INTERMEDIATE EXAMINATION
GROUP II
(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS
JUNE 2014

Paper- 9 : OPERATION MANAGEMENT AND INFORMATION SYSTEMS

Time Allowed : 3 Hours   Full Marks : 100

The figures in the margin on the right side indicate full marks.
Working Notes should form part of the answer.

Section A : (60 Marks)

OPERATION MANAGEMENT

Answer Question No. 1 (carrying 12 marks) which is compulsory and
any four (carrying 12 marks each) from the rest in this Section.

1. (a) Match the terms in Column I with the relevant terms in Column II.   0.5x8

	Column I		Column II
(A)	Benefit of Production Control	(i)	Reduced Manufacturing Cost
(B)	Limitations of Linear Programming	(ii)	Model of real phenomenon
(C)	Project Clean-up Phase	(iii)	Single Objective and Given Constraints
(D)	Simulation	(iv)	Balanced Inventory
(E)	Process Velocity	(v)	Voluntary group to identify problems
(F)	Quality Circle	(vi)	High reliability and rare requirement
(G)	Insurance Spares	(vii)	Value-added activities
(H)	Benefit of Work Study	(viii)	Dues are collected

(b) State suitable Material Handling Equipment, by choosing one out of (A) to (D), that should be used in each of the following four operations (i) to (iv) :   2
   [(A) EOT Crane; (B) Gravity chute; (C) Belt Conveyor; (D) Roller Table.]
   (i)   Transferring heavy materials from one department to another;
   (ii) Feeding coal and iron in steel plant;
   (iii) Transporting fertilizer packed bags to a truck on the ground below;
   (iv) Moving heavy load above the machine on the shop floor.

(c) State which of the following does not affect the Production Design: 1
   (i) Cost/Price Ratio   (ii) Process Capability   (iii) Reliability   (iv) Product Quality

(d) The time study of a machinery operation recorded cycle times of 7.0, 9.0,10.0 and 10.0 minutes. The analyst rated the observed worker as 90%. The firm uses a 0.15 allowance fraction. What is the standard time?   2
   (i) 8.1   (ii) 10.35   (iii) 9.53   (iv) 9.0

(e) If a firm sells 7,000 units, its loss is ₹ 40,000. But if it sells 10,000 units, its profit is ₹ 20,000. Calculate Fixed Cost: **2**
   (i) 2,00,000   (ii) 1,80,000   (iii) 1,60,000   (iv) 1,75,000

(f) Given the following alternatives, Linear Programming is a technique used in: **1**
   (i) Manufacturing Sequence   (ii) Product Mix
   (iii) Production Programme   (iv) Plant Layout

Answer:

1. (a) (A)   (iv)
       (B)   (iii)
       (C)   (viii)
       (D)   (ii)
       (E)   (vii)
       (F)   (v)
       (G)   (vi)
       (H)   (i)

   (b) (i)   (D) Roller Table;
       (ii)   (C) Belt Conveyor;
       (iii)   (B) Gravity chute;
       (iv)   (A) EOT Crane.

   (C) (iii)   Reliability.

   (d) (iii)   9.53
       Average cycle time = (7.0 + 9.0 + 10.0 + 10.0) / 4 = 9.0 minutes
       Normal time = 9.0 x 0.9 = 8.1 minutes.
       Standard Time = 8.1 / (1.0 - 0.15) = 9.53 minutes
       The standard time for this machinery operation would be set at 9.53 minutes, which is greater than the average cycle time observed. The average cycle time was adjusted for the rating factor (90%) and the allowance fraction (0.15).

   (e) (ii)   ₹ 1,80,000.
       Change in quantity = (10,000 - 7,000) = 3,000 units.
       Change in Profit = 20,000 - (-40,000) = ₹ 60,000.
       Therefore, unit contribution = (change in profit) / (change in output) = 60,000 / 3,000 = ₹20.
       So, when output = 10,000 units, total contribution = 20 x 10,000 = ₹ 2,00,000
       Fixed Cost = Total Contribution - Profit = 2,00,000 - 20,000 = ₹ 1,80,000.

   (f) (ii)   Product Mix.

2. (a) Write down the formula for: **1x3**
      (i) Performance (ii) Through put Ratio (iii) Breakdown Maintenance Index (as a % age)
   (b) The main shaft of calcinator has a very high reliability of 0.990. The equipment comes from abroad and has a high downtime cost associated with the failure of this shaft. This is estimated at ₹ 2 crore as the costs of sales lost and other relevant costs. However, this spare is quoted at ₹ 10 Lakh at present. Should the shaft spare be procured along with the equipment and kept or not? **2**
   (c) Compute the productivity per machine hour with the following data. Also draw your interpretation. **2**

Month	No. of machines employed	Working hours	Production units
March	400	225	99,000
April	500	200	1,00,000
May	600	250	1,35,000

(d) List down various phases of the simulation process. **2**

(e) A steel plant has a design capacity of 50,000 tons of steel per day, effective capacity of 40,000 tons of steel per day and an actual output of 36,000 tons of steel per day. Compute the efficiency of the plant and its utilisation. **2**

(f) Fill in the blank: **1**
Being part of operations function, _____ involves the shipping of goods to warehouses, retail outlets or final customers.

Answer:

2. (a) (i) $\text{Performance} = \dfrac{\text{Actual achievement in effective work done}}{\text{Ideal or basic standard target of achievement}} \times 100$

(ii) $\text{Throughput Ratio} = \dfrac{\text{Total throughput time}}{\text{Value added time}}$

(iii) Break-down Maintenance index (as a percentage) =
(Labour hour spent on break - down maintenance) / (Labour hours spent on all forms of maintenance) x 100

(b) The expected cost of down-time
= (Probability of failure) x (Cost when break-down occurs)
= (1 - 0.990) x (₹ 2 crore) = ₹ 2 lakh
However, the cost of procuring the spare now is ₹ 10 lakh. Therefore, expected cost of downtime is less than the cost of spare; hence the spare need not be bought along with the equipment.

(c) P = Productivity per machine hour
= Number of units produced /Machine hours
For March P = 99,000 / 90,000 =1.1
April   P = 100,000 / 100,000 = 1
May   P = 135,000 /150,000 = 0.9
Interpretation:- Though the total production in number of units is increasing, the productivity is declining.

(d) Phases of the simulation process:
(i) Definition of the problem and statement of objectives
(ii) Construction of an appropriate model
(iii) Experimentations with the model constructed
(iv) Evaluations of the results of simulations.

(e) Efficiency of the plant = Actual output/ Effective Capacity = 36000 / 40000 x 100 = 90%
Utilisation = Actual output/ Design Capacity = 36000 / 50000 x 100 = 72%

(f) Distribution

3. **(a) What are the various stages in the Design Process?** **3**
(b) Briefly state the role of Information Technology in Production/Operations Management. **3**

(c) Two alternative set-ups, A and B are available for the manufacture of a component on a particular machine, where the operating cost per hour is ₹ 20.

Particulars	Setup A	Setup B
Components / Setup	4000 pieces	3000 pieces
Setup cost / year	₹ 300	₹ 1500
Production rate / hour	10 pieces	15 pieces

Which of these set-ups should be used for long range and economic production? **6**

Answer:

3. (a) The various stages in the design process are:
    1. Ideas generation
    2. Screening and selection
    3. Initial design
    4. Economic analysis
    5. Prototype testing
    6. Redesign/modification
    7. Final specification

(b) Role of Information Technology in Production/Operations Management
Information technology is crucial to operations everywhere along the supply chain and to every functional area. Computer based information technology, in particular, has greatly influenced how operations are managed and how offices work. It makes cross-functional coordination easier and links a firm's basic processes. In a manufacturing plant, information technologies can link people with the work centres, data bases and computers.

(c) Considering one set-up:

Particulars	Setup A	Setup B
Setup cost	₹ 300	₹ 1,500
Operating hours / setup	4,000 / 10 = 400 hours	3,000/15 = 200 hours
Operating cost	20 x 400 = ₹ 8,000	20 x 200 = ₹ 4,000
Total Manufacturing cost	₹ 300 + 8,000 = ₹ 8,300	₹ 1,500 + 4,000 = ₹ 5,500
Manufacturing cost / piece	8,300/4,000 = ₹ 2.075	5,500/3,000 = ₹ 1.833

Assuming that the machine is used for production for one year having 2,000 hours of working:

Particulars	Setup A	Setup B
No. of set-ups	2000/400 = 5	2000/200=10
Set-up cost per year	5 x 300 = ₹ 1500	10 x 1500 = ₹ 15,000
Operating cost	2000 x ₹20 = ₹ 40,000	2000 x ₹ 20 = ₹ 40,000
No. of units produced / year	2000 x 10 = 20,000 nos.	2000x15 = 30,000 nos.
Total annual manufacturing cost	₹1500 +40,000 = ₹ 41,500	₹ 15,000 + 40,000 = ₹55,000
Manufacturing cost / unit	41,500/20,000 = ₹2.075	55,000 / 30,000 = ₹1.83

Since the manufacturing cost for set-up B is less, use setup B for long range and economic production.

4. **(a) You are appointed as a Consultant to implement ISO-9000 in a firm. Suggest various steps to be taken for implementing this. 10**
   (b) Monthly demand for a component is 1000 units. Setting-up cost per batch is ₹ 120. Cost of manufacture per unit is ₹ 20. Rate of interest may be considered at 10% p.a. Calculate the EBQ. 2

Answer:

4. (a) Implementation of ISO-9000:
    There are a number of steps that are necessary to implement a quality management system.
    (i) Senior Management Commitment. The most important step in implementing a quality system that will meet or exceed an ISO 9000 standard is to acquire the full support of upper management.
    (ii) Appoint the Management Representative. Once the commitment has been made, the process can proceed by adopting a project team approach and treating the same as other business undertaking and then management representative. This person is responsible for co-ordinating the implementation and maintenance of the quality system and is the contact person for all parties involved in the process, both internal and external.
    (iii) Awareness. This step requires an awareness program. Because the process is going to affect every member of the organization as well as require their input, and everyone should understand the quality system. They should know how it will affect day-to-day operation and the potential benefits.
    (iv) Appoint an Implementation Team. After everyone has been informed of the organization's intentions to develop the quality system, an implementation team should be assembled. This team should be drawn from all levels and areas of the organizations.
    (v) Training. The implementation team, supervisors and internal audit team should be trained. This activity can be accomplished by sending team leaders for training and by bringing the training in house for all team members through a one or two day seminar.
    (vi) Time Schedule. This activity develops a time schedule, for implementation and registration of the system.
    (vii) Select Element Owners. The implementation team selects owners for each of the system elements.
    (viii) Review the Present System. Review all the present-quality system. Copies of quality manuals, procedures, work instructions and forms presently in use are obtained. These documents are sorted into system elements to determine what is available and what is needed to complete the system.
    (ix) Write the Documents. Before written quality and procedure manuals — they can be combined into one document. Write appropriate work instructions to maintain the quality of specific functions. This process should involve every employee, because the best person to write a work instructions is the one who performs the job on a regular basis.
    (x) Install the New System. Integrate the policies, procedures and work instructions into the day-to-day workings of the organizational and document what is being done. It is not necessary for all elements to be implemented at the same time.
    (xi) Internal Audit. Conduct an internal audit of the quality system. This step is necessary to ensure that the system is working efficiently and to provide management with information for the comprehensive management review.
    (xii) Management Review. Conduct a management review, the management review is used to determine the effectiveness of the system in achieving the stated quality goals.
    (xiii) Pre-assessment. If a good job has been done on the previous steps, pre-assessment is not necessary.
    (xiv) Registration. This step requires three parts, choosing a registrar, submitting an application and conducting the registrar system audit. Choosing a registrar

include cost, lead time, customer's acceptance of the registrar, the registrar's accreditation and similarity with the industry. The applicant for registration should also include supplying the registrar with the policy and procedure manuals for their review. The time involved in the registrar's system audit and procedure manuals for their review should be determined by discussion.

(b) Calculation of EBQ:

$$EBQ = \sqrt{\frac{2 \times \text{Annual Demand} \times \text{Set-up cost}}{\text{Unit Cost} \times \text{Inventory carrying cost per unit per year}(₹)}}$$

$$= \sqrt{\frac{(2 \times 12 \times 1000 \times 120)}{(0.1 \times 20)}} = 1200 \text{ units.}$$

5. (a) **The following data on the exports of an item by a company during the various years fit a straight line, (for the time being, assume that a straight line gives a good fit). Give a forecast for the years 2013 and 2014.** **6**

Year	No. of items ('000)
2004	13
2005	20
2006	20
2007	28
2008	30
2009	32
2010	33
2011	38
2012	43

(b) **State the three levels of quality.** **3**
(c) **Expand the following:** **1x3**
   (i) **TPM**
   (ii) **PCO**
   (iii) **COVERT**

Answer:

5. (a) We can call the years as 'X' and exports as 'Y'. In order to use the normal equations for the least square line, we need ΣX, ΣY, ΣXY and ΣX^2. If we arrange X in such a way that $\Sigma X = 0$, it will simplify our calculations. Therefore, we call the year 2008 as 0, 2007 as -1 and 2009 as + 1 and likewise for the other years in the data.

The rearrangement is shown in the table as follows:

X	Y	X²	XY
-4	13	16	-52
-3	20	9	-60
-2	20	4	-40
-1	28	1	-28
0	30	0	0
1	32	1	32
2	33	4	66
3	38	9	114
4	43	16	172

ΣX = 0	ΣY = 257	ΣX²=60	ΣXY = 204

$\Sigma Y = a_0 N + a_1 \Sigma X$

$\Sigma XY = a_0 \Sigma X + a_1 \Sigma X^2$

As $\Sigma X = 0$ and $\Sigma Y = a_0 N$ and $\Sigma XY = a_1 \Sigma X^2$

Therefore, $a_0 = \Sigma Y / N = 257 / 9 = 28.56$

$a_1 = \Sigma XY / \Sigma X^2 = 204 / 60 = 3.4$

The equation of a straight line fitting the data is:

$Y = 28.56 + 3.4 X$

(a) Forecast for 2013, (i.e., X = 5): $Y = 28.56 + 3.4 (5) = 45.56$

(b) Forecast for 2014, (i.e., X = 6): $Y = 28.56 + 3.4 (6) = 48.96$

(b) Three Levels of Quality:

1.	Organization level	Meeting external customer requirements
2.	Process level	Meeting the needs of internal customers
3.	Performer level (job level or task design level)	Meeting the requirements of accuracy, completeness innovation, timeliness and cost.

(c) (i) TPM: Total Productive Maintenance
(ii) PCO: Preferred Customer Order
(iii) COVERT: Cost Over Time

6. (a) **A project consists of five activities. Activities P and Q run simultaneously. The relationship among the various activities is as follows:** 2

Activity	Immediate Successor
P	R
Q	S

Activity T is the last operation of the project and it is also immediate successor to R and S. Draw the network of the project.

(b) _____is another name for Human Factor Engineering. 1

(c) **The principles of motion economy are divided into three groups. What are the groups?** 2

(d) **The equation of the demand curve of a firm is p =12 - 0.4q and the equation of the total cost curve is C = 0.6q² + 4q + 5.**
Determine price, output, total revenue and profit if the objective of the firm is to maximize profit. 4

(e) **State the limitations of Oligopoly Price Policy.** 3

Answer:

6. (a)
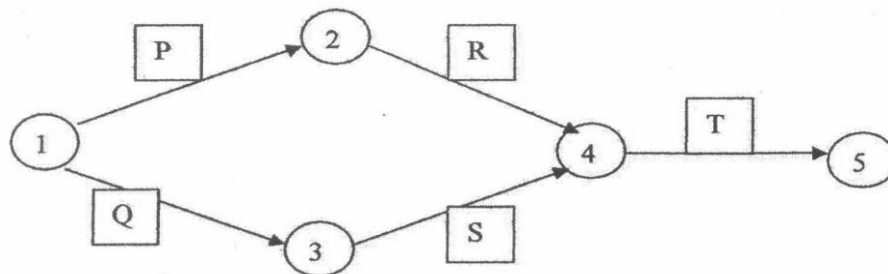
(b) Ergonomics

(c) The principles of motion economy are divided into three groups, viz.

(i) Effective use of the operator
(ii) Arrangement of the workplace
(iii) Tools and equipment

(d) Suppose total revenue = R and total profit = π
So, π = R - C = pq - C
or, π = (12 - 0.4q)q - (0.6q^2 + 4q + 5)
= 12q - 0.4q^2 - 0.6q^2 - 4q-5
= - q^2+ 8q - 5.
The first order condition to maximize π requires, dπ/dq = 0 or, - 2q + 8 = 0
or, 2q = 8
or, q = 4
d^{2}π/dq^2 = - 2 < 0. So the second order condition is also fulfilled.
Now, when q = 4,
p = 12-0.4(4) = 12-1.6= 10.40
R = pq = 10.4(4) = 41.6 and π = -(4)^2 + 8(4) - 5
= -16 + 32 – 5 = 11.

(e) Limitations of Oligopoly Price Policy:
The price policy under oligopoly does not help much to improve sales for the following reasons:
(i) Price cutting is not possible as it may lead to a price war resulting in all firms earning only normal profits,
(ii) Price reduction is not a plausible policy also because the customers may become suspicious about the quality of the product,
(iii) There is a general tendency of price rigidity under oligopoly; firms try to maintain a status quo as far as possible,
(iv) The Cost of production as well as selling costs are so high that it is not an easy job to reduce prices,
(v) This is more true in a situation of an inflationary rise in prices. It is ridiculous to talk of a reduction when maintaining the price is difficult,
(vi) Oligopolies are found mostly in the case of sophisticated manufactures such as engineering goods and consumer durables. The discretionary incomes squeeze under inflation. This poses a problem of demand recession, putting manufacturers in a situation of helplessness.

Section B (40 Marks)
Information Systems

Answer Question No. 7 (carrying 8 marks) which is compulsory and any four (carrying 8 marks each) from the rest in this Section.

7. (a) Match the terms in Column I with the relevant terms in Column II: 0.5x8

	Column I		Column II
(A)	Digital Signature	(i)	Scanning routines
(B)	Software Package	(ii)	Interact with environment
(C)	OLTP	(iii)	A computer to execute
(D)	Open Systems	(iv)	Algorithm to interpret data
(E)	Deterministic System	(v)	Direct access to information
(F)	Mathematical Model	(vi)	Syntax error
(G)	Debugging	(vii)	Authentication of electronic record
(H)	Programming language	(viii)	Interaction with certainty

(b) Each statement below is either True or False. Indicate the same in your answers: 1x2
(i) The primary existence of online business is in cyber space.
(ii) Rucker plan is an inventory control technique.

(c) Put an appropriate word or two in blank position: 1x2
(i) Transferring programmes from main memory to disk storage and back is called___.
(ii) In_____information system architecture, each workstation has equivalent capabilities and responsibilities.

Answer:

7. (a) (A)   (vii);
       (B)   (i);
       (C)   (v);
       (D)   (ii);
       (E)   (viii);
       (F)   (iv);
       (G)   (vi);
       (H)   (iii)

   (b) (i) True
       (ii) False

   (c) (i) Swapping,
       (ii) Peer-to-Peer

8. **(a) "After the identification of the problem, objectives of the proposed solution can be defined." What are the questions that should be answered while stating the solution? 3**
   (b) What are the objectives of MIS? 3
   (c) Is there any influence of qualitative factors on making decisions? 2

Answer:

8. (a) The following questions should be answered while stating the solution.
   (i) Functionality requirements: What functionalities will be delivered through the solution?
   (ii) Data to be processed: What data is required to achieve these functionalities?
   (iii) Control requirements: What are the control requirements for this application?
   (iv) Performance requirements: What level of response time, execution time and throughput is required?
   (v) Interfaces: Is there any special hardware/software that the application has to interface with? For example-Payroll application may have to capture from the attendance monitoring system that the company installs.
   (vi) Reliability requirements: The reliability required for an application depends on its criticality and the user profile.

   (b) Objectives of MIS
   • To provide the managers at all levels with timely and accurate information for control of business activities
   • To highlight the critical factors in the operation of the business for appropriate decision making
   • To develop a systematic and regular process of communication within the

organization on performance in different functional areas
- To use the tools and techniques available under the system for programmed decision making
- To provide best services to customers
- To gain competitive advantage
- To provide information support for business planning for future

(c) Apart from the quantitative estimates of revenues and costs, qualitative factors also need to be considered in decision-making process. Examples of qualitative factors are:
— Reputation of supplier,
— Suppliers' ability to meet performance standards,
— Suppliers' ability to meet time commitments.

9. (a) Briefly explain the features of Inventory Management in SAP?   **5**
(b) From the following two relations of X and Y, find X ∩ Y.   **3**

Relation X

Batch No.	Course
1	BBA
2	MCOM
3	BCOM
4	CMA

Relation Y

Batch No.	Course
2	MCOM
4	CMA
5	BA
6	BCA
7	DCA

Answer:

9. (a) Features of Inventory Management in SAP:
    - Entry of goods movements (receipt, issue, transfer posting etc.) are on real time basis. Goods movements include both "external" movements (e.g. goods receipts from external procurement, goods issues for sales orders) and "internal" movements (e.g. goods receipts from production, withdrawals of material for internal purposes, stock transfers, and transfer postings)
    - Creation of a document for every goods movement
    - Automatic updating of quantity & value for inventory management and creation of accounting documents (Cost Accounting and Financial Accounting).
    - Division of the stocks into different categories (such as Unrestricted-use stock, stock in quality inspection or blocked stock)
    - Batch management
    - Management of special stocks (e.g. Vendor consignments, material provided to vendor etc.)
    - Physical Inventory (Stock verification)
    - Various analyses (such as the stock overview, Age Analysis etc)

(b) X ∩ Y

X ∩ Y

Batch No.	Course
2	MCOM
4	CMA

10. (a) Explain (i) Asymmetric Crypto System, and (ii) Gray Box Testing.   2+2
(b) What are the advantages of the successful implementation of an ERP system?   4

Answer:

10. (a) (i)   "Asymmetric Crypto System" means a system of a secure key pair consisting of a private key for creating a digital signature and a public key to verify the digital signature.

     (ii) Gray Box Testing: Gray box testing is a software testing technique that uses a combination of black box testing and white box testing. In gray box testing, the tester applies a limited number of test cases to the internal workings of the software under test. In the remaining part of the gray box testing, one takes a black box approach in applying inputs to the software under test and observing the outputs.

    (b) Advantages of the successful implementation of an ERP system:
    - Business integration and Improved Data Accuracy.
    - Planning and MIS.
    - Improved Efficiency and Productivity.
    - Establishment of Standardized Procedures.
    - Flexibility and technology.

11. (a) List down various legal aspects of E-Commerce.   4
(b) What are the Various Database System Utilities?   4

Answer:

11. (a) Legal Aspects of E-commerce:
    Due to the new and different type of activities in E-commerce, various legal aspects have come up. These legal disputes and case laws are attracting attention of industries and governments around the world. A few legal aspects in E-commerce are:
    (i)   E -security.
    (ii) Integrity,
    (iii) Authentication,
    (iv) Jurisdiction,
    (v)   Contracts,
    (vi) Liability,
    (vii) Warranties,
    (viii) Taxation,
    (ix) Copyrights,
    (x)   Patents,
    (xi) Trademarks and Domain Names.
    Moreover these and other legal aspects still remain a serious problem in E-commerce not only in one country but all over the globe. Further many of the legal problems and questions that arise in E-commerce remained unanswered due to lack of specific laws or legal guidelines.

    (b) Database System Utilities:
     (i)   Loading: A loading utility is used to load existing data files—such as text files or

sequential files—into the database. Usually, the current (source) format of the data file and the desired (target) database file structure are specified to the utility, which then automatically reformats the data and stores it in the database. With the proliferation of DBMSs, transferring data from one DBMS to another is becoming common in many organizations. Some vendors are offering products that generate the appropriate loading programs, given the existing source and target database storage descriptions (internal schemas). Such tools are also called conversion tools.

(ii) Backup: A backup utility creates a backup copy of the database, usually by dumping the entire database onto tape. The backup copy can be used to restore the database in case of catastrophic failure. Incremental backups are also often used, where only changes since the previous backup are recorded. Incremental backup is more complex but it saves space.

(iii) File reorganization: This utility can be used to reorganize a database file into a different file organization to improve performance.

(iv) Performance monitoring: Such a utility monitors database usage and provides statistics to the DBA. The DBA uses the statistics in making decisions such as whether or not to reorganize files to improve performance.

Other utilities may be available for sorting files, handling data compression, monitoring access by users, and performing other functions.

12. Explain any four of the following terms: **2x4**
    (a) Iconic Scale Model;
    (b) Programme-data Independence;
    (c) Benefits of EDI;
    (d) Expert System;
    (e) Different parts of a Decision Table;
    (f) PKI.

Answer:

12. (a) Iconic scale model:
It is physical replica of the system based on different scale from original. Iconic models may appear to scale in three dimensions - such as model of a production process, building, car or an aircraft.

(b) Program-data Independence:
In traditional file processing, the structure of data files is embedded in the access programs, so any changes to the structure of a file may require changing all programs that access this file. By contrast, DBMS access programs do not require such changes in most cases. The structure of data files is stored in the DBMS catalog separately from the access programs. We call this property program-data independence.

(c) Benefits of EDI:
(i) The use of EDI eliminated many problems associated with traditional information flow such as the delay associated with making of documents.
(ii) As data is not repeatedly keyed (typed) therefore the chances of error are reduced.
(iii) Time required to re-enter data is saved.
(iv) As data is not re-entered at each step in the process, therefore labour costs are reduced.
(v) As time delays are reduced therefore more certainty in information flow is there.
(vi) EDI generates functional acknowledgement that the EDI message has been received by the recipient and is electronically transferred to sender. Therefore this acknowledgement which is sent electronically by the recipient to sender, states that

the message has been received.

(d) Expert System: An Expert system is a knowledge-based system which acts as an expert in devising solutions. An expert system acts in a specific area only with the support of knowledge database on this specific area. Knowledge data base means structured information stored on previous solution sets in unstructured problem situations. In other words, an expert system operates on previous experience which is stored in a database. Even the present solution devised from the system and the information on its outcome will also be stored.

(e) Different parts of a Decision Table: The four parts of the decision table are as follows:

  (i) Condition Stub - lists the comparisons or conditions;

  (ii) Action Stub - lists the actions;

  (iii) Condition entries - list in its various columns the possible permutations;

  (iv) Action entries - lists, in its columns corresponding to the condition entries the actions contingent upon the set of answers to questions of that column.

(f) PKI: Public Key Infrastructure (PKI) is about the management and regulation of key pairs by allocating duties between contracting parties (Controller/CA/Subscribers), laying down the licensing and business norms for CAs and establishing business processes/ applications to construct contractual relationships in a digitized world. The idea is to develop a sound public key infrastructure for an efficient allocation and verification of digital signatures certificates.