INTERMEDIATE EXAMINATION
GROUP II
(SYLLABUS 2008)

SUGGESTED ANSWERS TO QUESTIONS
JUNE 2013

PAPER- 9 : OPERATION MANAGEMENT AND INFORMATION SYSTEM

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 question from the rest, under Section I.

1. (a) Match the terms in Column I with the relevant terms in Column II. 0.5 x 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	(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: 1x5

(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 x 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……...

Answer 1.

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

(b)

(i)	A pump moves liquids from higher pressure to lower pressure. Reason: A Pump moves liquids from lower pressure to higher pressure.	False
(ii)	In general, long-range forecasting is more useful in production planning. Reason: In general, short term forecasting will be more useful in production planning.	False
(iii)	Technological obsolescence is a major danger which business firms face in modern era. Reason: Technological obsolescence is a major danger which business firms face in modern era. From example: whenever a firm decides to switch over to new machines or improved product designs, existing machine designs are said to be obsolete and becomes a major issue in the procurement and installation of machinery and equipment.	True
(iv)	Plastic coating is less durable than painting. Reason: Plastic coating is more durable than painting.	False
(v)	A work stoppage generally reduces the cost of production. Reason: Work stoppage does not reduce the cost of production.	False

(c) (i) Foundry.
(ii) Job evaluation.
(iii) Lead time.
(iv) Consumer.
(v) Tools.

2. (a) A company manufactures two items X_1 and X_2. They are sold at a profit of ₹ 30 per unit of X_1 and ₹ 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 x 3

(i) ('missing words')/(Inspections scheduled) x 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 ₹ 3,00,000, variable costs of ₹ 63 per unit and revenue ₹ 68 per unit. Annual fixed cost at Location B is ₹ 8,00,000, variable costs are ₹ 32 per unit and revenues are ₹ 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 ₹ 2,800. For a cost of ₹ 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

Answer 2.

(a) Introducing slack variables S_1, S_2 and S_3 the problem can be stated as follows :

Objective function

Maximize $Z = 30X_1 + 20X_2 + 0S_1 + 0S_2 + 0S_3$

Subject to the constraints

$$2X_1 + X_2 + S_1 + 0S_2 + 0S_3 = 280$$
$$3X_1 + 2X_2 + 0S_1 + S_2 + 0S_3 = 500$$
$$X_1 + 3X_2 + 0S_1 + 0S_2 + S_3 = 420$$

$$X_1, X_2, S_1, S_2, S_3 \geq 0$$

(b) (i) (Inspections incomplete)/(Inspections scheduled) x 100 should be less than 10%
(ii) Frequency of breakdowns = (Number of breakdowns)/(Available machine hours)
(iii) Effectiveness of planning =(Labour hours on scheduled maintenance)/(Total labour hours spent on maintenance).

(c) Aggregate Planning Strategies:

The variables of the production system are labour, materials and capital. These controllable variables constitute pure strategies by which fluctuations in demand and uncertainties in production actives can be accommodated.

Vary the size of the workforce: Output is controlled by hiring or laying of workers in proportion to changes in demand.
Vary the hours worked: Maintain the stable workforce, but permit idle time when there is a slack and permit overtime (OT) when demand is peak.
Vary inventory levels: Demand fluctuations can be met by large amount of inventory.
Subcontract: Upward shift in demand from low level. Constant production rates can be met by subcontractors to provide extra capacity.

(d) At the expected demand of 25000 units, profits (loss) for the alternatives are:

Location	A	B
Revenue	17,00,000	17,00,000
Costs		
Variables	15,75,000	8,00,000
Fixed	3,00,000	8,00,000
	18,75,000	16,00,000
Profit / (Loss)	(1,75,000)	1,00,000

Location B is most attractive, even though annual fixed costs are much higher than A.

Computation of BEP (Breakeven Point)

Location	A	B
Fixed cost (₹)	3,00,000	8,00,000
Contribution/unit (₹)	(68 – 63) = 5/unit	(68 – 32) = 36/unit
BEP (units)	3,00,000/5 = 60,000	8,00,000/36 = 22,222

The break-even point in the case of Location B will be achieved sooner (i.e. at a lower level of activity). Hence, from the context of BEP also Location B will be suitable.

Note : Students can show attractiveness either through profitability or BEP (any one method).

(e) (i) There are two alternative before management. One is to repair a machine or equipment only when it breaks down. This will save expense of inspection and replacement of a part before its lifetime ends. The other alternative is to replace the equipment before the expiry of its working life. This will involve cost of periodic shutdown for check - up and repairs. However, it will avoid the loss due to sudden failure or breakdown.

The two types of cost – cost of premature replacement and cost of breakdown- need to be balanced. The objective is to minimize total maintenance cost and downtime. Economic analysis is helpful in finding a judicious combination of two types of maintenance. The relationship between preventive maintenance time and repair time is also significant. Preventive maintenance policy is justified only when the average downtime and its cost is less than the average time taken to carry out breakdown repairs. If the machine happens to be part of production line, the breakdown of a machine would throw the entire production line out of gear while a preventive maintenance schedule might enable the repair to be performed during a scheduled idle time of the line.

(ii) Converting the frequencies to a probability distribution and determining the expected cost /month of breakdowns we get:

Number of breakdowns	Frequency in months	Frequency in percent	Expected Value
0	2	0.083	0.000
1	8	0.333	0.333
2	10	0.417	0.834
3	3	0.125	0.375
4	1	0.042	0.168
		Total	1.710

Breakdown cost per month; Expected cost = 1.710 x ₹2800 = ₹4788.
Preventive maintenance cost per month: -
Average cost of one breakdown/month = ₹2,800
Maintenance contract cost/ months = ₹1,500
Total = **₹4,300.**
Thus, preventive maintenance policy is suitable for the firm.

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 x 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 ₹ 20/unit or (2) 150 units at ₹ 12/unit.

Machine	Fixed cost (₹)	Variable cost (₹)
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 breakeven volume for machine B when the price is ₹ 12/unit?
(iv) Suppose the fixed cost for machine A is a stepped function with ₹ 50 up to 40 units and ₹ 100 thereafter. Will the answers to (i) and (ii) above vary? If so, what will be the revised answer? 2 x 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

Answer 3.

(a) The main types of equipment can be conveniently classified under the following heads:

- Aerial ropeways and cable-ways
- Conveyors
- Hoists and lifts
- Cranes
- Trucks and tractors
- Pallet handling trucks and pallets
- Earth moving equipment (these are of little concern in material handling)
- Automatic transfer equipment

(b) (i) CR: Critical Ratio
(ii) CNC: Computer Numerical Control
(iii) MTM: Methods Time Measurement
(iv) VAM: Vogel's Approximation Method
(v) SQC: Statistical Quality Control.

(c) (i) For 50 unit order at ₹20/ unit,
Costs for various machines:

Machine	₹	Profit	₹
Machine A	50 + 50 x 4= 250	1000 - 250	750
Machine B	200 + 50 x 2 = 300	1000 - 300	700
Machine C	400 + 50 x 1= 450	1000 - 450	550

Since Machine A gives the highest profit of ₹750, it is to be preferred.

(ii) For 150 unit order at ₹12/ unit.
Cost for various machines

Machine	₹	Profit	₹
Machine A	50 +150 x 4 = 650	1800 - 650	1,150
Machine B	200 +150 x 2 = 500	1800 - 500	1,300
Machine C	400 +150 x 1 = 550	1800 - 550	1,250

Hence Machine B is to be preferred.

(iii) Breakeven Volume for Machine B at ₹12/unit.
Let X be the No. of units to be produced.
Total costs at 'X' units = 200 + 2x
Total revenue at 'X' units = 12x.
At Breakeven point.
200 + 2x = 12x
i.e. 10x = 200
x = 20
Hence 20 units is the Breakeven Volume.

(iv) The fixed cost for machine A being a step function, the total cost of manufacturing of 50 units with machine A = ₹ (100 + 50 x 4) = ₹ 300, which is also the cost of production with machine B. Thus either of the two machines A or B could be chosen to produce 50 units.
In the other case the total cost at machine A will be ₹ [100 + (150 x 4)] = ₹ 700, which is higher than the production cost on machine B.
Hence the answer in this case will not vary.

(d) Average cycle time = $\frac{8+7+8+9}{4}$ = 8.0 minutes

Normal time = 8 x 0.9 = 7.2 minutes

Standard time = $\frac{7.2}{1-0.15}$ = 8.47 minutes

4. (a) For each part below, choose the most appropriate answer out of the four options given against each part: 1 x 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 ₹ 1,00,000 are as under:

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

Thereafter, running cost increases by ₹ 3,000, but resale value remains constant at ₹ 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

Answer4.

(a) (i) (D) Production by service,
(ii) (C) Optimal utilization of available resources,
(iii) (C) Process layout,
(iv) (C) Purpose for which forecast is made,
(v) (D) Least square method.

(b) Chart showing Optimal Replacement Period

Year	Net Capital Cost (C-S) (₹)	Running Cost (₹)	Cumulative operation Cost (₹)	Total Cost (₹) (2) + (4)	Average Annual Cost (₹) (5) / (1)
(1)	(2)	(3)	(4)	(5)	(6)
1	20,000	10,000	10,000	30,000	30,000
2	35,000	12,000	22,000	57,000	28,500
3	45,000	13,500	35,500	80,500	26,833
4	75,000	15,000	50,500	1,25,500	31,375
5	94,000	18,000	68,500	1,62,500	32,500,

Optimal replacement is the end of 3 rd year.

(c) (i) If plant is operated at 80% efficiency, output per month = (Actual Time / Standard Time) x efficiency level =(25 x 8 x 60) / 30 x (80 / 100) = 320 units

(ii) If the machine productivity is increased by 25%, actual machine time becomes (22 x 100) / 125 = 17.6 minutes; Actual total time per unit = 17.6 + 8 = 25.6 minutes.
Output per month = (8 x 60 x 25 x 80) / (25.6 x 100) = 375 units.

(iii) If operator's efficiency is reduced by 25%, operator time becomes = (8 x 100) / 75 = 10.67 minutes; Actual total time per unit = 10.67 + 22 = 32.67 minutes;
Output per month = (8 x 60 x 25 x 80) / (32.67 x 100) = 293.84 or, say 293 units.

(d) Total distance travelled by fork lift truck per trip = (0.3 + 0.3) km = 0.6 km (up and down)

No. of trips that can be made by the truck per shift = 8km / 0.6km x 8hrs = 106.66 trips/shift
No. of pallet loads carried per shift by each truck = 106.66 x 3 = 319.98 = 320
Total no. of fork lift trucks required for 640 pallet loads = 640/320 = 2 fork lift trucks.

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 x 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 x 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 x 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**

Answer 5.

(a) (i) Key field;
(ii) Risk Management;
(iii) DBMS;
(iv) Decision Support System.
(v) RAM

(b) (i) (A) Random file;
(ii) (C) Mathematical model;
(iii) (B) Hacking;
(iv) (B) Universal product code;
(v) (C) Method of data movement;

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

6. (a) What are the different modules and their functions in DBMS?

(b) Each statement below is either True or False. Indicate the same in your answers: 1 x 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

Answer 6.

(a) Modules and their functions in DBMS

A Database Management System has different modules, which takes care of different functions of a database. They are:

Module	Function
File Manager	Allocation of space on disk storage and store data structure
Database Manager	Interface between application programs and database
Query Processor	To Translate a query language to low level instructions to help processing of users' requests

DML Compiler	Conversion of DML statements into application program
DDL Compiler	Conversion of DDL statements into a table

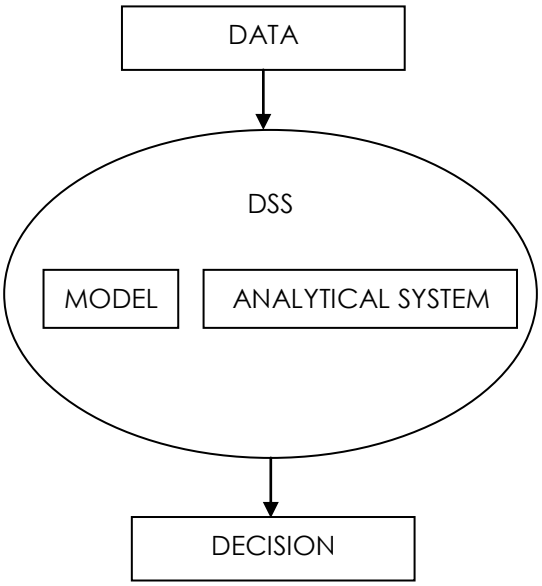
(b) (i) False
(ii) True
(iii) False

(c) No. of tracks per surface = 200
No. of sectors per track = 20
No. of recording surfaces = 10
Therefore, total number of sectors = 200 x 20 x 10 = 40,000
No. of bad sectors = 600
Therefore, no. of good sectors =40000 - 600 = 39,400

(d) Decision Support System (DSS) is a collective term to describe the various types of software, principally modeling or simulation, which provide input into management's decision making process. The 'what if?' analysis produced by spreadsheets is a typical example.
Decision support system is an IT tool based on models for interpretation and analysis of data, and presenting the same for facilitating decision making. An expert system is within the DSS so that unstructured problems are also taken care.

Decision Support System has the following three characteristics:
i) Support semi-structured and unstructured decision making
ii) Use model for solutions
iii) Flexible to respond the changing need of the decision maker

Structured or Programmed decision making is with the help of using data in a simple related decision making program which is based on technical knowledge on a particular area.
Unstructured or semi-structured decision making process involves a great technical expertise of the all subjects of all related fields and building model to handle the information to derive solution set.



Decision Support System

A DSS has the following three components:

i) **Databases** - A DSS must have one or more databases containing all relevant information. The system will extract the set of information from database with data-mining tools.

ii) **Model base** - Model base is the brain of a DSS. For example, mathematical models on Time Series analysis, Linear Programming, Statistical Quality Control will be tools used to solve many financial problems.

iii) **Technical Expertise** - A DSS system must have technical expertise in the domain field to understand the nature of information, nature of problems, appropriateness of model and additional intelligence required to handle the unstructured or semi-structured problem situations.

7. (a) Expand the following and write one or two sentences on each expression to convey its meaning or implication: 1 x 5

(i) CODASYL
(ii) BASIC
(iii) SET
(iv) ERP
(iv) 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

Answer 7.

(a) (i) CODASYL - Conference on Data Systems Languages. This was a consortium formed in 1959 to guide the development of a standard programming language that could be used on many computers. This effort led to the development of COBOL and other standards.
CODASYL is remembered almost entirely for two activities. Its work on development of COBOL Language and its activities in standardizing database interfaces.

(ii) BASIC - Beginners' All-Purpose Symbolic Instruction Code. It was developed by John G Kenedy and Thomas Kurtz, Professor of Mathematics at Dartmouth. This is very simple language and it is suitable for both scientific and commercial applications. A statement is written in a line and line number is assigned to each statement. Flow of control is managed through line number.

(iii) SET - Secure Electronic Transaction. Master card and Visa International card have been developed using SET protocols which are

- Merchant will have no access to credit card information
- SET requires authentication of trade prior parties to commencement of processing.

(iv) ERP - Enterprise Resource Planning: Enterprise Resource Planning has become a powerful tool in the hands of management for effective use of resources and to improve efficiency of an enterprise.

(v) RADIUS - Remote Authentication Dial In User Service: It is a networking protocol that provides centralized Authentication, Authorization, and Accounting (AAA) management for computers to connect and use a network service.

(b) ERP package is a software with the help of Database Management System integrating information related to all functional areas. Globally, ERP System is in great demand and Industry analysts are forecasting growth rate of more than 30% in next five years.

The reasons for accepting ERP System for replacing old business system are as follows:

- Improved business performance through optimum resource utilization
- Reduction in manufacturing cycle time by integrated planning process
- Better support Customers in fast changing market conditions
- Better Cost Control mechanism by way of accurate costing system
- Enhanced efficiency in control through feedback information and online access to accurate information
- Establishment of Decision Support System etc.

Three fundamental characteristics of an information system are accuracy, relevancy and timeliness. Today, time is a crucial parameter for good quality service to the market. In fact, there are interlinks among all the systems. A data in isolation does not give right direction in decision making. When the impact of the same can be seen in all activities in totality, the information becomes far more relevant. A well designed ERP package can provide these advantages.

Criteria for selection of an ERP Package

There are many ERP packages available in the market. Analysing all the packages for choosing the right one is a time consuming process. Thus, it is better to limit the number of packages at the beginning for the purpose of evaluation. Looking at the product literature of the vendors, one can eliminate the packages that are not at all suitable. Normally this evaluation process is done by a Committee. What is required to be done is gap-analysis between the requirement of the company and capability of the package. Presentation or demo from the selective vendors will provide some direction towards choosing the best. Of course, cost of the package is also a key factor. Cost benefit analysis is also to be done.

The Common Criteria for selection of an ERP package:

1. How best the package fits the requirement of the company
2. Provision for accommodating the changes in the system
3. Implementation and post Implementation support from vendor
4. Reliability of Vendor
5. Changes in Hardware and Skill requirement
6. Cost of the package and Budget

(c) Advantages of E-Commerce through Internet:

i) **Easy access to global information**: The Suppliers will put their product technical specifications and other commercial information in the world wide web. This publicity will involve little cost. Customers can make enquiry and place order through internet. Easy access to internet will give him opportunity to compare terms and conditions for commercial transaction.

ii) **Effective Advertising Media**: The consensus on low cost provision for advertisement in www will be an advantage in the hands of suppliers to open up their products to new customers who prefer internet for their shopping needs.

iii) **Free Entry**: The powerful search engines are encouraging the users to have access free of cost. The prospective buyers can take the advantage.

iv) **Market driven strategy**: The suppliers can judge their product response by analysing the visitors to the website and number of matured order and start their strategic decisions to carry on with the present trend or go for luring more buyers with better offer in terms of quality and price.

Impediments in E-Commerce

The research conducted by many experts on impediments of e-Commerce. Some of them are identified and given as follows:

i) Security: When an organization uses the internet to engage in e-commerce, it is likely many of its information are exposed to security risk, fraud and abuse. Out of them the most serious is credit card information.
ii) Legal Issues are many like protection against fraud, passing sensitive data to strangers etc.
iii) Cost of hardware, software and maintenance
iv) Lack of expertise
v) Need of training
vi) Uncertainty of market

8. Write short notes on any six of the following: 3 x 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.

Answer 8.

(a) Characteristics of usefulness of information: The following are the characteristics of information. These characteristics determine the quality and usefulness of information:

- **Timeliness** - This parameter is important to increase effectiveness in the use.
- **Accuracy** - The most important ingredient for quality of information.
- **Comprehensive** - Information should be integrated one with all other related issues to make it more meaningful.
- **Relevance** - The need for type of information differs from user to user. Relevant information filtered for a purpose ensures its effective and best use.
- **Understandability** - The information must be presented in a form that users can interpret the same for decision making.

(b) Workstation: Workstation generally refers to an intelligent terminal in a networking environment. Workstations may be any computer linked under LAN also. Sometimes, workstation may be single-user computer with high storage device. The way workstations are being termed these days, it can be taken any computer meant for a unit taking care of data entry or data storage load in a system to be a part of a bigger processing infrastructure.

(c) Dynamic analysis test: Unit testing refers to evaluating individual modules within a program. It is applicable for large programs in which each module constitutes substantive part of work, no matter whether the program is developed in-house or acquired. In the case of purchase of off-the-shelf program, this may not be applied. Unit testing can be of two types viz. static analysis test and dynamic analysis test.

A dynamic analysis test can be of two types:

Type of test	Detailment
Black-box test	Test cases are designed on the basis of requirements specification for the module and then executed to determine deviations from requirements. Internal logic of a module is not examined neither excesses to the specified requirements are determined.
Whitebox test	After the internal logic of a module has been examined, test cases are designed on the internal working of the module to traverse the different execution paths built into a program.

(d) Components of BIS: Business Information System comprises of:

(i) Transaction Processing System
(ii) Management Information System
(iii) Expert System
(iv) Decision Support System
(v) Executive Information System

(e) 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.

(f) Level of Management: Information requirement varies with the level of management and purpose. The levels of management in the order of hierarchy are Top Management, Middle Management and Operational Management. The activities of different levels of management are given below:

Top Management: Top management is concerned with strategic decisions like diversification, technology acquisition, new market exploration, strategic business alliance, takeover, merger etc.

Middle Level: Middle level management is generally involved tactical in decision making with the help of performance analysis, budget variance analysis, devising better productivity mechanism and control etc.

Operational Management: Operational Management staffs are mainly involved in scheduling the activities, keeping track of progress of day-to-day operations and decisions of well structured problems etc.
The characteristics of information varies depending on the functions of different levels of management.

(g) Benefits of Extranet: An extranet is a business-to-business intranet i.e. inter-organizational information system. It is an extension of intranet concept linking all intranets of related organizations for mutual benefits and sharing information among themselves. Instead of sharing information within one organization, it goes beyond. Generally it is opted when the two organizations are closely related by way of same group of entrepreneur house or they are strategic partners for a common corporate objective. In extranet, same infrastructure components as the internet, TCP/IP protocol and Web browser are used.
On Extranet, each participating companies have to have a common understanding for a common objective.
It may be sharing of information or sharing of software or sharing of technology in the computer media.
Extranet is commonly opted among the companies involved in supply chain management.

Benefits of extranet:

- Better corporate communication environment
- Low communication cost
- Faster processing of information flow etc.

(h) Features of HLL: High Level Languages were developed in such a fashion that the instructions are alike to English language so that following the instruction codes and writing programs become easier. This helped the programmers to overcome the shortcomings of low level languages extent. The following are the 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 there by reducing programming effort.