



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Manufacturing Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, _5th_ Semester,
End-Sem. Examination
SET - B

Course Code: SMS 1501

Time: 2 Hours

Course Name: Production Management

Max. Marks: 50

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Direct Cost in a Manufacturing Industry includes:
(i) Only direct labour cost (ii) Only direct material cost (iii) Summation of direct material and labour cost
2. MRP means
(i) Material Resource Planning (ii) Mean Resource Planning
(iii) Machine Resource Planning (iv) All
3. In Method Study, Transport is represented by
(i) Arrow (ii) Circle (iii) Square (iv) None of the above
4. Prime Cost in a Manufacturing Industry includes:
(i) All direct cost (ii) Factory overhead cost (iii) Summation of direct and factory overhead cost
5. Under M-T-M, the motion REACH is represented by
(i) M (ii) T&P (iii) P (iv) R
6. Under M-T-M, the motion POSITION is represented by
(i) M (ii) T&P (iii) P (iv) R
7. The benefits of Method Study is
(i) Removes Non Value Activities (ii) Adds Non Value Activities
(iii) Both of the above (iv) None of the above
8. Ergonomics is related
(i) Well-being of employees (ii) Benefits of industry
(iii) Benefits of Government (iv) None of the above
9. Application of Ergonomics are in
(i) Aerospace (ii) Product design (iii) Health care



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- (iv) All three
10. Ergo of Ergonomics word means
- (i) Natural laws (ii) Work (iii) Both (iv) None

Section – B

04X04 = 16 Marks

11. An operator manufactures 50 jobs in 6 hours and 30 minutes. If this time includes the time for setting his machine. Calculate the operator's efficiency. Standard time allowed for the job was:
- Setting time = 35 minutes
- Production time per piece = 8 minutes
12. What do you mean by EOD. Discuss various types of Elasticity of Demand.
13. What do you mean by Macro and Micro Economics.
14. A department store has found that in a four-month period, the best forecast is derived by using 40% of the actual sales for the most recent month, 30% of the two months ago, 20% of three months ago and 10% of four months ago. Find out the forecast for the 5th month, if the actual sales for the 4 month is:

Month	1	2	3	4	5
Sales in nos.	105	95	110	100	----

Section – C

04X06 = 24 Marks

15. Describe the steps for doing a method study of job process. Illustrate one of the recording techniques used in the method improvement with a case example.
16. A medium scale industry incurs the following costs for their products annually. The production volume on an average is 12000 a year.
- Raw material cost including losses due to scrap and wastage (due to rejection) = Rs.50000
 - Tool cost = Rs.4000
 - Wages to skilled hands engaged on production = Rs.20000
 - Wages to foremen, other supervisory staff = Rs.40000
 - Expenses of office staff (salary, bonus etc.) = Rs.12000
 - Expenses on sales and distribution agencies = Rs.8000



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g. Expenses on insurance, lighting etc.

= Rs.4000

Find direct cost as percentage of total cost.

17. Define Standard time. Discuss the steps involved in developing Standard Time.
18. What are benefits of breaking the operations into small elements?



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Registration No.:

School of Manufacturing Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, _5th_ Semester,
End-Sem. Examination

Answer key

SET - B

Course Code: SMS 1501

Time: 2 Hours

Course Name: Production Management

Max. Marks: 50

Instruction: Use of Calculator is Allowed

Section – A

10X01 = 10 Marks

- Direct Cost in a Manufacturing Industry includes:
(i) Only direct labour cost (ii) Only direct material cost (iii) Summation of direct material and labour cost
Ans. (iii)
- MRP means
(i) Material Resource Planning (ii) Mean Resource Planning
(iii) Machine Resource Planning (iv) All
Ans. (i)
- In Method Study, Transport is represented by
Ans. (i) Arrow (ii) Circle (iii) Square (iv) None of the above
Ans. (i)
- Prime Cost in a Manufacturing Industry includes:
(i) All direct cost (ii) Factory overhead cost (iii) Summation of direct and factory overhead cost
Ans. (i)
- Under M-T-M, the motion REACH is represented by
(i) M (ii) T&P (iii) P (iv) R
Ans. (iv)
- Under M-T-M, the motion POSITION is represented by
(i) M (ii) T&P (iii) P (iv) R
Ans. (iii)
- The benefits of Method Study is
(i) Removes Non Value Activities (ii) Adds Non Value Activities
(ii) Both of the above (iv) None of the above
- Ergonomics is related
(i) Well-being of employees (ii) Benefits of industry
(iii) Benefits of Government (iv) None of the above
Ans. (i)



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9. Application of Ergonomics are in
- (i) Aerospace (ii) Product design (iii) Health care
(iv) All three
- Ans. (iv)
10. Ergo of Ergonomics word means
- (i) Natural laws (ii) Work (iii) Both (iv) None
- Ans. (ii)

Section – B

04X04 = 16 Marks

11. An operator manufactures 50 jobs in 6 hours and 30 minutes. If this time includes the time for setting his machine. Calculate the operator's efficiency. Standard time allowed for the job was:

Setting time = 35 minutes

Production time per piece = 8 minutes

Soln:

Standard time for manufacturing 50 jobs = $35 + 8 \times 50 = 435$ minutes

Efficiency = $(435 \times 100) / 390 = 111.5\%$

12. What do you mean by EOD. Discuss various types of Elasticity of Demand.

Ans. EOD- The law of demand tells us that as the price of a commodity falls, the quantity demanded increases, and *vice versa*. (Eg. Gold)

In other words, it only tells us only direction of change but not the rate of change.

- Perfectly elastic demand (At a given price or less than the given price, infinite qty will be bought)
- Perfectly inelastic demand (Same qty will be bought at any price)
- Demand with unity elasticity (Equally proportionate demand for proportionate change)
- Relatively elastic demand (More than proportionate demand due to price change)
- Relatively inelastic demand (less than proportionate demand due to price change)

13. What do you mean by Macro and Micro Economics.

Ans.: **Micro economics: Microeconomics is the study of the small part or component of the whole economy that we are analyzing. For example we may be studying an individual firm or in any particular industry. In Microeconomics we study the price of a particular product or particular factor of the production.**

14. A department store has found that in a four-month period, the best forecast is derived by using 40% of the actual sales for the most recent month, 30% of the two months ago, 20% of three months ago and 10% of four months ago. Find out the forecast for the 5th month, if the actual sales for the 4 month is:

Month	1	2	3	4	5
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Sales in nos.	105	95	110	100	----
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Ans.: $F_5 = 0.4 \times 100 + 0.3 \times 110 + 0.2 \times 95 + 0.1 \times 105 = 102.5$ units.

Section – C

04X06 = 24 Marks

15. Describe the steps for doing a method study of job process. Illustrate one of the recording techniques used in the method improvement with a case example.

● Ans.: This involves systematic, orderly and scientific approach to problems and decisions must be taken after listing out all possible alternatives and evaluating them critically

1. **Select** the work to be studied
2. **Record** all relevant facts by direct observation
3. **Examine** the facts critically in sequence using special critical examination sheet
4. **Develop** the best method which is practical, economical and effective
5. **Install** the method as a standard practice

Maintain the method installed as a standard

16. A medium scale industry incurs the following costs for their products annually. The production volume on an average is 12000 a year.

- a. Raw material cost including losses due to scrap and wastage (due to rejection) = Rs.50000
- b. Tool cost = Rs.4000
- c. Wages to skilled hands engaged on production = Rs.20000
- d. Wages to foremen, other supervisory staff = Rs.40000
- e. Expenses of office staff (salary, bonus etc.) = Rs.12000
- f. Expenses on sales and distribution agencies = Rs.8000
- g. Expenses on insurance, lighting etc. = Rs.4000

Find direct cost as percentage of total cost.

Ans. Direct cost = $(50000 + 4000 + 20000) = 74000$

Total Cost = $74000 + 12000 + 8000 + 4000 = 98000$



17. Define Standard time. Discuss the steps involved in developing Standard Time.

Ans.:

Standard Time: It's a catalogue of "normal time" values for different elements of jobs or for minute movements involved in different jobs.

This catalogue is prepared by compiling the timings of a number of standard elements. The necessity of preparing such a catalogue arose because, generally, similar elements or motions are involved in many jobs. Eg.: Drilling holes is a common feature in many machine shop jobs.

If time study is to be conducted every time it would consume a lot of time. Hence it is economical to use previously timed and compiled data known as standard data.

Steps:

Decide the range of applicability of standard data

Break the job into elements as constant and variable elements

Conduct time study for wide variety of jobs or family of jobs under different set of parameters and conditions

Summarize the data using a summary form

Classify data into constant and variable elements

Calculate average standard time for constant elements

Explore the job characteristics leading to variability in elements

A graph between normal time dimension of variable is plotted to obtain a smooth curve

Test the data for correctness and accuracy

Compile the standard data obtained

18. What are benefits of breaking the operations into small elements?

- Ans.: The objectives of breaking down to elements are
 - **To Separate the productive and unproductive activities**
 - **To get clear , complete and accurate information**
 - **To calculate operator performance accurately**
 - **To get detailed work specification**
 - **To select the best method**
 - **To collect information to compile standard data**



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Registration No.:

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1502

Course Name: Integrated CAD-CAM-CNC

Time: 2 Hour

Max. Marks: 50

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. In a 2D CAD package anti-clockwise circular arc of radius, 5, specified from P1(15,10) to P2(10,15) will have its center at:

- A. (10,10)
- B. (15,10)
- C. (15,15)
- D. (10,15)

2. Which among the following is one of the first programming languages to use graphics other than text with black screen?

- A. Java
- B. VBA
- C. C#
- D. All of the above

3. Keyboard is a _____ input device.

- A. Graphical
- B. text
- C. Numericals
- D. Both B and C



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4. The UCS icon represents the intersection of the _____
- A. X axis
 - B. Y axis
 - C. Z axis
 - D. All of the above
5. Which of the following is the full form for ICG
- A. Installed Computer Graphics
 - B. Integrated Computer Graphics
 - C. Integrated Computer Graphs
 - D. Integrated Calculator Graphics
6. CNC drilling machine is considered to be a:
- A. Point to point controlled machine
 - B. Straight line controlled machine
 - C. Continuous line controlled machine
 - D. Servo controlled machine
7. MasterCAM is a -----
- A. Standalone CAM software
 - B. Integrated CAM software
 - C. Built In CAM software
 - D. All of the above
8. The axes of the turning machine are.
- A. Z and X-axes
 - B. Z and Y-axes
 - C. Y and X-axes
 - D. None of the above
9. The widely employed computer architecture for CAD-CAM applications is:
- A. Mainframe computer
 - B. Mini computer
 - C. Micro computer
 - D. Supercomputer
10. For generating a coons patch we require:
- A. A set of grid points on surface
 - B. A set of control points
 - C. Four bounding curves defining surface
 - D. Two bounding curves and a set of grid control points



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Section – B

04X04 = 16 Marks

11. Write down the full form of CAPP and name the softwares which is used to achieve this in industry?
12. Define what are geometric primitives and also give 5 different examples of solid geometric primitives.
13. Give two popular examples of CAE tools (Strictly programming languages) and also define how they both are different from each other?
14. Explain how Fanuc is a standalone programming controller for CNC machines?

Section – C

04X06 = 24 Marks

15. Explain what you mean by CNC control system and give four examples of CNC control systems with their country of origin?
16. Explain the steps of FEM technique used for Computer Simulations of physical systems
17. Differentiate between modelling and machining softwares with suitable examples?
18. Differentiate between DNC and CNC?



School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1502

Course Name: Integrated CAD-CAM-CNC

Time: 2 Hour

Max. Marks: 50

Answer Key

Section – A

10X01 = 10 Marks

1. In a 2D CAD package anti-clockwise circular arc of radius, 5, specified from P1(15,10) to P2(10,15) will have its center at:

- A. (10,10)
- B. (15,10)
- C. (15,15)
- D. (10,15)

2. Which among the following is one of the first programming languages to use graphics other than text with black screen

- A. Java
- B. **VBA**
- C. C#
- D. All of the above

3. Keyboard is a _____ input device

- A. Graphical
- B. text
- C. Numerical
- D. **Both B and C**

4. The UCS icon represents the intersection of the _____

- A. X axis
- B. Y axis
- C. Z axis
- D. **All of the above**

5. Which of the following is the full form for ICG?
- A. Installed Computer Graphics
 - B. **Integrated Computer Graphics**
 - C. Integrated Computer Graphs
 - D. Integrated Calculator Graphics
6. CNC drilling machine is considered to be a:
- A. **Point to point controlled machine**
 - B. Straight line controlled machine
 - C. Continuous line controlled machine
 - D. Servo controlled machine
7. MasterCAM is a -----
- A. **Stand alone CAM software**
 - B. Integrated CAM software
 - C. Built In CAM software
 - D. All of the above
8. The axes of the turning machine are:
- A. **Z and X-axes**
 - B. Z and Y-axes
 - C. Y and X-axes
 - D. None of the above
9. The widely employed computer architecture for CAD-CAM applications is:
- A. Mainframe computer
 - B. Mini computer
 - C. **Micro computer**
 - D. Supercomputer
10. For generating a coons patch we require:
- A. A set of grid points on surface
 - B. A set of control points
 - C. **Four bounding curves defining surface**
 - D. Two bounding curves and a set of grid control points

Section – B

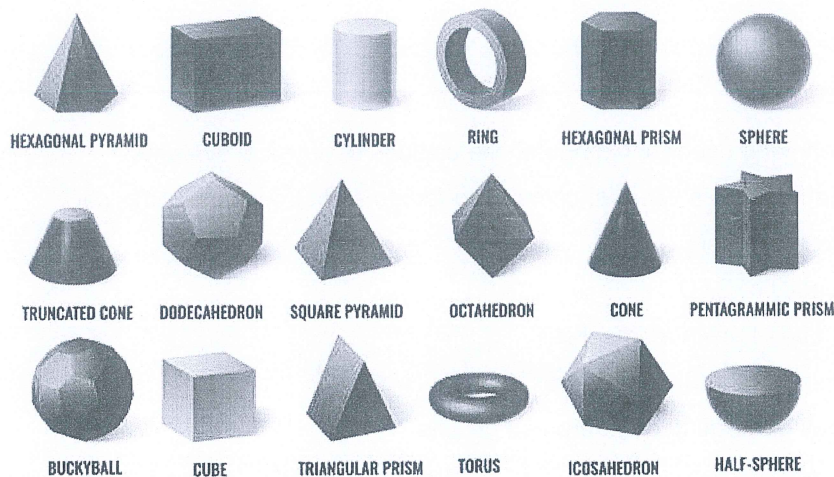
04X04 = 16 Marks

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

Ans. Computer Aided Process Planning is a technique by which a subject in industry generate Process planning with the use of computer with the help of various computer application Like Microsoft Excel.

12. Define what are geometric primitives and also give 5 different examples of solid geometric primitives?

Ans: geometric primitive (or prim) is the simplest (i.e. 'atomic' or irreducible) geometric shape that the system can handle (draw, store). All other graphic elements are built up from these primitives.



13. Give two popular examples of CAE tools (Strictly programming languages) and also define how they both are different from each other?

Ans: Two popular examples of CAE tools are

1. MATLAB
2. PYTHON

Python

1. It is a general purpose programming language
2. It is mainly used for developing computer softwares and applications
3. Open source

MATLAB

1. It is a commercial purpose programming language
2. It is mainly used for numerical computing and programming
3. owned by Mathswork.inc

14. Explain how Fanuc is a standalone programming controller for CNC machines?



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Ans: Fanuc is basic G-Code generator controller which works on any type of cnc machines for which it is coded. It is very different from controllers like Mazatrol which are only developed for MAZAK machines.

Section – C

04X06 = 24 Marks

15. Explain what you mean by CNC control system and give four examples of CNC control systems with their country of origin?

Ans: A CNC machine is run by a CNC control system. The control system consists of controller, servo motors, drives and feedback devices. The controller, servomotors and their drives come as a package called CNC control system, from one manufacturer only. Some of the leading global manufacturers of CNC control systems are: -

Fanuc (Japan)

Siemens (Germany)

Heidenhain (germany)

Mitsubishi (japan)

16. Explain the steps of FEM technique used for Computer Simulations of physical systems

Ans: FEM stands for Finite Element analysis used for calculating forces and stresses on physical systems replicated virtually inside computers

Modelling of physical systems exactly in CAD

Dividing whole body into smaller parts known as meshing

Applying boundary conditions like forces, torques and pressure

Post Processing of results includes generating contours and graphs

17. Differentiate between modelling and machining softwares with suitable examples?

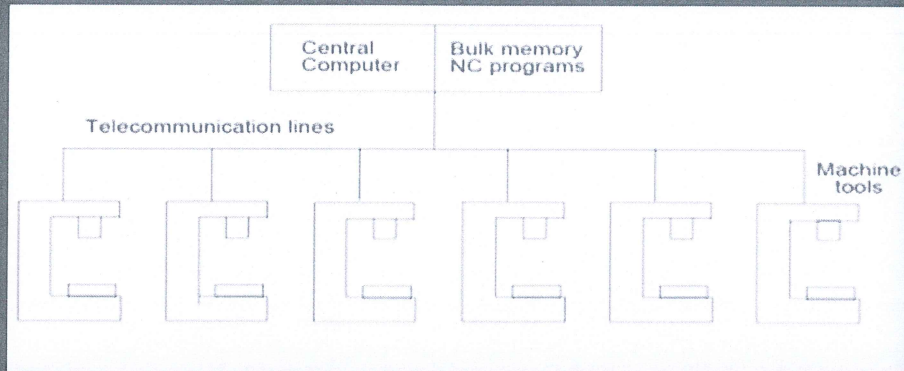
Ans: Modelling softwares: Used for generating 3D models e.g.: solidworks

Machining softwares: used to generate G codes for CNC machines via generating graphical tool path within CAM softwares

18. Differentiate between DNC and CNC?

Ans: CNC stands for computer numerical control, DNC stands for direct numerical control. In CNC, far off control of the operation is not possible, while in DNC facilitates far-flung control. CNC is transferring machine instruction, DNC controls the information distribution to a wide variety of machines.

DNC system without satellite computer



Presented by :- Nirajsinh Vasandia (130451119005)



B

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1503

Time: 2 Hour

Course Name: Basics of Multiaxis Machining & Dialog CNC Programming

Max. Marks: 50

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Rapid Feed rate of STAR SB-20R for X, Y and Z axes is _____
 - a) 35000 mm/min
 - b) 35000m/min
 - c) 35000mm/rev
 - d) 20 m/min
2. Maximum machining Diameter of STAR SB-20R is
 - a) 20 mm
 - b) 18 mm
 - c) 25 mm
 - d) 30 mm
3. Maximum Drilling Capability of STAR SB-20R for stationary tool is
 - a) 20 mm
 - b) 18 mm
 - c) 25 mm
 - d) 35 mm
4. Maximum spindle speed of STAR SB-20R is
 - a) 15000 rpm
 - b) 20000 rpm
 - c) 10000 rpm
 - d) 12000 rpm
5. What is operational mode of STAR SB-20R?
 - a) Left Handed



- b) Right Handed
 - c) Neutral
 - d) Both a and b
6. Electric motors are driven by _____ forces.
- a) Ferromagnetic
 - b) Electromagnetic
 - c) Gamma
 - d) External
7. Asynchronous motor is an ____ induction motor.
- a) AC
 - b) DC
 - c) Water
 - d) Gas
8. Basic Components of CNC Controllers are
- a) Power Supply unit
 - b) Circuitry protection unit
 - c) Motor driver unit
 - d) All of the above
9. Power transmission component includes
- a) Belts
 - b) Shaft
 - c) Couplings
 - d) All of the above
10. Joining elements include:
- a) Pins
 - b) Snap-fits
 - c) Both a & b
 - d) None of the above

Section – B

04X04 = 16 Marks

- 11. Name the various functional units of STAR SB-20R.
- 12. Write down the capacity and major specifications of STAR SB-20R.
- 13. Write down the main difference between synchronous and Asynchronous electric motor.
- 14. Write down the various popular controllers in use.



Section – C

04X06 = 24 Marks

15. Describe in brief about various types of five axis machining centers along with their application.
16. Provide details of various Power transmission units of STAR SB-20R.
17. What do you mean by functional units of a machine tool? Name the various functional units of a CNC lathe.
18. Write down the differences between Five axis machining and (3+2) axis machining?



School of Manufacturing Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, V Semester,
End-Sem. Examination

Course Code: SMS1503

Time: 2 Hour

Course Name: Basics of Multiaxis Machining & Dialog CNC Programming

Max. Marks: 50

Answer Key

Section – A

10X01 = 10 Marks

1. Rapid Feed rate of STAR SB-20R for X, Y and Z axes is _____
 - a) **35000 mm/min**
 - b) 35000m/min
 - c) 35000mm/rev
 - d) 20 m/min
2. Maximum machining Diameter of STAR SB-20R is
 - a) **20 mm**
 - b) 18 mm
 - c) 25 mm
 - d) 30 mm
3. Maximum Drilling Capability of STAR SB-20R for stationary tool is
 - a) **20 mm**
 - b) 18 mm
 - c) 25 mm
 - d) 35 mm
4. Maximum spindle speed of STAR SB-20R is
 - a) 15000 rpm
 - b) 20000 rpm
 - c) **10000 rpm**
 - d) 12000 rpm
5. What is operational mode of STAR SB-20R?
 - a) Left Handed
 - b) **Right Handed**
 - c) Neutral
 - d) Both a and b
6. Electric motors are driven by _____ forces.
 - a) Ferromagnetic
 - b) **Electromagnetic**
 - c) Gamma



- d) External
7. Asynchronous motor is an ___ induction motor.
- a) **AC**
 - b) DC
 - c) Water
 - d) Gas
8. Basic Components of CNC Controllers are
- a) Power Supply unit
 - b) Circuitry protection unit
 - c) Motor driver unit
 - d) **All of the above**
9. Power transmission component includes
- a) Belts
 - b) Shaft
 - c) Couplings
 - d) **All of the above**
10. Joining elements include:
- a) Pins
 - b) Snap-fits
 - c) **Both a & b**
 - d) None of the above

Section – B

04X04 = 16 Marks

11. Name the various functional units of STAR SB-20R.

Ans.

- a) Guide Bush
- b) Back Attachment
- c) Back -4 spindle
- d) Head Stock
- e) Tool Post

12. Write down the capacity and major specifications of STAR SB-20R.

Item		Specifications
Maximum machining diameter		Φ 20 mm
Maximum headstock stroke	Guide bush version	205 mm
	Non-guide bush version	50 mm
Maximum drilling capability	Stationary tool	Φ 20 mm
	Power driven tool	Φ 5 mm Φ 6 mm & Φ 7 mm
Maximum tapping capability	Stationary tool	M 10x P1.5
	Power driven tool	M 5 x P0.5, M6x P1.0
Maximum milling capability		Φ 7 mm, Φ 10 mm

13. 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

14. Write down the various popular controllers in use.

Ans. 1) Fanuc 21M

2) Sinumerik Operate 840D

3) Heidenhain TNC426

Section – C

04X06 = 24 Marks

15. 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.

16. Provide details of various Power transmission units of STAR SB-20R.

Ans.

Item		Specifications	Remarks
Power supply	Voltage	3 phase, 200Vac±10%	
	Frequency	50/60Hz ±1Hz	
	Capacity	SB-12R	Load run average power: 4.5KVA
SB-16R/ 20R		Load run average power: 3.7KVA	
Main circuit breaker	Machine	Rated current: 30A Rated shutdown capacity: Icu/Ics: 2.5/1kA	QF001
	External transformer	Rated current: 20A Rated shutdown capacity: Icu/Ics: 2.5/1kA	Transformer [0G492]
		Rated current: 20A Rated shutdown capacity: Icu/Ics: 7.5/4kA	Transformer CE Marking Version [0T497]
Leakage current		5mA	
Electric circuit diagram No.		10171/**_****	Included with the machine **_**** is an edition number

17. 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.

18. 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.



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Registration No.:

Set-B

School of Manufacturing Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, V Semester,
End-Sem. Examination

Course Code: SMS1504
Course Name: Project work

Time: 2 Hour
Max. Marks: 50

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. After the "table of content" the main part of the project report should always be written in the following order:
 - A. Introduction, body, conclusion
 - B. Body, introduction, appendix
 - C. Introduction, reference, conclusion
 - A. Conclusion, body, introduction
2. Who creates the project team?
 - D. Factory manager
 - E. Project manager
 - F. Operation manager
 - G. Purchase manager
3. Which stage of project management life cycle requires the maximum time of completion
 - A. Conceptualization
 - B. Planning
 - C. Execution
 - D. Estimation
4. Assembling project team and assigning their responsibilities are done during which phase of a project management?
 - A. Initiation
 - B. Planning
 - C. Execution
 - D. Closure
5. In project management when does planning take place?
 - A. Before the project
 - B. During the project execution
 - C. At the start of the project
 - D. After the project

6. Conflict occurrence in project is
 - A. Unavoidable
 - B. Depend on type of project
 - C. Avoidable
 - D. Depends on culture

7. Evaluate following statement: The project report should always be written at the end of the project.
 - A. Yes, because at the end all the information and data are available. It does not make sense to start with project report writing in the beginning therefore.
 - B. No, the phase "project report writing" should be started at the very beginning and should be a continuous activity during the whole project. It helps to avoid a work overload at the end of the project. If not enough information and data is available, the structure/template of the report can always be prepared.
 - C. No, the project report should be written at the beginning of the project because the team just needs to follow to what is written in the report. At the end the project team adds only the appendix.
 - D. None of the answers above is correct.

8. In the initial stage of the project the probability of completing the project is _____.
 - A. Zero
 - B. High
 - C. Low
 - D. Medium

9. The review of the successes and the mistakes is normally held during _____ phase.
 - A. Initiation
 - B. planning
 - C. execution
 - D. closure

10. Risk in project management is defined as
 - A. An uncertain management event that, if it occurs, has a positive effect on project objectives
 - B. An uncertain management event that, if it occurs, has a negative effect on project objectives
 - C. An uncertain management event that, if it occurs, has a positive and negative effect on project objectives
 - D. An uncertain event that do not have any effect on project objectives

Section – B

04X04 = 16 Marks

11. What do you understand by the term "project"?
12. What is critical path method (CPM)?
13. Write the name of three typical project risks and to take a suitable risk reduction measure for each risk.
14. The interplay of knowledge and influence of decisions in the progress of projects.

a) Please name the red line correctly

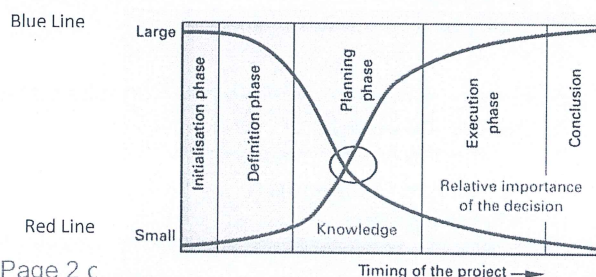


Figure 4: Influence of the decisions and knowledge on



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- b) Please name the blue line correctly
- c) Explain the importance of the intersection point in the circle in own words. What document should be signed ideally at this point?
- d) Explain about the signed document at intersection point

Section – C

04X06 = 24 Marks

- 15. Explain the progression of a project from **Point A to Point B** with the help of diagram and illustrate the five different phases of the project.
- 16. Define the SMART Acronym.
- 17. Explain the five project phases in proper sequence also draw layout diagram to support this.
- 18. Explain about the project organization structure with help of diagram.



School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1504

Time: 2 Hour

Course Name: Project Work

Max. Marks: 50

Answer Key

Section – A

10X01 = 10 Marks

1. After the "table of content" the main part of the project report should always be written in the following order:
 - A. **Introduction, body, conclusion**
 - B. Body, introduction, appendix
 - C. Introduction, reference, conclusion
 - A. Conclusion, body, introduction
2. Who creates the project team?
 - A. Factory manager
 - B. Project manager**
 - C. Operation manager
 - D. Purchase manager
3. Which stage of project management life cycle requires the maximum time of completion
 - A. Conceptualization
 - B. Planning
 - C. Execution**
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 - D. An uncertain event that do not have any effect on project objectives

Section – B

04X04 = 16 Marks

11. What do you understand by the term “project”?

Ans.

- 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**.

12. What is critical path method (CPM)?

Ans.

The **critical path method (CPM)**, or **critical path analysis (CPA)**, is an algorithm for scheduling a set of project activities.^[1] It is commonly used in conjunction with the program evaluation and review technique (PERT). A critical path is determined by identifying the longest stretch of dependent activities and measuring the time^[2] required to complete them from start to finish.

- A list of all activities required to complete the project (typically categorized within a work breakdown structure) - Structure planning
- The time (duration) that each activity will take to complete - Time planning
- The dependencies between the activities - Net planning
- Logical end points such as milestones or deliverable items.

13. Write the name of three typical project risks and to take a suitable risk reduction measure for each risk.

Ans.

Project risks – typical project risks

- Over-optimistic timing and budget plan Example of risk reduction measure: Planning of reserves/extra resources in the project contract (similar measure to reduce the risk is also valid)
- Loss of key employees due to illness, leaving the company Risk reduction measure: Planning of reserves/extra resources in the project contract (similar measure to reduce the risk is also valid)
- Non-compliance with agreed deadlines Risk reduction measure: Precise reporting and monitoring of the progress of the Project (similar measure to reduce the risk is also valid)
- Conflict between team members Risk reduction measure: Addressing conflicts early and solution-oriented in team Meetings (similar measure to reduce the risk is also valid)
- Lack of support of management Risk reduction measure: Write interim reports, using examples to point out the importance of the project. (similar measure to reduce the risk is also valid)
- Lack of acceptance among potential users of the product Risk reduction measure: Carry out experiments on the customers at an early stage. Design aspects of the product in such a way that the customers want the product. (similar measure to reduce the risk is also valid)
- Technological feasibility such as limited material properties or size Risk reduction measure: Recognize and recommend early termination of the project (similar measure to reduce the risk is also valid)
- Legal risk such as product liability Risk reduction measure: Know legal aspects of the area of interest. Derive responsibilities for product safety from this, adhere to them in the product and record them in the user manual. (similar measure to reduce the risk is also Valid)

14. The interplay of knowledge and influence of decisions in the progress of projects.

a) Please name the red line correctly

Knowledge

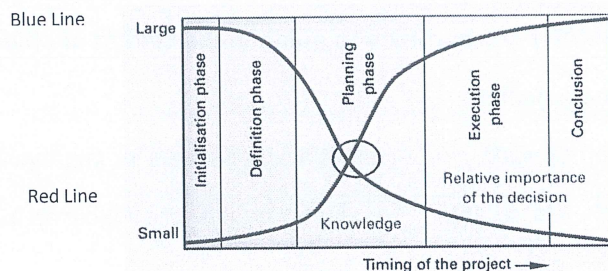


Figure 4: Influence of the decisions and knowledge on

b) Please name the blue line correctly
Influence of decision

c) Explain the importance of the intersection point in the circle in own words. What document should be signed ideally at this point?

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At this moment the knowledge has increased to such a value that the project contract can be signed. The influence of the decision has decreased, but is still high enough to make the decision for the coming project phases.

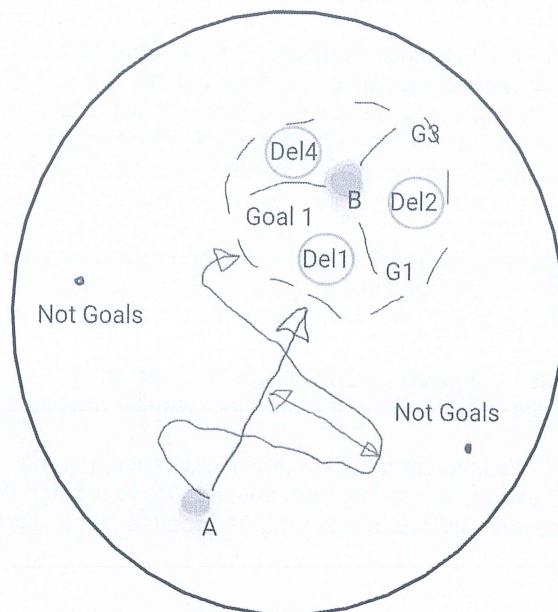
- d) Explain about the signed document at intersection point
 Contract is an agreement between two or more parties, to exchange providing a specific work (Scope of Work) with agreed compensations (mainly cost and/or any others specified in the contract) include terms and conditions.

Section – C

04X06 = 24 Marks

15. Explain the progression of a project from **Point A to Point B** with the help of diagram and illustrate the five different phases of the project.

Ans.



Phase 1 - Conception and Initiation
(Area of interest)

Phase 2 - Definition and planning
(Starting Point A - Ending Point B)
(Project contract)

Phase 3 - Launch or Execution
(Project progress in reality)

Phase 4 - Performance and Control
(Progress in reality to the plan has to be updated) (Gap needs to be minimized)

Phase 5 - Closure
(Handing over the deliverables)

16. Define the SMART Acronym.

Ans.

SMART is an 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.

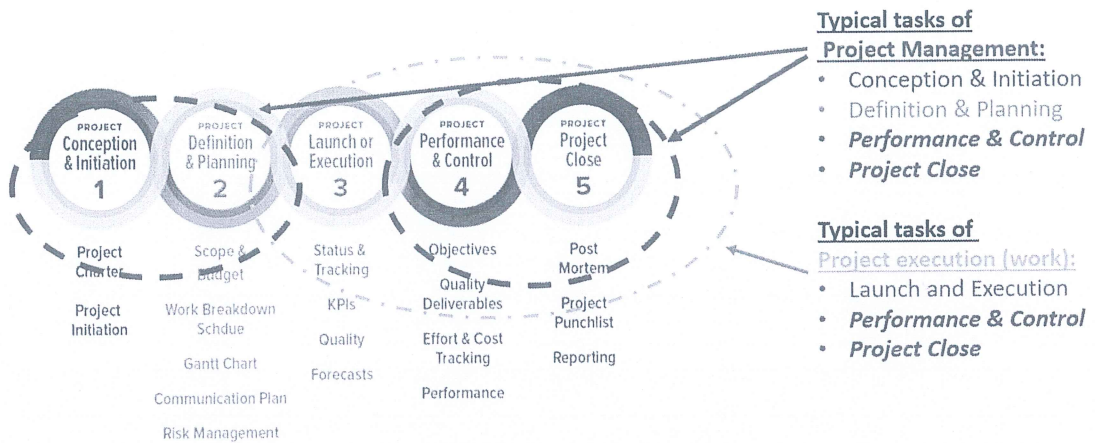
R *Realistic* – state what results can realistically be achieved, given available resources.

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

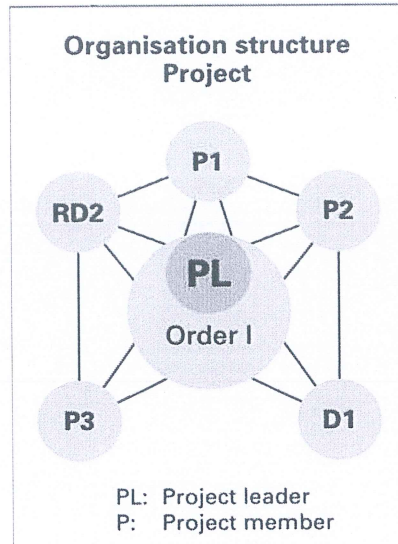
17. Explain the five project phases in proper sequence also draw layout diagram to support this.

Ans.

Project Phases:



18. Explain about the project organization structure with help of diagram.





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Registration No.:

School of Manufacturing Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1505

Course Name: Quality Management

Time: 2 Hour

Max. Marks: 50

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which of the following statement is correct?
 - A. R – charts are to control the central tendency of the process
 - B. R – charts are to control the dispersion of the process
 - C. R – charts are to control the mean of the process
 - D. B & C both
2. HEIJUNKA stands for:
 - A. Production stop
 - B. Production start
 - C. Production leveling
 - D. Mass production
3. 80/20 Rules is applicable for
 - A. Pareto Charts
 - B. Fishbone Diagram
 - C. To define the OEE
 - D. PFMEA
4. A six sigma process has defect level below _____ defects per million opportunities.
 - A. 3.4
 - B. 4.3
 - C. 5.6
 - D. 6.0



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5. Which generic approach's precursor is the Toyota Production System?
 - A. Kaizen
 - B. TQM
 - C. Lean manufacturing
 - D. Six sigma
6. Which of the following is correct in context to Inspection?
 - A. It is a way to prevent the production of bad items
 - B. Inspection adds to the cost of the product but not for its value
 - C. Fatigue and Monotony don't affect any inspection judgment
 - D. None of the above
7. Which of the following is not among 7 QC tools?
 - A. Check sheet
 - B. Histogram
 - C. Kanban
 - D. Pareto chart
8. The cause and effect diagram is also called
 - A. Stratification analysis
 - B. Total quality management
 - C. PDCA technique
 - D. Fishbone diagram
9. ISO 9000 determines
 - A. If the company practices its written procedures
 - B. If vendors are performing well
 - C. Process capability
 - D. The kind of control chart to be used
10. Seven QC tools include
 - A. Team meetings & 5-S
 - B. Deming 14 points approach
 - C. Workers' toolkit
 - D. Histogram

Section – B

04X04 = 16 Marks

11. What is TPS? Explain.
12. Write down purpose of inspection.
13. What is COPQ? Define Appraisal and prevention cost.
14. Differentiate between Quality control & Quality assurance with practical example.



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Section – C

04X06 = 24 Marks

15. Name the 7 QC tool. Explain the fishbone diagram with neat & clean Sketch.
16. What are the different types of waste in Lean manufacturing & define them?
17. Explain Pareto chart with appropriate example.
18. Write at least six characteristics of quality circle.



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School of Manufacturing Skills

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Course Name: Quality Management

Time: 2 Hour

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Answer Key

Section – A

10X01 = 10 Marks

- Which of the following statement is correct?
 - R – charts are to control the central tendency of the process
 - R – charts are to control the dispersion of the process**
 - R – charts are to control the mean of the process
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- HEIJUNKA stands for:
 - Production stop
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 - Pareto Charts**
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 - To define the OEE
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- A six sigma process has a defect level below _____ defects per million opportunities.
 - 3.4**
 - 4.3
 - 5.6
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- Which generic approach's precursor is the Toyota Production System?
 - Kaizen**
 - TQM
 - Lean manufacturing
 - Six sigma



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6. Which of the following is correct in context to Inspection?
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 - A. Team meetings & 5-S
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 - C. Workers' toolkit
 - D. Histogram

Section – B

04X04 = 16 Marks

11. What is TPS? Explain.

Ans.

TPS is based on two concepts: JIDOKA and just-in-time. JIDOKA, a Japanese term that can be translated as “automation with a human touch” is a method for quickly identifying and correcting any issues that could lead to faulty production. Just-in-time is about refining and coordinating each production process so that it only produces what is required by the next process in the sequence. By applying these concepts, we are able to produce vehicles quickly and efficiently, every one meeting our high quality standards and our customers' individual requirements.



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12. Write any two purposes of inspection.

Ans.

- (1) To distinguish good lots from bad lots
- (2) To distinguish good pieces from bad pieces.
- (3) To determine if the process is changing.
- (4) To determine if the process is approaching the specification limits.

13. What is COPQ? Define Appraisal and prevention cost.

Ans.

Those costs that are generated as a result of producing defective material. This cost includes the cost involved in fulfilling the gap between the desired and actual product/service quality. It also includes the cost of lost opportunity due to the loss of resources used in rectifying the defect. This cost includes all the labour cost, rework cost, disposition costs, and material costs that have been added to the unit up to the point of rejection. COPQ does not include detection and prevention cost.

14. Differentiate between Quality control & Quality assurance with a practical example.

Ans.

- **Quality Control:** "A part of quality management focused on fulfilling quality requirements".
- **Quality Control** is defined as "The operational techniques and activities used to fulfil requirements for quality".
- **Quality Assurance:** "A part of quality management focused on providing confidence that quality requirements will be fulfilled"
- **Quality Assurance** is defined as "All the planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfil requirements for quality".

Section – C

04X06 = 24 Marks

15. Name the 7 QC tool. Explain the fishbone diagram with neat & clean Sketch.

Ans.

- Histogram or stem-and-leaf plot
- Check sheet
- Pareto chart
- Cause-and-effect diagram
- Defect concentration diagram
- Scatter diagram
- Control chart

16. What are the different types of waste in Lean manufacturing & define them?

Ans.

- unnecessary transportation;
- excess inventory;

- the unnecessary motion of people, equipment or machinery;
- waiting, whether it is people waiting or idle equipment;
- over-production of a product;
- over-processing or putting more time into a product than a customer needs, such as designs that require high-tech machinery for unnecessary features; and
- defects, which require effort and cost for corrections.
- Waste of unused talent and ingenuity.

17. Explain the Pareto chart with appropriate example.

Ans.

A Pareto diagram, also called 80/20 rule, is used to graphically abridge and display the relative significance of the differences between clusters of data i.e., separating the vital few causes (20%) that account for a dominant share of quality loss (80%) (Besterfield, 2001). The Pareto diagram is based on the Pareto principle, which states that few of the defects account for most of the effects.

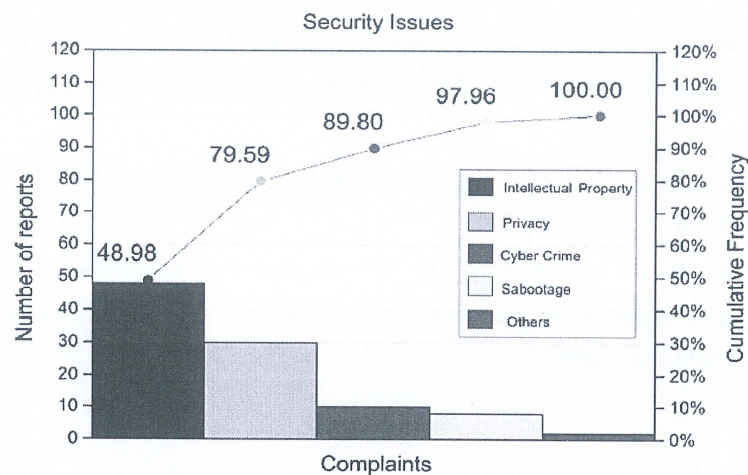


Figure 4 Pareto diagram used to prioritize the security issues

18. Write at least six characteristics of the quality circle.

Ans.

- Volunteers
- Set Rules and Priorities
- Decision made by consensus
- Members of a circle need to receive training
- Support of senior management required
- Members need to be empowered



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Fishbone Diagram Steps:

1. Define the problem or effect to be analyzed.
2. Form the team to perform the analysis. Often the team will uncover potential
3. causes through brainstorming.
4. Draw the effect box and the center line.
5. Specify the major potential cause categories and join them as boxes connected to
6. the center line.
7. Identify the possible causes and classify them into the categories in step 4. Create
8. new categories, if necessary.
9. Rank order the causes to identify those that seem most likely to impact the problem.
10. Take corrective action.

