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MBA – 025

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 7114 Roll No.

M. B. A.

(SEM. II) EXAMINATION, 2008-09

PRODUCTION & OPERATIONS MANAGEMENT

Time : 3 Hours] *[Total Marks : 100*

Note : (1) This question paper contains **three** parts.

(2) All questions are **compulsory**.

PART - I

1 This question contains 20 objective type questions. **1×20**

Attempt all questions and choose the correct answer and write it in answer book :

(i) Who developed the use of standardization in large-scale mass production using a moving assembly line?

(a) Frederick Winslow Taylor

(b) Frank Gilbreth

(c) Adam Smith

(d) Charles Babbage

(e) Henry Ford

(ii) Higher productivity derived from efficient operations leads to

(a) more expensive goods and services

(b) lower quality goods and services

(c) higher discretionary incomes for consumers

(d) increased dependence on expensive labor

(iii) Which of the following best describes the concept of the value chain?

(a) adding financial value to an organization through the acquisition of other firms

(b) the step-wise increases in product prices as raw materials are turned into goods/services

(c) the steps in manufacturing that add value to finished products

(d) all steps in the transformation process that add value even if they don't come from manufacturing

(iv) The four basic competitive priorities are cost, quality, delivery and flexibility.

(a) True

(b) False

(v) Operations management divides decisions into three broad categories. They are:

(a) Strategic, operational and financial

(b) Personnel, financial and operational

(c) Strategic, tactical and operational planning and control

(d) Planning, tactical and control

(e) Planning, organizing and financial

(vi) A service that consists of specific functions that are part of the product itself is called a(n)

(a) Embedded service

(b) Comprehensive service

(c) Integrated solution

(d) Distribution control

(vii) Which of the following types of processes will be used to produce gasoline and petroleum products?

(a) Job Shop
(b) Batch
(c) Assembly Line
(d) Continuous Processing
(e) Project

(viii) Which of the following factors contributes to successful product design?

(a) Using engineers/designers exclusively in the design phase
(b) Eliminating prototype development as a part of the design phase
(c) Ignoring quality, cost and delivery issues in the design phase
(d) Surprising the customer with extra features

(ix) To properly integrate new technology into their organization, a firm should realize

(a) that there are no limitations on the usefulness of that technology
(b) that customer training in the use of the technology will typically be unnecessary
(c) that customer `fear of the unknown' is still a real issue
(d) that it will only work for tangible products

(x) An operation where machine tools are changed automatically are known as

(a) a machine center
(b) computer integrated manufacturing
(c) a flexible manufacturing system
(d) computer-aided design

(xi) Performance measures concerned with specific work processes that are virtually the same for all industries refer to

(a) Internal benchmarks
(b) Competitive benchmarks
(c) Functional benchmarks
(d) Generic benchmarks

(xii) Sunk costs are expenses which have no effect on a decision and therefore, should not be taken into account in considering investment alternatives.

(a) True
(b) False

(xiii) Depreciation refers to the allocation of cost due to deterioration of tangible assets.

(a) True
(b) False

(xiv) A cost that must be incurred if an investment is not made is a(n)

(a) Sunk cost

(b) Fixed cost

(c) Avoidable cost

(d) Opportunity cost

(xv) Which of the following is NOT an economic investment decision?

(a) Purchasing new facilities

(b) Improving labor efficiency

(c) Make or buy

(d) Closing a plant

(xvi) Deming would argue that as much as 94% of poor quality is the responsibility of :

(a) Management

(b) The process

(c) Workers

(d) Engineering

(xvii) Which of the following is NOT consistent with the concept of TQM?

(a) Organizational leadership

(b) Quality control departments

(c) Continuous improvement

(d) Customer focus

(xviii) Which of the following is appropriate for Six Sigma quality?

(a) Defects per hundred

(b) Defects per thousand

(c) Defects per hundred thousand

(d) Defects per million

(xix) Which of the following is NOT a qualitative factor in location decisions?

(a) Local infrastructure

(b) Worker education and skills

(c) Product content requirements

(d) Exchange rates

(xx) Which of the following is NOT a mark of a good layout in manufacturing?

(a) Straight line flow patter (or adaption)

(b) Predictable production line

(c) Bottleneck operations

(d) Work stations close together

PART - II

2 Read the following case carefully and answer the questions given below :

The Best Engineering Part is No Part

Putting together NCR Corp.'s new 2760 electronic cash register is a snap.In fact, William R. Sprague can do it in less than two minutes--blindfolded. To get that kind of easy assembly, Sprague, a senior manufacturing engineer at NCR, insisted that the point-of-sale terminal be designed so that it parts fit together with no screws or bolts. The entire terminal consists of just 15 vendor-produced components. That's 85 per cent fewer parts, from 65 percent fewer suppliers, than in the company's previous low-end model, the 2160. And the terminal takes only 25 percent as much time to assemble. Installation and maintenance are also a breeze, says Sprague. "The simplicity flows through to all of the downstream activities, including field

service." The new NCR product is one of the best examples to date of the payoffs possible from a new engineering approach called design for manufacturability, mercifully shortened to DFM. Other DFM enthusiasts include Ford, General Motors, IBM, Motorola, Perkin Elmer, and Whirlpool. Since 1981, Genral Electric Co. has used DFM in more than 100 development programs from major appliances to gearboxes for jet engines. GE figures that the concept has netted $200 million in benefits, either from cost savings or from increased market shares.

NUTS TO SCREWS

One U.S. champion of DFM is Geoffrey Boothroyd, a professor of industrial and manufacturing engineering at the University of Rhode Island and the cofounder of Boothroyd Dewhurst Inc. This tiny Wakefield, Rhode Island, company has developed several computer programs that analyze designs for ease of manufacturing. The biggest gains,

notes Boothroyd, come from eliminating screws and other fasteners. On a supplier's invoice, screws and bolts may run mere pennies apiece, and collectively they account for only about 5 per cent of a typical product's bill of materials. But tack on all of the associated costs, such as the time needed to align components while screws are inserted and tightened, and the price of using those mundane parts can pile up to 75 percent of total assembly costs. "Fasteners should be the first thing to design out of a product,"he says. Had screws been included in the design of NCR's 2760, calculates Sprague, the total cost over the lifetime of the model would have been $12,500--per screw. "The huge impact of little things like screws, primarily on overhead costs, just gets lost," he says. That's understandable, he admits, because for new-product development projects "the overriding factor is hitting the market window. It's better to be on time and over budget than on

budget but late." But NCR got its simplified terminal to market in record time without overlooking the little details. The product was formally introduced last January, just 24 months after development began. Design was a paperless, interdepartmental effrot from the very start. The product remained a computer model until all members of the team--from design engineering, manufacturing, purchasing, customer service, and key suppliers--were satisfied. That way, the printed circuit boards, the molds for its plastic housing, and other elements could all be developed simultaneously. This eliminated the usual lag after designers throw a new product "over the wall" to manufacturing, who then must figure out how to make it. "Breaking down the walls between design and manufacturing to facilitate simultaneous engineering," Sprague declares, "was the real breakthrough." The design process began with a mechanical computer-aided engineering program that allowed the team to

fashion three dimensional models of each part on a computer screen. The software also analyzed the overall product and its various elements for performance and durability. Then the simulated components were assembled on a computer workstation's screen to assure that they would fit together properly. As the design evolved, it was checked periodically with Boothroyd Dewhurst's DFM softare. This prompted several changes that trimmed the parts count from an initial 28 to the final 15.

NO MOCK-UP

After everyone on the team gave their thumbs-up, the data for the parts were electronically transferred directly into computer-aided manufacturing systems at the various suppliers. The NCR designers were so confident everything would work as intended that they didn't bother making a mock-up. DFM can be a powerful weapon against foreign competition. Several years ago, IBM used Boothroyd

Dewhurst's software to analyze dot-matrix printers it was sourcing from Japan--and found it could do substantially better. Its Proprinter has 65 percent fewer parts and slashed assembly time by 90 percent. "Almost anything made in Japan," insists Professor Boothroyd, "can be improved upon with DFM-often impressively."

Questions :

(a) What development problems has the NCR approach overcome? **3×10=30**

(b) What can be other traditional methods to overcome such development problems?

(c) What do you mean by Nuts to Screws in this case? - Explain.

PART - III

3 Define Scheduling. How does it differ from loading? State the objectives of scheduling. **12 $\frac{1}{2}$**

OR

3 Differentiate between : "Job-order production" and "Batch production system". Which amongst these will suit a small-car manufacturing plant?

4 Define the terms Standardization, Simplification, Specialization and Diversification in context of new product development. **12½**

OR

4 Define cycle-time. State the methods of reducing cycle time.

5 Describe briefly the ABC, FSN and VED analysis of inventory control. **12½**

OR

5 What are the major decision factors in selection of a plant layout for a small-car manufacturer? How important will social and political factors are in this decision?

6 For the organizations listed below, describe the inputs, the transformation process, and outputs of the productive system. **12½**

(a) a high school / university library

(b) hotel

(c) a small manufacturing firm.

OR

6 List the important differences between goods production and service production.