BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

2nd In-Sem. Examination

Course Code: SMS1501 **Time: 1 Hour**

Course Name: Production Management **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Use of Calculators is Allowed.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

1. The objective of Work Study is
   (a) Productivity improvement
   (b) Cost estimation
   (c) Labour counting
   (d) None of the above
2. Work Study can be applied
   (a) Design
   (b) IT industry
   (c) AC industry
   (d) All of the above
3. In Flow Process Chart, the symbol for operation is
   (a) Circle
   (b) Inverted triangle
   (c) Arrow
   (d) None of the above
4. The objective of Time Study is
   (a) To reduce ineffective time
   (b) To increase ineffective time
   (c) To maintain ineffective time
   (d) None of the above
5. Ergonomics can be applied in
   (a) Aerospace
   (b) Product design
   (c) Health care
   (d) All of the above

Section – B

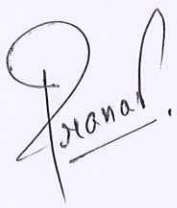
03X02 = 06 Marks

6. Define Ergonomics? Write down the objectives of Ergonomics?
7. What do you mean by Time Study? Write down the objective of Time Study?
8. Write down the steps in Method Study?

Section – C

03X03 = 09 Marks

9. Explain in detail the step "Record under Method Study" in detail?
10. A job has been sub-divided into two elements. The time for each element and respective rating are given below: Calculate the normal time and standard time for each element and for the job if the allowance is 15%.
    Element-1: Observed time - 0.7 min. , Rating factor - 80% .
    Element-2: Observed time - 0.8 min. , Rating factor - 100%
11. Explain in detail the step "Examine under Method Study" in detail?



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

2nd In-Sem. Examination

Course Code: SMS1501 | **Time: 1 Hour**

Course Name: Production Management | **Max. Marks: 20**

Answer Key

Section – A

05X01 = 05 Marks

1. The objective of Work Study is
   (a) Productivity improvement
   (b) Cost estimation
   (c) Labour counting
   (d) None of the above
   Ans. (a)

2. Work Study can be applied
   (a) Design
   (b) IT industry
   (c) AC industry
   (d) All of the above
   Ans. (d)

3. In Flow Process Chart, the symbol for operation is
   (a) Circle
   (b) Inverted triangle
   (c) Arrow
   (d) None of the above
   Ans. (a)

4. The objective of Time Study is
   (a) To reduce ineffective time
   (b) To increase ineffective time
   (c) To maintain ineffective time
   (d) None of the above
   Ans. (a)

5. Ergonomics can be applied in
   (a) Aerospace
   (b) Product design
   (c) Health care
   (d) All of the above
   Ans. (d)

Section – B

03X02 = 06 Marks

6. Define Ergonomics? Write down the objectives of Ergonomics?

Ans. - Ergonomics (or human factors) is the scientific discipline concerned with interactions among humans and other elements of a system in carrying out a purposeful activity.

Objectives of ergonomics:

Optimize integration of man and machine in order to increase work rate and accuracy

- To provide a better working place befitting the needs and requirements of the worker
- To design equipments and machinery in such a way that there is minimal mental and physical strain on the worker
- To provide a conducive environment for executing his task effectively and efficiently with least efforts.

7. What do you mean by Time Study? Write down the objective of Time Study?

Ans.- **This is the most widely used means of work measurement**

By using time study, an analyst will be taking a small sample of a single worker's activity and using it to derive a standard for the tasks of that nature

Objectives of time study:

To find out the time taken for each job
To reduce ineffective time involved in the job
To reduce the total time taken for a job

To find the allowed or standard time for a job

8. Write down the steps in Method Study?

Ans.-

i. ***Select*** the work to be studied
ii. ***Record*** all relevant facts by direct observation
iii. ***Examine*** the facts critically in sequence using special critical examination sheet
iv. ***Develop*** the best method which is practical, economical and effective
v. ***Install*** the method as a standard practice
vi. ***Maintain*** the method installed as a standard practice

Section – C

03X03 = 09 Marks

9. Explain in detail the step "Record under Method Study" in detail?

Ans.-

RECORDING: This is done to trace the movement of men, materials and other things in any process in the simplest possible manner

- The various recording techniques are
  - Charts
  - Diagrams
  - Models
  - Photographic aids

10. A job has been sub-divided into two elements. The time for each element and respective rating are given below: Calculate the normal time and standard time for each element and for the job if the allowance is 15%.

Element-1: Observed time - 0.7 min. , Rating factor - 80% .

Element-2: Observed time - 0.8 min. , Rating factor - 100%

Ans.- Element-1: Normal time – 0.56 min , Standard time – 0.659 min.
Element-2: Normal time – 0.8 min , Standard time – 0.94 min

11. Explain in detail the step "Examine under Method Study" in detail?

Ans.-

EXAMINE:

- This is the most important step in method study.
- This step aims at:
    - Eliminating the activity altogether if necessary
    - Combining it with other activities
    - Changing sequence of activities
    - Simplifying the activity
- A series of questions classified as Primary and Secondary are asked in this step.
- ***Primary Questions:***
    - What is the purpose of the event? Why is it necessary
    - Where does the event take place? Why there?
    - When does it occur? Why then?
    - Who carries out the work? Why he?
    - How is the purpose achieved? Why that way?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

2nd In-Sem. Examination

Course Code: SMS1502 **Time: 1 Hour**

Course Name: Integrated CAD CAM CNC **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

Q1. Which among the following is the correct full form of CAM?

A. Computer Aided Marking
B. Computer Aided Manufacturing
C. None of these
D. Both of these

Q2. Which among the following was the first CAD software in the world (still in use)?

A. AutoCAD
B. AutoCADD
C. Solidworks
D. CATIA

Q3. Solidworks has been developed by which of the following company

A. Dassault
B. CNC Software Inc.
C. AutoDesk
D. None of the above

Q4. Which of the following is the most used manual ISO coding platform.

A. Fanuc
B. Siemens
C. Heldienhien
D. None of the above

Q5. Modern CAD systems works on:

A. GUI
B. BCD
C. ICG
D. None of the above

Section – B

03X02 = 06 Marks

Q6. Write down the full form of CAPP and name the softwares which are used to achieve this in industry?

Q7. Write down the Full form of AutoCAD and the year in which it was released by Autodesk?

Q8. Mention the name of any two programming languages which are popularly used as a CAE tool?

Section – C

03X03 = 09 Marks

Q9. Describe different types of CAD softwares with one example each?

Q10. Explain what are CAE softwares and also describe its types?

Q11. Describe, Why is there a need to shift on PLM softwares?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

2nd In-Sem. Examination

Course Code: SMS1502 **Time: 1 Hour**

Course Name: Integrated CAD CAM CNC **Max. Marks: 20**

Answer Key

Section – A

1.Which among the following is the correct full form of CAM

B. Computer Aided Manufacturing

2.Which among the following was the first CAD software in the world (still in use)

A. AutoCAD

3.Solidworks has been developed by which of the following company

A. Dassault

4.Which of the following is the most used manual ISO coding platform

A. Fanuc

5.Modern CAD systems works on:

C. ICG

Section – B

Q6.Write down the full form of CAPP and name the softwares which are used to achieve this in industry?

Ans: Computer Aided Process Planning, Microsoft Excel,Dassault 3D experience platform

Q7.Write down the Full form of AutoCAD and the year in which it was released by Autodesk?

Ans: Automate Computer Aided Design, 1982

Q8.Mention the name of any two programming languages which are popularly used as a CAE tool?

Ans:Python and MATLAB

Section – C

Q9. Describe different types of CAD softwares with one example each?

Ans: Different types of cad softwares are as follows:

1. drafting type : primarily used for drafting purpose (to make plots or drawings)
e.g: AutoCAD(Autodesk) (Automate Computer Aided Design 1982 first release), later versions came up with additional 3d capabilities.

2. modelling type: these are used for generating digital models of physical objects.
e.g: solidworks(Dassault systemes), Catia (Dassualt systemes), NX (Seimens corp.)
catia: Computer Aided Three dimensional Interactive Application

digital model: model prepared with the help of computer graphics
computer always works on digits(0,1 binary digits)

3.PLM .these types of softwares covers all phases of product lifecycles. (1.sketching ,2.digital model development CAS ,3.simulation, 4.manufacturing 5. costing or marketting, 6. dispatch, 7. aftersales support.(updates)) eg 3D experince
and TEAM CENTER from NX, catia , NX

Q10. Explain what are CAE softwares and also describe its types?
Ans: These softwares are used for real life testing and simulation of physical conditions upon digital models.
e.g.: Ansys, Hypermesh, Comsol , MATLAB, PYTHON
1. standalone: Ansys , Hypermesh, Abaqus
2. Integrated: Solidworks simulation, Catia simulation, Nastran(NX)
3. some are default programming language but also used as CAE tool (Python(free of cost),MATLAB)

Q11. Describe, Why is there a need to shift on PLM softwares?
Ans: Following points are are the reasons for need of PLM
1. Purchasing different softwares for different would increase a high stake in purchasing and maintanence cost
2. Communication between diffrent softwares are not that simple accurate
3. it is one package for all types of works in industry.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

2nd In-Sem. Examination

Course Code: SMS1503 **Time: 1 Hour**

Course Name: Basic of Multi-Axis Machining & Dialog CNC Programming **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

1. Power transmission component includes
   a) Belts
   b) Shaft
   c) Couplings
   d) All of the above
2. Joining elements include:
   a) Pins
   b) Snap-fits
   c) Both a & b
   d) None of the above
3. Electric motors are driven by _____ forces.
   a) Ferromagnetic
   b) Electromagnetic
   c) Gamma
   d) External
4. Asynchronous motor is an ___ induction motor.
   a) AC
   b) DC
   c) Water
   d) Gas

5. Basic Components of CNC Controllers are
   a) Power Supply unit
   b) Circuitry protection unit
   c) Motor driver unit
   d) All of the above

Section – B

02X03 = 06 Marks

6. Write down the main difference between synchronous and Asynchronous electric motor.
7. Write down the various popular controllers in use.

Section – C

03X03 = 09 Marks

8. What do you mean by functional units of a machine tool? Name the various functional units of a CNC lathe.
9. Describe in brief about various types of five axis machining centers along with their application.
10. Write down the differences between Five axis machining and (3+2) axis machining?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer Key

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc., Vth Semester,

2nd In-Sem. Examination

Course Code: SMS1503 **Time: 1 Hour**

Course Name: Basics of Multi-axis Machining and Dialog CNC programming **Max. Marks: 20**

Answer Key

Section – A

05X01 = 05 Marks

1. Power transmission component includes
   d) All of the above
2. Joining elements include:
   c) Both a & b
3. Electric motors are driven by _____ forces.
   b) Electromagnetic
4. Asynchronous motor is an ___ induction motor.
   a) AC
5. Basic Components of CNC Controllers are
   d) All of the above

Section – B

02X03 = 06 Marks

6. Write down the main difference between synchronous and Asynchronous electric motor.

Ans. **Synchronous motor:**

Synchronous motor is a motor that operates at synchronous speed, i.e., speed of the rotor is equal to the stator speed of the motor.

Asynchronous motor:

Asynchronous motor is an AC Induction motor. The rotor of the Asynchronous motor rotates at the speed less than the synchronous speed

7. Write down the various popular controllers in use.

Ans. 1) Fanuc 21M
2) Sinumerik Operate 840D
3) Heidenhain TNC426

Section – C

03X03 = 09 Marks

8. What do you mean by functional units of a machine tool? Name the various functional units of a CNC lathe.

Ans. 1) Drive Units
2) Power transmission Units
3) Work units
4) Supporting and holding components
5) Joints and fastening units
6) Measuring and control units
7) Units for environmental protection, disposal and safety at work.

9. Describe in brief about various types of five axis machining centers along with their application.

Ans. **1) Rotary table + Pivot Spindle Head**

This machine design is effective for tall workpieces and for cylindrical parts with holes around the periphery.

2) Double rotary table

This is the best machine for the use of long tools or extensions. It is also effective for cylindrical parts with a ring of holes in one face.

3) Double Pivot Spindle Head

This machine is effective for parts that are rectangular instead of round.

4) Rotary Table + Table Trunnion

This machine can take relatively deep cuts for its size.

10. Write down the differences between Five axis machining and (3+2) axis machining?

Ans. **5-Axes Machining**

1. Also called continuous or simultaneous 5-axis machining involves continuous adjustments of the cutting tool along all five axes to keep the tip optimally perpendicular to the part.
2. Machining is faster.
3. Movement at higher speed results in increased wear rate as well as greater need for part crash detection hence it is more difficult from programming point of view.

(3+2) Axes Machining

1. Also called positional 5-axis machining involves executing 3-axis program with cutting tool locked at an angle determined by the two rotational axes. Machining that involves reorienting the tool bit along the rotational axes between cuts is called '5-axis indexed' though it still counts 3+2.
2. Machining is relatively slow due to stopping and starting between each reorientation of the tool.
3. Part programming is relatively simpler.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5th Semester,

2nd In-Sem. Examination

Course Code: SMS1504 **Time: 1 Hour**

Course Name: Project Work **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

1. Assembling project team and assigning their responsibilities are done during which phase of a project management?
   a) Initiation
   b) Planning
   c) Execution
   d) Closure
2. The basic nature of a project is a _____ one.
   a) Permanent
   b) temporary
   c) (A) or (B)
   d) Both (A) and (B)
3. How the project work will be carried out, monitored, and controlled? These questions are answered in which phase of the project management?
   a) Initiating
   b) Planning
   c) Executing
   d) Closing
4. Which of the following is NOT a part of project management?
   a) Initiating
   b) monitoring
   c) closing
   d) All above are parts

5. The review of the successes and the mistakes is normally held during _____ phase.
    a) Initiation
    b) Planning
    c) Execution
    d) Closure

Section – B

03X02 = 06 Marks

6. What do you understand by the term "project"?
7. Write Advantages of project management?
8. Write a short note on mass production.

Section – C

03X03 = 09 Marks

9. Define the SMART Acronym.
10. Explain project Phases Lifecycle with diagram.
11. Explain the five project phases in proper sequence also draw layout diagram to support this.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5th Semester,

2nd In-Sem. Examination

Course Code: SMS1504 | **Time: 1 Hour**

Course Name: Project work | **Max. Marks: 20**

Answer Key

Section – A

1. Assembling project team and assigning their responsibilities are done during which phase of a project management?
   a) Initiation
2. The basic nature of a project is a _____ one.
   b) temporary
3. How the project work will be carried out, monitored, and controlled? These questions are answered in which phase of the project management?
   b) Planning
4. Which of the following is NOT a part of project management?
   d) All above are parts
5. The review of the successes and the mistakes is normally held during _____ phase.
   d) Closure

Section – B

6. What do you understand by the term "project"?
   - A project is defined as a "**temporary endeavor** with a **beginning and an end** and it must be used to create a **unique product, service or result**".
   - Projects are undertakings that are characterized essentially by the **uniqueness** of the **conditions that affect it as a whole.**

7. Write Advantages of project management?

The following advantages speak for the application of project management in the process of solving complex tasks:

- Good integration of different specialists and thus different competencies in mixed project teams,
- Achieving greater creativity and innovativeness in the problem-solving process,
- Achieve better responsiveness to changing customer needs (compared to line organization),
- Optimal use of available resources to solve problems,
- Achieving a better identification with the objectives for complex projectsand so on.

8. Write a short note on mass production.

- Mass production is the manufacturing of large quantities of standardized products, often using assembly lines or automation technology. Mass production facilitates the efficient production of a large number of similar products.
- Mass production is also referred to as flow production, repetitive flow production, series production, or serial production.

Section – C

9. Define the SMART Acronym.

SMART is a acronym to guide in the setting of objectives and goals in project management.

S *Specific* – target a specific area for improvement.

M *Measurable* – quantify or at least suggest an indicator of progress.

A *Achievable* – specify who will do it.

R *Realistic*– state what results can realistically be achieved, given available resources.

T *Time-related* – specify when the result(s) can be achieved.

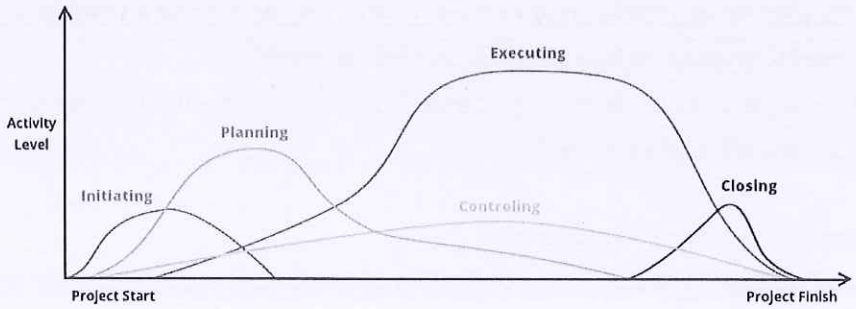
10. Explain project Phases Lifecycle with diagram.

Typical tasks of Project Management:

- Conception & Initiation
- Definition & Planning
- ***Performance & Control***
- ***Project Close***

Typical tasks of Project Execution (work):

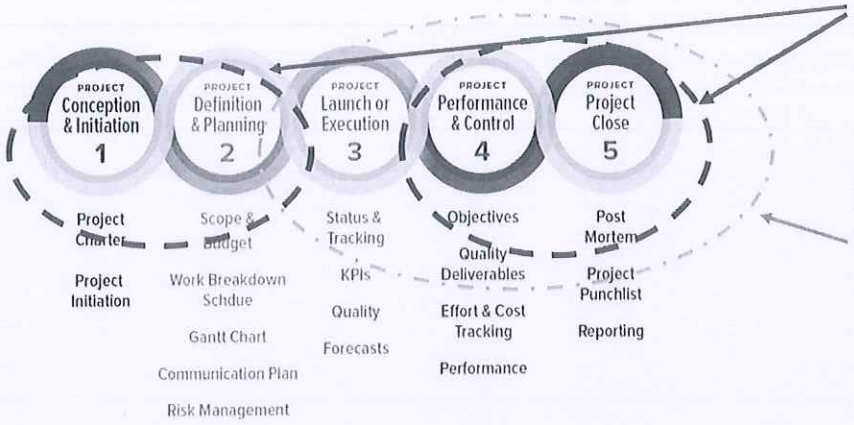
- Launch and Execution
- ***Performance & Control***
- ***Project***



How processes overlap on a project
Planning is the most important at the start of a project. Then, executing takes over.
Controlling is important throughout the entire project.

11. Explain the five project phases in proper sequence also draw layout diagram to support this.

Project Phases:



Typical tasks of Project Management:

- Conception & Initiation
- Definition & Planning
- ***Performance & Control***
- ***Project Close***

Typical tasks of Project execution (work):

- Launch and Execution
- ***Performance & Control***
- ***Project Close***

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, V Semester,

2nd In-Sem. Examination

Course Code: SMS1505 **Time: 1 Hour**

Course Name: Quality Management **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Section A contains 5 Questions. Each question carries 1 Marks.
3. Section B contains 3 Questions. Each question carries 2 Marks.
4. Section C contains 3 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

1. A six sigma process has defect level below _____ defects per million opportunities.
   A. 4.3
   B. 3.4
   C. 3.2
   D. 2.4

2. Lean manufacturing focuses on.
   A. Mass production
   B. Batch production
   C. Waste elimination
   D. None of the above.

3. _____ is not among the lean tools.
   A. Histogram
   B. JIT
   C. KANBAN
   D. JIDOKA

4. Which charts are used for variable data?
   A. X bar chart & R chart
   B. P chart & C chart
   C. Np chart & U chart
   D. None of above.

5. Process capability index is denoted by.
   A. A_P
   B. C_P
   C. A_{PK}
   D. C_{PK}

Section – B

03X02 = 06 Marks

6. What does MURA means?
7. Write one differences between variables and attributes.
8. Define TAKT time.

Section – C

03X03 = 09 Marks

9. Write down the X bar chart limit formulas and define all the character used in formula?
10. What are C_P and C_{PK}? Write down the formula used to calculate both.
11. What is the principle of lean manufacturing?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 5th Semester,

2nd In-Sem. Examination

Course Code: SMS1505 **Time: 1 Hour**

Course Name: Quality Management **Max. Marks: 20**

Section – A

05X01 = 05 Marks

1. A six sigma process has defect level below _____ defects per million opportunities.

   B. 3.4

2. Lean manufacturing focuses on

   C. waste elimination

3. _____ is not among lean tools.

   A. Histogram

Answer key

4. Which charts are used for variable data

   A. X bar chart & R chart

5. Process capability index is denoted by?

   D. C_{PK}

Section – B

03X02 = 06 Marks

6. What does MURA means?

   Ans.

   The second "M" is for **MURA,** or inconsistency.

7. Write three differences between variable and attributes.

   Ans.

Sr. No.	Variable	Attribute
1	Characteristics that can take any real value	Defect-related characteristics
2	May be in whole or in fractional numbers	Classify products as either good or bad or count defects
3	Continuous random variables	Categorical or discrete random variables

8. Define TAKT time.
Ans. It's the maximum amount of time a product needs to be produced while still meeting consumer demand.

Section – C

03X03 = 09 Marks

9. Write down the X bar chart limit formulas and define all the character used in formula?
Ans.

$$\textit{Upper control limit (UCL)} = \bar{\bar{x}} + A_2\bar{R}$$

$$\textit{Lower control limit (LCL)} = \bar{\bar{x}} - A_2\bar{R}$$

where $\bar{R}$ = *average range of the samples*
A_2 = *control chart factor found in Table S6.1*
$\bar{\bar{x}}$ = *mean of the sample means*

10. What are C_P and C_{PK}? Write down the formula used to calculate both.
Ans.

$$C_p = \frac{\textit{Upper Specification - Lower Specification}}{6\sigma}$$

$$C_{pk} = \textit{minimum of}\left(\frac{\textit{Upper Specification Limit} - \bar{\bar{x}}}{3\sigma}\right), \left(\frac{\bar{\bar{x}} - \textit{Lower Specification Limit}}{3\sigma}\right)$$

11. What is the principle of lean manufacturing?

Ans.

1. **Value (**from the customer's perspective)
2. **Value Stream** (map the steps in the value stream)
3. **Flow** (create a smooth flow)
4. **Pull** (the right amount pulled at the right time, no more, no less)
5. **Perfection** (elimination of all waste in the value stream)