DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

UNIT NO. 1 - Introduction to Industrial Engineering and Productivity

SUBJECT: Industrial Engineering **COURSE : BE (2015 Pattern)**

THEORY QUESTIONS

Q.1	Define productivity and explain factor affecting on productivity.
Q.2	Explain the function Controlling of management with the help of suitable examples
Q.3	Explain productivity models any two in Industrial Engineering.
Q.4	Explain types of organization.
Q.5	Define Industrial Engineering and its objectives.
Q.6	Explain Line and Staff Organization.
Q.7	Explain types of production system.
Q.8	List different functions of management.
Q.9	Short Note on Productivity Improvement Techniques
Q.10	Calculate various productivity factors and total productivity with the following data: (i)Output= 1,00,000 (ii) Labor = 20,000 (iii) Material = 30,000 (iv) Capital= 20,000 (v) Energy= 5000, Other expenses= 2000. (units are same for inputs and output)
Q.11	Calculate various productivity factors and total productivity with the following data: (i)Output= 10,000 (ii) Labor = 3,000 (iii) Material = 2,000 (iv) Capital= 3,000 (v) Energy= 1000, Other expenses= 500. (units are same for inputs and output)
Q.12	Compare Job Production System with Mass Production System

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

UNIT NO. 2 - Work Study

SUBJECT: Industrial Engineering **COURSE : BE (2015 Pattern)**

THEORY QUESTIONS

Q.1	Define Work study and specify the objectives and describe the steps involved in work study.
Q.2	What is method study? What are the objectives of method study and Explain the scope of method study?
Q.3	Discuss the importance of Motion Economy
Q.4	What are Therbligs? List them all with symbols and the meaning.
Q.5	What is synthetic motion study? Give details of arriving at rating performance.
Q.6	Define Value Engineering. Enlist all the steps for implementing Value Engineering.Write short notes on types of elements.
Q.7	What are the components of work study?
Q.8	Explain human factors in work study
Q.9	Describe the steps involved in carrying out method study.
Q.10	Explain with examples method study symbols for recording the facts
Q.11	Describe with suitable example operation process chart
Q.12	Describe with suitable examples Flow process chart
Q.13	Describe with suitable example Two handed process chart
Q.14	Describe with suitable example Multiple activity chart
Q.15	Write a short note on: Travel Chart
Q.16	Write a short note on: String Diagram
Q.17	Write a short note on: Micro motion analysis
Q.18	Write a short note on: SIMO chart
Q.19	Write a short note on: Value Engineering & Value Analysis

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

SUBJECT: Industrial Engineering **COURSE : BE (2015 Pattern)**

Unit III- Work Measurement

<table>
<tr><td>1</td><td>List down the various steps in conducting a stop watch time study.</td></tr>
<tr><td>2</td><td>Outline the general procedure for a work sampling study to determine the standard time</td></tr>
<tr><td>3</td><td>What do you understand by Predetermined Motion Time study(PMTS) and Method Time Measurement (MTM).</td></tr>
<tr><td>4</td><td>A group of 10 workers working for 8 hours per day produced 320 pieces of component. It was observed that 15 % of the total available time workers were idle and for the remaining time they worked at an average performance of 80%. Calculate standard time for the job assuming operations to be completed manually and workers are entitled for 12 % relaxation allowances</td></tr>
<tr><td>5</td><td>A work sampling study was conducted for 100 hrs. in the machine shop in order to estimate the standard time. The total number of observations recorded was 3000. No working activity could be noticed for 500 observations. The ratio between manual and machine elements was 3:1. Average rating factor was estimated as 1.15 and the total numbers of articles produced during the study period were 6000.Rest and Personal allowances may be taken as 12% of the normal time.</td></tr>
<tr><td>6</td><td>“Various allowances are considered in building up the standard time of a job”. What are these allowances? Why are they given? How are assessed?</td></tr>
<tr><td>7</td><td>How do you determine the sample size in work measurement? Also steps in arriving at standard time in Work sampling.</td></tr>
<tr><td>8</td><td>State various work measurement techniques. Explain any one o them.</td></tr>
<tr><td>9</td><td>State the limitation of time study.</td></tr>
<tr><td>10</td><td>Following are the elements of a machining operation. Calculate normal time, Standard time for this job. Assume contingency allowance to be 3 %.
<table>
<tr><th>Sr. No.</th><th>Observed Time in min</th><th>Rating %</th><th>Frequency</th><th>Relaxation allowance %</th></tr>
<tr><td>1</td><td>1.80</td><td>60</td><td>1</td><td>10</td></tr>
<tr><td>2</td><td>2.20</td><td>90</td><td>1</td><td>12</td></tr>
<tr><td>3</td><td>6.30</td><td>100</td><td>1</td><td>10</td></tr>
<tr><td>4</td><td>3.20</td><td>100</td><td>1</td><td>10</td></tr>
<tr><td>5</td><td>1.40</td><td>90</td><td>1</td><td>12</td></tr>
<tr><td>6</td><td>20.00</td><td>80</td><td>1/25</td><td>12</td></tr>
</table></td></tr>
<tr><td>11</td><td>Write short note on : Performance rating.</td></tr>
<tr><td>12</td><td>A work sampling study conducted has following details:</td></tr>
</table>

<table>
<tr><td></td><td>(i)Total time observed: 6500 min;
(ii) No. of working observations: 2500
(iii) No. of idle observations:250;
(iv) Performance rating during observations: 90
(v) No. of parts produced=400;
(vi) Allowances: 10%
Calculate:
(a) Standard time.
(b) Estimate the accuracy at 95% confidence level;
(c) Comment on results for accuracy of +/- 10%</td></tr>
<tr><td>13</td><td>The observed times and performance rating for 5 elements of a job are given in the table. Calculate standard time, assuming rest and personal allowance as 15% and contingency allowance as 2% of basic time.
<table>
<tr><td>Element No.</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Observed time , min</td><td>0.2</td><td>0.08</td><td>0.5</td><td>0.12</td><td>0.1</td></tr>
<tr><td>Performance Rating %</td><td>85%</td><td>80%</td><td>90%</td><td>85%</td><td>80%</td></tr>
</table></td></tr>
</table>

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

SUBJECT: Industrial Engineering **COURSE : BE (2015 Pattern)**

Unit IV- Production Planning and control

1	Define the term "Production Planning and control". State its objectives
2	Describe the functions of Production Planning and control in brief
3	There are two industries manufacturing two types of plugs. The standard time per piece is 1.5 minute; output of the two industries is 300 and 200 respectively per shift of 8 hrs. Then (i)What is the productivity of each per shift of 8 hrs? (ii)What is the production of each per week (6 days) on the basis of double shift?
4	Master Production schedule is to drive the entire production system. Identify the MPS function
5	What is supply chain management and the strategies? What are current trends in logistics and distribution?
6	What is MRP, MRP I, MRP II? What is ERP? What are the benefits of using ERP? Give a brief account of evolution of ERP.
7	Enlist various functional modules of ERP. Give a brief account of any one module.
8	Give the characteristic features of the following types of Production system (i) Job order & Project Type (ii) Batch production (iii) Mass production and flow production
9	What is push pull systems of production? Which one will lead to more productivity?
10	What is capacity planning? What is Production Planning and control, need of PPC?

B.E. (MECHANICAL ENGINEERING)

402049C: INDUSTRIAL ENGINEERING

UNIT 05: FACILITY DESIGN

Q. 1 What is EOQ model of inventory control? Give deterministic and probabilistic models of inventory control.(Numerical).What is ABC and VED analysis? 6

Q. 2 What is Assembly line balancing? What are all the advantages of Line Balancing?(Numerical also required) 8

Q. 3 What are the factors involved in locating the plant. 6

Q. 4 Give different types of plant layout used in manufacturing. Describe what is Computer aided layout design 8

Q. 5 Enumerate all 10 Principles of Material Handling? List all Unit load principles , types of Material handling systems. 10

Q.6 A company manufactures house hold mixers. The assembly line manufacturing has no. of tasks to be performed according to the precedence requirements given in table. 12

Task	Precedence requirement	Task Time (min)
A	-------	4
B	--------	2
C	--------	5
D	A, C	3
E	D	4
F	D	2
G	B,E,F	3
H	G	2

The Company intends to set up an assembly line to produce 80 units per 8 hours shifts.

Balance the Assembly line and find----

1) Efficiency of line
2) Draw precedence diagram
3) Fine the desired cycle time
4) Calculate the theoretical no. of work stations

Q.7 A manufacturer has to supply his customers 3600 units of products per year. Shortages are not permitted. Inventory carrying cost is Rs.1.2 per unit per annum. The set up cost per run is Rs.80. 10

Find:

1. EOQ
2. Optimum no. of orders per annum.
3. Average annual inventory cost (minimum)
4. Optimum period of supply per optimum order

Q.8	A Contractor undertakes to supply diesel engines to a truck manufacturing company at the rate of 25 per day. He finds the cost of holding a completed engine stock is Rs.16 per month. Production of engines is in batches and each time a new batch is started, there are set up costs of Rs.10,000. How frequently should the batches be started and what will be the minimum average inventory cost and production time if production rate is 40 engines per day.	12
Q.9	Explain FSN analysis	6
Q.10	Explain VED analysis	6
Q.11	What is ABC and VED analysis?	6
Q.12	Explain various cost involved in Inventory briefly.	8
Q.13	Give the purpose of Inventory Control	6
Q.14	Explain selection criteria of Material Handling	6
Q.15	Short note on Unit Load	6

UNIT 06: ENGINEERING ECONOMY, HUMAN RESOURCE AND INDUSTRIAL SAFETY

Q. 1	Explain in details what are different elements of cost?	6
Q. 2	Define the term cost give the basis of **classification cost**	6
Q. 3	What do you understand by **Break even analysis?**	6
Q. 4	Write a short note on **Break even analysis**	6
Q. 5	Explain different uses of **Break-even analysis**	6
Q.6	The non-variable manufacturing cost and operating expenses of a company are rs 40000 a year the marginal contribution is 40% of sales. a. What is the company's BEP? b. What profit can be expected on the sales of Rs 12000? c. What sales volume is required to produce a profit of Rs 20000?	6
Q.7	Write a short note on Profit and Loss Account	6
Q.8	Write a short note on Techniques for evaluation of capital investments	
Q.9	What is Pay back method explain in detail.	6
Q.10	Explain Internal Rate of Return IRR	6
Q.11	Explain Net Present Value(NPV)	6
Q. 12	What are different methods of evaluation of capital investments?(IRR, present value of cash flow, payback period)	6
Q.13	What is KRA? What are all the essential aspects in man power recruitment? How can the performance of employees be improved in an organisation?	4
Q. 14	Why performance appraisal is important for achieving the organizational goals?	6
Q. 15	What are the general rules of industrial safety? How can we achieve safety in industrial environment?	8
Q.16	Given: Fixed cost=30,000/ and Variable cost= Rs.2/unit Selling price=Rs.10 per unit. Sales=Rs. 1, 00,000 1. Calculate if the sales is Rs.1, 40,000/ 2. Calculate the turn over required if profit target of Rs.60, 000/ has been budgeted 3. What would be the selling price per unit when BEP is brought down to 5000 units.	12