

INTERMEDIATE EXAMINATION

December 2014

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.

Operation Management

Answer question No. 1 which is compulsory and any two questions from the rest.

1. (a) Put an appropriate word in blank position: 1×5=5
- (i) \_\_\_\_\_ focuses on such areas as inventory goals and wage budgets.
  - (ii) IBFS is optimal and unique when all numbers in the \_\_\_\_\_ are non-negative.
  - (iii) The investment on machines in a straight line layout is \_\_\_\_\_ than the investment on machines in a functional layout.
  - (iv) \_\_\_\_\_ refers to the heating and cooling operations which are usually applied to induce softening.
  - (v) \_\_\_\_\_ machines are often kept to reduce the loss due to the breakdown of a key machine.
- (b) Expand the following: 1×4=4
- (i) AQL (ii) SRAC
  - (iii) NET (iv) CRAFT
- (c) Examine each statement and indicate whether it is 'True' or 'False'. 1×5=5
- (i) A special purpose Machine Tool performs only a limited number of specialised operations with great speed and precision.
  - (ii) Strikes and lock-out are controllable factors affecting Capacity Planning.
  - (iii) Incentives are substitute for lower wages.
  - (iv) Linear Programming does not consider uncertainties.
  - (v) Depending on the need, the maintenance activity may be centralized or decentralized.
2. (a) Mention when the following trucks are used: 4
- (i) Forklift truck (ii) Reach trucks
  - (iii) Stackers (iv) Stillage trucks
- (b) In a transformer, it is observed that the voltage of secondary winding is 115 volts and the number of turns in primary coil and secondary coil are 250 and 500 respectively. Calculate the voltage of primary winding, and derive whether it is a 'step-up' or 'step-down' type of transformer. 3

Please Turn Over

- (c) The probabilities of failure  $p_n$  of an equipment in the  $n^{\text{th}}$  period after maintenance have been estimated as follows:

n	1	2	3	4
$p_n$	0.1	0.2	0.4	0.3

Cost of preventive maintenance : ₹ 150

Cost of breakdown maintenance : ₹ 100

Determine the optimum frequency of preventive maintenance.

5

- (d) Maximise  $3x_1 + 2x_2$  under the following restrictions:

6

$$x_1 \geq 0, x_2 \geq 0$$

$$2x_1 + x_2 \leq 40$$

$$x_1 + x_2 \leq 24$$

$$2x_1 + 3x_2 \leq 60$$

3. (a) Mention the different techniques which are used for improving productivity in industry. 5
- (b) The demand of a certain item is random. It has been estimated that the monthly demand of the item has a normal distribution with a mean of 680 and a standard deviation of 130 units. The unit price of the item is ₹ 10 per unit; the ordering cost is ₹ 20. The inventory carrying cost is estimated to be 25 per cent per year. The procurement lead time is constant and is one week. Find the most economic ordering policy and the expected total cost of controlling inventory, given that the service level is 97.5%. [Z for 97.5% service level may be taken as 2.] 6
- (c) List the various objectives of maintenance. 4
- (d) What are the features of Kinetic Pumps? 3
4. (a) A manufacturing enterprise has introduced a bonus system of wage payment on a slab-rate based on cost of production towards labour and overheads.

The slab-rate being—

1% - 10%	saving in production cost	5% of saving
Between 11% - 20%	saving in production cost	15% of saving
Between 21% - 40%	saving in production cost	30% of saving
Between 41% - 70%	saving in production cost	40% of saving
Above 70%	saving in production cost	50% of saving

The rate per hour for three workers A, B, C are ₹ 5, ₹ 6 and ₹ 6.25 respectively. The overhead recovery rate is 500% of production wages and the material cost is ₹ 30 per unit. The standard cost of production per unit is determined at ₹ 150 per unit.

If the time taken by A, B, C to finish 10 units is 25 hours, 30 hours and 18 hours respectively, what is the amount of bonus earned by the individual workers and actual cost of production per unit? 6

- (b) Expand FMS and state its key components. 3
- (c) Give the formula for calculating the following: 2
- (i) Performance of the department (ii) Frequency of breakdowns
- (d) You are appointed to provide consulting services to a plant for planning its layout. State the objectives of a good plant layout. 7

**Information Systems**

Answer Question No. 5 which is compulsory and any two questions from the rest.

5. (a) Put an appropriate word in blank position: 1×5=5
- (i) A \_\_\_\_\_ system is a system which does not have any interaction with outside environment.
  - (ii) Rectifying the failure of a particular module of the computer to put back the machine in working condition falls under \_\_\_\_\_ maintenance.
  - (iii) In DBMS, the statements like insertion, deletion, updation of rows in a table are part of \_\_\_\_\_ language.
  - (iv) \_\_\_\_\_ may be defined as the use of parties, external to the organisation, to provide goods or services to the organisation.
  - (v) \_\_\_\_\_ is a tool for developing a program for a given problem.
- (b) Each statement below is either 'True' or 'False'. Indicate the same in your answers. 1×5=5
- (i) RPG is a Procedure-Oriented Language.
  - (ii) Firewalls can protect the system from virus.
  - (iii) Implementation of ERP involves replacement of all existing Information Systems.
  - (iv) Encryption is a process of converting a text into a scrambled form by the use of some mathematical function.
  - (v) Sequential files are suited for on-line inquiry processing.
- (c) Match words in Column I with Column II: 0.5×8=4

Column I	Column II
(A) Assembly Language	(i) Direct Access Sector Device
(B) Gopher	(ii) ERP Package
(C) Rules	(iii) Internet protocol
(D) OLAP software	(iv) Telephone Exchange
(E) Trap door	(v) 'Just-in-time' information delivery
(F) Disk	(vi) Low level language
(G) QUAD	(vii) Access to system by passing normal systems control
(H) Circuit switching	(viii) One of the components of a decision table and refers to the unique combinations of condition

6. (a) 'Structured programming means the art of developing programs in a structured fashion to make it readable and maintainable.' Mention the rules to be followed to develop it. 2
- (b) List the characteristics of an Information System. 2
- (c) What are the different criteria for File Organization in a system? 6
- (d) Mention the purposes of the following controls in Processing Environment: 6
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|----------------------|--------------------|
| (i) Limit Check      | (ii) Input Coding  |
| (iii) Output Control | (iv) Hashing       |
| (v) Exception Report | (vi) Control Total |
- (e) What is the purpose of Integration Testing? 2

**Please Turn Over**

7. (a) What is Information? What are the characteristics of useful Information? 3+5
- (b) Expand the following: 6
- (i) DRAM
  - (ii) EGA
  - (iii) BPR
  - (iv) APIs
  - (v) HTTP
  - (vi) ISACA
- (c) Draw diagrams illustrating Hierarchical Database and Network Database. 2+2
8. Write short notes on *any six*: 3×6=18
- (i) Advantages of Data Mining
  - (ii) Models used for representing the Information
  - (iii) Main features of Client Server architecture
  - (iv) Centralized Architecture
  - (v) Programmed decision making
  - (vi) Generalised Audit Programmes that can be used as audit tools
  - (vii) Characteristics of secondary storage device
  - (viii) Sub systems in Finance Module in ERP System
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