



**School of Manufacturing Skills  
Session: 2019-20 (Summer Semester)  
B. Voc. Program, V Semester,  
2<sup>nd</sup> In-Sem. Examination**

**Course Code: SMS1501**

**Course Name: Production Management**

**Time: 1 Hour**

**Max. Marks: 20**

**Instructions:**

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

**Section – A**

05X01 = 05 Marks

1. Effective Demand means:
  - a) The amount consumers desire
  - b) Must be able to pay
  - c) Must be willing and able to pay
2. Macro Economics belongs to:
  - a) Average economics
  - b) Whole economics
  - c) Individual economics
3. Consumer means:
  - a) Customer
  - b) Seller
  - c) Business Owner
4. Overhead Expenses in a Manufacturing Industry means:
  - a) Direct material cost
  - b) Direct labour cost
  - c) R&D cost
5. Prime Cost in a Manufacturing Industry includes:
  - d) All direct cost
  - e) Factory overhead cost
  - f) Summation of direct and factory overhead cost



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## Section – B

03X02 = 06 Marks

6. Explain demand curve with graph.
7. Write down the factors influencing the demand of big (50") fridge in Indian market.
8. Yesterday, the price of envelopes was \$5 a box, and Ram was willing to buy 10 boxes. Today, the price has gone up to \$6 a box, and Ram is now willing to buy 8 boxes. What is Ram's elasticity of demand?

## Section – C

03X03 = 09 Marks

9. The annual sales of Pen Drive manufacturing industry during the period of 2010-2019 are given below in tabular form. We have to find out the trend of the sales using 4 years moving averages method and forecast the value for the year 2020.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sales in Rs. Lakhs	13	16	16	18	20	22	19	21	?

10. What do you mean by Elasticity of Demand? Explain various types of Elasticity of Demand.
11. The accounts of Rahim Manufactures Ltd. for the year ended 31st December 2018 show the following:

	Rs.
Materials purchased	1,40,000
Direct labour	60,000
Direct expenses	30,000
Factory expenses	30,000
Office & administrative expenses	20,000

Find out:

- (a) Prime Cost
- (b) Work Cost
- (c) Cost of Production



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**Answer Key**

**Section – A**

05X01 = 05 Marks

1. Effective Demand means:  
c) Must be willing and able to pay
2. Macro Economics belongs to:  
b) Whole economics
3. Consumer means:  
a) Customer
4. Overhead Expenses in a Manufacturing Industry means:  
c) R&D cost
5. Prime Cost in a Manufacturing Industry includes:  
a) All direct cost

**Section – B**

03X02 = 06 Marks

6. Explain demand curve with graph.  
Ans. When cost is increasing, demand is decreasing and vice-versa.
7. Write down the factors influencing the demand of big (50") fridge in Indian market?  
Ans.: D = (Price, Income, Tastes, Popularity, Advertising, Expectations of consumers)



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8. Yesterday, the price of envelopes was \$5 a box, and Ram was willing to buy 10 boxes. Today, the price has gone up to \$6 a box, and Ram is now willing to buy 8 boxes. What is Ram's elasticity of demand?

Ans.:  $EOD = \frac{(8-10)/10}{(6-5)/5} = -1$

### Section – C

03X03 = 09 Marks

9. The annual sales of Pen Drive manufacturing industry during the period of 2010-2019 are given below in tabular form. We have to find out the trend of the sales using 4 years moving averages method and forecast the value for the year 2020.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sales in Rs. Lakhs	13	16	16	18	20	22	19	21	?

Ans.: Demand forecast for 2020 =  $(20+22+19+21)/4 = 20.5 = 21$

10. What do you mean by Elasticity of Demand? Explain various types of Elasticity of Demand.

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

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

11. The accounts of Rahim Manufactures Ltd. for the year ended 31st December 2018 show the following:

	Rs.
Materials purchased	1,40,000
Direct labour	60,000
Direct expenses	30,000
Factory expenses	30,000
Office & administrative expenses	20,000

Find out:

- (a) Prime Cost
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- (c) Cost of Production

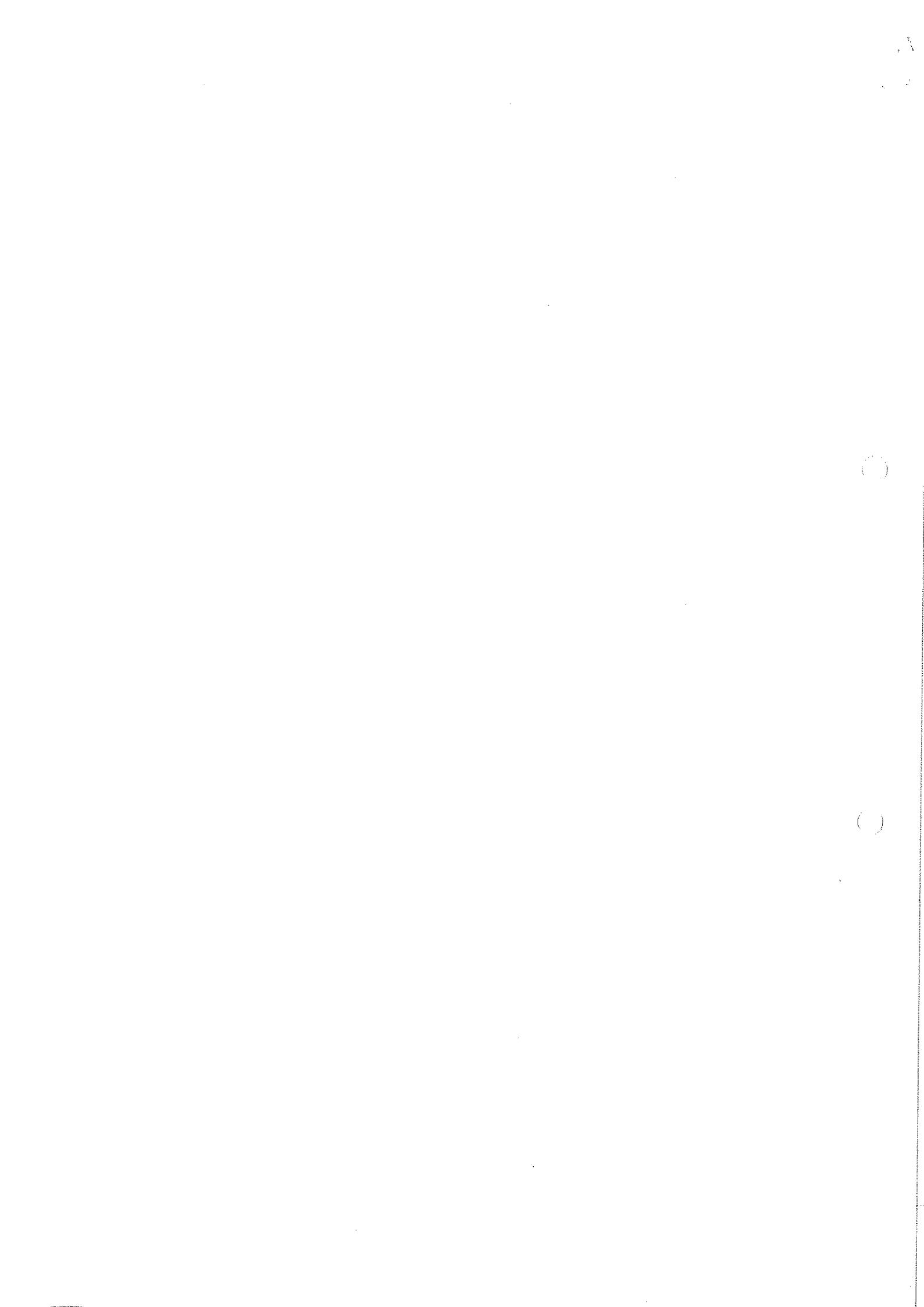


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Ans.: (a) Prime cost =  $140000 + 60000 + 30000 + 30000 = 260000$

Work cost =  $260000 + 30000 = 290000$

Cost of Production =  $290000 + 20000 = 310000$





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**Course Code: SMS1503**

**Time: 1 Hour**

**Course Name: Basics of Multiaxis Machining & Dialog CNC Programming**

**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 of the following material is not used in chromating?
  - a) Iron
  - b) Manganese
  - c) zinc
  - d) magnesium
2. Which process is used to give a steel part as a primer for coating?
  - a) Chromating
  - b) Phosphating
  - c) Electrostatic painting
  - d) None of above
3. What is the material thickness for waterjet cutting?
  - a) 1 to 100 mm
  - b) 1 to 1000 mm
  - c) 20 to 5000 mm
  - d) 10 to 50 mm
4. What is the percentage of sheet metal thickness for Die clearance?
  - a) Above 25%
  - b) Above 10%
  - c) Up to 5%
  - d) Up to 30%



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5. In the sheet metal cutting, the cutting force necessary for cutting  $F$  is dependent on-
- Cut area
  - Maximum shear strength
  - A & B
  - None of these

### Section – B

03X02 = 06 Marks

- What are the advantages of electrostatic powder coating?
- Define electroplating.
- Explain the nibbling process in shearing machine.

### Section – C

03X03 = 09 Marks

- Describe the chemical vapor composition (CVD) and write down their advantage and application.
- Explain thermal spraying method of metal coating.
- Explain the plasma cutting for sheet metal cutting.



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**Answer Key**

**Section – A**

05X01 = 05 Marks

1. Which of the following material is not used in chromating?  
d) magnesium
2. Which process is used to give a steel part as a primer for coating?  
b) Phosphating
3. What is the material thickness for waterjet cutting?  
a) 1 to 100 mm
4. What is the percentage of sheet metal thickness for Die clearance?  
c) Up to 5%
5. In the sheet metal cutting, the cutting force necessary for cutting F is dependent on...  
c) A & B

**Section – B**

03X02 = 06 Marks

6. What are the advantages of electrostatic powder coating?

**Ans. Advantages**

- Solvent free coating with thermosetting resins.
- Recovery of the over-spray coating powder.
- Environmentally friendly.
- All-over coating and good adhesion to the part.

7. Define to electroplating.

**Ans.** Electroplating is the process of applying a metal coating on another piece of metal (or another conductive surface) through an **electro-deposition process**. In electroplating, the deposited metal becomes part of the existing product with the plating/coating.

8. Explain the nibbling process in shearing machine.

**Ans.** Nibblers are used to cut out arbitrary shapes in sheet metals. The material is cut using a punch with short, rapidly –sequenced stroke. Nibblers are also used on NC –controlled machines to make shapes which can not be punched using standard tools from the tool magazine. During the process, the metal punch is traversed under the tool so that required shape is created.

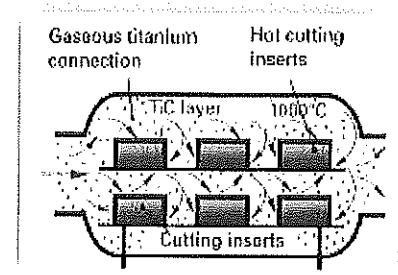
### Section – C

03X03 = 09 Marks

9. Describe the chemical vapor composition (CVD) and write down their advantage and application.

**Ans.** Chemical Vapour Deposition (CVD) is an atmosphere controlled process conducted at elevated temperatures (1000 °C) in a CVD reactor.

During this process, **thin-film coatings** are formed as the result of reactions between **various gaseous phases** and the heated surface of substrates within the CVD reactor. As different gases are transported through the reactor, distinct hard coating layers are formed on the **tool**.

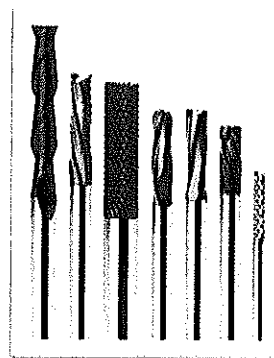
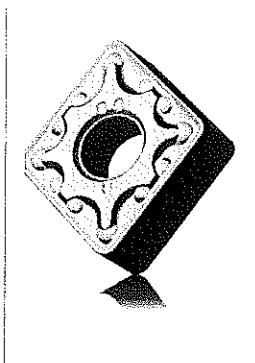


#### Advantage

- Possibility of coating with oxides, metal carbides and metal nitrides.
- Thin multilayer coating is also possible.

#### Applications

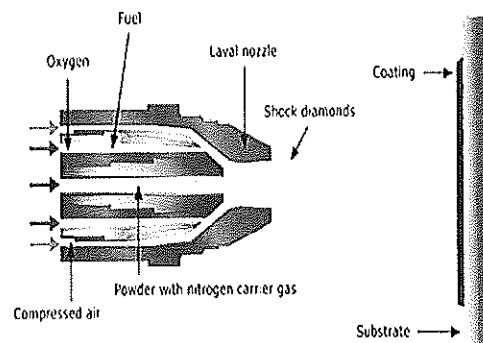
- Coating of tools and indexable cutter inserts, guide rollers, thread guides and similar objects with hard materials coatings of  $Al_2O_3$ , TiC, TiN, TiAlN and AlCrN.



10. Explain thermal spraying method of metal coating.

**Ans.** Thermal spraying techniques are coating processes in which melted (or heated) materials are sprayed onto a surface. The "feedstock" (coating precursor) is heated by electrical (plasma or arc) or chemical means (combustion flame).

- Thermal spraying can provide thick coatings (approx. thickness range is 20 microns to several mm, depending on the process and feedstock), over a large area at high deposition rate as compared to other coating processes such as electroplating, physical and chemical vapour deposition.
- Coating materials available for thermal spraying include metals, alloys, ceramics, plastics and composites. They are fed in powder or wire form, heated to a molten or semi molten state and accelerated towards substrates in the form of micrometer-size particles.
- Combustion or electrical arc discharge is usually used as the source of energy for thermal spraying.



11. Explain the plasma cutting for sheet metal cutting.

**Ans.** In plasma cutting, the material is cut by a plasma beam which impacts the cutting location at an extremely high temperature and high speed. Plasma means an electrically-charged, highly heated gas.

First, a pilot arc is ignited between the tungsten electrode and the cutting nozzle. The supplied cutting gas flows through the arc and is immediately converted to a plasma state due to the high temperature. A voltage applied between the electrode and work piece accelerates the plasma towards the workpiece. As soon as the plasma beam contacts the work piece, the arc jumps across to the work piece and the pilot arc is switched off. The high-energy plasma beam, which has a temperature of up to 30,000 °C, melts the material at the contact location and blows it out of the kerf.

When plasma cutting non-conductive materials (non – metals) no arc is possible between the electrode and the workpiece. For this reason, a further electrode must be used to close the electric circuit.

Application	Alloy steels, non-ferrous metals and non-metals
Material thicknesses	1 mm to 100 mm
Cutting speed	Up to 6 m/min for separating cuts and up to 4 m/min for quality cuts
Cutting gases	Argon, nitrogen, mixture of the two, helium, compressed air
Advantages	Cutting of all metals at high cutting speeds and good cutting quality is possible
Disadvantages	Protective equipment required to counter the generated noise, dust and smoke, expensive machines

