



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

**SET-A**

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, III & V Semester,**  
**End-Sem. Examination**

**Course Code: SMS1113**

**Time: 2 Hours**

**Course Name: Basic Pneumatics (Open Elective)**

**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. SI unit of pressure is:
  - a)  $N/m^2$
  - b) bar
  - c) Pascal
  - d) All of above
2. Which type of air dryer uses silica gel as a drying agent?
  - a) Absorption air dryer
  - b) Adsorption air dryer
  - c) Refrigerant air dryer
  - d) None of above
3. A hydraulic system operates at a pressure up to-
  - a) 10-12 bar
  - b) 7-8 bar
  - c) 400 bar
  - d) 700 bar
4. The Function of Tank is to-
  - a) Maintain a pressure range
  - b) Drain water content
  - c) Prevents from pressure fluctuation
  - d) Remove dust particles from air
5. When  $PV=Constant$ , if we increase the volume then pressure will-
  - a) Remains constant
  - b) Decrease
  - c) Increase
  - d) None of these



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

6. AND element is also known as -
  - a) Dual pressure valve
  - b) Shuttle Valve
  - c) Check valve
  - d) None of the above
7. In a pneumatic system, a sensor/limit switch serves the purpose of:
  - a) Control
  - b) Feedback
  - c) Storage
  - d) Flux
8. What type of Refrigerant we are using in our Dryer?
  - a) R22
  - b) R34a
  - c) R134a
  - d) R34
9. What is L in FRL unit-
  - a) Lubricant
  - b) Liquid
  - c) Lubricator
  - d) Lubrication
10. The Standard Atmosphere Pressure is?
  - a) 13 bar
  - b) 1.013 bar
  - c) 2 bar
  - d) 2.013 bar

### Section – B

04X04 = 16 Marks

11. What is the difference between Bistable and Monostable valves?
12. What is Air Dryer? Name three type of air dryers.
13. Draw the symbol of air compressor and electric motor.
14. Draw a circuit diagram for Single Acting Cylinder with combination of *Meter In* and *Meter Out*.

### Section – C

04X06 = 24 Marks

15. Draw the symbol of *air filter* and *air dryer* and explain the difference between them.
16. What is Air Production system? Explain all the components of Air production system.
17. Draw the Symbol of Quick Exhaust Valve. Also write its function.
18. Write down any six applications of Pneumatics.



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

**SET-A**

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, III & V Semester,**  
**End-Sem. Examination**

**Course Code: SMS1113**

**Course Name: Basic Pneumatics**

**Time: 2 Hours**

**Max. Marks: 50**

**Answer Key**

**Section – A**

10X01 = 10 Marks

1. SI unit of pressure is:  
c) Pascal
2. Which type of air dryer uses silica gel as a drying agent?  
b) Adsorption air dryer
3. A hydraulic system operates at a pressure up to-  
d) 700 bar
4. The Function of Tank is to-  
c) Prevents from pressure fluctuation
5. When  $PV=Constant$ , if we increase the volume then pressure will-  
b) Decrease
6. AND element is also known as -  
a) Dual pressure valve
7. In a pneumatic system, a sensor/limit switch serves the purpose of:  
b) Feedback
8. What type of Refrigerant we are using in our Dryer?  
c) R134a
9. What is L in FRL unit-  
c) Lubricator
10. The Standard Atmosphere Pressure is-  
a) 13 bar  
b) 1.013 bar  
c) 2 bar  
d) 2.013 bar

**Section – B**

04X04 = 16 Marks

11. What is the difference between Bistable and Monostable valves?

**Ans. Monostable valve**

These valves have a defined position to which they automatically return. Spring returned valves are monostable valves.

**Bistable valve**



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

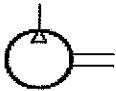

These valves do not have any preferred position and remains in their position until another input signal is operated.

12. What is Air Dryer? Name three type of air dryers.

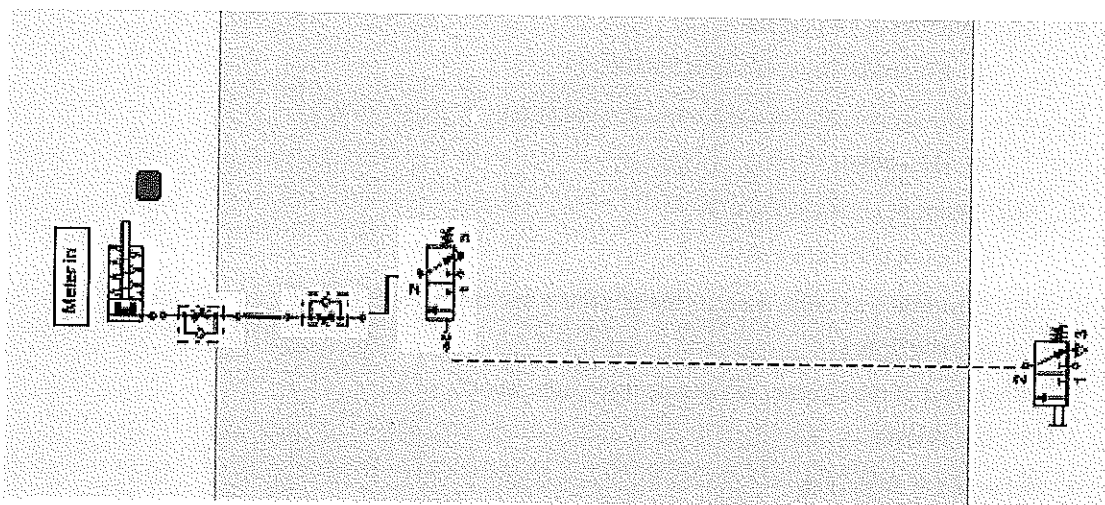
Ans. Air Dryer is a device which is used to remove the water contaminates from the Compressed Air. It has three types

- Absorption dryer
- Adsorption dryer
- Refrigeration dryer

13. Draw the symbol of air compressor and electric motor.

1	Compressor		Compress the atmospheric air to required pressure.
2	Electric Motor		Provide mechanical power to compressor

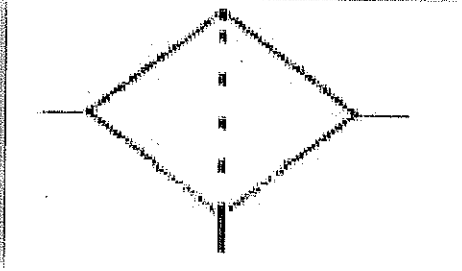
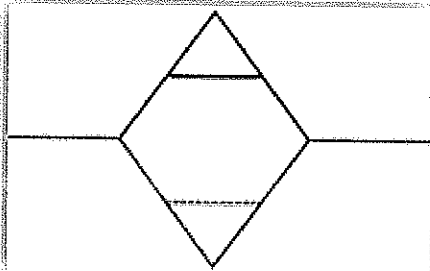
14. Draw a circuit diagram for Single Acting Cylinder with combination of *Meter In* and *Meter Out*.



### Section – C

04X06 = 24 Marks

15. Draw the symbol of *air filter* and *air dryer* and explain the difference between them.

Air Filter	Air Dryer
	



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

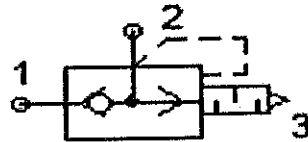
16. What is Air Production system? Explain all the components of Air production system.

Ans. In Air production system we compress environmental air and make it ready to use for pneumatics system. Components of air production are as follows:

- Compressor
- Electric motor
- Pressure switch
- Check valve
- Tank
- Pressure gauge
- Auto/Manual drain
- Safety valve
- Air dryer
- Line Filter
- Intercooler

17. Draw the Symbol of Quick Exhaust Valve. Also write its function.

Ans. It removes air quickly from actuator and increase the speed of actuator



18. Write down any six applications of Pneumatics.

Ans.

Operation of system valves for air, water or chemicals

Operation of doors

Unloading of hoppers in building, steel making, mining and chemical industries.

Lifting, Moving and Holding a part

Dental drills

Vacuum lifting of thin sheets.

Pneumatic robots



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Manufacturing Skill**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, III & V Semester**  
**End-Sem. Examination**

**Course Code: SMS1113**

**Course Name: Basic Pneumatics (Open Elective)**

**Time: 2 Hours**

**Max. Marks: 50**

**Answer Key**

**Section – A**

10X01 = 10 Marks

1. SI unit of pressure:
  - a)  $N/m^2$
  - b) bar
  - c) **Pascal**
  - d) All of above
2. Which type of valve we are using in pneumatics?
  - a) Slide
  - b) Plane
  - c) Poppet
  - d) **Spool**
3. FRL unit is also known as.
  - a) Shuttle Valve
  - b) Service Unit
  - c) **Air Service Unit**
  - d) None of above
4. Which type of air dryer is used silica gel as a drying agent?
  - a) Absorption air dryer
  - b) **Adsorption air dryer**
  - c) Refrigerant air dryer
  - d) None of above
5. What is L in FRL unit-
  - a) Lubricant
  - b) Liquid
  - c) **Lubricator**
  - d) Lubrication
6. Which air we control in METER IN method?
  - a) **Air that going to actuator**
  - b) Air that coming from actuator
  - c) Both of above
  - d) None of above
7. In pneumatic the volume flow of air is expressed in term of:
  - a)  $M^3/s$
  - b) Liter/minute



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

- c) Both a and b  
d) None of above
8. When  $PV = \text{Constant}$ , if we increase the volume then pressure will.....?  
a) Remains constant  
b) Decrease  
c) Increase  
d) none of these
9. The Standard Atmosphere Pressure is?  
a) 13 bar  
b) 1.013 bar  
c) 2 bar  
d) 2.013 bar
10. What type of Refrigerant we are using in our Dryer?  
a) R22  
b) R34a  
c) R134a  
d) R34

### Section – B

04X04 = 16 Marks

11. What is Air Dryer? Name three type of air dryers.

**Answer:** Air Dryer is Device which is used to remove the water contaminates from the Compressed Air. It has three types

- 1) Absorption dryer
- 2) Adsorption dryer
- 3) Refrigeration dryer

12. Define Pressure and Pascal Law.

**Answer:** -Pressure is defined as force per unit area. The standard unit for pressure is the Pascal, which is Newton per square meter.

$$P = \frac{F}{A} = \frac{N}{mm^2}$$

This unit is small and to avoid huge number, we use bar.

$$100,000 \text{ pas} = 100\text{KPa} = 1\text{bar}$$

A pressure in the pneumatics is over-pressure (above the atmosphere pressure) and referred as gauge pressure.

A pressure below the atmosphere is under pressure or vacuum. **The standard atm. Pressure is 1.013 bar.**

### Pascal law

- An external pressure applied to a fluid in a closed vessel is uniformly transmitted throughout the fluid.

$$P_1 = P_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

13. What is the difference between Bistable and Monostable valves?

**Answer: -**

### Monostable valve

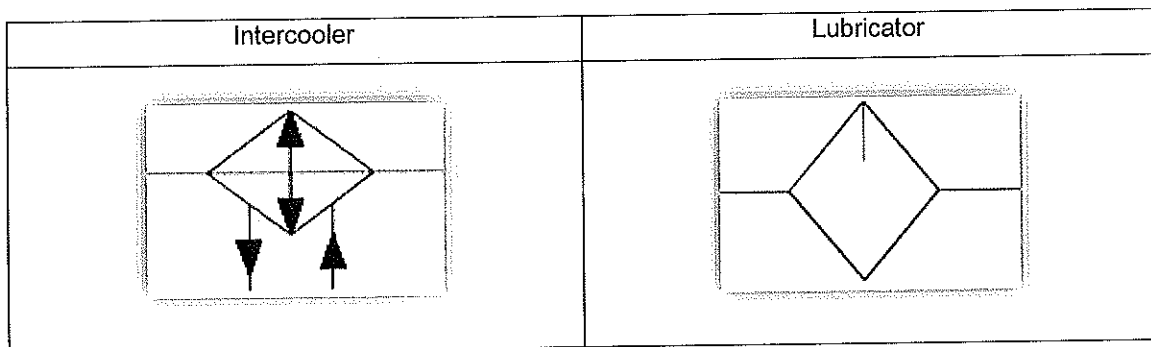
These valves have a defined position to which they automatically return. Spring returned valves are monostable valves.

### Bistable valve

These valves do not have any preferred position and remains in their position until another input signal is operated.

14. Draw the symbol of intercooler and lubricator.

**Answer: -**



### Section – C

04X06 = 24 Marks

15. What is Air Production system? Explain all the components of Air production system.

**Answer: -** In Air production system we compress environmental air and make it ready to use for pneumatics system. Components of air production are as follows:

- Compressor
- Electric motor
- Pressure switch
- Check valve
- Tank
- Pressure gauge
- Auto/Manual drain
- Safety valve
- Air dryer
- Line Filter
- Intercooler

16. Write down any six applications of Pneumatics.

**Answer: -**

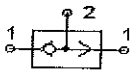
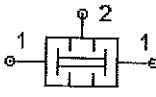
- Operation of system valves for air, water or chemicals
- Operation of doors
- Unloading of hoppers in building, steel making, mining and chemical industries.
- Lifting, Moving and Holding a part
- Dental drills
- Vacuum lifting of thin sheets.
- Pneumatic robots



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

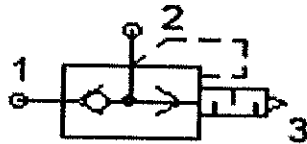
17. Draw the symbol of OR and AND elements. Also write another name.

**Answer: -**

	OR element/shuttle valve		It provides output when we give any input
	And element/dual pressure valve		It only provides output when we give both side input

18. Draw the Symbol of Quick Exhaust Valve. Also write its function.

**Answer: -** It removes air quickly from actuator and increase the speed of actuator





# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

## School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS 1114

Time: 2 Hours

Course Name: Basics of Production Management (OE)

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. Micro Economics deals with  
(i) Whole economy (ii) Part of whole economy (iii) Both of the above  
(iv) None of the above
2. For relatively inelastic demand, the value of  $e_p$  is  
(i) Infinite (ii) Less than one (iii) One (iv) More than one
3. For relatively elasticity, the value of  $e_p$  is  
(i) Infinite (ii) Zero (iii) One (iv) More than one
4. Delphi Method of forecasting is used for  
(i) Short range (ii) for all (iii) long range (iv) None of the above
5. Direct Cost in a Manufacturing Industry includes:  
(i) Only direct labor cost (ii) Only direct material cost (iii) Summation of direct material and labor cost (iv) None of the above
6. Prime Cost in a Manufacturing Industry includes:  
(i) All direct cost (ii) Factory overhead cost (iii) Summation of direct and factory overhead cost
7. Delphi Method of forecasting is used for  
(i) Steel industry (ii) Coal industry (iii) Inventory control  
(iv) New product demand
8. Under ABC analysis, quantity of Class-B product is  
(i) 70 – 80 % (ii) 15 – 20 % (iii) 5 – 10 % (iv) None of the above
9. Benefits of Process Planning are  
(i) Reduction in setup costs (ii) Reduction in tooling costs  
(iii) Reduction in material costs (iv) All
10. Distribution overhead includes  
(i) Warehouse charges (ii) transportation of goods  
(iii) depreciation of vehicle (iv) all of the above



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

## Section – B

04X04 = 16 Marks

11. Discuss in detail the steps of Delphi Method.
12. What do you mean by Time Study? Discuss in detail the objective of Time Study.
13. Define Ergonomics. Write down the objective and the application of Ergonomics.
14. Discuss in detail the various Production System.

## Section – C

04X06 = 24 Marks

15. What do you mean by Standard Data in Time Study? Write down the steps involved in developing Standard Data.
16. An industry incurs the following costs for their products annually. The production volume on an average is 1000 a year.

a. Raw material cost	= Rs. 30000
b. Coolant cost	= Rs.2000
c. Operators cost	= Rs.10000
d. Expenses of office staff (salary, bonus etc.)	= Rs.12000
e. Expenses on sales and distribution agencies	= Rs.8000
f. Expenses on insurance, lighting etc.	= Rs.4000

Find direct cost as percentage of total cost.

17. What do you mean by Process Planning? Write down the various elements of Process Planning.
18. Discuss in detail the various Elements of Cost in Manufacturing Industry.



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

## School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS 1114

Time: 2 Hours

Course Name: Basics of Production Management

Max. Marks: 50

### Answer Key Section – A

10X01 = 10 Marks

1. Micro Economics deals with  
(i) Whole economy (ii) Part of whole economy (iii) Both of the above (iv) None of the above  
Ans. (ii)
2. For relatively inelastic demand, the value of  $e_p$  is  
(i) Infinite (ii) Less than one (iii) One (iv) More than one  
Ans. (ii)
3. For relatively elasticity, the value of  $e_p$  is  
(i) Infinite (ii) Zero (iii) One (iv) More than one  
Ans. (iv)
4. Delphi Method of forecasting is used for  
(i) Short range (ii) for all (iii) long range (iv) None of the above  
Ans. (iii)
5. 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)
6. 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)
7. Delphi Method of forecasting is used for  
(i) Steel industry (ii) Coal industry (iii) Inventory control  
(iv) New product demand  
Ans. (iv)
8. Under ABC analysis, quantity of Class-B product is  
(i) 70 – 80 % (ii) 15 – 20 % (iii) 5 – 10 % (iv) None of the above  
Ans. (ii)
9. Benefits of Process Planning are  
(i) Reduction in setup costs (ii) Reduction in tooling costs  
(iii) Reduction in material costs (iv) All  
Ans. All
10. Distribution overhead includes  
(i) Warehouse charges (ii) transportation of goods



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

(iii) depreciation of vehicle (iv) all of the above

Ans. (iv)

## Section – B

04X04 = 16 Marks

11. Discuss in detail the steps of Delphi Method?

Ans.

- The result may be rated acceptable if the person making the guess is an expert in the matter.
- In this method, a panel of outside experts is identified.
- They are given a series of structured questionnaires.
- The answers of each questionnaire are used as input for the design of the next questionnaire.
- The identity of experts is not disclosed. This is for the purpose that nobody should influence the opinion of others.

12. What do you mean by Time Study? Discuss in detail 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

13. Define Ergonomics? Write down the objective and the application 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.

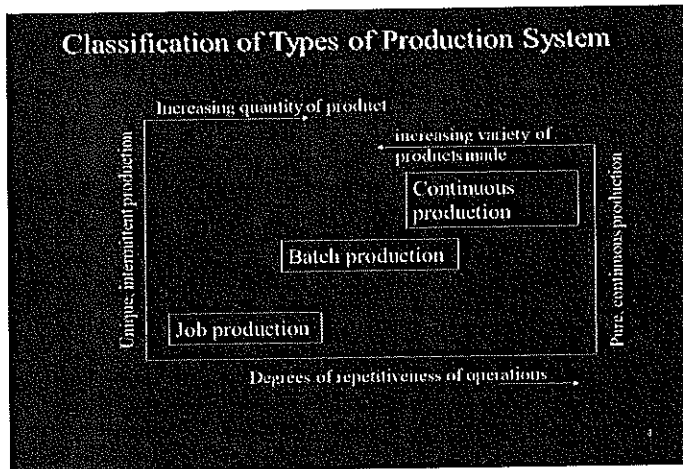
### **Application of Ergonomics**

- Aerospace
- Training
- Product Design
- Nuclear and Virtual Environments
- Health Care
- Transportation



14. Discuss in detail the various Production System?

Ans.



### Section – C

04X06 = 24 Marks

15. What do you mean by Standard Data in Time Study? Write down the steps involved in developing Standard Data?

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

Steps involved in developing standard data

- 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

16. An industry incurs the following costs for their products annually. The production volume on an average is 1000 a year.

- |                                                  |             |
|--------------------------------------------------|-------------|
| a. Raw material cost                             | = Rs. 30000 |
| b. Coolant cost                                  | = Rs.2000   |
| c. Operators cost                                | = Rs.10000  |
| d. Expenses of office staff (salary, bonus etc.) | = Rs.12000  |
| e. Expenses on sales and distribution agencies   | = Rs.8000   |
| f. Expenses on insurance, lighting etc.          | = Rs.4000   |

Find direct cost as percentage of total cost.

Ans. Direct cost = (30000 + 2000 + 10000) = 42000

Total Cost = 42000 + 12000 + 8000 + 4000 = 66000

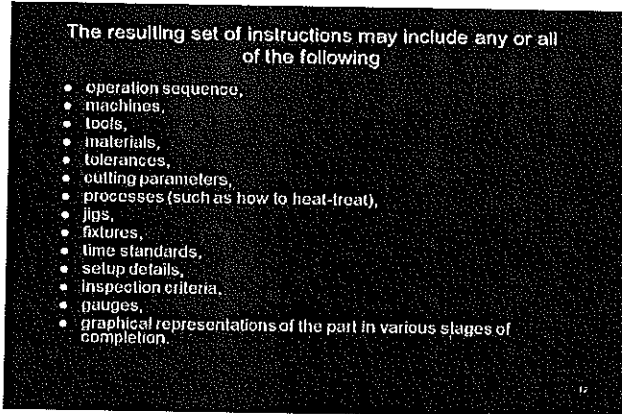
% = 42000 / 66000 = 63.6



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

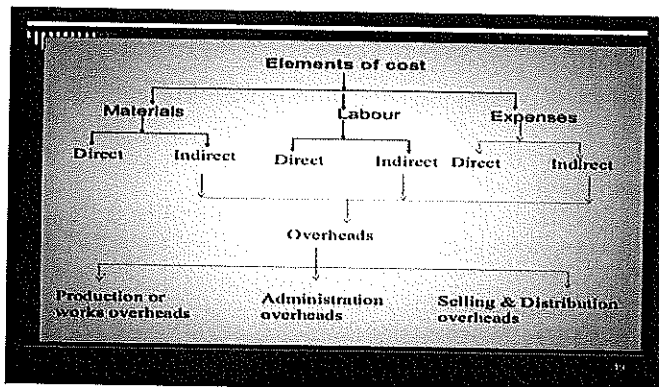
17. What do you mean by Process Planning? Write down the various elements of Process Planning?

Ans. Process planning is a key element that focuses on selecting resources for use in the execution and completion of a project.



18. Discuss in detail the various Elements of Cost in Manufacturing Industry?

Ans.





# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

## School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1114

Time: 2 Hours

Course Name: Basics of 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. ABC Analysis is used for  
(i) Inventory control (ii) Cost control (iii) Production control  
(iv) None of the above
2. The value of  $e_p$  for Unity elasticity demand is  
(i) More than one (ii) Equal to one  
(iii) Less than one (iv) Zero
3. In Batch Production system, number of products are  
(i) Less (ii) medium  
(iii) high (iv) Zero
4. In Production System, inputs are  
(i) Materials (ii) Man (iii) Machine (iv) All of the above
5. Prime Cost in a Manufacturing Industry includes:  
(i) All direct cost (ii) Factory overhead cost (iii) Summation of direct and factory overhead cost
6. JIT concept is used for  
(i) Better production (ii) Labour management (iii) Material cost  
(iv) Inventory control
7. Overhead Expenses in a Manufacturing Industry means:  
(i) Direct material cost (ii) Direct labour cost (iii) R&D cost (iv) None of the above
8. Benefits of Process Planning are  
(i) Reduction in setup costs (ii) Reduction in tooling costs  
(iii) Reduction in material costs (iv) All
9. In Conventional system, faster production is more efficient  
(i) True (ii) false (iii) in between (iv) None
10. Application of Ergonomics are in  
(i) Aerospace (ii) Product design (iii) Health care  
(iv) All three



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

## Section – B

04X04 = 16 Marks

11. Write down the various methods of forecasting? Explain Barometric Method of forecasting?
12. Write down the comparison between Conventional and JIT attributes.
13. 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 5<sup>th</sup> 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. What do you mean by Process Planning? Discuss various elements of Process Planning.
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.

17. Discuss in detail: (i) Loading (ii) Routing (iii) Scheduling
18. What do you mean by Time Study? Write down the steps required for Time Study in detail.



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

## School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, V Semester,

End-Sem. Examination

Course Code: SMS1114

Time: 2 Hours

Course Name: Basics of Production Management

Max. Marks: 50

Answer Key  
Section – A

10X01 = 10 Marks

1. ABC Analysis is used for  
(i) Inventory control (ii) Cost control (iii) Production control  
(iv) None of the above  
Ans. (iv)
2. The value of  $e_p$  for Unity elasticity demand is  
(i) More than one (ii) Equal to one  
(iii) Less than one (iv) Zero  
Ans. (ii)
3. In Batch Production system, number of products are  
(i) Less (ii) medium  
(iii) high (iv) Zero  
Ans. (ii)
4. In Production System, inputs are  
(i) Materials (ii) Man (iii) Machine (iv) All of the above  
Ans. (iv)
5. 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)
6. JIT concept is used for  
(i) Better production (ii) Labour management (iii) Material cost  
(iv) Inventory control  
Ans. (iv)
7. Overhead Expenses in a Manufacturing Industry means:  
(i) Direct material cost (ii) Direct labour cost (iii) R&D cost (iv) None of the above  
Ans.: C
8. Benefits of Process Planning are  
(i) Reduction in setup costs (ii) Reduction in tooling costs  
(iii) Reduction in material costs (iv) All  
Ans. All
9. In Conventional system, faster production is more efficient  
(i) True (ii) false (iii) in between (iv) None  
Ans. (i)
10. Application of Ergonomics are in  
(i) Aerospace (ii) Product design (iii) Health care  
(iv) All three  
Ans. (iv)



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

## Section – B

04X04 = 16 Marks

11. Write down the various methods of forecasting? Explain Barometric Method of forecasting?

Ans.

<b>Methods of Forecasting</b>	
SURVEY METHOD	STATISTICAL METHOD
1. Survey of buyer's intentions	1. Trend projection method
2. Expert opinion method or <i>Delphi Method</i>	2. Simple Moving averages method
3. Controlled Experiments	3. Weighted Moving Average Method
4. Simulated market situations	4. Barometric method

### BAROMETRIC METHOD

- ▣ Improvement over trend projection method
- ▣ Events of the present are used to predict future demand
- ▣ Basic approach- constructing an index of relevant economic indicators
  - Leading indicators
  - Coincident indicators
  - Diffusion indices

12. Write down the comparison between Conventional and JIT attitudes!

Ans.

Conventional	Just-in-Time
<p>Large lots are efficient (more is better)</p> <p><i>Faster production is more efficient</i></p> <p>Scheduling and queues are necessary tradeoffs to maximize output from equipment and manpower</p> <p><i>Inventory provides safety</i></p>	<p>Ideal lot size is one unit (less is better)</p> <p><i>Faster production than necessary is a waste (balanced production is more efficient)</i></p> <p>Tradeoffs are bad; they trade one waste for another and prevent the proper solution of problems</p> <p><i>Safety stock is a waste</i></p> <p>Inventory is undesirable</p>

13. 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 5<sup>th</sup> month, if the actual sales for the 4 month is:

Month	1	2	3	4	5



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Sales in nos.	105	95	110	100	----
---------------	-----	----	-----	-----	------

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. What do you mean by Process Planning? Discuss various elements of Process Planning?

Ans.

**Process planning**

- In a manufacturing setting, it includes establishing the general sequence of steps that begin with the acquisition of materials and end with the creation of a finished product.
- Process planning consists of preparing a set of instructions that describe how to manufacture a part which will satisfy engineering design specifications.

The resulting set of instructions may include any or all of the following

- operation sequence,
- machines,
- tools,
- materials,
- tolerances,
- cutting parameters,
- processes (such as how to heat-treat),
- jigs,
- fixtures,
- time standards,
- setup details,
- inspection criteria,
- gauges,
- graphical representations of the part in various stages of completion.

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

% =  $74000 / 98000 = 75.5$

17. Discuss in detail: (i) Loading (ii) Routing (iii) Scheduling

Ans.:

### Loading

Execution of the schedule plan as per the route chalked out

It includes the assignment of the work to the operators at their machines.



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Machine loading is carried out in conjunction with routing, to ensure smooth work flow and with estimating, to ensure that the prescribed methods, feeds and speeds are best utilized.

Loading – who will do the work

Routing – where

Scheduling – when it shall be done

Gantt Charts are most commonly used to determine the existing load and also to foresee how fast a job can be done.

### Routing

It prescribes the flow of work in the plant and is related to considerations of layout, of temporary storage locations for raw material and components, and of material handling systems.

Operations path and sequence are established.

To determine the best and cheapest sequence of operations and to ensure that this sequence is strictly followed.

Its procedure involves:

- An analysis of the article to determine what to make and what to buy
- To determine the quality and type of material
- Determining the manufacturing operations and their sequence
- A determination of lot sizes
- Determination of scrap factors
- An analysis of cost the article
- Organization of production control forms

### Scheduling

It concerns with time element and priorities of a job.

**Production Schedule:** To schedule that amount of work which can easily be handled by plant and equipment without interference.

Following factors consider:

1. Physical plant facilities
2. Personnel
3. Necessary materials and purchased parts

**Master Schedule:** It is weekly or monthly break-down of the production requirement for each product for a definite time period.

This forms a base for all subsequent scheduling activities.

**Manufacturing schedule:** It is prepared on the basis of type of manufacturing process involved. It would show the required quantity of each product and sequence in which the same to be operated.

**Scheduling of job order manufacturing:** Scheduling acquires greater importance in job order manufacturing.

18. What do you mean by Time Study? Write down the steps required for Time Study in detail?

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

- The steps for time study are as follows
  - Select the job to be studied
  - Breakdown the job into smallest possible elements
  - Inform the worker and define the best method
  - Observe the time for appropriate number of cycles
  - Determine the average cycle time
  - Determine the normal time
  - Determine the standard time using average cycle and normal time



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, I Semester,**  
**End-Sem. Examination**

**Course Code: SMS1115**

**Time: 2 Hours**

**Course Name: Assembly (Open Elective)**

**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. Jam Nut is also called.
  - (a) Lock nut
  - (b) Castle nut
  - (c) A & B both
  - (d) None of the above
2. Non-metallic gaskets are made up of
  - (a) Wood & Brass
  - (b) Aluminum & Rubber
  - (c) Rubber & Asbestos
  - (d) All of the above
3. The joints which can be assembled and dismantled whenever required
  - (a) Temporary Joint
  - (b) Rivet joint
  - (c) A & B Both
  - (d) None of the above
4. Example of semisolid lubricant is
  - (a) Mineral oil
  - (b) Grease
  - (c) Graphite
  - (d) Vegetable oil
5. Set screw is used to.
  - (a) Prevent the relative motion between two part
  - (b) Prevent loosening of threads between the nut and screw
  - (c) A & B Both
  - (d) None of the above
6. Which gears Teeth are parallel to axis of shaft?
  - (a) Bevel Gear
  - (b) Spur gear



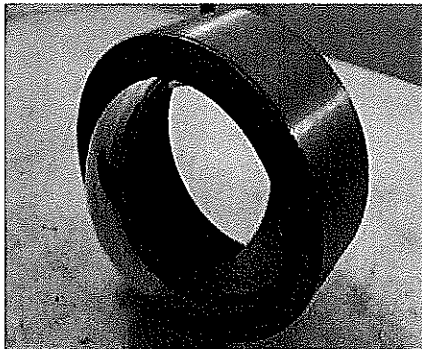
## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

- (c) All  
(d) None
7. Which gears teeth are at an angle with axis of shaft?  
(a) helical gear  
(b) Spur gear  
(c) All  
(d) None
8. Which mechanical element present between two bearing rings?  
(a) cage  
(b) races  
(c) Both  
(d) None
9. Choose the correct gear which can transmit power at 90 Degree to axis of shaft.  
(a) Spur gear  
(b) helical gear  
(c) bevel gear  
(d) none of the above
10. Choose the correct name of mechanical element which have no head and thread on entire length.  
a) Stud  
b) Set screw  
c) A & B both  
d) None of the above

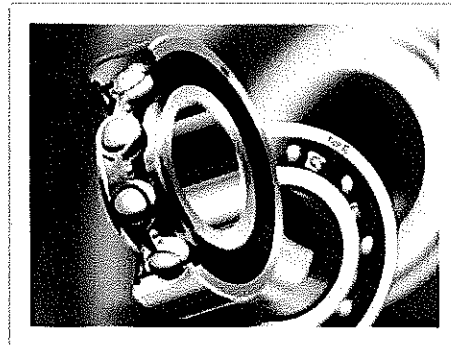
### Section – B

04X04 = 16 Marks

11. Write the name of the following parts. (3)



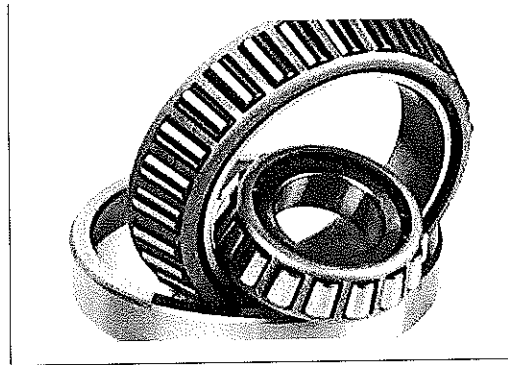
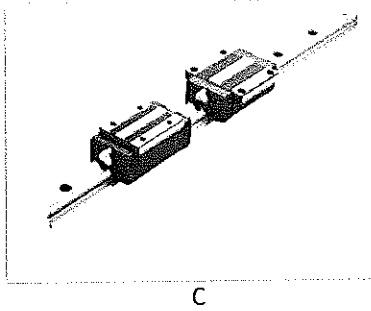
A



B



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

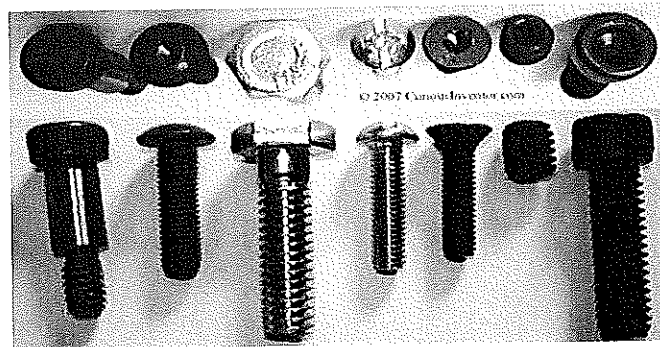


12. What is lubrication and what are the objectives of lubrication.
13. Write down the Advantages and Disadvantages of v-belt over flat belt drive.
14. What is screw locking device? Why we are using locking device also write the type of locking device?

### Section – C

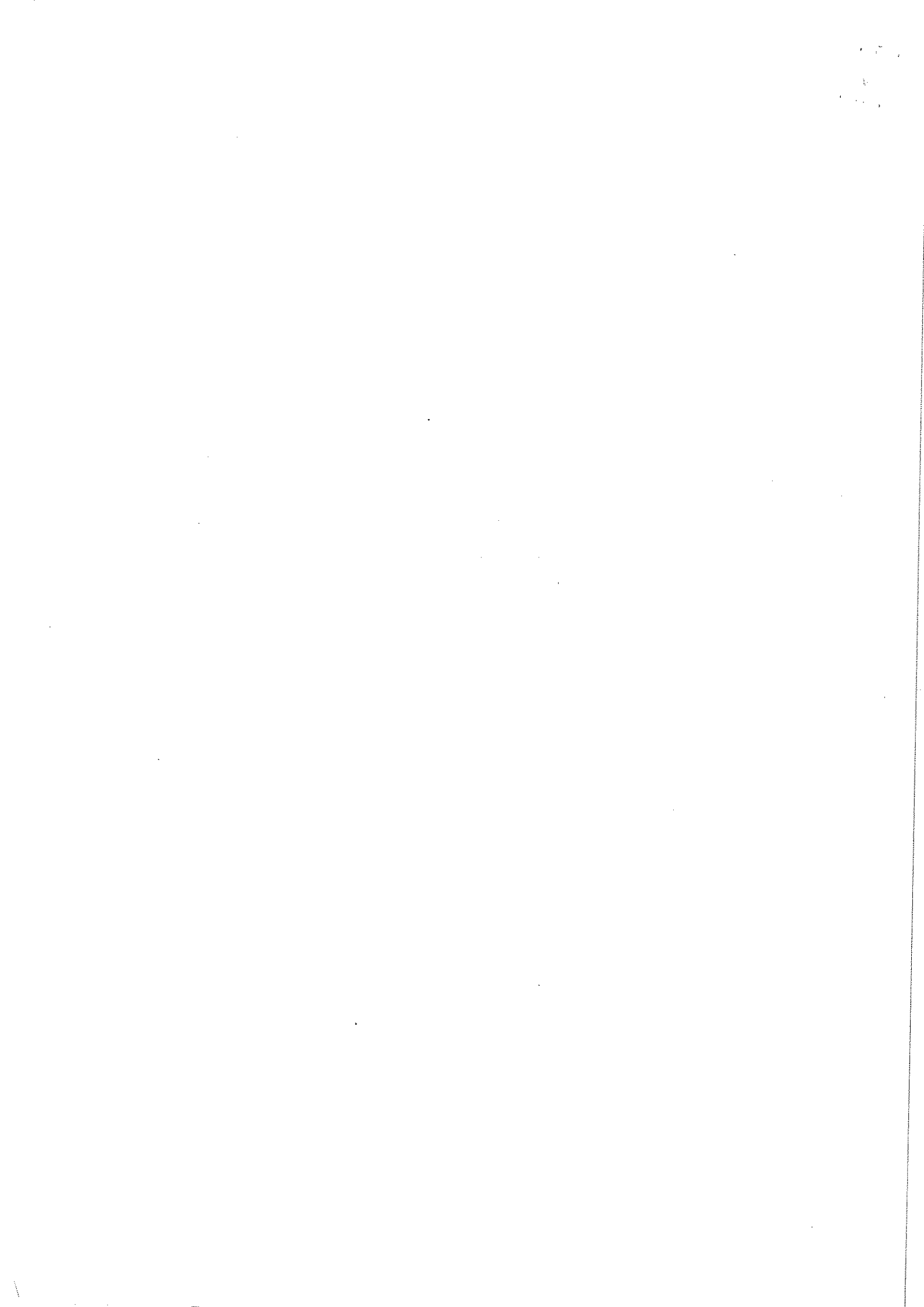
04X06 = 24 Marks

15. What is the dowel pin and oil seal? Also write the two function of oil seal.
16. Write down the names of any five from the picture given below.



17. Write the advantage and disadvantages of timing belt.
18. What is gear? Explain the spur gear.

*BS*





# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, I Semester,**  
**End-Sem. Examination**

**Course Code: SMS1115**

**Course Name: Assembly (Open Elective)**

**Time: 2 Hours**

**Max. Marks: 50**

**Answer Key**  
**Section – A**

10X01 = 10 Marks

1. Jam Nut is also called. -
  - (a) Lock nut
2. Non-metallic gaskets are made up of
  - (c) Rubber & Asbestos
3. The joints which can be assembled and dismantled whenever required:
  - (a) Temporary joint
4. Example of semisolid lubricant is
  - (b) Grease
5. Set screw is used to.
  - (c) Prevent the relative motion between two part
6. Which gears Teeth are parallel to axis of shaft.
  - (b) Spur gear
7. Which gears teeth are at an angle with axis of shaft
  - (b) Spur gear
8. Which mechanical element present between two bearing rings
  - (b) Races
9. Choose the correct gear which can transmit power at 90 Degree to axis of shaft.
  - (c) Bevel gear
10. Choose the correct name of mechanical element which have no head and thread on entire length.
  - (c) A & B both

**Section – B**

04X04 = 16 Marks

11. Write the name of the following parts. (4)

- A. Plain Bearing
- B. Deep groove ball bearing
- C. Linear Guideways
- D. Tapered roller

12. What is lubrication and what are the objectives of lubrication

Ans. Lubrication is science of reducing friction by application of suitable substance called lubricant between the rubbing surfaces of bodies having relative motion.



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

- To reduce friction.
- To carry away heat generated due to friction.
- To reduce/prevent wear.
- Protection against corrosion.

13. Write down the Advantages and Disadvantages of v-belt over flat belt drive.

### Advantages

- Friction is high due to wedge action, results in power transmitting capacity.
- Slip is negligible due to wedge action.
- Can operate vertically also.

### Disadvantages

- Cost is high, creep is high.
- Construction is complicated.

14. What is screw locking device? Why we are using locking device also write the type of locking device?

Locking devices are used to prevent loosening of threads between the nut and screw. Fastening become loose when subjected to cyclic and impact loads. Loosening is due to reduction of friction force in the threads due to consecutive expansion and contraction of the bolt resulting from fluctuating axial load.

**JAM NUT (lock nut)**

**CASTLE NUT with a split pin**

**SPLIT NUT**

**LOCKING WITH SETSCREW**

### Section – C

04X06 = 24 Marks

15. What is the dowel pin

**Answer:** They are short, cylindrical rods made of various materials including wood, metal, Plastic.

**Dowell pins can be tapered, grooved, slotted**

### Oil seal-

An oil seal is a mechanical device, which is used to prevent leakage of fluid between two machine components

### Function of oil seal

To prevent leakage of expensive lubricating oils from the transmission system.

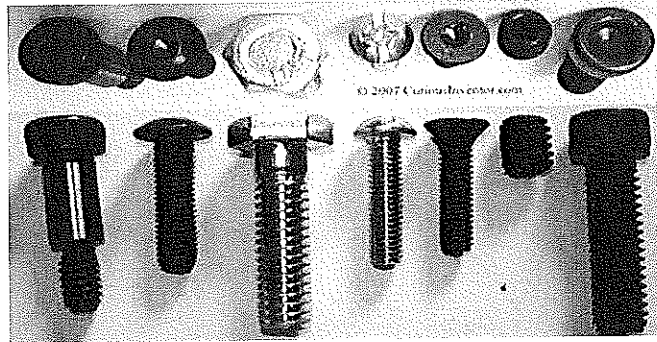
To prevent the entry of foreign particles like dust or abrasive material into the operating system



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

16. Write down the names of any five from the picture given below. (5)

- a. Set screw
- b. Button head cap screw
- c. CSK screw
- d. Button head cap screw
- e. Hexa head cap screw
- f. Round head slotted cap screw



17.

### Advantages

When correctly tension-ed, they have no slippage.

Less noise.

Lubrication is not necessary.

Needs least tension of all belts and most efficient.

### Disadvantages

Relatively high cost.

Less protection from overload.

No length adjustment

18. Gears are toothed wheels which transmit power and motion by successive engagement of teeth.

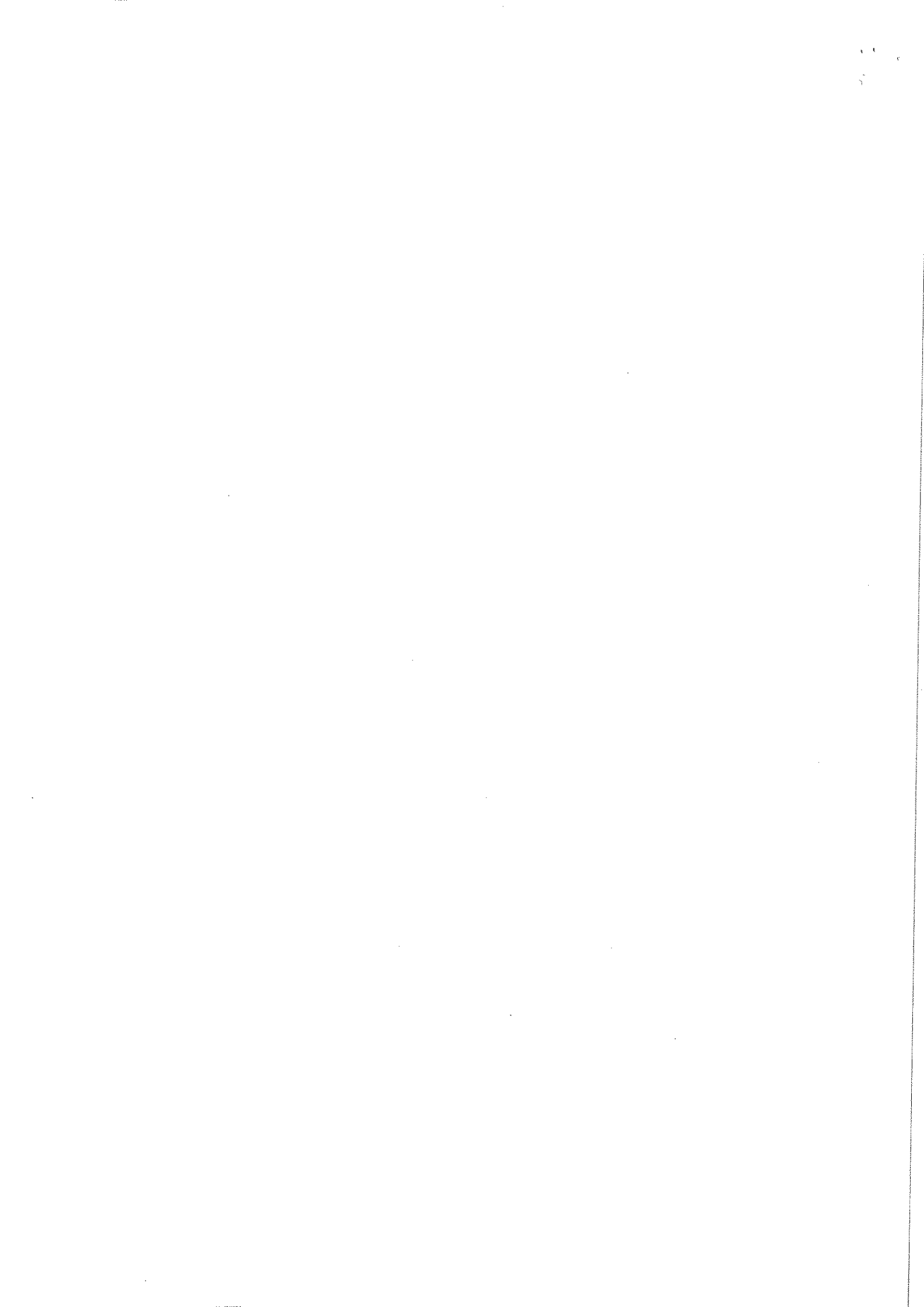
They are generally used when the distance between the shafts is less.

### **Spur gear**

Teeth are parallel to axis of shaft.

Impose radial load on shafts.

Can be used only where shafts are parallel.





# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, I Semester,**  
**End-Sem. Examination**

**Course Code: SMS1115**

**Time: 2 Hours**

**Course Name: Assembly (Open Elective)**

**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. Example of semi solid lubricant is
  - (a) Mineral oil
  - (b) Grease
  - (c) Graphite
  - (d) Vegetable oil
2. Non-metallic gaskets are made up of
  - (a) Wood & Brass
  - (b) Aluminum & Rubber
  - (c) Rubber & Asbestos
  - (d) All of the above
3. The joints which can be assembled and dismantled whenever required
  - (a) Temporary Joint
  - (b) Rivet joint
  - (c) A & B Both
  - (d) None of the above
4. Jam Nut is also called.
  - (a) lock nut
  - (b) Castle nut
  - (c) A & B both
  - (d) None of the above
5. Set screw is used to.
  - (a) Prevent the relative motion between two part
  - (b) Prevent loosening of threads between the nut and screw
  - (c) A & B Both
  - (d) None of the above
6. Which gears Teeth are parallel to axis of shaft?
  - (a) Bevel Gear
  - (b) Spur gear



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

- (c) Both  
(d) None
7. Which gears teeth are at an angle with axis of shaft?  
(a) helical gear  
(b) Spur gear  
(c) Both  
(d) None
8. Which mechanical element present between two bearing rings?  
(a) cage  
(b) races  
(c) Both  
(d) None
9. Choose the correct gear which can transmit power at 90 Degree to axis of shaft.  
(a) Spur gear  
(b) helical gear  
(c) bevel gear  
(d) none of the above
10. Choose the correct name of mechanical element which have no head and thread on entire length.  
a) Stud  
b) Set screw  
c) A & B both  
d) None of the above

### Section – B

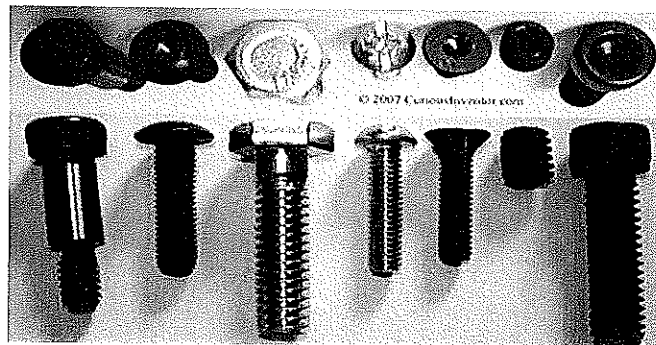
04X04 = 16 Marks

11. Explain the chain drive.  
12. What is lubrication and what are the objectives of lubrication.  
13. Write down the Advantages and Disadvantages of v-belt over flat belt drive.  
14. What is screw locking device? Why we are using locking device also write the type of locking device?

### Section – C

04X06 = 24 Marks

15. What is the dowel pin and oil seal? Also write the two function of oil seal.  
16. Write down the names of any five from the picture given below.



17. Write the advantage and disadvantages of timing belt.  
18. What is gear and explain the spur gear.

*BS*



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, I Semester,**  
**End-Sem. Examination**

**Course Code: SMS1115**

**Course Name: Assembly (Open Elective)**

**Time: 2 Hours**

**Max. Marks: 50**

**Answer Key**  
**Section – A**

10X01 = 10 Marks

1. Example of semisolid lubricant is-  
(b) Grease
2. Non-metallic gaskets are made up of  
(c) Rubber & Asbestos
3. The joints which can be assembled and dismantled whenever required:  
(a) Temporary joint
4. Jam Nut is also called.  
(d) Lock nut
5. Set screw is used to.  
(c) Prevent the relative motion between two part
6. Which gears Teeth are parallel to axis of shaft.  
(b) Spur gear
7. Which gears teeth are at an angle with axis of shaft  
(b) Spur gear
8. Which mechanical element present between two bearing rings  
(b) Races
9. Choose the correct gear which can transmit power at 90 Degree to axis of shaft.  
(c) Bevel gear
10. Choose the correct name of mechanical element which have no head and thread on entire length.  
(c) A & B both

**Section – B**

04X04 = 16 Marks

11. Explain the chain drive.

A chain can be defined as a series of links connected by pin joint.

Positive drive.

For a properly lubricated chain, efficiency is from 96% to 98%.

Does not require initial tension.

Used in bicycle, motorcycle and in other automobile vehicles also and many more.



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

12. What is lubrication and what are the objectives of lubrication

Ans. Lubrication is science of reducing friction by application of suitable substance called lubricant between the rubbing surfaces of bodies having relative motion.

To reduce friction.

To carry away heat generated due to friction.

To reduce/prevent wear.

Protection against corrosion.

13. Write down the Advantages and Disadvantages of v-belt over flat belt drive.

### Advantages

- Friction is high due to wedge action, results in power transmitting capacity.
- Slip is negligible due to wedge action.
- Can operate vertically also.

### Disadvantages

- Cost is high, creep is high.
- Construction is complicated.

14. What is screw locking device? Why we are using locking device also write the type of locking device?

Locking devices are used to prevent loosening of threads between the nut and screw. Fastening become loose when subjected to cyclic and impact loads. Loosening is due to reduction of friction force in the threads due to consecutive expansion and contraction of the bolt resulting from fluctuating axial load.

JAM NUT (lock nut)

CASTLE NUT with a split pin

SPLIT NUT

LOCKING WITH SETSCREW

## Section – C

04X06 = 24 Marks

15. What is the dowel pin

Answer: They are short, cylindrical rods made of various materials including wood, metal, Plastic.

Dowell pins can be tapered, grooved, slotted

**Oil seal-**

An oil seal is a mechanical device, which is used to prevent leakage of fluid between two machine components

**Function of oil seal**



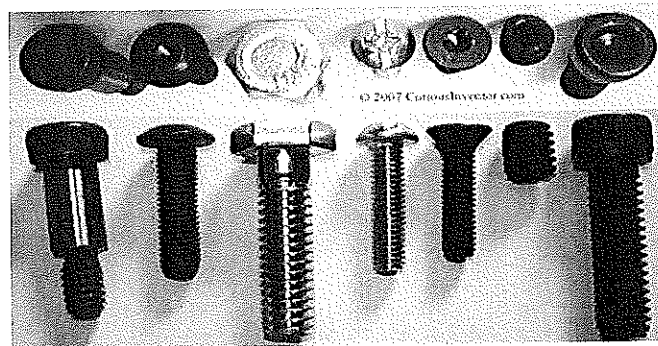
## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

To prevent leakage of expensive lubricating oils from the transmission system.

To prevent the entry of foreign particles like dust or abrasive material into the operating system

16. Write down the names of any five from the picture given below. (5)

- a. Set screw
- b. Button head cap screw
- c. CSK screw
- d. Button head cap screw
- e. Hexa head cap screw
- f. Round head slotted cap screw



17.

### Advantages

When correctly tension-ed, they have no slippage.

Less noise.

Lubrication is not necessary.

Needs least tension of all belts and most efficient.

### Disadvantages

Relatively high cost.

Less protection from overload.

No length adjustment

18. Gears are toothed wheels which transmit power and motion by successive engagement of teeth.

They are generally used when the distance between the shafts is less.

### **Spur gear**

Teeth are parallel to axis of shaft.

Impose radial load on shafts.

Can be used only where shafts are parallel.





# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-A

Registration No.: .....

**School of Manufacturing Skills**  
**Session: 2021-22 (Summer Semester)**  
**B. Voc. Program, III & V Semester,**  
**End-Sem. Examination**

**Course Code: SMS1116**

**Time: 2 Hours**

**Course Name: Basics of Handskills (Open Elective)**

**Max. Marks: 50**

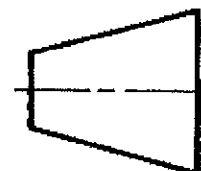
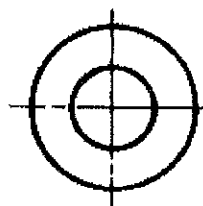
**Instructions:**

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. Vernier caliper is suitable for
  - a) External dimension measurement
  - b) Internal dimension measurement
  - c) Depth measurement
  - d) All of the above
2. What would be the procedure for tapping process?
  - a) Drill – core drill – tapping
  - b) Spot drill – drill – CSK –tapping
  - c) Spot drill – drill – CSK – core drill – tapping
  - d) None of the above
3. Which of the following indicates the enlarging scale?
  - a) 3:3
  - b) 1:5
  - c) 5:2
  - d) None of the above
4. Point angle of a twist drill is?
  - a) 45°
  - b) 120°
  - c) 118°
  - d) 90°
5. Identify the projection view shown in the picture
  - a) First angle
  - b) Third angle
  - c) Cannot be determined
  - d) Both a & b





## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

6. What is the full form of RPM?
- Revolution per motion
  - Revolution per minute
  - Reciprocal per minute
  - Reciprocal per motion
7. How many axes are there in the Fehlmann Picomax -20 drilling machine?
- 4 axis
  - 2 axis
  - 3 axis
  - 5 axis
8. Point angle for spot drill
- 45
  - 60
  - 75
  - 90
9. Vernier caliper is suitable for
- External dimension measurement
  - Internal dimension measurement
  - Depth measurement
  - All of the above
10. Point angle of a twist drill is?
- 45°
  - 120°
  - 118°
  - 90°

### Section- B

04X04= 16 Marks

- Write the any five tool holders name.
- Explain the title block in the drawing.
- Write the parts name of the Vernier caliper with neat and clean diagram.
- Define the facing and turning operation.

### Section- C

04X06= 24 Marks

- Derive the formula to calculate the chamfer value for making radius by hand.
- Explain the rules and techniques for filing.
- Define the following;
  - Drilling
  - Reaming
  - Tapping
  - Countersinking
- A. Describe the lathe machine (Gedee weiler) with diagram and nomenclature.  
B. what operations would be performed on Lath Machine (Gedee weiler)

1.



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-B

Registration No.: .....

## School of Manufacturing Skills

Session 2021-22 (Summer Semester)

B. Voc. Program, I Semester

End-Sem. Examination

Course Code: SMS1116

Time: 2 Hour

Course Name: Basics of Handskills  
(open elective)

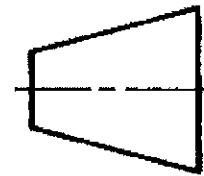
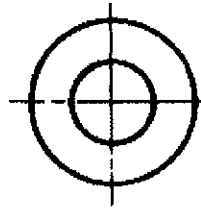
Max. Marks: 50

### Answer Key

Section- A

10X1= 10 Marks

1. What would be the procedure for tapping process?
  - a) Drill – core drill – tapping
  - b) Spot drill – drill – CSK –tapping**
  - c) Spot drill – drill – CSK – core drill – tapping
  - d) None of the above
2. Which of the following indicates the enlarging scale?
  - a) 3:3
  - b) 1:5
  - c) 5:2**
  - d) None of the above
3. Identify the projection view shown in the picture
  - a) First angle
  - b) Third angle**
  - c) Cannot be determined
  - d) Both a & b



4. Which of the following is the part of bench vice?
  - a) Anvil plate
  - b) Lead screw
  - c) Spindle
  - d) All of the above**
5. Bed of the drilling machine (fehlmann) is made of which material
  - a) High speed steel
  - b) Carbide
  - c) Cast iron**
  - d) Mild steel
6. What is the full form of RPM?
  - a) Revolution per motion
  - b) Revolution per minute**



## BHARTIYA SKILL DEVELOPMENT UNIVERSITY

- c) Reciprocal per minute
  - d) Reciprocal per motion
7. How many axes are there in the Fehlmann Picomax -20 drilling machine?
- a) 4 axis
  - b) 2 axis
  - c) **3 axis**
  - d) 5 axis
8. Point angle for spot drill
- a) 45
  - b) 60
  - c) 75
  - d) **90**
9. Vernier caliper is suitable for
- a) External dimension measurement
  - b) Internal dimension measurement
  - c) Depth measurement
  - d) **All of the above**
10. Point angle of a twist drill is?
- a) 45°
  - b) 120°
  - c) **118°**
  - d) 90°

### Section- B

04X4= 16 Marks

11. Write the any five tool holders name?

Answer:

1. Drill chuck
2. Sleeve
3. Tap holder
4. Collet holder
5. Pin holder

12. Explain the title block in the drawing.

Answer:

It has the following information

1. Material code and dimensions
2. Scale
3. Projection view
4. Organization information
5. modification

13. Write the parts name of the Vernier caliper with neat and clean diagram.

Answer:

Main scale



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Vernier scale

Depth bar

External jaws

Internal Jaws

14. Define the facing and turning operation.

Answer:

In turning, facing is metal removal process to reduce the length of workpiece.

Turning is a process to reduce the diameter of the workpiece.

## Section- C

04X6= 24 Marks

15. Derive the formula to calculate the chamfer value for making radius by hand.

Answer:

Derivation to Calculate Chamfer Value for Radius-

Let:  $AB = BC = AD = R$

So in triangle ABC, angle C and A is of  $45^\circ$

$$AC^2 = AB^2 + BC^2 = R^2 + R^2 = 2R^2$$

$$AC = R\sqrt{2} = R \times 1.414 = 1.414R$$

$$AC = AD + CD \rightarrow CD = AC - AD \rightarrow CD = 1.414R - R = 0.414R$$

In triangle FDC –

Angle D is of  $90^\circ$ , C is of  $45^\circ$ , so angle F is also of  $45^\circ$

$$\text{Then, } CF^2 = FD^2 + CD^2$$

$$\rightarrow (0.414R)^2 + (0.414R)^2$$

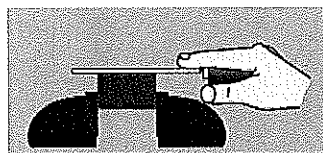
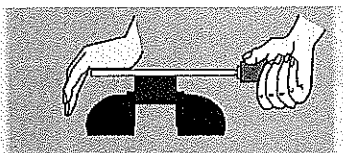
$$CF = 0.414R\sqrt{2} = 0.414R \times 1.414$$

$$CF = 0.5853R = CF \approx 0.6R$$

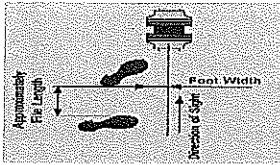
16. Explain the rules and techniques for filing.

Answer:

- Clamp the workpiece properly, 70% part should be covered in clamping (as per workpiece clamping rules)
- Hold the file as per instructions



- Take the proper posture and gesture (running position).
- The distance between the feet and the hands should be equal.



- Start filing diagonally at 20 degrees.
- Correct force distribution and movement direction
- The file only removes material in forward direction so exert pressure only in the cutting direction
- Inspect the workpiece as per need.

17. Define the following;

- a) Drilling                      b) Reaming                      c) Tapping                      d) Countersinking

Answer:

- a) Drilling – It is a process of making hole onto the work piece.  
 b) Reaming – It is a process of enlarging a hole with high surface quality and within tolerance of 10 – 20 microns.  
 c) Tapping – It is a process of making internal thread with a special tool named 'tap'.  
 d) CSK – It is a process of making a conical shape at the entrance of the hole.

18. A. Describe the lathe machine (Gedee weiler) with diagram and nomenclature.

B. what operations would be performed on Lath Machine (Gedee weiler)

A. Answer:

- |                      |               |
|----------------------|---------------|
| 1. Bed               | 4. Apron      |
| 2. Z slide & X slide | 5. Head Stock |
| 3. Lead screw        | 6. Tail Stock |

B. Answer:

- Turning
- Facing
- Grooving
- Threading
- Knurling
- Drilling & Boring