



**School of Manufacturing Skills**

**Session: 2021-22 (Winter Semester)**

**B. Voc. Program, III Semester,**

**1<sup>st</sup> In-Sem. Examination**

**Course Code: SMS1301**

**Course Name: CNC Milling**

**Time: 1 Hour**

**Max. Marks: 20**

**Instructions:**

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

**Section – A**

05X01 = 05 Marks

1. What is the full form of CNC?
  - a) Computer Number Control
  - b) Computer Number Center
  - c) Computer Numerical Control
  - d) Computer Numerical Code
2. RESET is used to-
  - a) Cancel an alarm
  - b) Alter word
  - c) Delete input
  - d) None
3. EOB is -
  - a) End of Block
  - b) Enter of Block
  - c) Both
  - d) None
4. G00 is defined as-
  - a) Linear Interpolation
  - b) Circular Interpolation
  - c) Rapid Traverse
  - d) Dwell
5. G04 is defined as -
  - a) Linear Interpolation
  - b) Circular Interpolation
  - c) Rapid Traverse
  - d) Dwell



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## Section – B

03X02 = 06 Marks

6. What is the difference between MDI mode and Memory Mode?
7. Explain the use of Edit Mode.
8. What is the use of DRY RUN?

## Section – C

03X03 = 09 Marks

9. Write down the program structure used in CNC Milling.
10. Explain the Reference Points of the EMCO Milling Machines.
11. Explain the difference between G02 and G03 with syntax.



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Registration No.: .....

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Course Code: SMS1301

Course Name: CNC Milling

Time: 1 Hour

Max. Marks: 20

### Answer Key Section – A

05X01 = 05 Marks

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  - a) Computer Number Control
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  - c) **Computer Numerical Control**
  - d) Computer Numerical Code
2. RESET is used to-
  - a) **Cancel an alarm**
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  - c) Both
  - d) None
4. G00 is defined as-
  - a) Linear Interpolation
  - b) Circular Interpolation
  - c) **Rapid Traverse**
  - d) Dwell
5. G04 is defined as -
  - a) Linear Interpolation
  - b) Circular Interpolation
  - c) Rapid Traverse
  - d) **Dwell**

### Section – B

03X02 = 06 Marks

6. What is the difference between MDI mode and Memory Mode?

Ans. In MDI mode, temporary programs are executed which vanishes after one-time execution. In Memory mode, permanent programs are executed which are already saved in the computer.
7. Explain the use of Edit Mode.



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Ans. All new programs are prepared in Edit Mode only. Also editing in existing programs is possible only in edit mode.

8. What is the use of DRY RUN?

Ans. DRY RUN is used to test run of programs.

### Section – C

03X03 = 09 Marks

9. Write down the program structure used in CNC Milling.

#### Program Structure

CNC programming for machine tools according to DIN 66025 is used.

The CNC program is a sequence of program blocks which are stored in the control.

With machining of workpieces these blocks will be read and checked by the computer in the programmed order.

The corresponding control signals will be sent to the machine.

The CNC program consists of:

- Program number
- CNC blocks
- Words
- Addresses
- number combinations (for axis addresses partly with sign)

10. Explain the Reference Points of the EMCO Milling Machines.

#### Reference Points of the EMCO Milling Machines

##### **M = Machine zero point**

An unchangeable reference point established by the machine manufacturer.

Proceeding from this point the entire machine is measured.

At the same time "M" is the origin of the coordinate system.

##### **R = Reference point**

A position in the machine working area which is determined exactly by limit switches. The slide positions are reported to the control by the slides approaching the "R".

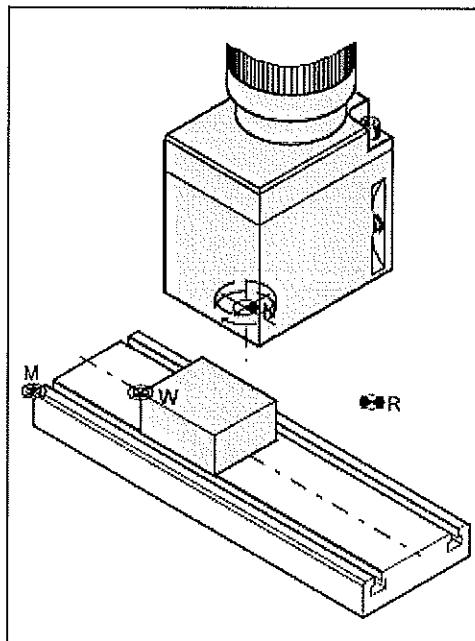
Required after every power failure.

##### **N = Tool mount reference point**

Starting point for the measurement of the tools. "N" lies at a suitable point on the tool holder system and is established by the machine manufacturer.

##### **W = Workpiece zero point**

Starting point for the dimensions in the part program. Can be freely established by the programmer and moved as desired within the part program.



Reference points in the working area

11. Explain the difference between G02 and G03 with syntax.



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## G02 Circular Interpolation Clockwise

## G03 Circular Interpolation Counterclockwise

### Format

N... G02/G03 X... Y... Z... I... J... K... F...

or

N... G02/G03 X... Y... Z... R... F...

X, Y, Z... End point of the arc (abs. or incr.)

I, J, K... Incremental circle parameter

(distance from start point to the centre point, I is related to X, J to Y, K to Z)

R..... Radius of the arc (arc < semicircle with +R, > semicircle with -R), can be programmed instead of the circle parameter I, J, K

The tool will be traversed along the defined arc with the programmed feed F.

### Notes

The circular interpolation can be proceeded in the active plane only.

Programming the value 0 for I, J or K can be omitted.

The observation of G02, G03 occurs always vertical to the active plane.





**School of Manufacturing Skills**

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**B. Voc. Program, III Semester,**

**1<sup>st</sup> In-Sem. Examination**

**Course Code: SMS1305**

**Time: 1 Hour**

**Course Name: Material Science**

**Max. Marks: 20**

**Instructions:**

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

**Section – A**

05X01 = 05 Marks

1. Which one is a natural material?
  - (a) Plastic
  - (b) Glass
  - (c) Granite
  - (d) Ceramics
2. Carbon percentage available in steel-
  - (a) 0-2 %
  - (b) 2-4%
  - (c) 4-8 %
  - (d) None of these
3. Which one of these have higher density?
  - (a) Tungsten
  - (b) Lead
  - (c) Copper
  - (d) Aluminum
4. Which one of these have higher melting point temperature?
  - (a) Aluminum
  - (b) Tungsten
  - (c) Iron
  - (d) Copper
5. Which one is not an artificial material?
  - (a) Plastic
  - (b) Rubber
  - (c) Ceramics
  - (d) Wood



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## Section – B

03X02 = 06 Marks

6. Define the followings
  - (a) Melting point temperature
  - (b) Thermal conductivity
7. Define the followings?
  - (a) Machinability
  - (b) Weldability
8. Differentiate between elastic & plastic deformation.

## Section – C

03X03 = 09 Marks

9. Explain any three mechanical properties of metals.
10. Write down the classification of metals based on composition & properties.
11. Write down chemical properties of metals.



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## School of Manufacturing Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, III Semester,

1<sup>st</sup> In-Sem. Examination

Course Code: SMS1305

Course Name: Material Science

Time: 1 Hour

Max. Marks: 20

### Answer Key

#### Section – A

05X01 = 05 Marks

1. Which one is a natural material?
  - (a) Plastic
  - (b) Glass
  - (c) Granite**
  - (d) Ceramics
2. Carbon percentage available in steel.
  - (a) 0-2 %**
  - (b) 2-4%
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4. Which one of these have higher melting point temperature?
  - (a) Aluminum
  - (b) Tungsten**
  - (c) Iron
  - (d) Copper
5. Which one is not an artificial material?
  - (a) Plastic
  - (b) Rubber
  - (c) Ceramics
  - (d) Wood**

#### Section – B

03X02 = 06 Marks

6. Define the followings
  - (a) Melting point temperature: - **Temperature at which material starts melting into liquid known as melting temperature of the material.**



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(b) Thermal conductivity :- It is a physical property of material. When heat is flow from one end and it passes through the other end this behavior of material is call thermal conductivity

7. Define the followings?

(a) Machinability :-

There different types of material available in the world. Some material are not machinable and some material are very easy to machine for manufacturing these property of material known as machinability of material..

(b) Weldability

Welding is a metal joining process In welding processs some material are easy to join as their melting temp is low but some are very difficult to join this behavior of material is known as weldability

8. Differentiate between elastic & plastic deformation?

When an external force is applied on a material thus it changes it shape if the material gain it shape back after removing the force its known as elastic deformation. If the material broke down is known as plastic deformation

### Section – C

03X03 = 09 Marks

9. Explain any three mechanical properties of metals?

#### **Elastic-plastic deformation behaviour:**

A square bar made from unalloyed structural steel displays elastic as well as plastic deformation when it is bent.

The bar only partially springs back if it is strongly bent. A permanent plastic deformation remains. The material displays an elastic-plastic deformation under heavy load. Many materials display an elastic-plastic deformation under heavy load.

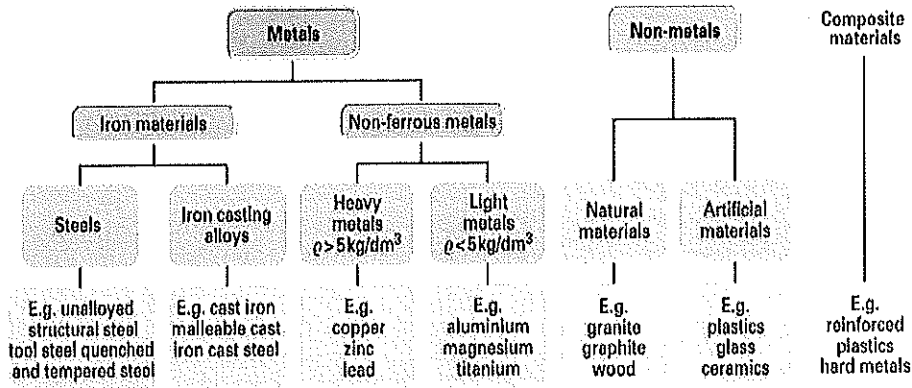
**Toughness:** Material is referred to as tough if its elastic-plastic deformation under heavy loading remains small and there is extreme resistance to deformation. Structural and stainless steels are examples of tough materials.

**Brittleness:** A material is referred to as brittle if it fractures into pieces when exposed to impact. Ceramic material and glass as well as some types of cast iron and incorrectly hardened steels are brittle.

10. Write down the classification of metals based on composition & properties?



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11. Write down chemical properties of metals?

### Corrosion Stability:

It describes the behaviour of a material under the destructive influence of humid air, industrial atmosphere, polluted water or other aggressive substances. The destruction of a material starting at its surface due to chemical and electrochemical processes is referred to as corrosion

### Flammability:

The flammability of some materials, such as plastics, may also have to be taken into account when selecting a material.

### Scaling resistance:

It describes the reaction behaviour of materials at high temperatures.





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**Course Code: SMS1307**

**Time: 1 Hour**

**Course Name: Manufacturing Processes**

**Max. Marks: 20**

**Instructions:**

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

**Section – A**

05X01 = 05 Marks

1. Metal forming is a process in which the metal is deformed plastically to get into the desired shape.
  - a. True
  - b. False
2. The process of plastically deforming a metal above the metal's recrystallization temperature is:
  - a. Cold working
  - b. Rolling
  - c. Hot working
  - d. Extrusion
3. Rolling is a forming process in which thickness of the metal plate is decreased by increasing its length.
  - a. True
  - b. False
4. Nature of Force applied in the bulk forming is:
  - a. Tensile
  - b. Compressive
  - c. Shear
  - d. All
5. Which of the following casting techniques is the best technique for casting tubes and hollow pipes?
  - a. Die Casting
  - b. Slush Casting
  - c. Centrifugal Casting
  - d. Investment Casting



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## Section – B

03X02 = 06 Marks

6. Define Manufacturing Process and Also classify it with neat and clean chart.
7. Define the following:
  - b) Rolling
  - c) Extrusion
  - d) Forging
8. Explain the pattern allowance.

## Section – C

03X03 = 09 Marks

9.
  - a. Define metal casting process and write the basic six steps for casting.
  - b. Define the following with diagram.
    - Pattern
    - Runner
    - Gate
    - Drag & Cope
10. Describe the sand casting in details with diagram.
11. Describe the investment casting in details with diagram.



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## School of Manufacturing Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, III Semester,

1<sup>st</sup> In-Sem. Examination

Course Code: SMS1307

Time: 1 Hour

Course Name: Manufacturing Process

Max. Marks: 20

### Answer Key Section – A

05X01 = 05 Marks

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  - a. True
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2. The process of plastically deforming a metal above the metal's recrystallization temperature.?
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### Section – B

03X02 = 06 Marks

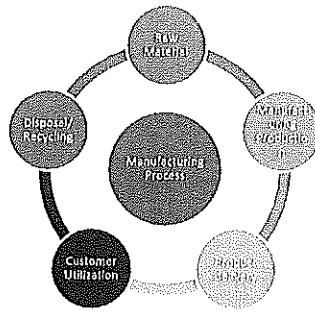
6. Define Manufacturing Process and Also classify it with neat and clean chart?

Answer:

Manufacturing is the production of goods through the use of labour, machinery, tools and biological or chemical processing or formulation. Manufacturing can either mean transforming raw materials into finished goods on a large scale, or the creation of more complex items by selling basic goods to manufacturers for the production of items such as automobiles, aircraft, or household appliances.



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7. Define the following with diagram of each process:

- Rolling
- Extrusion
- Forging

Answer:

- Rolling:** Rolling is a forming process in which thickness of the metal plate is decreased by increasing its length.
- Extrusion:** Extrusion is a process where a material undergoes plastic deformation by the application of a force causing that material to flow through an orifice or die.
- Forging:** Forging is a manufacturing process involving the shaping of a metal through hammering, pressing, or rolling

8. Explain the pattern allowance.

There are the following types of pattern allowances are used in the casting process.

- Shrinkage Allowance
- Draft Allowance
- Machining Allowance
- Deformation or Camber Allowance
- Shake or Rapping Allowance

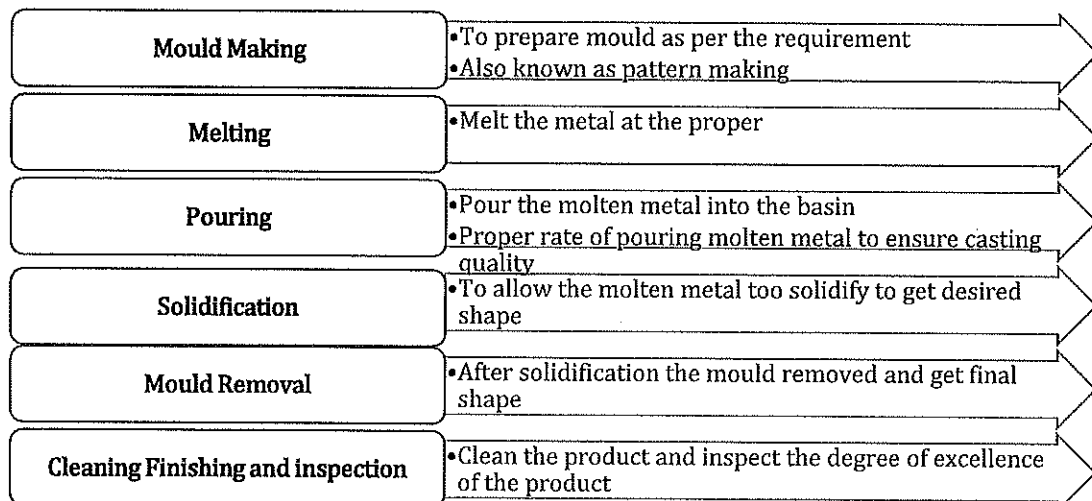
## Section – C

03X03 = 09 Marks

9.

a. Define metal casting process and write the basic six steps for casting.

Answer: Casting means pouring molten metal into a mold with a cavity of the shape to be made, and allowing it to solidify. When solidified, the desired metal object is taken out from the mold either by breaking the mold or taking the mold apart. The solidified object is called the casting





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b. Define the following with diagram.

- Pattern
- Runner
- Gate
- Drag & Cope

Answer:

- Pattern –It is replica of Mould
- Runner\_ It is a way to flow molten metal into the cavity
- Gate- A point of entering into cavity to fill the mould
- Drag & Cope- The complete process of casting is divided into two parts, first is cope and second is drag

10. Describe the sand casting in details with diagram. And also write the process steps.

Answer:

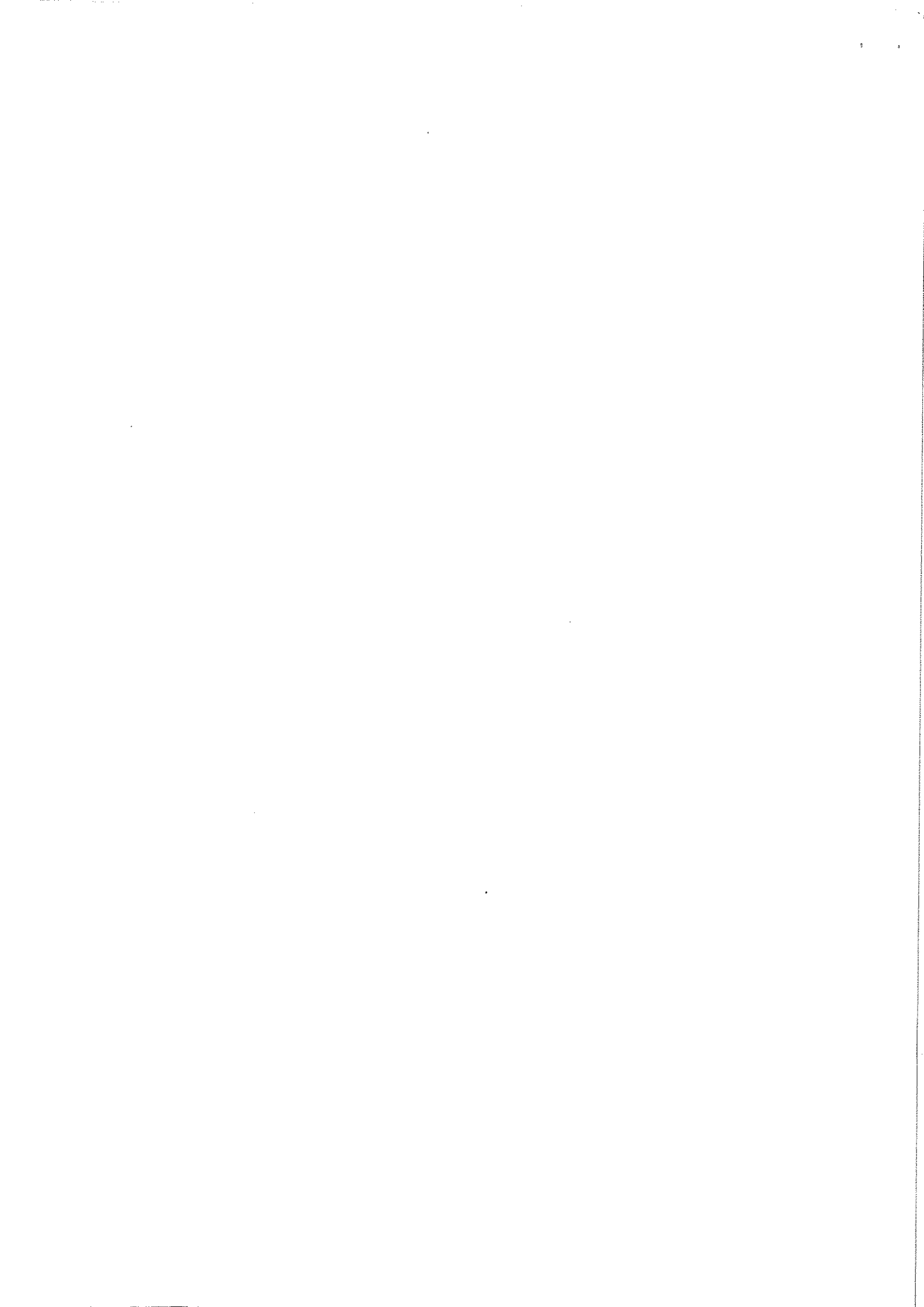
- In sand casting which is also known as sand molded casting, an object is produced by sand mold. The process involves pouring of the molten metal in to the mold cavity. The molten metal is then cooled to the room temperature. The metal is solidified. After cooling, the metal object is separated from the mold.
- Mainly Green or Natural and Synthetic Sands are used
- Before making patterns these thing should be kept in mind.
  - Pattern material.
  - Pattern Allowances
  - Cost of making pattern

11. Describe the investment casting in details with process steps.

Answer:

Investment casting is a manufacturing process in which a wax pattern is coated with a refractory ceramic material. Once the ceramic material is hardened its internal geometry takes the shape of the casting. The wax is melted out and molten metal is poured into the cavity where the wax pattern was. The metal solidifies within the ceramic mold and then the metal casting is broken out. This manufacturing technique is also known as the lost wax process

Dental fixtures, gears, cams, ratchets, jewelry, turbine blades, machinery components and other parts of complex geometry.





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**1<sup>st</sup> In-Sem. Examination**

**Course Code: GEN1302**

**Time: 1 Hour**

**Course Name: Computer Aided Drawing**

**Max. Marks: 20**

**Instruction:**

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

05X01 = 05 Marks

Q1. "A picture is worth more than a thousand words". Which of the following engineering drawing fundamentals is put in light by this statement?

- a) importance of computer graphics in an engineering drawing
- b) importance of graphics over text in an engineering drawing
- c) importance of art over text in an engineering drawing
- d) None of the above

Q2. How many dimensions are required to represent an engineering drawing in its physical form?

- a) Two dimensions
- b) Three dimensions
- c) One dimension
- d) more than three dimensions

Q3. Which among the following is the correct full form of GD&T?

- a) Geometric dimensioning and tolerancing
- b) General dimensioning and tolerancing
- c) Geometric dimensioning and tolerance
- d) Geometric dimension and tolerance

Q4. Which of the following best describes the role of computer graphics in engineering drawing

- a) It revolutionized the field of engineering drawing
- b) it creates no effect
- c) it degraded the quality of engineering drawing
- d) can't say anything



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Q5. 0.001m is equivalent to \_\_\_\_\_ microns.

- a) 0.1 micron
- b) 1 micron
- c) 10 microns
- d) None of these

## Section – B

03X02 = 06 Marks

Q6. What do you mean by engineering drawing?

Q7. Define the word graphics.

Q8. Give examples of any two drawing instruments.

## Section – C

03X03 = 09 Marks

Q9. Why do we choose graphics over text as a medium to represent engineering drawing?

Q10. Differentiate between drawing instruments and accessories with proper examples.

Q11. Differentiate between Engineering drawing and Artistic drawing with the help of diagrams.



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**Course Code: GEN1302**

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**Course Name: Computer Aided Drawing**

**Max. Marks: 20**

**Answer Key**

**Section – A**

05X01 = 05 Marks

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- a) It revolutionized the field of engineering drawing**
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- a) 0.1 micron
- b) 1 micron**
- c) 10 microns
- d) None of these



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## Section – B

03X02 = 06 Marks

Q6. What do you mean by engineering drawing?

Ans: Engineering drawing is the graphical means of expressing technical details without the barrier of any language.

Q7. Define the word graphics?

Ans: Pictures, design and computer art together constitutes the word graphics.

Q8. Give examples of any two drawing instruments?

Ans: Divider and Compass

## Section – C

03X03 = 09 Marks

Q9. Why do we choose graphics over text as a medium to represent engineering drawing?

Ans: We have chosen graphics over text as a medium to represent engineering drawing because of the following reasons

1. understanding graphics require no prior knowledge
2. graphics in short conveys way more information than text
3. unlike text graphics have no language barrier

Q10. Differentiate between drawing instruments and accessories with proper examples?

Ans:

Instruments	Accessories
1.Prime work doer	1.Increase instruments performance
2.work cant be done without instruments	2.Work can be done but with decrease performance
3.For drawing pencil is instruments	3.For drawing eraser is accessories

Q11. Differentiate between Engineering drawing and Artistic drawing with the help of diagrams?

S.no.	Points of difference	Engineering drawing	Artistic drawing
1.	Technical information	It contains technical information Eg: dimensions, symbols and notes	It contains no technical information
2.	manufacturability	It can be manufactured easily in workshops	It can't be manufactured
3.	understandability	It can be understand by technical persons only	It can be understand by all types of persons
4.	examples	diagram	diagram



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

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## School of Manufacturing Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, III Semester,

1<sup>st</sup> In-Sem. Examination

Course Code: GEN1305

Time: 1 Hour

Course Name: Elementary Drawing Skills

Max. Marks: 20

### Instructions:

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

### Section – A

05X01 = 05 Marks

1. Drawing in an industry is not related to which stage?
  - a) Conceptual stage
  - b) Design stage
  - c) Modification stage
  - d) None of the above
2. Standard size of drawing sheet as per BIS for A3 sheet?
  - a) 841mm X 1189mm
  - b) 549mm X 841mm
  - c) 420mm X 594mm
  - d) 297mm X 420mm
3. Distance from the observer to the object is finite and the object is viewed from single point, is a characteristic of which view?
  - a) parallel view
  - b) prospective view
  - c) both (a) and (b)
  - d) none of the above
4. Which line one should use to show the cutting plane lines?
  - a) Long chain thick at end and thin elsewhere
  - b) Long chain thin at end and thick elsewhere
  - c) Short chain thick at end and thin elsewhere
  - d) None of the above
5. What is a purpose of hatching?
  - a) to show the presence of a material
  - b) to show the narrow areas
  - c) none of the above
  - d) both (a) and (b)



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### Section – B

03X02 = 06 Marks

6. Define parallel projection.
7. Define prospective projection.
8. What is elementary drawing?

### Section – C

03X03 = 09 Marks

9. Why do we need to elementary drawing?
10. What is the different between technical drawing and artistic drawing?
11. What information should be available in an Engineering Drawing?



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1<sup>st</sup> In-Sem. Examination

Course Code: GEN1305

Course Name: Elementary Drawing Skills

Time: 1 Hour

Max. Marks: 20

### Answer Key

#### Section – A

05X01 = 05 Marks

1. Drawing in an industry is not related to which stage?
  - (a) Conceptual stage
  - (b) Design stage
  - (c) Modification stage
  - (d) None of the aboveAns. (d) None of the above
2. Standard size of drawing sheet as per BIS for A3 sheet?
  - a) 841mm X 1189mm
  - b) 549mm X 841mm
  - c) 420mm X 594mm
  - d) 297mm X 420mmAns. (d) 297mm X 420mm
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  - a) parallel view
  - b) prospective view
  - c) both (a) and (b)
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4. Which line one should use to show the cutting plane lines?
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  - (c) Short chain thick at end and thin elsewhere
  - (d) None of the aboveAns. (a) Long chain thick at end and thin elsewhere
5. What is a purpose of hatching?
  - a) to show the presence of a material
  - b) to show the narrow areas
  - c) none of the above
  - d) both (a) and (b)Ans.: (a) to show the presence of a material



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

## Section – B

03X02 = 06 Marks

6. Define parallel projection?

Ans parallel projection

- Distance from the observer to the object is infinite; Projection lines are parallel and object is positioned at infinity.
- Less realistic but easier to draw

7. Define prospective projection?

Ans prospective projection

- Distance from the observer to the object is finite and the object is viewed from a single point projector are not parallel.
- Perspective projections mimic what the human eyes see, however, they are difficult to draw.

8. What is elementary drawing?

Ans

- Engineering Drawing is the Graphical means of expressing technical details without the barrier of language.
- It is the Universal Language for Engineers.

## Section – C

03X03 = 09 Marks

9. Why do we need to elementary drawing?

- It would just be impossible to communicate all necessary details about the Airbus A380 verbally or in writing – Illustration (picture/drawing) is useful.
- A Drawing is worth a thousand words.
- The Airbus A380 would be impossible to create without computer graphics and drawing models.
- Drawings are the road maps which show how to manufacture products and structures.

10. what is the different between technical drawing and artistic drawing?

Technical drawing	Artistic drawing
Technical drawing consists of dimensions, Scale, projection method	Artistic drawing does not consists of dimensions, Scale, projection method
It conveys the technical detail to accomplish or manufacture a part or structure	It expresses the emotions or conveys the feelings

11. What information should be available in an Engineering Drawing?



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**Shape of an object**

**Exact Sizes and tolerances of various parts of the object**

**The finish of the product**

**Machine cost**

**Machining sequence**

**The details of materials**

**Catalogue no. of the product**

**Date on which the drawing was made**

**The person who made the drawing**

**The company's name**

