INTERMEDIATE EXAMINATION
GROUP II
(SYLLABUS 2008)

SUGGESTED ANSWERS TO QUESTIONS
JUNE 2015

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.

OPERATION MANAGEMENT

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

1. (a) Choose the most correct alternative: 1×5

(i) (Total station time/cycle time × Number of work stations) × 100 is known as
(A) Line efficiency
(B) Line smoothness
(C) Balance delay of line
(D) Station efficiency

(ii) The most powerful and popular method for solving linear programming problem is
(A) Simplex method
(B) Graphical method
(C) Transportation method
(D) Assignment method

(iii) Most suitable layout for continuous production is
(A) Line layout
(B) Process layout
(C) Group technology
(D) Matrix layout

(iv) The card, which is prepared by dispatching department to book the labour involved in each operation
(A) Labour card
(B) Wage card
(C) Credit card
(D) Job card

(v) …….. are designed to take drills up to about 8/16 inch in diameter.
(A) Sensitive Drilling Machine
(B) Pillar Drilling Machine
(C) Radial Drilling Machine
(D) Multiple Spindle Drilling Machine

(b) Put an appropriate work in blank position: 1×5
(i) _____ systems replace human beings to read data from products and documents and interpret the data.
(ii) The user's expectation method of _____ provides a subjective feel of the market.

(iii) _____ control is typically found wherever a particular bottleneck machine exist in the process of manufacturing.
(iv) General purpose machines are less prone to _____.
(v) Turning means producing _____ surface on a job.

(c) Indicate whether the following are TRUE or FALSE. 1×4
(i) A Jig is an appliance which holds the work when it is machined.
(ii) Activity Sampling is not a technique of Job Evaluation.
(iii) A good plant layout is one of the factors in effective utilisation of labour.
(iv) Labour-intensive technology does not involve investment in huge capital intensive system.

Answer:

1. (a) (i) (A) Line efficiency
(ii) (A) Simplex method
(iii) (A) Line layout
(iv) (D) Job card
(v) (A) Sensitive Drilling Machine

(b) (i) Automated Identification systems replace human beings to read data from products and documents and interpret the data.
(ii) The user's expectation method of sales forecasting provides a subjective feel of the market.
(iii) Load control is typically found wherever a particular bottleneck machine exists in the process of manufacturing.
(iv) General purpose machine are less prone to obsolescence.
(v) Turning means producing cylindrical surface on a job.

(c) (i) False
(ii) True
(iii) True
(iv) True

2. (a) Kindly mention the various plant layout principles. 3
(b) State the Principal Parts of a Lathe. 3
(c) A company is considering the expansion of a manufacturing process by adding more 1 Ton capacity furnaces. Each batch (1 ton) must undergo 30 minutes of furnace time, including load and unload operations. However the furnace is used only 80% of the time due to power restriction in other parts of the system. The required output for the new layout is to be 16 tons/shift (8 hours). Plant (system) efficiency is estimated at 50% of system capacity.
(i) Determine system capacity and the number of furnaces required.
(ii) Estimate the percentage of time, the furnaces will be idle. 4
(d) The annual hand-made furniture show and sales occurs next month and the school of vocational studies is planning to make furniture for the sale. There are three wood working classes – I year, II year, III year at the school and they have decided to make three styles of chairs A, B and C. Each chair must receive work in each class and the time in hours for each chair in each class is given.

Chair	I year	II year	III year
A	2	4	3
B	3	3	2
C	2	1	4

In the next month there will be 120 hours available in first year class, 160 hours in the second year class and 100 hours in their year class to produce chairs. The teacher of the wood working class feels that a maximum of 40 chairs can be sold at the show. The teacher has determined that the profit from each type of chair will be A – ₹40, B – ₹35 and C – ₹30.
Formulate a linear programming model to determine how many chairs should be produced to maximize profit. 8

Answer:

2. (a) The following are the plant layout principles:
- Principle of Minimum Travel
- Principle of Sequence
- Principle of Usage
- Principle of Compactness
- Principle of Safety and Satisfaction
- Principle of Flexibility
- Principle of Minimum Investment

(b) (1) The Bed,
(2) The Headstock
(3) The Tailstock, which is also called the Loose Headstock,
(4) The Carriage,
(5) The Gearbox,
(6) The Feed Shaft and the Lead Screw.

(c) (i) **Required system capacity** = $\frac{16\text{ tons / shift}}{0.5}$ =32 tons/shift= $\frac{32}{8\times0.8}$ =5 tons/hour

Individual furnace capacity = $\frac{1\text{ton}}{0.50\text{ hour}}$ = 2 ton/hour per furnace

Number of furnaces required = $\frac{5\text{ tons / shift}}{2\text{ ton / hour per furnace}}$ = 2.5 (say) 3 furnaces.

(ii) **Percentage of idle time**:
Total hours available / shift = 3 furnaces × 8 hours = 24 furnace-hour
Total hours of actual use/shift = (24 – 8) = 16 ton × 0.5 hour / ton = 8 furnace – hour
Idle time = 16 furnace-hour % of idle time = 16/24 = 67%.

(d) Let x_1 be the chairs produced of A type
x_2 be the chairs produced of B type
x_3 be the chairs produced of C type

Formulation

$2x_1 + 3x_2 + 2x_3 \leq 120$
$4x_1 + 3x_2 + x_3 \leq 160$
$3x_1 + 2x_2 + 4x_3 \leq 100$
$x_1, x_2, x_3 \geq 0$

Objective function

Maximise $Z = 40x_1 + 35x_2 + 30x_3$

The problem is solved by simple method, convert inequalities into equalities by adding slack variables.

$2x_1 + 3x_2 + 2x_3 + x_a = 120$
$4x_1 + 3x_2 + x_3 + x_b = 160$
$3x_1 + 2x_2 + 4x_3 + x_c = 100$

Rewriting objective function as $Z - 40 x_1 - 35x_2 - 30x_3 = 0$
Selection of non-basic variables $n - m = 6 - 3 = 3$
Where n = No. Of variables
m = No. Of constraint equation, where x_a, x_b and x_c are slack variables.

Non basic variables $x_1 = x_2 = x_3 = 0$ gives.

x_a = 120
x_b = 160
x_c = 100

The Initial solution is represented in starting table.

Starting table

Basics	Z	x_1	x_2	x_3	x_a	x_b	x_c	RHS	Ratio
Z	1	-40	-35	-30	0	0	0	0	--
x_a	0	2	3	2	1	0	0	120	60
x_b	0	4	3	1	0	1	0	160	40
x_c	0	3	2	4	0	0	1	100	33.33

Entering variable x_1 leaving variable = x_c literation no. 1.

Basics	Z	x_1	x_2	x_3	x_a	x_b	x_c	RHS	Ratio
Z	1	0	-25/3	70/3	0	0	40/3	4000/3	--
x_a	0	0	5/3	-2/3	1	0	-2/3	160/3	32
x_b	0	0	1/3	-13/3	0	1	-4/3	80/3	80
x_c	0	1	2/3	4/3	0	0	1/3	100/3	50

Entering variable x_2 leaving variable = x_a literation no. 2.

Basics	Z	x_1	x_2	x_3	x_a	x_b	x_c	RHS	Ratio
Z	1	0	0	20	5	0	10	1600	--
x_a	0	0	1	-2/5	3/5	0	-2/5	32	
x_b	0	0	0	42/10	-3/25	1	-94/75	20	
x_c	0	1	0	19/9	-2/5	0	17/15	12	

As Z row has all positive values hence optimal solution has reached
$Z = 1600$, $x_1 = 12$ units, $x_2 = 32$ units, $x_3 = 0$.

Alternative solution for Formulation of linear programming model.

Let x_1, are the chairs produced of A type

x_2 are the chairs produced of B type

x_3 are the chairs produced of C type

Formulation

$2x_1 + 3x_2 + 2x_3 \leq 120$

$4x_1 + 3x_2 + x_3 \leq 160$

$3x_1 + 2x_2 + 4x_3 \leq 100$

$x_1 + x_2 + x_3 \leq 40$ (maximum sale estimated –forecasting constraint)

$x_1, x_2, x_3 \geq 0$

Objective function

Maximise $Z = 40 x_1 + 35 x_2 + 30 x_3$

3. (a) What are the objectives of Material Requirement Planning? 4

(b) A company manufactures 100 units of a product everyday and sells it for ₹7 each. Direct material cost is ₹2 per unit and direct labour is paid ₹1 per unit. Overheads are ₹300 per day in total. A market research survey indicates that 200 units can be sold per day if the price can be brought down to ₹6. Production can be increased to this level, if an incentive scheme which would cost ₹125 per day to administer is implemented, given the workmen proportionate increase in their earnings. Examine with appropriate calculations whether and, if so, how much gains are made by the company and the workmen. Comment on the social desirability of such incentive schemes. 4

(c) The choice of technology depends on several factors, both internal and external to the organization choosing the technology. List them. 4

(d) A company planning to manufacture a household cooking range has to decide on the location of the plant. Three locations are being considered viz., Patna, Ranchi, and Dhanbad. The fixed costs of the three location are estimated to be ₹30 lakh, ₹50 lakh, and ₹25 lakh per annum respectively. The variable costs are ₹300, ₹200 and ₹350 per unit respectively.

The expected sales price of the cooking range is ₹700 per unit. Find out:

(i) The range of annual production /sales volume for which each location is the most suitable and

(ii) Which one of the three locations is the best location at a production/sales volume of 18,000 units? 6

Answer:

3. (a) MRP Objectives:

(1) Inventory reduction: MRP determines how many components are required, when they are required in order to meet the master schedule. It helps to procure the materials/components as and when needed and thus avoid excessive build up of inventory.

(2) Reduction in the manufacturing and delivery lead times: MRP identifies materials and component quantities, timings when they are needed, availabilities and procurements, and actions required to meet delivery deadlines. MRP helps to avoid delays in production and priorities production activities by putting due dates on customer job orders.

(3) Realistic delivery commitments: By using MRP, production can give marketing timely information about likely delivery times to prospective customers.

(4) Increased efficiency: MRP provides a close coordination among various work centres and hence helps to achieve uninterrupted flow of materials through the production line. This increases the efficiency of production system.

(b) Given, a company manufactures 100 units of a product everyday and sells it for ₹7 each

Direct material cost per unit = ₹2; Direct labour cost per unit = ₹1

Total revenue for 100 units = 100 × 7 = ₹700

Total cost for 100 units = ₹300 + (100 × 3) = ₹600

Thus, Profit = 700 – 600 = 100.

Total revenue for 200 units = 200 × 6 = 1200

Total cost for 200 units = ₹300 + ₹125 + (200 × 3) = ₹1025

Thus, Profit = 1200 – 1025 = 175.

Gains made by the company from the incentive scheme = ₹175 – ₹100 = ₹75

Gains made by workmen = ₹75. Such incentive schemes are socially desirable as both workmen and the company stand to gain. Consumers also gain because the product is available at a lower price.

(c) The internal factors are:

(i) Availability of funds for investment;
(ii) Product life cycle and technology-life cycle position;
(iii) Present plant capacity and technology adopted (i.e., current technology).

The external factors are:

(i) Government policies and regulations, availability of resources such as raw materials, energy, skilled labour etc., required for using the new technology;
(ii) Market scenario (market demand, customer requirement of product quality etc.).

(d) The total cost of the three locations are:

At Total cost = Fixed cost + Variable cost for a volume "X"
Patna => Total cost = 30,00,000 + 300 × X
Ranchi => Total cost = 50,00,000 + 200 × X
Dhanbad => Total cost = 25,00,000 + 350 × X

We can compute and plot the total costs per annum at the three different locations for the various cases of production volume of 5,000, 10,000, 15,000, 20,000, 25,000 units.

(i) Patna

Volume (Units)	5,000	10,000	15,000	20,000	25,000
Total =	30,00,000+	30,00,000+	30,00,000+	30,00,000+	30,00,000+
Cost (₹)	300 (5,000)	300 (10,000)	300 (15,000)	300 (20,000)	300 (25,000)
	= ₹45 lakhs	= ₹60 lakhs	= ₹75 lakhs	= ₹90 lakhs	= ₹105 lakhs

(ii) Ranchi

Volume (Units)	5,000	10,000	15,000	20,000	25,000
Total =	50,00,000+	50,00,000+	50,00,000+	50,00,000+	50,00,000+
Cost (₹)	200 (5,000)	200 (10,000)	200 (15,000)	200 (20,000)	200 (25,000)
	= ₹60 lakhs	= ₹70 lakhs	= ₹80 lakhs	= ₹90 lakhs	= ₹100 lakhs

(iii) Dhanbad

Volume (Units)	5,000	10,000	15,000	20,000	25,000
Total =	25,00,000+	25,00,000+	25,00,000+	25,00,000+	25,00,000+
Cost (₹)	350 (5,000)	350 (10,000)	350 (15,000)	350 (20,000)	350 (25,000)
	= ₹42.5 lakhs	= ₹60 lakhs	= ₹77.5 lakhs	= ₹95 lakhs	= ₹112.5 lakhs

If the volume distribution be as follows:

	Up to 10,000 units	Between 10,000 units to 20,000 units	Above 20,000 units
Favourable Location	Dhanbad	Patna	Ranchi

For a volume 18000 units favourable location is Patna which can be substantiated by the followings:
Patna => 30,00,000 + 300 × 18,000 = ₹84 lakhs
Ranchi => 50,00,000 + 200 × 18,000 = ₹86 lakhs
Dhanbad => 25,00,000 + 350 × 18,000 = ₹88 lakhs

4. (a) A company has 50 identical machines in its facilities. The cost of preventive servicing (C_P) is ₹20 and the cost of repair after breakdown (C_R) is ₹100. The company seeks the minimum cost preventive servicing frequency and has collected the data on breakdown probabilities in the following table:
Probabilities of machine breakdown, by month:

Months after servicing that breakdown occurs (i)	Probability that breakdown will occur (P_i)	$i.P_i$
1	0.10	0.10
2	0.05	0.10
3	0.05	0.15
4	0.10	0.40
5	0.15	0.75
6	0.15	0.90
7	0.20	1.40
8	0.20	1.60
	1.00	5.40

8

(b) Briefly list the advantages of CAD. 3
(c) Briefly describe 'Auto Transformer'. 2
(d) Expand the following: 1×5
(i) SQC
(ii) UCL
(iv) CNC
(v) VAM
(vi) TQM

Answer:

4. (a) The mean time before failure is 5.4 months and the expected cost with no preventive maintenance would be 100 ×50/5.4 = ₹925.93 per month.

The following calculations show B_j, the expected number of breakdowns between preventive maintenance intervals, for the possible intervals, that may be considered.
$B_1 = MP_1 = 50\ (0.10) = 5$
$B_2 = m\ (P_1 + P_2) + B_1P_1 = 50(0.10 + 0.05) + 5(0.10) = 8$
$B_3 = 50(0.10 + 0.05 + 0.05) + 8\ (0.10) + 5\ (0.05) = 11.05$
Accordingly, $B_4 = 16.75$, $B_5 = 25.63$, $B_6 = 35.5$, $B_7 = 48.72$, $B_8 = 63.46$.

The costs of various preventive maintenance intervals are summarized in the table below:

Cost of alternative preventive maintenance intervals

Number of months between preventive services (j)	B_j Expected Number of Breakdown in $_j$ months	Expected cost/ month to Repair Breakdown $C_R/B_j/_j$	Cost per month for preventive service every $_j$ month $C_R(M)/_j$	Total expected cost per month of preventive maintenance and repair
(1)	(2)	(3)	(4)	(5)
1	5.00	500.00	1000.00	1500.00
2	8.00	400.00	500.00	900.00
3	11.05	368.33	333.33	701.66
4	16.75	418.75	250.00	668.75
5	25.63	512.60	200.00	712.60
6	35.50	591.67	166.67	758.34
7	48.72	696.00	142.86	838.86
8	63.46	793.25	125.00	918.25

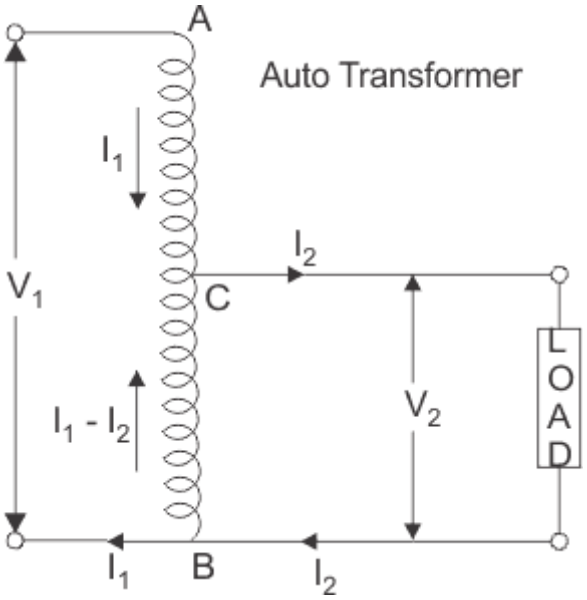
A policy of performing preventive maintenance every 4 months results in the lowest average cost, about ₹669. This amount is ₹257 per month less than the ₹926 expected cost without preventive maintenance.

This policy would reduce the costs by (257 ÷ 926) × 100 = 27.75% below the cost of repairing the machines only when they breakdown.

(b) Advantages of CAD:

(i) Allows designers to save time and money;
(ii) Eliminates prototype model building;
(iii) Allows designers to determine costs and test variables;
(iv) Low cost of design;
(v) Eliminates manual drafting;
(vi) Makes review of numerous options in design possible;
(vii) Faster development, better products and accurate flow of information to other departments;
(viii) Product cost can be determined at the design stage itself.

(c) (i) For a very small variation in output and input voltage "double wound" transformer becomes expensive and "Auto wound transformer" becomes cheaper. Auto transformer has a single winding and the secondary voltage is tapped from that winding as shown in figure:



(d) Expand the following:

(i) SQC : Statistical Quality Control
(ii) UCL : Upper Control Limit
(iii) CNC : Computer Numerical Control
(iv) VAM : Vogel's Approximation Method
(v) TQM : Total Quality Management

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: 5

(i) The _____ is the concept of data integration by way of specialized data storage and retrieval technique.
(ii) PROM chip is used to store program of _____ nature.
(iii) Boostrapping means loading _____ in Computer after the power is switching on.
(iv) Errors in a program may be of two types, _____ and _____ .
(v) Documentation for program is known as Programming _____ .

(b) Expand the following: 5

(i) EDPAA.
(ii) DASD.
(iii) EBCDIC.
(iv) RADIUS.
(v) MAC.

(c) Choose the most appropriate answer from the alternatives in the set: 4

(i) 'Packet Switching' on the internet refers to
(A) type of security
(B) switching components
(C) method of data movement
(D) packet of hard copy of documents

(ii) Point-of-Sale or POS pertains to
(A) sales points plotted in computer graphics
(B) sales between two location
(C) a value that identifies the location of sales data in storage
(D) an input-output device updating sales and inventory

(iii) Vacuum Tube Technology was used in which generation of Computers?
(A) First
(B) Second
(C) Third
(D) Fourth

(iv) The files created during processing for an application area are
(A) Work File
(B) Transaction File
(C) Key File
(D) Master File

Answer:

5. (a) (i) The data warehousing is the concept of data integration by way specialized data storage and retrieval technique.
(ii) PROM chip is used to store program of permanent nature.
(iii) Bootstrapping means loading Operating System in Computer after the power is switching on.
(iv) Errors in a program may be of two types – Syntax and Logical.
(v) Documentation for program is known as Programming Manual.

(b) (i) EDPAA : EDP Auditors Association
(ii) DASD : Direct Access Sector Device
(iii) EBCDIC : Extended Binary-Coded Decimal Interchange Code
(iv) RADIUS : Remote Authentication Dial In User Service
(vi) MAC : Medium Access Control

(c) (i) (C) Method of data movement
(ii) (D) An input-output device updating sales and inventory
(iii) (A) First,
(iv) (A) Master File

6. (a) Your job involves deciding the pricing of a product in an organization. List the information required for taking this decision. 3
(b) Describe the following computer frauds in a line. 5
(i) Trap door
(ii) Hacking
(iii) Virus
(iv) Cracker
(v) Super-zapping
(c) What is Data Base? State its characteristics. 2+6
(d) What are the types of Disk Drives? 2

Answer:

6. (a) Information required to decide on the pricing of a product are:
- Recent history of price changes
- Demand for the product
- Graph showing the relationship between demand and price exhibited by recent results
- Effect of demand of changing price over time
- Prices of substitute products
- Price of similar products
- Cost of sales etc.

(b) (i) Trap door - Access to system by passing normal systems control.
(ii) Hacking - Unauthorized access to software and information.
(iii) Virus - Use of software to damage set of software/data files in the machine.
(iv) Cracker - Unauthorized access to machine with intention of damage to data, software etc.
(v) Super-zapping – Access to special system programs bypassing normal systems control.

(c) A data base is a collection of inter-related data with controlled redundancy to serve one or more applications in fulfilling their need. Database is used by an organization to store its data from different operational areas so that they can be shared by each operation collectively. Use of database has become very popular over the conventional file system for two reasons – integrated information and its security features.

Characteristics of data base:
- Information Sharing – Data is shared by different applications.
- Controlled redundancy – In a non-database system, each application has its own files. In a database, duplicate data is eliminated and thus redundancy is controlled.
- Consistency – Data set from database (.e., from one place) ensures better reliability of data instead of collection of different files.

- Security – Unauthorised access to data base is restricted by use of password.
- Integrity – Data is kept in integrated fashion and updation at one place ensures high integrity.
- Persistence – Data is the database exist permanently.
- Independence – The three levels in the schema (internal, conceptual and external) should be independent of each other so that the changes in one level does not affect the other.

(d) Types of Disk Drives:

(i) Exchangeable – This type of disk are replaceable. Once the work on a particular disk is over, it can be removed and another disk can be mounted.

(ii) Fixed Disk – This type of drive is permanently mounted in the computer. This is also called Winchester disk. The term Winchester came from the place Winchester where this type of drive was first developed.

7. (a) The commonly observed gap between the system expert and the management expert sometimes becomes a bottleneck in designing an effective MIS. Apart from the above, list other limiting factors for MIS. 6

(b) Indicate whether the following are TRUE or FALSE: 1×5

(i) Risk management program should be reactive rather than proactive.

(ii) Payroll is an example of transaction processing in an organization.

(iii) EDI's job is to receive and transit the documents among the trading partners.

(iv) Only executable files can be infected by virus.

(v) The basic aim of normalisation in data structure is to eliminate redundancy and inconsistent dependency.

(c) What is the purpose of Integration Testing? Mention the different types of Integration Testing. 2+3

(d) Differentiate between Parallel Transmission and Serial Transmission. 2

Answer:

7. (a) Limiting factors for an effective MIS are:

- Effectiveness of MIS depends on efficiency of the management in using it and it is not a substitute of Management.
- MIS only provides information and non-programmed decision making is in the hand of management.
- Frequent changes in the information need of management reduce efficiency of MIS.
- Success depends on quality of output and their effective use.
- Effectiveness is greatly affected where culture of hoarding and not sharing information is there.
- Problem of perception of utility.
- Lack of proper training and awareness of both operation staff and the users on the use of MIS.
- With the change in technology and business environment, management need of information changes thereby suggesting periodic review and continuous monitoring.
- Cost Benefit assessment depends on many subjective assessments.

(b)

(i) FALSE
(ii) TRUE
(iii) TRUE
(iv) FALSE
(v) TRUE

(c) Integration testing refers to evaluation of groups of program modules to determine whether:

- interfaces are working properly,
- specified requirements are met,
- there is any degeneration under high workloads, and
- processing is carried out efficiently.

There may be three types of integration testing approach:
Type of test and its detailment:

1. Top-down test – Top level modules are tested first by simulating lower-level dummy modules to confirm the working of the interface correctly.
2. Bottom-up test – Bottom level modules are tested first by simulating higher-level dummy modules to confirm correctness of the working of the interface.
3. Hybrid test – It is a combination of top-down and bottom-up test. This is also known as sandwich testing.

Auditor should gather evidence of integration testing and check whether systematic approach was adopted and execution was carried out properly.

(d) Parallel transmission uses different wires for transmission in different direction whereas serial transmission uses single wire to transmit each data bit continuously and serially.

Parallel transmission	Serial Transmission
Use of different wires	Use of single wires
High speed	Slow
Expensive	Low cost
Used for high volume data transmission	Unused for transmission between a terminal and a computer

8. Write short notes on any six: **3×6 =18**

(i) Firewall
(ii) Advantages of Codification of data
(iii) Auditing around the computer and auditing through the computer
(iv) Integrative Approach to develop MIS
(v) Steps in decision making process
(vi) Magnetic Ink Character Recognition (MICR)
(vii) Features of High Level Languages
(viii) FTP

Answer:

8. (i) Firewall

Firewalls offer an effective system to protect access by unauthorized user from outside. The main feature of firewall is packet-filtering router so that vital information does not pass to any unauthorized intruder, even if he manages get access to the network system. It is a system of security in the network with the help of hardware and software. A software checks all incoming and outgoing internet traffics. The firewall routes the massages to a safe area to avoid any danger in the forward transmission of massages. The screening by firewall software may delay the transmission process but ensures proper security.

(ii) Advantages of Codification of data

Codification is a system of convenient representation of data. Code is scientific representation of actual data in short form. Its advantages:

- Shorter code in place of actual data reduces errors in data entry.
- Codes are used to classify the transactions easily.
- Sorting or merging by code is a scientific system step in data processing. Without Code data processing will be cumbersome.
- Codification helps report generation to be efficient.

(iii) Auditing around the computer and auditing through the computer

Auditing around the computer requires the following steps:

- Selection of one or more critical output from the computer system.
- Verification of the results exhibited by the output to ascertain correctness and completeness of the transactions processed.
- Audit trail to locate the original source of input for verification.

Auditing through the computer implies verification of the computerised system itself and its efficacy to produce the correct and required output.

(iv) Integrative Approach to develop MIS

Under this system, the top management identifies the information requirements from different sub-systems and specifies other guidelines for integration of these information for effective support to decision making. The managers from different functional areas present the flow of information under individual sub-systems. The aspect of integration of information of different sub-systems is considered at the planning stage. Any modifications required at different points are pre-conceived at the beginning so that they are taken care from the design stage.

This approach of implementation allows designing better structure of databases and ensures smooth flow of information at different levels of management of different functional areas.

(v) Steps in decision making process

Decision making process follows a scientific system and the steps involved are:

(a) Identification of problem and diagnosis of the problem;
(b) Collection of relevant Information;
(c) Search for alternatives and evaluation of them;
(d) Decision structuring;
(e) Selecting preferred option;
(f) Communication to relevant action points;
(g) Implementation.

(vi) Magnetic Ink Character Recognition (MICR)

MICR code is developed by American Banking Association (ABA). The advantage of MICR code is that any document having MICR character can be read by a computer because both manual entry data and data through reading devices are checked to ensure correctness. Another advantage of MICR is that is reduces or eliminates the amount of coding unnecessarily.

(vii) Features of High Level Languages

- They are English like Languages and easy to learn.
- Standard sets of words and well defined structures are used.
- Program development effort is less.
- Debugging is easy.
- Portability is high.
- It is not machine dependent.
- It was procedure oriented thereby reducing programming effort.

(viii) FTP

File Transfer Protocol is used for file transfer one computer to another. It works in client-server technology. A client makes requires to have an access to information. The FTP client program searches the file, locate it and transfer the file to servers called FTP servers. These servers act as interface and initiate the transfer process.

Steps involved are

- Connection with the FTP server
- Navigate the file structure
- Transfer the file.