

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 between 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 occurred	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

- (i) Which machine should be used if 50 units order is accepted and how much profit will result?
- (ii) Which machine should be used if the 150 units order is accepted and what will be the resultant profit?
- (iii) What is the break-even volume for machine B when the price is Rs. 12/unit?
- (iv) Suppose the fixed cost for machine A is a stepped function with Rs. 50 up to 40 units and Rs. 100 thereafter. Will the answers to (i) and (ii) above vary? If so, what will be the revised answer? 2×4
- (d) The time study of a machinery operation recorded cycle times of 8·0, 7·0, 8·0 and 9·0 minutes. The analyst rated the observed worker as 90%. The firm uses a 0·15 allowance fraction. Compute the standard time. 2
4. (a) For each part below, choose the most appropriate answer out of the four options given against each part: 1×5
- (i) Surface hardening is an example of
- (A) Production by application of machine tool,
(B) Production by disintegration,
(C) Production by integration,
(D) Production by service.
- (ii) The desired objective of Production and Operation Management is
- (A) Use of cheap machinery to produce,
(B) To train unskilled workers to manufacture goods perfectly,
(C) Optimal utilization of available resources,
(D) To earn good profits.
- (iii) Most suitable layout for Job Production is
- (A) Line layout,
(B) Matrix layout,
(C) Process layout,
(D) Product layout.
- (iv) The time horizon selected for forecasting depends on
- (A) The salability of the product,
(B) The selling capacity of salesman,
(C) Purpose for which forecast is made,
(D) Time required for production cycle.
- (v) A method in which a trend line is drawn in such a way that the sum of the squares of deviations of the actual points above and below the trend line is at the minimum is known as
- (A) Squared trend method,
(B) Equal square method,
(C) Adjusted square method,
(D) Least square method.

- (b) A fleet owner finds from his past records that the costs per year of running a vehicle whose purchase price is Rs. 1,00,000 are as under:

Year	1	2	3	4	5
Runing costs (Rs.)	10,000	12,000	13,500	15,000	18,000
Resale value (Rs.)	80,000	65,000	55,000	25,000	6,000

Thereafter, running cost increases by Rs. 3,000, but resale value remains constant at Rs. 6,000. At what age is a replacement due? 5

- (c) The following data is available for a machine in a manufacturing unit:

Hours worked per day	8
Working days per month	25
Number of operator	1
Standard minutes per unit of production : Machine time	22
Operator time	8
Total time per unit	30

- (i) If plant is operated at 80% efficiency, and the operator is working at 100% efficiency, what is the output per month?
- (ii) If machine productivity is increased by 25% over the existing level, what will be the output per month?
- (iii) If operator efficiency is reduced by 25% over the existing level, what will be the output per month? 2+2+2
- (d) S. K. Timber Workshops use forklift trucks to transport lumber from factory to a storage area 0.3 km away. The lift trucks can move three loaded pallets per trip and travel at an average speed of 8 km. per hour (allowing for loading, unloading, delays and travel). If 640 pallet loads must be moved during 8 hours shift, how many lift trucks are required? Assume single shift working and 300 working days in a year. 2

Section II : Information Systems

Answer Question No. 5 which is compulsory and any two questions from the rest, under Section II.

5. (a) Put an appropriate word or two in blank position: 1×5
- (i) A record is identified by its _____.
- (ii) _____ is a process of assessing risk and reducing it to an acceptable level.
- (iii) In Client Server architecture, _____ software is used.
- (iv) An Executive Information System is an advanced model of _____.
- (v) After bootstrapping, Operating System from Hard Disk is loaded into _____ to put the computer in operation.

(b) For each part below, choose the most appropriate answer out of the four options given against each part: 1×5

(i) Data are stored sequentially on the value of the key field irrespective of order of creation of records

- (A) Random file;
- (B) Sequential file;
- (C) Word file;
- (D) Transaction file.

(ii) A data set in the form of graph, picture or frictional diagram is represented by

- (A) Iconic scale model;
- (B) Analytical model;
- (C) Mathematical model;
- (D) Waterfall model.

(iii) Unauthorised access to software and information for causing damage is known as

- (A) Cracking;
- (B) Hacking;
- (C) Virus;
- (D) Software piracy.

(iv) Barcode is

- (A) Unit used in banking industry;
- (B) Universal product code;
- (C) Spreadsheet package;
- (D) Scan graphs.

(v) 'Packet switching' on the Internet refers to

- (A) Type of circuitry;
- (B) Switching components;
- (C) Method of data movement;
- (D) Packet of hard copy of documents.

(c) Match the terms in Column I with the relevant terms in Column II

0-5×8

Column I	Column II
(A) Super zapping	(i) Market Intelligence
(B) Trend monitoring	(ii) To eliminate syntax errors
(C) Debugging	(iii) Carried out by the programmer
(D) Protocol	(iv) Programs written in HLL
(E) Function test	(v) Access to special system programs bypassing normal systems control
(F) Source Program	(vi) Rules for transmission
(G) RAM	(vii) Complex interface
(H) Synchronous Communication	(viii) Volatile

Please Turn Over

6. (a) What are the different modules and their functions in DBMS? 5
- (b) Each statement below is either True or False. Indicate the same in your answers: 1×3
- (i) Cost Benefit analysis is made during the system evaluation phase.
 - (ii) Master file contains the information which are permanent in nature.
 - (iii) The basic aim of normalization is to ensure that the same data are stored in more than one place.
- (c) In a disk pack, number of tracks in each surface are 200 and number of sectors in each track are 20. If there are 10 Nos. of recording surfaces and 600 bad sectors in the disk pack, calculate total number of good sectors. 2
- (d) Explain DSS. What are its characteristics? Narrate the components of DSS. 2+3+3
7. (a) Expand the following and write one or two sentences on each expression to convey its meaning or implication: 1×5
- (i) CODASYL
 - (ii) BASIC
 - (iii) SET
 - (iv) ERP
 - (v) RADIUS
- (b) What is an ERP package? What are the reasons for accepting ERP system as an ideal system for replacing the old business system? What are the common criteria for selecting an ERP package? 1+3+3
- (c) What are the advantages of E Commerce through Internet? What are the impediments in introducing the same? 3+3
8. Write short notes on *any six* of the following: 3×6
- (a) Characteristics of usefulness of information;
 - (b) Workstation;
 - (c) Dynamic analysis test;
 - (d) Components of BIS;
 - (e) Objectives of MIS;
 - (f) Level of management;
 - (g) Benefits of Extranet;
 - (h) Features of HLL.
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