BHARTIYA SKILL DEVELOPMENT UNIVERSITY

28

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

1st In-Sem. Examination

Course Code: GEN1302 **Time: 1 Hour**

Course Name: Computer Aided Drawing **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 01 Mark.
3. Section B contains 03 Questions. Each question carries 02 Mark.
4. Section C contains 03 Questions. Each question carries 03 Marks.

Section – A

05X01 = 05 Marks

1. Which among the following is darkest pencil of all?
   a) 2B
   b) 3B
   c) H
   d) 2H
2. Which among the following is the drawing standard followed in Germany?
   a) DIN
   b) ASME
   c) IS
   d) ISO
3. 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
4. Graphics constitutes of _____?
   a) Images
   b) Diagrams
   c) Designs
   d) A and C both
5. 0.05 mm is equivalent to _____ microns.
   a) 5 microns
   b) 50 microns
   c) 500 microns
   d) None of these

Section – B

03X02 = 06 Marks

6. What do you mean by engineering drawing?
7. Give two uses of divider.
8. Why does A0 size paper have exactly the size of 841 X 1189mm?

Section – C

03X03 = 09 Marks

9. What do you mean by layout of an engineering drawing explain with the help of diagram?
10. What information should be available in a layout of engineering drawing?
11. Differentiate between instruments and accessories with the help of diagram.

Set - A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

1st In-Sem. Examination

Course Code: GEN1302 | **Time: 1 Hour**

Course Name: Computer Aided Drawing | **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 01 Mark.
3. Section B contains 03 Questions. Each question carries 02 Mark.
4. Section C contains 03 Questions. Each question carries 03 Marks.

Answer Key A

Section – A

05X01 = 05 Marks

1. Which among the following is darkest pencil of all?
   a) 2B
   b) 3B
   c) H
   d) 2H
2. Which among the following is the drawing standard followed in Germany?
   a) DIN
   b) ASME
   c) IS
   d) ISO
3. 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
4. Graphics constitutes of _____?
   a) Images
   b) Diagrams
   c) Designs
   d) A and C both
5. 0.05 mm is equivalent to _____ microns.
   a) 5 microns
   b) 50 microns
   c) 500 microns
   d) None of these

Section – B

03X02 = 06 Marks

6. What do you mean by engineering drawing?

Ans: Engineering drawing is a graphical means of expressing technical details without the barrier of language. It is the universal language for engineers/technical (supervisor and operators) persons.

7. Give two uses of divider.

Ans: Two uses of divider are as follows:

1. It is used for indirect measurement
2. It is used for scribing purposes

8. Why does A0 size paper have exactly the size of 841 X 1189mm?

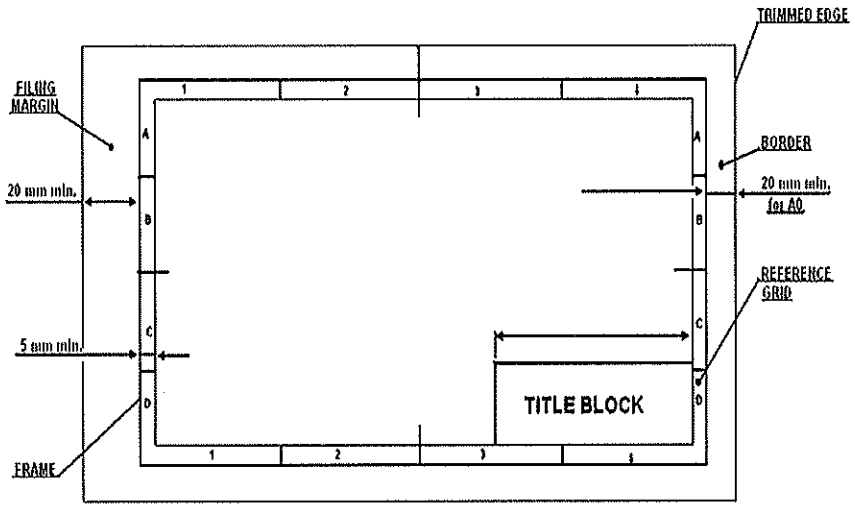
Ans: We have standardized the A0 area as 1 square meter in rectangle form therefore it is deduced as 841 x 1189 mm.

Section – C

03X03 = 09 Marks

9. What do you mean by layout of an engineering drawing explain with the help of diagram?

Ans: Layout: An engineering drawing has to follow a standard format in which drawing sheet consist of drawing space, title block and sufficient margins is called layout of engineering drawing.



10. What information should be available in a layout of engineering drawing?

Ans: It should contain following information:

- 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

11. Differentiate between instruments and accessories with the help of diagram.

S.No.	Instruments	Accessories
1.	Instruments are the things which are prime work doing devices without which work can't be completed	Accessories are the things which when attached with instruments results in the efficiency of the instruments.
2.	Pencil is an example of an instrument because in absence of which we can't draw things	Drawing board pins are the example of accessories as without pins we are able to draw engineering drawings although with reduced efficiency.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

1st In-Sem. Examination

Course Code: SMS1303 **Time: 1 Hour**

Course Name: Advanced conventional Machining **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. Full form of HSS.
   a) High stainless steel
   b) High strength steel
   c) High speed steel
   d) High shine steel
2. Cutters should have _____ stiffness and toughness if they are to have the longest possible life.
   a) Low
   b) High
   c) Moderate
   d) Neutral
3. Carbides are classified into the main groups of _____
   a) P, M & K
   b) P, N & K
   c) Q, M & N
   d) Q, W & M
4. Formulae for feed rate is
   a) $F_r = f_z \times Z \times N$
   b) $F_r = f_z \times N$
   c) $F_r = f_z \times Z$
   d) None of the above
5. A drill bit angle of _____ is used for long chip light metals.
   a) 130°
   b) 140°
   c) 90°
   d) 45°

Section – B

03X02 = 06 Marks

6. What are the advantages of mixed ceramics compared with oxide ceramics?
7. Write Four properties of Cutting material.
8. Write short notes on
   a) HSS
   b) Carbide

Section – C

03X03 = 09 Marks

9. Explain
   a) Stiffness
   b) Toughness
   c) Hardness
10. Describe Coating Cutting tools and also name the most important coating materials.
11. Write properties of DP inserts.

Set - A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

1st In-Sem. Examination

Course Code: SMS1303 **Time: 1 Hour**

Course Name: Advanced conventional Machining **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.

Answer Key A

Section – A

05X01 = 05 Marks

1. Full form of HSS.
   a) High stainless steel
   b) High strength steel
   c) High speed steel
   d) High shine steel
2. Cutters should have _____ stiffness and toughness if they are to have the longest possible life.
   a) Low
   b) High
   c) Moderate
   d) Neutral
3. Carbides are classified into the main groups of _____
   a) P, M & K
   b) P, N & K
   c) Q, M & N
   d) Q, W & M
4. Formulae for feed rate is
   a) $F_r = f_z \times Z \times N$
   b) $F_r = f_z \times N$
   c) $F_r = f_z \times Z$
   d) None of the above
5. A drill bit angle of _____ is used for long chip light metals.
   a) 130°
   b) 140°
   c) 90°
   d) 45°

Section – B

03X02 = 06 Marks

6. What are the advantages of mixed ceramics compared with oxide ceramics?

Ans. **oxide ceramics**

Inserts made of oxide ceramics consist of aluminum oxide and are sensitive to major temperature changes. For this reason, machining normally takes place without cooling lubricants. Oxide ceramics are normally used for machining cast iron.

Mixed ceramics

These are made of Al_2O_3 with TiC are tougher than pure ceramics and have a better resistance to temperature changes.

7. Write Four properties of Cutting material.

Ans.

- High hot hardness
- high wear resistance
- high compression strength
- high toughness & stiffness

8. Write short notes on

a) HSS

b) Carbide

HSS

Ans. Its contains tungsten, molybdenum, vanadium and cobalt as its main alloy elements. It has highest toughness and lowest hardness of all the various cutting materials.

Carbide

Ans. it is composite material which is manufactured by sintering raw materials in powder form. During this hard tungsten carbide is bonded with the softer binder material of cobalt.

Section – C

03X03 = 09 Marks

9. Explain

a) Stiffness

b) Toughness

c) Hardness

Stiffness

Ans.: ability to withstand bulk deformation

Toughness

Ans.: ability to withstand shocks without damage

Hardness

Ans.: ability of a material surface to withstand locals deformation

10. Describe Coating Cutting tools and also name the most important coating materials.

Ans. The wear resistance of cutting tools can be increased by coating.

Increased cutting speed and feed speeds and therefore more economic production, can be achieved through higher temperature resistance.

The most important coating materials are

- Titanium nitride (TiN)
- Titanium carbide (TiC)
- Titanium carbonitride (TiCN)
- Aluminum oxide (Al2O3)
- Diamond

11. Write properties of DP inserts.

Ans.

a) Hardest cutting material
b) High wear resistance
c) Temperature resistant upto 600°c
d) Chemical reaction with steel alloy material

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

1st In-Sem. Examination

Course Code: SMS1304 **Time: 1 Hour**

Course Name: Pneumatics **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 01 Mark.
3. Section B contains 03 Questions. Each question carries 02 Mark.
4. Section C contains 03 Questions. Each question carries 03 Marks.

Section – A

05X01 = 05 Marks

1. The Fluid use to transmit power in Pneumatics is-
   a) Air
   b) Water
   c) Oil
   d) Liquid
2. A hydraulic system operates at a pressure up to-
   a) 10-12 bar
   b) 7-8 bar
   c) 400 bar
   d) 700 bar
3. Fluid power system is based upon-
   a) Bernoulli's principle
   b) Gas law
   c) Avogadro's law
   d) Pascal law
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

Section – B

03X02 = 06 Marks

6. Draw the symbol of **FRL** unit. Also write it's other name and full form.
7. Define Pressure and Pascal Law.
8. Draw the symbol of **OR** and **AND** elements. Also write their another name.

Section – C

03X03 = 09 Marks

9. What is Air Production system? Explain all the components of Air production system.
10. Write down any five advantages of using atmospheric air in Pneumatics.
11. Explain any five differences between *Pneumatic System* and *Hydraulic System.*

Set - A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

1st In-Sem. Examination

Course Code: SMS1304 **Time: 1 Hour**

Course Name: Pneumatics **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 01 Mark.
3. Section B contains 03 Questions. Each question carries 02 Mark.
4. Section C contains 03 Questions. Each question carries 03 Marks.

Answer Key

Section – A

05X01 = 05 Marks

1. The Fluid use to transmit power in Pneumatics is-
   - **a) Air**
   - b) Water
   - c) Oil
   - d) Liquid
2. A hydraulic system operates at a pressure up to-
   - a) 10-12 bar
   - b) 7-8 bar
   - c) 400 bar
   - **d) 700 bar**
3. Fluid power system is based upon-
   - a) Bernoulli's principle
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   - c) Avogadro's law
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4. The Function of Tank is to-
   - a) Maintain a pressure range
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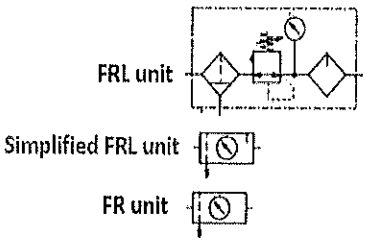
   - **c) Prevents from pressure fluctuation**
   - d) Remove dust particles from air
5. When PV=Constant, if we increase the volume then pressure will-
   - a) Remains constant
   - **b) Decrease**
   - c) Increase
   - d) none of these

Section – B

03X02 = 06 Marks

6. Draw the symbol of **FRL** unit. Also write it's other name and full form.

   Ans. It is a combine unit of Filter, Pressure regulator and Lubricator elements. It's also known as Air service unit.



7. Define Pressure and Pascal Law.

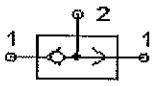
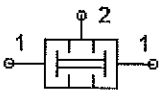
   Ans. Pressure – It is defined as force per unit area.

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

$$P1 = P2$$

$$\frac{F1}{A1} = \frac{F2}{A2}$$

8. Draw the symbol of **OR** and **AND** elements. Also write their another name.

1	OR element/shuttle valve		It provide output when we gives any input
2	And element/dual pressure valve		It only provide output when we gives both side input

Section – C

03X03 = 09 Marks

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

   Ans. Air production system mainly involves the process of Producing compressed dry air. For Producing compressed dry air, different components are used. They are given as below:

   COMPRESSOR: Air Taken in at Atmospheric pressure is compressed and delivered at higher pressure to pneumatic systems. Thus, transforms mechanical energy into Pneumatic energy.

ELECTRIC MOTOR: Supplies mechanical power to compressor. Thus, transforms electrical energy into mechanical energy.
PRESSURE SWITCH: Controls the electric motor by sensing the pressure in the tank. It is set to a maximum pressure at which it stops the motor, and a minimum pressure at which it restarts it.
CHECK VALVE: Lets the compressed air from the compressor into the tank and prevents it leaking back when the compressor is stopped.
TANK: Stores the compressed air from the compressor and prevents the Pressure fluctuations.
PRESSURE GAUGE: Indicates the tank pressure.
AUTO DRAIN: Drains all the water condensing in the tank without supervision.
SAFETY VALVE: Blows compressed air off if the pressure in the tank should rise above the allowed pressure.
AIR DRYER: Cools the compressed air to a few degrees above freezing point and condenses most of the air.
LINE FILTER: Being in the main type, this filter must have a minimal pressure drop and the capability of oil mist removal. It helps to keep the line free from dust, water and oil.

10. Write down any five advantages of using atmospheric air in Pneumatics.

Availability: Air is available everywhere and can be compressed with a portable compressor so most factories and industries use this for many activities.

Storage: It is easily stored in tanks in large volume.

Simplicity of Design: Most pneumatic components are of simple design and structure.

Easy to Work: Pneumatic components have simple control and are easily fitted to provide automation.

Choice of Movement: It provides both linear movement and angular rotation with continuously variable operational speeds.

Economy: Low installation cost and low maintenance cost as no service is required.

Reliability: High system reliability because pneumatic components have a long working life.

Resistance to Environment: High temperature, dust and corrosive atmosphere does not affect it while many other systems may get affected.

11. Explain any five differences between *Pneumatic System* and *Hydraulic System.*

S. No.	Hydraulic System	Pneumatic System
1.	It uses a pressurized liquid as a fluid	It uses compressed gas, usually air, as a fluid
2.	An oil hydraulic system operates at pressure up to 700 bar	A pneumatic system usually operates at 10–12 bar
3.	Generally designed as closed system	Usually designed as open system
4	Valve operations are difficult	Valve operations are easy
5	Heavier in weight	Lighter in weight
6	Pumps are used to provide pressurized liquids	Compressors are used to provide compressed gases

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

1st In-Sem. Examination

Course Code: SMS1305 **Time: 1 Hour**

Course Name: Material Science **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 01 Mark.
3. Section B contains 03 Questions. Each question carries 02 Mark.
4. Section C contains 03 Questions. Each question carries 03 Marks.

Section – A

05X01 = 05 Marks

1. Generally, steel has how much amount of carbon?
   a) less than 2%
   b) greater than 2%
   c) less than 20%
   d) greater than 20%
2. What is meaning of JR in the material code "S 235 JRC+C"?
   a) yield strength I
   b) suitable for cold flanging
   c) quality grade (impact testing energy)
   d) type of steel
3. Which of the following is not refining process?
   a) basic oxygen process
   b) inert gas blowing process and
   c) the combined oxygen
   d) carburizing
4. _____ is the heavy metal (density > 5kg/dm^3)
   a) Aluminium
   b) Magnesium
   c) Copper
   d) Titanium
5. Which is not a Natural material?
   a) Glass
   b) Granite
   c) Graphite
   d) Wood

Section – B

03X02 = 06 Marks

6. Explain the "Basic Oxygen Process" with the neat diagram.
7. Describe the process of extraction of pig iron from iron ores.
8. Define Linear thermal expansion with formula.

Section – C

03X03 = 09 Marks

9. Describe the classification of steel and various types of mechanical properties of material.
10. Explain any three production engineering properties of materials.
11. Draw the flow chart of the classification of materials based on their composition and common properties.

Set - A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 3rd Semester,

1st In-Sem. Examination

Course Code: SMS1305 **Time: 1 Hour**

Course Name: Material Science **Max. Marks: 20**

Instructions:

1. Attempt all questions.
2. Section A contains 05 Questions. Each question carries 01 Mark.
3. Section B contains 03 Questions. Each question carries 02 Mark.
4. Section C contains 03 Questions. Each question carries 03 Marks.

Answer Key

Section – A

05X01 = 05 Marks

1. Generally, steel has how much amount of carbon?
   - **a) less than 2%**
   - b) greater than 2%
   - c) less than 20%
   - d) greater than 20%
2. What is meaning of JR in the material code "S 235 JRC+C"?
   - a) yield strength I
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4. _____ is the heavy metal (density > 5kg/dm^3)
   - a) Aluminium
   - b) Magnesium
   - **c) Copper**
   - d) Titanium
5. Which is not a Natural material?
   - **a) Glass**
   - b) Granite
   - c) Graphite
   - d) Wood

Section – B

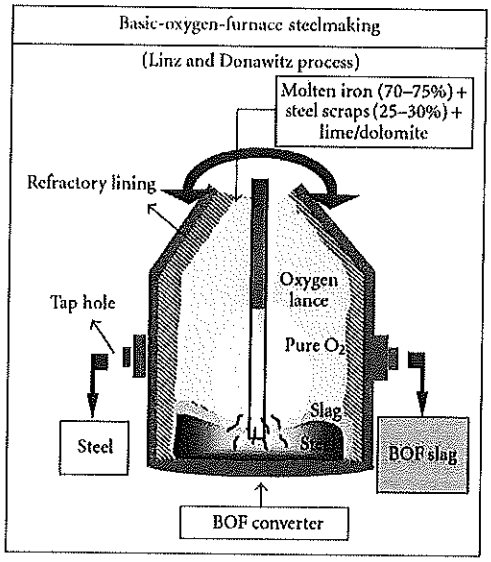
03X02 = 06 Marks

6. Explain the "Basic Oxygen Process" with the neat diagram.

Ans. Molten pig iron from a blast furnace

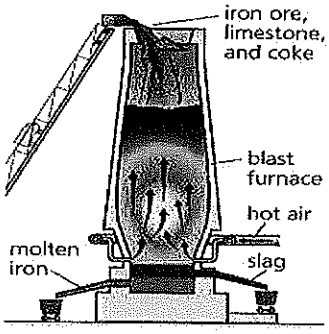
High purity oxygen at a pressure of 700–1,000 kilopascals

Fluxes (burnt lime or dolomite) are fed.



7. Describe the process of extraction of pig iron from iron ores.

Ans. **Pig iron** is produced by smelting of iron ore in blast furnaces or by smelting ilmenite in electric furnaces. **Pig iron** is supplied in a variety of ingot sizes and weights, ranging from 3 kg up to more than 50 kg. The vast majority of **pig iron** is produced and consumed within integrated steel mill complexes.



8. Define Linear thermal expansion with formula.

Linear Thermal Expansion: The coefficient of linear thermal expansion α is the change in length Δl of a 1m long body that occurs for a temperature change Δt = 1 °C.

The thermal expansion Δl must be taken into account for measuring instruments and mounted parts or for cast parts. Cast parts undergo heat shrinkage after casting and this must be compensated for by a size allowance.

Linear thermal expansion $\Delta l = l_1 \cdot \alpha \cdot \Delta t$

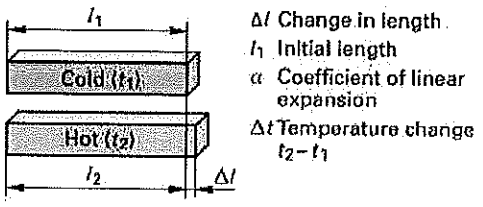


Figure 1: Linear thermal expansion

Section – C

03X03 = 09 Marks

9. Describe the classification of steel and various types of mechanical properties of material.

Ans. Steels can be classified reasonably well into a few major groups according to their chemical compositions, applications, shapes and surface conditions.

Chemical composition

On the basis of chemical composition, steels can be grouped into three major classes: carbon steels, low-alloy steels, and high-alloy steels.

1.Carbon steel: - Carbon steels are by far the most produced and used, accounting for about 90 percent of the world's steel production.

a) Low carbon steel: - It is also known as mild steel. It has 0.04-0.3% carbon content in steel. It covers a great diversity of shapes from flat to structural beam.

b) Medium carbon steel: - It is stronger than low carbon steel. It has 0.3-0.6% carbon content in steel. It is used in shafts & gear, railway wheels, structural beam.

c) High carbon steel: - It is very difficult to cut, bend or weld. It has 0.6-1.5% carbon content in it. With such a high carbon content it is stronger and harder but less ductile than low or medium carbon steel. It is also known as carbon tool steel. It is used id dies, cutting tool, hammer.

2. Alloy steel: - Combining carbon steel with one or more alloying element to increase their Characteristics i.e. hardness, toughness, brittleness. Some alloying elements are-

a) Chromium: - It is used to increase hardness, toughness or wear resistance of steel.

b) Cobalt: - It improves high temperature resistance of steel.

c) Nickel: - It increase strength, toughness & corrosion resistance.

d) Manganese: - It Increase surface hardness & resistance to strain.

10. Explain any three production engineering properties of materials.

Castability:

A material is castable if it forms a low viscosity melt that completely fills the mould and does not form any voids (shrinkage cavities) in the solidified material. The various types of cast iron, aluminium casting alloys, copper zinc and zinc casting alloys have good Castability.

Formability:

It is the ability of a material to be formed into a work-piece due to a plastic deformation when force is applied. Hot forming processes include hot rolling and forging, while cold forming processes include cold rolling, bending, folding and deep drawing.

Low carbon steels, soft iron and aluminium and copper wrought alloys exhibit high formability. Iron casting alloys are not formable.

Machinability:

It indicates whether and under which conditions a material can be manufactured using machining techniques, such as turning, milling and grinding. The surface quality of the machined surface, the machining conditions and the service life of the machine tools are quantifying parameters for the machinability.

Weldability:

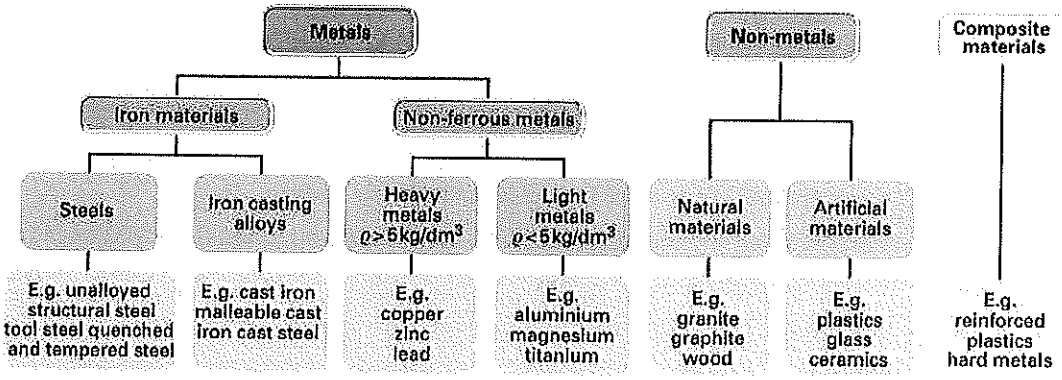
It describes the suitability or unsuitability of a material for welding. Unalloyed and low alloy steels with a low carbon content have good welding properties. High alloy steels as well as aluminium and copper alloys can also be welded using special welding methods.

Hardenability:

Hardenability and heat treatability refer to the capacity of a material to increase its hardness and strength by targeted heat treatment.

Most steels, some iron casting alloys and heat treatable aluminium alloys can be hardened.

11. Draw the flow chart of the classification of materials based on their composition and common properties.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

(98)

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

1st In-Sem. Examination

Course Code: SMS1306 **Time: 1 Hour**

Course Name: Advanced Grinding & 3D Measurement **Max. Marks: 20**

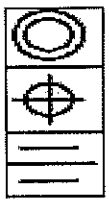
Instruction:

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

Section – A

05X01 = 05 Marks

1. For the structural steel which type of abrasive we use?
   a) Diamond
   b) Boron nitride
   c) Aluminum oxide
   d) Silicon carbide
2. Full form of SPA3.
   a) Servo Power Amplifier
   b) Servo pack Amplifier
   c) Service position Amplifier
   d) Service power Amplifier
3. Which symbol is used for Position?
   a)
   b)
   c)

   d) None of the above
4. What is coolant concentration percentage for grinding?
   a) 10%
   b) 12%
   c) 5%
   d) 15%

5. What is the designation for hardness grade range A-D of an abrasive tool?
    a) Soft
    b) Extremely soft
    c) Hard
    d) Very hard

Section – B

03X02 = 06 Marks

6. Define grinding?
7. Write down the applications of CMM.
8. Which is the coolant used by us as a cutting oil? Write any 5 uses of Cutting Oil.

Section – C

03X03 = 09 Marks

9. Explain the pore structure in the grinding wheel.
10. Draw symbols of the following given tolerances;
    a) Cylindricity
    b) Parallelism
    c) Total run out
    d) Perpendicularity
11. Explain the various parts of CMM.

Set - A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, III Semester,

1st In-Sem. Examination

Course Code: SMS1306 **Time: 1 Hour**

Course Name: Advanced Grinding & 3D Measurement **Max. Marks: 20**

Instruction:

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

Answer Key A

Section – A

05X01 = 05 Marks

1. For the structural steel which type of abrasive we use?
   a) Diamond
   b) Boron nitride
   c) Aluminum oxide
   d) Silicon carbide
2. Full form of SPA3.
   a) Servo Power Amplifier
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   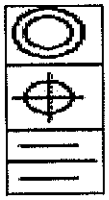

   d) None of the above
4. What is coolant concentration percentage for grinding?
   a) 10%
   b) 12%
   c) 5%
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5. What is the designation for hardness grade range A-D of an abrasive tool?
   a) Soft
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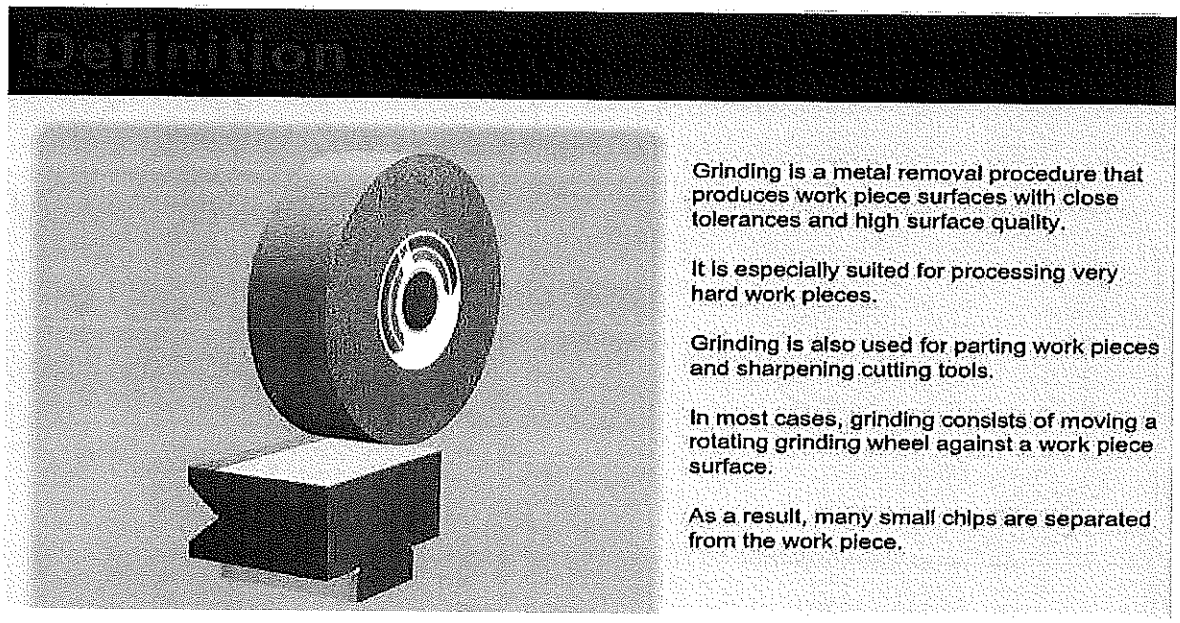
   c) Hard
   d) Very hard

Section – B

03X02 = 06 Marks

6. Define grinding?



7. Write down the applications of CMM.

Ans. Application of CMM

- ✓ Aerospace Industries
- ✓ Automotive
- ✓ Food processing
- ✓ Healthcare
- ✓ Paper
- ✓ Pharmaceuticals
- ✓ Plastics
- ✓ Research and development
- ✓ Semiconductor

8. Which is the coolant used by us as a cutting oil? Write any 5 uses of Cutting Oil.

Ans. STRUB coolant is using now by us as a cutting oil.

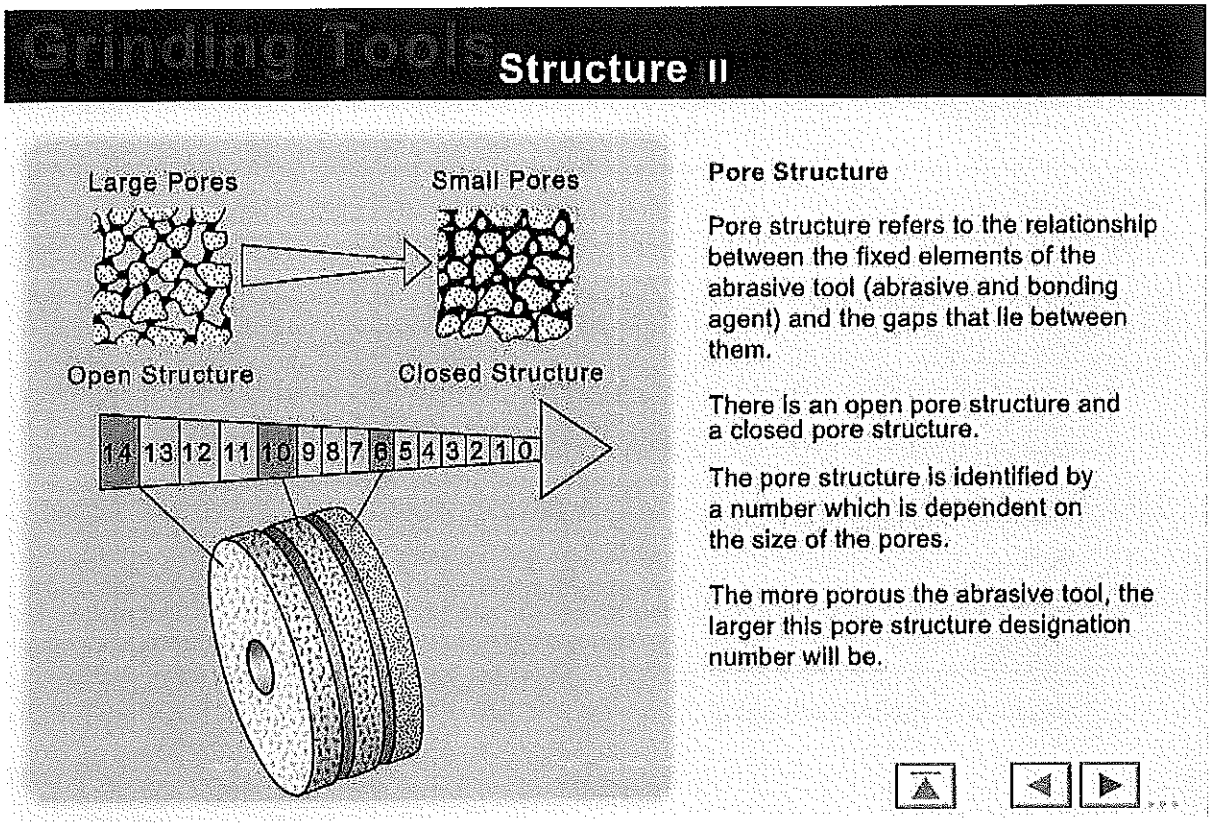
Following are the uses of cutting oil

i. Heat dissipation
ii. Reduce tool wear
iii. Increase surface finish
iv. As a lubricant
v. Increase tool life

Section – C

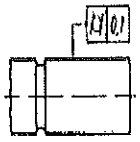
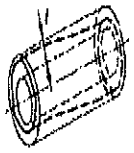
03X03 = 09 Marks

9. Explain the pore structure in the grinding wheel.

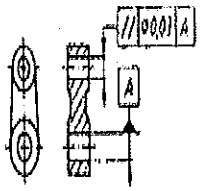
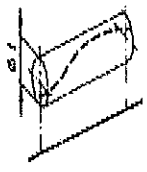


10. Draw symbols of the following given tolerances;

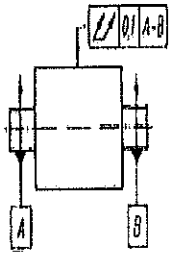
a) Cylindricity

⌭	Cylindricity			The considered surface shall be contained between two coaxial cylinders 0,1 apart.

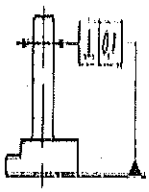
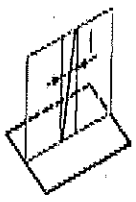
b) Parallelism

//	Parallelism of a line (axis) with reference to a datum line			The toleranced axis shall be contained in a cylindrical zone of diameter 0,03, parallel to the datum axis A (datum line).

c) Total run out

↗	Total run-out radial			The total radial run-out shall not be greater than 0,1 at any point on the specified surface during several revolutions about the datum axis A-B, and with relative axial movement between part and measuring instrument. The movement shall be guided along a line having a theoretically perfect form of the contour and being in correct position to the datum axis.

d) Perpendicularity

⊥	Perpendicularity of a line (axis) with reference to a datum surface			The axis of the cylinder, to which the tolerance frame is connected, shall be contained between two parallel planes 0,1 apart, perpendicular to the datum surface.

11. Explain the various parts of CMM.

Granite structure

Servo motor

Air bearings

Probe heads

Probes

Styli

Controller

Software

Measuring scale (each axis)