INTERMEDIATE EXAMINATION

June 2013

I-P9(OMS)
Syllabus 2008

Operation Management and Information Systems

Time Allowed: 3 Hours

Full Marks : 100

The figures in the margin on the right side indicate full marks.

Section I : Operation Management

Answer **Question No. 1,** *which is compulsory and* **any two** *questions from the rest, under Section I.*

1. (a) Match the terms in Column I with the relevant terms in Column II. 0·5×8

Column I	Column II
(A) Machining of flat metallic surfaces by single point cutting tools	(i) Economic lot size
(B) One of the key decisions that determines the long run efficiency in operations	(ii) Hobbing operation
(C) The most accurate way of cutting gears	(iii) Shifting production during breakdown
(D) Delivery of products to customers or to inventory stocks according to some pre determined schedule	(iv) Preventive Maintenance
(E) The quantity of output produced in one batch which results in lowest average cost of production	(v) Plant Layout
(F) Various workloads are assigned to standby under utilized machines at intervals and by rotation in order to maintain the output	(vi) Robotics
(G) Periodic inspection of equipment and machinery to uncover conditions that lead to production break down and harmful depreciation	(vii) Production Planning and Control
(H) A fast developing field of technology in which human like machines perform production tasks	(viii) Shaping

(b) Examine each statement and indicate whether it is **True** or **False** : 1×5

(i) A pump moves liquids from higher pressure to lower pressure.

(ii) In general, long range forecasting is more useful in production planning.

(iii) Technological obsolescence is a major danger which business firms face in modern era.

(iv) Plastic coating is less durable than painting.

(v) A work stoppage generally reduces the cost of production.

(c) Put an appropriate word or two in blank position. 1×5

(i) The Pattern Shop in a factory should ideally be near the _____.

(ii) Factor comparison is a method of _____.

(iii) _____ is the interval betweeen placing an order for a particular item and its actual receipt.

(iv) Product is a combination of potential utilities for a _____.

(v) A jig contains a device for guiding the _____.

Please Turn Over

2. (a) A company manufactures two items X_1 and X_2. They are sold at a profit of Rs. 30 per unit of X_1 and Rs. 20 per unit of X_2. X_1 requires 2 kgs of materials, 3 man hours and 1 machine hour per unit. X_2 requires 1 kg of material, 2 man hours and 3 machine hours per unit.

During each production run there are 280 kgs of material available, 500 labour hours and 420 hours of machines used. Please introduce the slack variables and write down the equations, including the objective function, that will determine the quantity of production of the two items to maximize profits. 4

(b) Replace the 'missing words' with appropriate terms in the following formula to evaluate the work done by preventive maintenance: 1×3

(i) ('missing words')/(Inspections scheduled) × 100 should be less than 10%

(ii) Frequency of breakdowns = (Number of breakdowns)/('missing words')

(iii) Effectiveness of planning = (Labour hours on scheduled maintenance)/ ('missing words').

(c) How do the variables of the production system help to constitute aggregate planning strategies? 2

(d) Location A would result in annual fixed cost of Rs. 3,00,000, variable costs of Rs. 63 per unit and revenue Rs. 68 per unit. Annual fixed cost at Location B is Rs. 8,00,000, variable costs are Rs. 32 per unit and revenues are Rs. 68 per unit. Sales volume is estimated to be 25,000 units/year. Which location is attractive? 3

(e) (i) "The main problem in maintenance analysis is to minimize the overall cost of maintenance without sacrificing the objectives." What are the alternatives before the management and how do you achieve a balance between the conflicting alternatives? 3

(ii) A Public transport system is experiencing the following number of breakdowns for months over the past 2 years in their new fleet of vehicles :

Number of breakdowns	0	1	2	3	4
Number of months this occured	2	8	10	3	1

Each breakdown costs the firm an average of Rs. 2,800. For a cost of Rs. 1,500 per month, preventive maintenance can be carried out to limit the breakdowns to an average of one per month. Which policy is suitable for the firm? 3

3. (a) Name the major heads under which the main types of material handling equipment can be conveniently classified 3

(b) Expand the following: 1×5

(i) CR

(ii) CNC

(iii) MTM

(iv) VAM

(v) SQC

(c) Empire Glass Company can produce a certain insulator on any three machines which have the following charges shown below. The firm has an opportunity to accept an order for either (1) 50 units at Rs. 20/unit or (2) 150 units at Rs. 12/unit.

Machine	Fixed cost (Rs.)	Variable cost (Rs.)
A	50	4/unit
B	200	2/unit
C	400	1/unit