



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MECHANICAL ENGINEERING TUTORIAL QUESTION BANK

Course Title	INDUSTRIAL ENGINEERING
Course Code	AME803
Class	B.Tech
Semester	VI
Year	2018-2019
Team of Instructors	Dr. K Ch Apparao, Associate Professor, Mechanical Engineering

Objectives:

Industrial management is the organizational process that includes strategic planning, setting; objectives, managing resources, deploying the human and financial assets needed to achieve objectives, and measuring results. Management also includes recording and storing facts and information for later use or for others within the organization. The concept of management planning involves direction, planning, adjustment, control, and cooperation. Management functions are not limited to managers and supervisors.

S.No	Question	Blooms Taxonomy Level	Course Learning Outcome
UNIT-I			
INTRODUCTION TO CONCEPT OF INDUSTRIAL MANAGEMENT			
Part - A (Short Answer Questions)			
1	Define management -administration and organization	Understand	AME803.01
2	Explain the factors of effective organization.	Understand	AME803.02
3	What do you understand by Industrial Management?	Understand	AME803.03
4	State the principles of management	Remember	AME803.02
5	What are the main objectives of industrial management?	Understand	AME803.01
6	What are the responsibilities of a production manager?	Understand	AME803.01
7	What is the importance of industrial management?	Understand	AME803.02
8	What is Batch production?	Understand	AME803.03
9	How is batch production different from Job production?	Remember	AME803.04
10	What is the formula to arrive the cost of a product?	Understand	AME803.02
11	What are the characteristics of mass and flow production?	Understand	AME803.01
12	what is production planning.	Understand	AME803.02
13	What is production control?	Understand	AME803.01
14	what are the essential steps in production control?	Understand	AME803.02
15	What is push system?	Remember	AME803.01
16	What is pull system?	Understand	AME803.01
17	What are the aggregate planning strategies?	Understand	AME803.02
18	What do you understand by level strategy?	Understand	AME803.03

19	How is financial management related to industrial management?	Remember	AME803.02
20	What are the different types of industrial management techniques available?	Understand	AME803.01
Part - B (Long Answer Questions)			
1	Define Industrial Management & explain its concept. What are the applications and importance of Industrial Management?	Understand	AME803.02
2	Write a detailed note on development of Industrial Management. Discuss the scope of Industrial Management.	Understand	AME803.01
3	Define Productivity. State its importance giving suitable examples. What are the three major types of productivity measures?	Understand	AME803.02
4	Describe the various techniques of improving productivity. What are the benefits of increasing productivity to the workers and management?	Remember	AME803.02
5	State the different types of production system. State the “job-order production system”, “batch production system” and “mass production system”.	Understand	AME803.01
6	What is productivity Index? Explain briefly	Understand	AME803.02
7	What are the various forms of Industrial Ownership? Explain the advantages & disadvantages of a Single ownership firm.	Understand	AME803.01
8	What factors should be considered for deciding the ownership of an industry before starting it?	Understand	AME803.02
9	What are private sector enterprises? Discuss their relative merits & demerits?	Remember	AME803.01
10	Differentiate between Joint Stock Company and partnership organization.	Understand	AME803.02
11	What is Public Sector Organization? What are its aims and objectives	Understand	AME803.01
12	Which production system will be suitable for a small-car manufacturing plant?	Understand	AME803.02
13	Differentiate production v/s productivity.	Understand	AME803.02
14	What are the expectations from productivity?	Understand	AME803.01
15	What are the benefits from productivity?	Remember	AME803.02
16	Explain the dynamics of productivity changes.	Understand	AME803.02
17	Explain the advantages of productivity measures.	Understand	AME803.01
18	Explain the limitations of productivity measures.	Understand	AME803.02
19	Discuss the techniques for the improvement of productivity.	Remember	AME803.01
20	What are various levels of productivity measurements?	Understand	AME803.02
UNIT-II			
TIME AND MOTION STUDY, WORK SIMPLIFICATION			
Part - A (Short Answer Questions)			
1	What do you mean by work study?	Understand	AME803.04
2	Define work sampling.	Understand	AME803.05
3	Explain about the standard time(S.T) .	Understand	AME803.05
4	Explain the concept of OC curve.	Remember	AME803.06
5	What do you mean by method study.	Understand	AME803.07
6	Mention techniques used in method study.	Understand	AME803.06
7	Mention any two objectives of work study.	Understand	AME803.05
8	What are the objectives of Method study?	Understand	AME803.06

9	How work simplification differs from Work study?	Remember	AME803.07
10	What are the work considerations in Work study?	Understand	AME803.08
11	Explain the term “Work-study and the Management”	Understand	AME803.05
12	Explain the term “Work-study and Super visors”.	Understand	AME803.06
13	Explain the term “Work-study and Workers”.	Understand	AME803.04
14	What is the influence of method and time study on production activities?	Understand	AME803.05
15	What are the reasons of excess work content?	Remember	AME803.06
16	What are the objectives of Method study?	Understand	AME803.04
17	What is Micro- motion study?	Understand	AME803.05
18	What is Memo- motion study?	Understand	AME803.05
19	What are the various recording techniques?	Remember	AME803.06
20	What are limitations of method study?	Understand	AME803.07

Part - B (Long Answer Questions)

1	What is Management? Explain the features & importance of management?	Understand	AME803.06
2	Describe briefly the 14 Principles of management.	Understand	AME803.05
3	Explain the scientific theories of management. How is scientific theory helpful in managing the activities of business?	Understand	AME803.06
4	What is time study? Define Work study. State its objectives.	Remember	AME803.07
5	Differentiate between Method Study & Work Measurement.	Understand	AME803.08
6	What do you mean by a process chart? Explain the symbols used in a process charts.	Understand	AME803.05
7	What is the importance of Outline Process Chart in method study? Compare outline process chart and flow process chart.	Understand	AME803.06
8	Define the term Production Planning. State its objectives. What are the various steps in production planning?	Understand	AME803.04
9	Describe the role of production planning and control in industrial management.	Remember	AME803.05
10	Distinguish between routing and scheduling. Give examples.	Understand	AME803.06
11	Explain different techniques of method study.	Understand	AME803.06
12	Describe about the method study and its objectives? Write the steps involved?	Understand	AME803.05
13	What is work study? Explain various techniques of work study?	Understand	AME803.06
14	Explain different procedure steps involved in method study?	Understand	AME803.07
15	Why work study is valuable for production management?	Remember	AME803.08
16	Discuss the installation of proposed methods.	Understand	AME803.05
17	Explain the various principles of motion economy.	Understand	AME803.06
18	Differentiate Cycle graph v/s Chrono cycle graph.	Understand	AME803.04
19	Explain the critical examination of Method study.	Remember	AME803.05
20	How work study is used as a tool to improve productivity?	Understand	AME803.06

UNIT-III INVENTORY CONTROL

Part – A (Short Answer Questions)

1	Define the term inventory. Give a few examples.	Understand	AME803.09
2	What is the meaning of Inventory Control?	Understand	AME803.10
3	Who manages inventory, and how do they manage inventory surplus?	Understand	AME803.08
4	Explain the concept of EOQ model.	Remember	AME803.10

5	What are inventory costs and storage cost?	Understand	AME803.09
6	Mention various systems available for inventory control.	Understand	AME803.10
7	What is meant by cost reduction?	Understand	AME803.09
8	Define VED analysis.	Understand	AME803.10
9	Explain the concept of safety stock.	Remember	AME803.08
10	What is stores management?	Understand	AME803.10
11	How do you eliminate excess or obsolete inventory?	Understand	AME803.09
12	Does your warehouse benefit from reslotting?	Understand	AME803.10
13	What is your order picking procedure?	Understand	AME803.09
14	What is a supply chain?	Understand	AME803.10
15	Define LSCM	Remember	AME803.08
16	What is the objective of supply chain?	Understand	AME803.09
17	What is supply chain surplus?	Understand	AME803.10
18	Write any three importance of SCM	Understand	AME803.08
19	List down the supply chain drivers	Remember	AME803.10
20	What is the basic assumptions of EOQ model?	Understand	AME803.09
Part - B (Long Answer Questions)			
1	Explain the meaning of inventory & inventory control. Discuss its significance in managing any Industrial Organization.	Understand	AME803.09
2	Discuss briefly the various technique of inventory control?	Understand	AME803.10
3	How does uncertainty in demand and lead-time affect inventory levels?	Understand	AME803.10
4	What is opportunity & sunk cost. What are the costs associated with inventory?	Understand	AME803.09
5	Explain Inventory Carrying Cost & Ordering Cost with example.	Remember	AME803.10
6	Explain the Deterministic Model of inventory management.	Understand	AME803.09
7	What are FIFO & LIFO methods?	Understand	AME803.10
8	Explain the ABC analysis and VED analysis model of inventory management.	Understand	AME803.08
9	What is EOQ? Discuss the various advantages & disadvantages of EOQ model?	Understand	AME803.10
10	What do you understand by SCM? What are the different components of supply chain?	Remember	AME803.09
11	A factory uses annually 24,000 units of raw material which costs Rs.125 per unit placing each order costs Rs.25 and carrying costs is 6% per year of average inventory. i) Find out the economic order quantity. ii) how many orders are to be placed in a year iii) what is the total inventory cost for year including the cost of material	Understand	AME803.10
12	An auto industry purchases spark plugs at the rate of Rs.25 per piece . The annual consumption of spark plugs is 18000 numbers. If the ordering cost is Rs.250 per order and carrying cost is Rs.25 % per annum. What would be the EOQ? If the supplier of spark plugs offer discount of 5% for order quantity of 3000 numbers per order do you accept the discount offer?	Understand	AME803.09
13	What will be the EOQ for an item with annual demand of 5,000 units, a cost per order of Rs. 50, inventory carrying cost of Rs.7.50 per unit and the unit price of the item is Rs. 2	Understand	AME803.10
14	Define supply chain management. What are the differences/similarities between logistics and supply chain management?	Understand	AME803.08

15	What is the role of outsourcing in supply chain management?	Understand	AME803.10
16	Describe the four types of business process links and give an example of a situation when each would be appropriate.	Remember	AME803.09
17	Identify the eight supply chain processes and explain why they are cross-functional.	Understand	AME803.10
18	Discuss the five basic components of Supply Chain Management.	Understand	AME803.09
19	<p>An auto parts supplier sells Hardy-brand batteries to car dealers and auto mechanics. The annual demands approximately 1,200 batteries. The supplier pays \$28 for each battery and estimates that the annual holding cost is 30 percent of the battery's value. It costs approximately \$20 to place an order (managerial and clerical costs). The supplier currently orders 100 batteries per month.</p> <p>a) Determine the ordering, holding, and total inventory costs for the current order quantity. b) Determine the economic order quantity (EOQ). c) How many orders will be placed per year using the EOQ? d) Determine the ordering, holding, and total inventory costs for the EOQ. How has ordering cost changed? Holding cost? Total inventory cost?</p>	Understand	AME803.09
20	A company makes bicycles. It produces 450 bicycles a month. It buys the tires for bicycles from a supplier at a cost of \$20 per tire. The company's inventory carrying cost is estimated to be 15% of cost and the ordering is \$50 per order.	Remember	AME803.09

UNIT-IV

QUALITY CONTROL

Part - A (Short Answer Questions)

1	Define quality control.	Understand	AME803.13
2	Explain quality circles and give objectives.	Understand	AME803.14
3	Explain acceptance sampling.	Understand	AME803.15
4	Define pareto analysis.	Remember	AME803.09
5	What is meant by quality tools and TQM?	Understand	AME803.10
6	Describe about different types of control charts.	Understand	AME803.08
7	What is meant by work measurement?	Understand	AME803.10
8	Describe the control charts for variables.	Understand	AME803.09
9	Describe about C charts.	Remember	AME803.10
10	Write the steps involved in method study.	Understand	AME803.09
11	Define quality assurance.	Understand	AME803.10
12	Explain briefly about the statistical quality control (SQC).	Understand	AME803.08
13	Explain the major differences between quality control and quality assurance.	Understand	AME803.11
14	Explain why quality is important to both producers and consumers	Understand	AME803.13
15	Describe the six sigma approach to quality.	Remember	AME803.14
16	Evaluate the benefits for a firm of adopting a Kaizen approach to quality assurance.	Understand	AME803.15
17	What is the difference between functional and nonfunctional testing?	Understand	AME803.09
18	What is meant by Verification and Validation?	Understand	AME803.10

19	What are the Dimensions of Quality?	Remember	AME803.08																																																																														
20	Give the Basic Concepts of TQM?	Understand	AME803.10																																																																														
Part – B (Long Answer Questions)																																																																																	
1	Define Quality. Explain the determinants of quality.	Understand	AME803.11																																																																														
2	What do you understand by Quality Control? What are the objective & benefits of Quality control?	Understand	AME803.11																																																																														
3	What do you understand by Process control? Define Control Chart and give the objectives of X and R charts.	Understand	AME803.11																																																																														
4	Explain about Statistical Quality Control with the help of control charts.	Remember	AME803.11																																																																														
5	What is the meaning of UCL & LCL? Briefly explain variable charts and attribute charts.	Understand	AME803.11																																																																														
6	What do you understand by Acceptance Sampling? Discuss sequential sampling.	Understand	AME803.11																																																																														
7	Explain the methods of double and sequential sampling.	Understand	AME803.11																																																																														
8	Briefly discuss the benchmarking process.	Understand	AME803.11																																																																														
9	What is the concept of six sigma? Discuss the six sigma capability	Remember	AME803.11																																																																														
10	What is total quality management? Explain the different kinds of control charts?	Understand	AME803.11																																																																														
11	Discuss the various control charts for attributes? Explain them briefly.	Understand	AME803.11																																																																														
12	<p>The following table gives the number of defects in a casting used to making crank case of diesel engine. Construct appropriate control chart with control limits and comment on the process</p> <table border="1"> <thead> <tr> <th>C. No</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>No of defects</td> <td>15</td> <td>11</td> <td>25</td> <td>10</td> <td>12</td> <td>20</td> <td>15</td> <td>10</td> <td>17</td> <td>13</td> </tr> </tbody> </table>	C. No	1	2	3	4	5	6	7	8	9	10	No of defects	15	11	25	10	12	20	15	10	17	13	Understand	AME803.11																																																								
C. No	1	2	3	4	5	6	7	8	9	10																																																																							
No of defects	15	11	25	10	12	20	15	10	17	13																																																																							
13	<p>Construct the appropriate control charts for the following data. twelve samples of five cookies each during two weeks were considered</p> <table border="1"> <thead> <tr> <th>Sample</th> <th colspan="5">Chips per cookie</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>5</td> <td>2</td> <td>5</td> <td>2</td> <td>5</td> </tr> <tr> <td>3</td> <td>4</td> <td>3</td> <td>4</td> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>6</td> <td>4</td> <td>6</td> <td>4</td> <td>6</td> </tr> <tr> <td>5</td> <td>2</td> <td>5</td> <td>2</td> <td>5</td> <td>2</td> </tr> <tr> <td>6</td> <td>5</td> <td>6</td> <td>5</td> <td>6</td> <td>5</td> </tr> <tr> <td>7</td> <td>2</td> <td>7</td> <td>2</td> <td>7</td> <td>2</td> </tr> <tr> <td>8</td> <td>1</td> <td>8</td> <td>1</td> <td>8</td> <td>1</td> </tr> <tr> <td>9</td> <td>6</td> <td>9</td> <td>6</td> <td>9</td> <td>6</td> </tr> <tr> <td>10</td> <td>6</td> <td>10</td> <td>6</td> <td>10</td> <td>6</td> </tr> <tr> <td>11</td> <td>6</td> <td>11</td> <td>6</td> <td>11</td> <td>6</td> </tr> <tr> <td>12</td> <td>5</td> <td>12</td> <td>5</td> <td>12</td> <td>5</td> </tr> </tbody> </table>	Sample	Chips per cookie					1	2	1	2	1	2	2	5	2	5	2	5	3	4	3	4	3	4	4	6	4	6	4	6	5	2	5	2	5	2	6	5	6	5	6	5	7	2	7	2	7	2	8	1	8	1	8	1	9	6	9	6	9	6	10	6	10	6	10	6	11	6	11	6	11	6	12	5	12	5	12	5	Understand	AME803.11
Sample	Chips per cookie																																																																																
1	2	1	2	1	2																																																																												
2	5	2	5	2	5																																																																												
3	4	3	4	3	4																																																																												
4	6	4	6	4	6																																																																												
5	2	5	2	5	2																																																																												
6	5	6	5	6	5																																																																												
7	2	7	2	7	2																																																																												
8	1	8	1	8	1																																																																												
9	6	9	6	9	6																																																																												
10	6	10	6	10	6																																																																												
11	6	11	6	11	6																																																																												
12	5	12	5	12	5																																																																												

14	<p>A company bottles soft drinks. The bottle comes in only one flavour and only one size (16 ounces) the first daily samples of till weights of 20 bottles are,</p> <p>(i) compute control limits draw X and R charts (ii) plot thee 10 points and discuss whether the production process is in control</p> <table border="1" data-bbox="280 461 836 846"> <thead> <tr> <th>Sample</th> <th>X</th> <th>R</th> </tr> </thead> <tbody> <tr><td>1</td><td>16.05</td><td>0.20</td></tr> <tr><td>2</td><td>16.04</td><td>0.25</td></tr> <tr><td>3</td><td>15.98</td><td>0.62</td></tr> <tr><td>4</td><td>15.91</td><td>0.71</td></tr> <tr><td>5</td><td>16.02</td><td>0.58</td></tr> <tr><td>6</td><td>16.09</td><td>0.37</td></tr> <tr><td>7</td><td>15.95</td><td>0.35</td></tr> <tr><td>8</td><td>16.06</td><td>0.21</td></tr> <tr><td>9</td><td>15.94</td><td>0.29</td></tr> <tr><td>10</td><td>15.94</td><td>0.46</td></tr> </tbody> </table> <p>Given $A_2=0.180$ $D_3=0.414$ $D_4=1.586$</p>	Sample	X	R	1	16.05	0.20	2	16.04	0.25	3	15.98	0.62	4	15.91	0.71	5	16.02	0.58	6	16.09	0.37	7	15.95	0.35	8	16.06	0.21	9	15.94	0.29	10	15.94	0.46	Understand	AME803.11			
Sample	X	R																																					
1	16.05	0.20																																					
2	16.04	0.25																																					
3	15.98	0.62																																					
4	15.91	0.71																																					
5	16.02	0.58																																					
6	16.09	0.37																																					
7	15.95	0.35																																					
8	16.06	0.21																																					
9	15.94	0.29																																					
10	15.94	0.46																																					
15	<p>The number of defectives found in lots 200 each are given below for 16 lots</p> <table border="1" data-bbox="296 1048 1027 1424"> <thead> <tr> <th>Lot no</th> <th>No of defectives</th> <th>Lot no</th> <th>No of defectives</th> </tr> </thead> <tbody> <tr><td>1</td><td>6</td><td>9</td><td>6</td></tr> <tr><td>2</td><td>12</td><td>10</td><td>10</td></tr> <tr><td>3</td><td>8</td><td>11</td><td>20</td></tr> <tr><td>4</td><td>12</td><td>12</td><td>12</td></tr> <tr><td>5</td><td>16</td><td>13</td><td>16</td></tr> <tr><td>6</td><td>20</td><td>14</td><td>10</td></tr> <tr><td>7</td><td>24</td><td>15</td><td>6</td></tr> <tr><td>8</td><td>10</td><td>16</td><td>12</td></tr> </tbody> </table> <p>Construct np control chart and comment.</p>	Lot no	No of defectives	Lot no	No of defectives	1	6	9	6	2	12	10	10	3	8	11	20	4	12	12	12	5	16	13	16	6	20	14	10	7	24	15	6	8	10	16	12	Remember	AME803.11
Lot no	No of defectives	Lot no	No of defectives																																				
1	6	9	6																																				
2	12	10	10																																				
3	8	11	20																																				
4	12	12	12																																				
5	16	13	16																																				
6	20	14	10																																				
7	24	15	6																																				
8	10	16	12																																				
16	What is the difference between functional and non functional testing?	Understand	AME803.11																																				
17	What are the ten conditions for the selection and evaluation of suppliers?	Understand	AME803.11																																				
18	Explain Deming Philosophy?	Understand	AME803.11																																				
19	Explain the implementation and documentation of Quality System?	Remember	AME803.11																																				
20	Explain the Benefits of ISO 14000?	Understand	AME803.11																																				
UNIT- V DEMAND FORECASTING AND COST ESTIMATION																																							
Part - A (Short Answer Questions)																																							
1	How would you define forecasting?	Understand	AME803.11																																				
2	How important is forecasting? What are the evidences that it is important?	Understand	AME803.11																																				

3	How is the sales forecast used within the different functional areas in a company?	Understand	AME803.11
4	What time frame is used for immediate, short-term, medium-term, and long-term forecasting?	Remember	AME803.11
5	What are the steps of the forecasting process?	Understand	AME803.11
6	Why is Forecasting So Important to the Average Business?	Understand	AME803.11
7	The last four months of sales were 8, 10, 15, and 9 units. The last four forecasts were 5, 6, 11, and 12 units. The Mean Absolute Deviation (MAD) is	Understand	AME803.11
8	Given an actual demand of 61, a previous forecast of 58, and an α of .3, what would the forecast for the next period be using simple exponential smoothing?	Understand	AME803.11
9	What is the delphi method? Describe its main advantages and limitations	Remember	AME803.11
10	What are the main characteristics of accurate forecasts?	Understand	AME803.11
11	Describe the data requirements that must be met if regression analysis is to provide a useful basis for forecasting.	Understand	AME803.11
12	Classify the allowances considered in cost estimation	Understand	AME803.11
13	Differentiate costing from estimation	Understand	AME803.11
14	What do you mean by cost accounting?	Understand	AME803.11
15	Distinguish between cost estimation and cost accounting.	Remember	AME803.11
16	List the types of estimates	Understand	AME803.11
17	Classify the sources of cost estimation	Understand	AME803.11
18	Point out any two objectives of cost estimation	Understand	AME803.11
19	Explain batch costing	Remember	AME803.11
20	Explain briefly about conceptual cost estimating	Understand	AME803.11

Part - B (Long Answer Questions)

1	<p>A company that manufactures electrical motors have the following statistics of their quarterly demand for the last three years:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Quarter</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>250</td> <td>380</td> <td>450</td> </tr> <tr> <td>2</td> <td>230</td> <td>280</td> <td>310</td> </tr> <tr> <td>3</td> <td>190</td> <td>240</td> <td>270</td> </tr> <tr> <td>4</td> <td>290</td> <td>330</td> <td>390</td> </tr> <tr> <td>Total</td> <td>1060</td> <td>1230</td> <td>1420</td> </tr> </tbody> </table> <p>Use the multiplicative seasonal method to estimate the quarterly demand for the fourth year.</p>	Quarter	Year 1	Year 2	Year 3	1	250	380	450	2	230	280	310	3	190	240	270	4	290	330	390	Total	1060	1230	1420	Understand	AME803.11
Quarter	Year 1	Year 2	Year 3																								
1	250	380	450																								
2	230	280	310																								
3	190	240	270																								
4	290	330	390																								
Total	1060	1230	1420																								
2	<p>Suppose that a Hamburger chain has 12 stores in a certain city. Sales figures and profits for the stores are given in the table below. Obtain a regression line for the data, and predict profit for a store assuming sales of \$10 million.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Sales (Million)</th> <th>Profit (Million)</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>0.15</td> </tr> <tr> <td>2</td> <td>0.10</td> </tr> <tr> <td>6</td> <td>0.13</td> </tr> <tr> <td>4</td> <td>0.15</td> </tr> </tbody> </table>	Sales (Million)	Profit (Million)	7	0.15	2	0.10	6	0.13	4	0.15	Understand	AME803.11														
Sales (Million)	Profit (Million)																										
7	0.15																										
2	0.10																										
6	0.13																										
4	0.15																										

	<table border="1"> <tbody> <tr><td>14</td><td>0.25</td></tr> <tr><td>15</td><td>0.27</td></tr> <tr><td>16</td><td>0.24</td></tr> <tr><td>12</td><td>0.20</td></tr> <tr><td>14</td><td>0.27</td></tr> <tr><td>20</td><td>0.44</td></tr> <tr><td>15</td><td>0.34</td></tr> <tr><td>7</td><td>0.17</td></tr> </tbody> </table> <p>Hint: Use the Linear regression analysis equation: $Y = a + bX$ Where: Y = dependent variable X = independent variable a = Y-intercept of the line b = slope of the line Further: $a = \bar{y} - b\bar{x}$ and $b = (\sum XY - n\bar{x}\bar{y}) / (\sum X^2 - n\bar{x}^2)$ Where: \bar{y} = average of the Y-values \bar{x} = average of the X-values n = number of points in the sample</p>	14	0.25	15	0.27	16	0.24	12	0.20	14	0.27	20	0.44	15	0.34	7	0.17				
14	0.25																				
15	0.27																				
16	0.24																				
12	0.20																				
14	0.27																				
20	0.44																				
15	0.34																				
7	0.17																				
3	<p>The monthly demand for a certain model of industrial robots has been as follows:</p> <table border="1"> <thead> <tr><th>Month</th><th>Units</th></tr> </thead> <tbody> <tr><td>May</td><td>90</td></tr> <tr><td>June</td><td>72</td></tr> <tr><td>July</td><td>99</td></tr> <tr><td>August</td><td>103</td></tr> <tr><td>September</td><td>95</td></tr> <tr><td>October</td><td>99</td></tr> <tr><td>November</td><td>113</td></tr> <tr><td>December</td><td>108</td></tr> </tbody> </table> <p>a) Use the exponential smoothing method to forecast the number of units for June - January. The initial forecast for May was 95 units; $\alpha = 0.2$. b) Calculate the absolute percentage error for each month from June through December and the MADE and MAPE of forecast error as of the end of December. c) Repeat the calculations, but with $\alpha = 0.4$ and compare the outcome. d) Which α generates the better forecasts?</p>	Month	Units	May	90	June	72	July	99	August	103	September	95	October	99	November	113	December	108	Understand	AME803.11
Month	Units																				
May	90																				
June	72																				
July	99																				
August	103																				
September	95																				
October	99																				
November	113																				
December	108																				
4	Explain the procedure followed for estimating the cost of an industrial product	Remember	AME803.11																		
5	<p>A factory has 15 lathes of same make and capacity and five shapers of same make and capacity. Lathe occupies 30m.sq. area while shaper occupies 15m.sq. During one calendar year factory expense for the section area are as follows:</p> <p>(i) Building rent and depreciation 5,000 (ii) Indirect labor and material 15,000 (iii) Insurance 2,000 (iv) Depreciation charges of lathe 5,000</p>	Understand	AME803.11																		

	(v) Depreciation charges of shapers 3,000 (vi) Power consumption for lathe 2,000 (vii) Power consumption for shapers 1,000 Evaluate the machine hour rate for lathes and shapers work for 25,000 hrs and 8,000 hrs respectively		
6	Describe various methods of job estimation	Understand	AME803.11
7	Explain the procedure followed for estimating the cost of an individual product	Understand	AME803.11
8	Discuss the various methods used allocation of overheads	Understand	AME803.11
9	Describe step by step procedure for estimating the direct material cost	Remember	AME803.11
10	Explain different methods of cost estimation	Understand	AME803.11

Prepared by:

Dr. K Ch Apparao, Associate Professor, Mechanical Engineering

HOD, ME