **Waste reduction:** A faster turnaround of stock prevents goods becoming damaged or obsolete while sitting in storage, reducing waste. This again saves money by preventing investment in unnecessary stock, and reducing the need to replace old stock.
- **Smaller investments:** JIT inventory management is ideal for smaller companies that don't have the funds available to purchase huge amounts of stock at once. Ordering stock as and when it's needed helps to maintain a healthy cash flow.

Q.10 An engine run at 150 rpm drives a line shaft by means of a belt. The engine pulley is 750mm diameter and pulley of line shaft 450 mm. A 900 mm diameter pulley on a line shaft drives a 150 mm diameter pulley keyed to dynamo shaft. Find the speed of dynamo shaft.

When 1) there is no slip 2) there is slip of 2% at each drive ?

Solution:

1. When there is no slip

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

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

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

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

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

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

Q.11 Compare belt, chain and gear drive used for power transmission ?

Ans:

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