

Answer to PTP_Intermediate_Syllabus 2008_Jun2015_Set 2

Paper 9 - Operations Management & Information Systems

Time allowed-3hrs

Full Marks: 100

Section I: Operation Management

Answer Question No. 1 which is compulsory and any
Two questions from the rest, under Section I.

Working Notes should form part of the answer.

1.

a) Choosing The Correct Answer: [4]

- i) The act of assessing the future and make provisions for it is known as
 - A. Planning
 - B. Forecasting
 - C. Assessment
 - D. Scheduling
- ii) For a marketing manager, the sales forecast is:
 - A. Estimate of the amount of unit sales for a specified future periods
 - B. Arranging the salesmen to different segment of the market
 - C. To distribute the goods through transport to satisfy the market demand
 - D. To plan the sales methods.
- iii) One of the product examples for line layout is
 - A. Repair workshop
 - B. Welding shop
 - C. Engineering colleges
 - D. Cement
- iv) One of the advantages of Method of Least square is
 - A. It is a very easy method
 - B. It does not use mathematics
 - C. Trend values of all years of the series may be obtained
 - D. None of the above

b) Give your views on the following statements [4]

- i) Incentives are substitute for lower wages
- ii) Mechanization and Automation lower employee morale
- iii) Total productivity of a given situation cannot be measured in absolute terms
- iv) Method study should precede work measurement.

c) Expand the items in List 'A' and match them with the related functional areas of production management in List 'B' : [6]

List 'A'	List 'B'
VA	Cost Benefit Analysis
IFCI	Cost Control
CBA	Project funding
USP	Statistical quality control
ILO	Marketing strategy
LCL	Labour related standards

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Answer:

a)

- i) B
- ii) A
- iii) D
- iv) C

b)

- i) No. incentives are in addition to wages and are meant for increasing production and improving productivity.
- ii) No. they will simplify job and as such morale will improve.
- iii) No. in such case output and input can be converted into monetary terms and productivity can be measured.
- iv) Yes, Method Study is concerned with the reduction of the work content of a job and Work Measurement is concerned with the investigation of any ineffective time and with the subsequent establishment of time standard the operation is carried out in improved fashion, as determined by method.

c)

List 'A'	Expansion	Matching with List 'B'
VA	Value Analysis	Cost Control
IFCI	Industrial Finance Corporation of India	Project funding
CBA	Cost Benefit Analysis	Project viability checking
USP	Unique Selling Proposition	Marketing strategy
ILO	International Labour Organization	Labour related standards
LCL	Lower Control Limit	Statistical quality control

2.

a) A large computer installation contains 2,000 components of identical nature which are subject to failure as per probability distribution that follows:

Month End:	1	2	3	4	5
% Failure to date:	10	25	50	80	100

Components which fail have to be replaced for efficient functioning of the system. If they are replaced as and when failures occur, the cost of replacement per unit is ₹ 3. Alternatively, if all components are replaced in one lot at periodical intervals and individually replace only such failures as occur between group replacement, the cost of component replaced is ₹ 1.

- (i) Assess which policy of replacement would be economical.
- (ii) If group replacement is economical at current costs, then assess at what cost of individual replacement would group replacement be uneconomical.
- (iii) How high can the cost per unit in group replacement be to make a performance for individual replacement policy? [6+3+3=12]

b) A company has two plants P and Q with fixed costs of ₹1,00,000 and ₹1,50,000 respectively. Both the plants are designed to produce up to 10,000 units each. The variable costs of two plants due to difference of production are as follows:

Production (Units)	Plant P (₹)	Plant Q (₹)
2,500	72,000	58,000

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5,000	90,000	78,000
7,500	1,54,000	1,02,000
10,000	2,20,000	2,30,000

Find the most economic loading schedule.

[6]

Answer:

a)

(i) Computation of Failures & Mean life

Month	Probability	$P_1 X_1$
1	0.10	0.10
2	0.15	0.30
3	0.25	0.75
4	0.30	1.20
5	0.20	1.00
		3.35

Average No. of Replacements = $2000/3.35 = 597$

Cost of Individual Replacement = $597 \times 3 = 1791$

Computation of expected No. of Replacements:

Month 0	$N_0 = N_0 P_0 = 2000 \times 0$	0
1	$N_1 = N_0 P_1 = 2000 \times 0.1$	200
2	$N_2 = N_0 P_2 + N_1 P_1 = 2000 \times 0.15 + 200 \times 0.1$	320
3	$N_3 = N_0 P_3 + N_1 P_2 + N_2 P_1 = 2000 \times 0.25 + 200 \times 0.15 + 320 \times 0.1$	562
4	$N_4 = N_0 P_4 + N_1 P_3 + N_2 P_2 + N_3 P_1 = 2000 \times 0.3 + 200 \times 0.25 + 320 \times 0.15 + 562 \times 0.1$	754.2
5	$N_5 = N_0 P_5 + N_1 P_4 + N_2 P_3 + N_3 P_2 + N_4 P_1 = 2000 \times 0.2 + 200 \times 0.3 + 320 \times 0.25 + 562 \times 0.15 + 754.2 \times 0.1$	699.72

Computation of Average cost

Month	Individual Replacement	Cost		Total Cost	Average Cost
		IR	GR		
		₹	₹	₹	₹
1	200	600	2000	2600	2600
2	520	1560	2000	3560	1780
3	1082	3246	2000	5246	1748.67*
4	1836.2	5508.6	2000	7408.6	1877.15
5	2535.92	7607.76	2000	9607.76	1921.55

Since the average cost is lowest in 3rd month, the optimal interval i.e., replacement is 3 months. Also the average cost is less than ₹ 1791 of individual replacement, the group replacement policy is better.

(ii) Let 'K' be the cost of Individual Replacement

Month	Average Cost of Group Replacement	Average cost of IR	'K' Value (₹)
1	1 (2000 + 200 K)	597 K	5.04
2	0.5 (2000 + 520 K)	597 K	2.97
3	0.33 (2000 + 1082 K)	597 K	2.82

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4	0.25 (2000 + 1836.2 K)	597 K	3.62
5	0.20 (2000 + 2535.92 K)	597 K	4.45

If group replacement is anything smaller than 2.82, then Group Replacement would be uneconomical.

(iii) Let 'a' be the unit cost of Group Replacement Policy

Month	Average Cost of Group Replacement	Average cost of IR	'a' Value (₹)
1	1 (2000 a + 600)	1791	0.60
2	0.5 (2000 a + 1560)	1791	1.01
3	0.33 (2000 a + 3246)	1791	1.06
4	0.25 (2000 a + 5508.6)	1791	0.83
5	0.20 (2000 a + 7607.76)	1791	0.67

When unit cost is more than ₹ 1.06 then Individual Replacement policy would be better.

- b) The fixed costs are irrelevant and only the incremental costs should be considered. Incremental costs will be as follows:

Particulars	Plant P (₹)	Plant Q (₹)
Total incremental costs	72,000	58,000
	18,000	20,000
	64,000	24,000
	66,000	1,28,000
Per unit incremental costs	28.80	23.20
	7.20	8.00
	25.60	9.60
	26.40	51.20

Decision:

For first 2,500 units	Plant Q
for next 2,500 units	Plant P
for next 2,500 units	Plant Q
for last 2,500 units	Plant P

3.

- a) A company, engaged in the manufacture of three products viz. A,B and C the available data are given in the tables:

Minimum Sale Requirements

Product	Minimum Sale Requirements per unit
A	10
B	20
C	30

Operations, Required Processing Time and Capacity

Operations	Time (hrs) required per item of			Total available hours (per month)
	A	B	C	
1	1	2	2	200

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2	2	1	1	220
3	3	1	2	180

Profit per unit

Product	Profit per unit (₹)
A	10
B	15
C	8

Formulate the linear programming problem only.

[1+(1/2×6) =4]

- b) State the differences in Programme Evaluation and Review Technique (PERT) and Critical Path Method (CPM). [6]
- c) State the circumstances under which a company would go for either a time based policy or condition based policy for Preventive maintenance. [3]
- d) List the points to be considered while designing a Maintenance Programme for an organization. [5]

Answer:

- a) Let x,y and z denote the number of units produced per month for the products A,B and C respectively. The appropriate mathematical formulation of the problem is:

$$\text{Maximise } Z = 10x + 15y + 8z$$

Subject to the constraints:

$$x + 2y + 2z \leq 200 \quad \dots(1)$$

$$2x + y + z \leq 220 \quad \dots(2)$$

$$3x + y + 2z \leq 180 \quad \dots(3)$$

$$x \geq 10 \quad \dots(4)$$

$$y \geq 20 \quad \dots(5)$$

$$z \geq 30 \quad \dots(6)$$

$$x \geq 0, y \geq 0, z \geq 0$$

- b) Although these techniques i.e. PERT and CPM use the same principles and are based on network analysis yet they differ from each other in the following respect:
- (i) Programme Evaluation and Review Technique (PERT) is appropriate where time estimates are uncertain in the duration of activities as measured by optimistic time, most likely time, and pessimistic time, whereas Critical Path Method (CPM) is good when time estimates are found with certainty. CPM assumes that the duration of every activity is constant and therefore every activity is critical or not.
 - (ii) PERT is concerned with events which are the beginning or ending points of operation while CPM is concerned with activities.
 - (iii) PERT is suitable for non-repetitive projects while CPM is designed for repetitive projects.
 - (iv) PERT can be analysed statistically whereas CPM not.
 - (v) PERT is not concerned with the relationship between time and cost, whereas CPM establishes a relationship between time and cost and cost is proportionate to time.

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- c) Time based maintenance policy is generally followed where the breakdown of an item can be predicted fairly accurately, e.g., group replacement policy of all the bulbs. A comparative cost-benefit study between a group replacement policy and an individual replacement policy is generally made.

For condition based maintenance policy, think of a patient in an Intensive Care Unit fitted with several gadgets and probes. His different parameters, e.g., blood pressure, pulse rate, breathing rate, etc., are constantly being watched from a screen where graphs, charts and various signals are being displayed. Like patient the different parameters of plant and machinery, e.g., noise, vibration, heat etc., may be obtained which reflect its condition. By inserting probes at various convenient places, we can get signatures on monitor to analyze. This is condition monitoring by signature analysis.

- d) While designing a maintenance programmed the main objective of management should be to reduce the total cost of maintenance without sacrificing the efficiency and effectiveness of the plant. The following points are to be considered while designing a maintenance programmed:
- The maintenance operation should increase the life of the asset at affordable cost.
 - The maintenance programmed should not affect the normal working of the plant. This involves proper planning, having spare machines etc.
 - Manpower required for maintenance plan should determined and proper training should be imparted to them.
 - The equipments may be classified according to their criticality.
 - Lubrication schedules should be prepared, spares and equipment replacement policy should be decided.
 - The maintenance plan should be communicated to all concerned.
 - Techniques to be employed in carrying out maintenance.
 - Maintenance standard time may be fixed.
 - The programmed itself may have to be modified in light of the experience gained.

4.

- a) The processing times for five jobs and their due dates are given for a single machine scheduling below.

Job (j)	1	2	3	4	5
Processing time (t_j) hrs	9	7	5	11	6
Due date (in days) (d_j)	16	20	25	15	40

- Determine the sequence
- Total completion time
- Average completion time
- Average number of jobs in the system and average job lateness using the following priority sequencing rules
 - Shortest Processing Time (SPT)
 - Earliest Due Date (EDD)
 - Longest Processing Time (LPT)
- Compare the above characteristics for the three sequencing rules. [[$(3 \times 5) + 1 = 16$]]

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- b) The main shaft of calcinator has a very high reliability of 0.990. The equipment comes from Russia and has a high downtime cost associated with the failure of this shaft. This is estimated at ₹ 3 crore as the costs of sales lost and other relevant costs. However, this spare is quoted at ₹ 12 lakh at present. Should the shaft spare be procured along with the equipment and kept or not? [2]

Answer:

- (i) Shortest Processing Time (SPT) sequence.
As per this rule, the job with the shortest processing time is scheduled first and immediately followed by next lowest processing time and so on.

Job Sequence(J)	Processing time(t _j) days	Flow time (F _j) days	Due Date(d _j) days	Job lateness (Days)
3	5	5	25	0
5	6	11	40	0
2	7	18	20	0
1	9	27	16	11
4	11	38	15	23
Total	38	99		34

The various characteristics are:

Total completion time (flow time) = 38 days

$$\text{Average completion time} = \frac{\text{Total Flow Time}}{\text{No. of jobs}} = \frac{99}{5} = 19.8$$

$$\text{Average number of jobs in the system} = \frac{\text{Total Flow Time}}{\text{Total process time (completion)}} = \frac{99}{38} = 2.61 \text{ jobs}$$

$$\text{Average job lateness} = \frac{\text{Total Job lateness}}{\text{No. of jobs}} = \frac{34}{5} = 6.8 \text{ days}$$

(ii) Earliest Due Date(EDD) rule

As per this rule priority is given to the job with earliest due date. Arranging the jobs sequence gives the sequence as 4-1-2-3-5.

Job Sequence (j)	Processing time (C _j)	Flow time(F _j)	Due Date(D _j)	Job lateness (Days)
4	11	11	15	0
1	9	20	16	4
2	7	27	20	7
3	5	32	25	7
5	6	38	40	0
Total	38	128		18

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Characteristics:

- Total completion time = 38 days
- Average completion time = $\frac{\text{Flow time}}{\text{No. of jobs}} = \frac{128}{5} = 25.6$ days
- Average number of jobs in the system = $\frac{\text{Flow time}}{\text{Completion time}} = \frac{128}{38} = 3.37$ jobs
- Average job lateness = $\frac{18}{5} = 3.6$ days

(iii) Longest Processing Time (LPT) Rule

The job sequence and computations as per this priority sequencing rule is given as follows:

Job Sequence (j)	Processing time (C _j)	Flow time (F _j)	Due Date (D _j)	Job lateness (Days)
4	11	11	15	0
1	9	20	16	4
2	7	27	20	7
5	6	33	40	0
3	5	38	25	13
Total	38	129		24

Characteristics:

- Total completion time = 38 days
- Average completion time = $\frac{\text{Flowtime}}{\text{No. of jobs}} = \frac{129}{5} = 25.8$ days
- Average number of jobs in the system = $\frac{\text{Flowtime}}{\text{Completiontime}} = \frac{129}{38} = 3.39$ jobs
- Average job lateness = $\frac{24}{5} = 4.8$ days

Comparison of Priority rules

Priority rule	Total completion time	Avg. completion time	Avg. No. of jobs in the system	Avg. Job lateness
SPT	38	19.8	2.61	6.8
EDD	38	25.6	3.37	3.6
LPT	38	25.8	3.39	4.8

b) The expected cost of down-time

$$= (\text{Probability of failure}) \times (\text{Cost when break-down occurs})$$

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$$= (1 - 0.990) \times (\text{₹ } 3 \text{ crore}) = \text{₹ } 3 \text{ lakh}$$

However, the cost of procuring the spare now is ₹ 12 lakh. Therefore, expected cost of downtime is less than the cost of spare; hence the spare need not be bought along with the equipment.

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 phrase in blank position. [5]
- i) ----- is the abbreviation of the term binary digit.
 - ii) An extra bit in a byte that enables the computer to check for internal errors is called ----- bit.
 - iii) Laser printer is a ----- printer.
 - iv) The range of frequencies available for data transmission is called-----.
 - v) The activities of an Information System is collection, generation and -----of information to right users.
- b) State whether following statements are true or false: [5]
- i) RAM is volatile, i.e contents are lost when power is switched off.
 - ii) Virtual memory is provision of secondary storage which acts as secondary memory.
 - iii) Multiplexer facilitates use of multiple lines to connect multiple computers.
 - iv) Viewing a taped television show is an example of synchronous communication.
 - v) BASIC is suitable for both scientific and commercial applications.
- c) Write short notes on(any two): [2×2=4]
- i) DHTML
 - ii) JAVA
 - iii) Extranet
 - iv) World Wide Web

Answer:

- a)
- i) BITS.
 - ii) Parity.
 - iii) Non-impact.
 - iv) Bandwidth.
 - v) Dissemination.
- b)
- i) True.
 - ii) False.
 - iii) False.
 - iv) False.
 - v) True
- c)

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- i) **DHTML (Dynamic Hyper Text Markup Language):** This is the latest version of HTML that is still being designed. DHTML solves a huge list of problems associated with laying out webpage designs.
- ii) **JAVA:** This is a new language. Destined to change the Internet in a way very wonderful. This language can allow you to do incredibly versatile things via web pages running programs.
- iii) **Extranet:** An extension of a corporate internet. It connects the internal network of one company with the internets of its customers and suppliers. This makes it possible to create e-commerce applications that link all aspects of a business relationship, from ordering to payment.
- iv) **World Wide Web:** It is also known as just "the web" or WWW, this is perhaps the main reason for the internet's growing popularity in recent years. Based on a client server architecture, the web consists of numerous servers on the internet. A server is identified by an address in a special format, called the Uniform Resource Locator.

A web site is a computer server with databases and connectivity. It has homepages of its own or for its customers on rent. A homepage can be set up at customer's own site with appropriate information. The homepage can serve as a mirror of an organisation that provides financial data, on-line order forms etc.

6.

- a) **Explain Relational Data Base Management System.** [3]
- b) **Describe system. Explain the types of system according to Interactive Behaviour.** [2+3]
- c) **"The final step of the system implementation is its evaluation." State the functions as being served by the system evaluation. Discuss different aspects of evaluation.** [5]
- d) **Describe Data Dictionary.** [3]
- e) **Explain Transform Analysis and Transaction Analysis.** [2]

Answer:

a) RDBMS – Relational Data Base Management System or Relational DBMS

A DBMS has to be persistent, that is it should be accessible when the program created the data ceases to exist or even the application that created the data restarted. A DBMS also has to provide some uniform methods independent of a specific application for accessing the information that is stored.

RDBMS adds the additional condition that the system supports a tabular structure for the data, with enforced relationships between the tables. This excludes the databases that don't support a tabular structure or don't enforce relationships between tables.

DBMS does not impose any constraints or security with regard to data manipulation it is user or the programmer responsibility to ensure the ACID PROPERTY of the database whereas the RDBMS is more with this regards because RDBMS defines the integrity constraint for the purpose of holding ACID PROPERTY. RDBMS may be or may not be Client Server Database System.

Examples:

DBMS – File System, XML

RDBMS – SQL Server, Oracle

- b) A system is a collection of inter-related and interdependent elements or components that operate collectively to achieve some common purpose or goal. For example – Human body is a system, consisting of various parts such as head, heart, hands, legs etc and they work well together. A computer based information system is also a system consist of collection of people, hardware, software, data and procedures that interact to provide timely information to authorized people for such decision making and for the other purposes.

Type of system According to Interactive Behaviour:

1. Open System
2. Closed System

Differentiate between open and closed systems:

Open Systems: Open systems actively interact with their environment. Such systems regularly get inputs and give outputs to its environment. Open systems are also able to adapt to environmental changes for their survival and growth. Business organization is an example of such system. Marketing System is an open system. The system takes inputs/feedbacks and gives outputs to its environment by way of giving products of the company and also creates new customers.

Closed Systems: A closed system is self contained and does not interact or make exchange across its boundaries with its environment. Closed systems do not get the feedback they need from the external environment and tend to deteriorate eventually. For example, if a marketing system does not get feedback from the market, its efficiency will gradually continue to decrease.

- c) **Evaluation of the new system:** The final step of the system implementation is evaluation. Evaluation provides the feedback necessary to assess the value of information and the performance of personnel and technology included in the newly designed system.

There are two basic areas of information systems that should be evaluated. The first area is concerned with whether the newly developed system is operating properly. The other area is concerned with whether the user is satisfied with the information system with regard to the reports supplied by it.

Development evaluation: Evaluation of the development process is primarily concerned with whether the system was developed on schedule and within budget.

Operation evaluation: The evaluation of the information system's operation pertains to whether the hardware, software and personnel are capable to perform their duties and they do actually perform.

Operation evaluation answers such questions:

- i) Are all transactions processed on time?
- ii) Are all values computed accurately?
- iii) Is the system easy to work with and understand?
- iv) Is terminal response time within acceptable limits?
- v) Are reports processed on time?
- vi) Is there adequate storage capacity for data?

Information evaluation: The extent to which information provided by the system is supportive to decision making is the area of concern in evaluating the system. User satisfaction can be used as a measure to evaluate the information provided by an

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information system. If management is generally satisfied with an information system, it is assumed that the system is meeting the requirements of the organization.

- d) Data Dictionary:** Each computer record of a data dictionary contains information about a single data item used in a business information system. The information in each record of a Data Dictionary may include the following:
- Codes describing the data item's length, data type and range.
 - Identity of the source documents used to create the data.
 - Names of the computer files storing the data item.
 - Identity of individuals/programs permitted to access the data item.
 - Identity of programs/individuals not permitted to access the data item.
 - Names of the computer programs that modify the data item.

For an Auditor, A data dictionary can also help to establish an audit trail because it can identify the input sources of data items, the computer programs that modify particular data items, and the managerial reports on which data items are output.

For the accountants, a data dictionary can also be used to plan the flow of transaction data through the system.

e) Transform Analysis

One approach used to derive a program structure chart from program DFD is transform analysis.

Transaction Analysis

An alternative structured design strategy for developing structure charts is called transaction analysis.

7.

- List the liability under Law of Tort and Internet. [4]
- State the concept of the cost of quality. [2]
- Describe Electronic Data Interchange (EDI). State the use of Electronic Data Interchange (EDI). [4+2=6]
- List any two reasons for the Spread of E- commerce. [2]
- Explain ERP Accounts Payable and Receivable. [4]

Answer:

- a)** Basically tort is a civil wrong which involves civil liability and civil action. Most of the cases relating to fraud, negligence, misrepresentation, false advertisement, and IPRs infringement are covered under it.
- Strict liability: Products that produce the wrong solution, causing injury to others, fall under laws of strict liability or negligence. The basis of liability involves product liability and is covered under tort law. Therefore the moot question is that if such product is purchased online causing injury to another person whether rule of liability would be applicable?
 - Fraud: If an e-merchant gives false advertisement on the website or sells wrong products or a customer gives an unauthorized credit card over the Internet, whether he or she will be liable for fraud?
 - Suppose a product is bought online but consumer finds it defective. Again here question is of liability. Here depending upon how liability is worded liability is of the manufacturer. Generally in such situation every person involved in transaction (manufacturer, e-merchant and seller) would be liable.

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- b) The concept of cost of quality are:
- i) The premise underlying cost reduction is to decrease costs while maintaining or improving product quality.
 - ii) If the quality of products and services does not conform to quality standards, the organization incurs the cost of nonconformance to quality standards.
- c) Before Electronic Data Interchange (EDI) following steps were involved in commerce:
- Step I:** Creation of purchase order (PO) by the customer.
- Step II:** PO is sent by the customer (sender of the message) using post office, fax, and telex and so on.
- Step III:** PO is received by the supplier (receiver of the message).
- Step IV:** PO is interpreted by the supplier (receiver).
- After EDI following steps were involved in commerce:
- Step I:** Customer's computer system creates and sends the electronic PO.
- Step II:** PO is received by the supplier (receiver of the message) and places the order directly into his system and he acts accordingly.

Uses of Electronic Data Interchange (EDI)

EDI is used in following ways:

- i) EDI is used to electronically transfer documents such as purchase order, invoices, shipping notices, receiving advises and other standard business correspondence between the trading partners.
 - ii) EDI can also be used to transmit financial information and payment in electronic form. However, where EDI is used for effecting payment it is commonly known as financial EDI or electronic funds transfer.
- d) **Main Reasons for the spread of E-commerce:**
- i) Digital convergence, i.e., it means that due to digital revolution almost all digital devices can communicate with one another.
 - ii) Today's E-commerce is available to anyone, anywhere in the world, anytime 24/7 (24 hours a day, 7 days a week).
- e) Accounts payable and Accounts receivable modules are two important execution modules under finance segment of an ERP system. Financial relationship with vendors who are providing input to the organization in the form of goods and services are maintained in Accounts Payable (AP) module. On the flip side, the financial connection with customers who use output of the organization, are dealt through Accounts Receivable (AR) module. Both these modules maintain personal accounts either of debtors or creditors and maintain various sub ledgers such as control account, currency fluctuation accounts etc. as an integral part of General Ledger (GL).

Accounts Payable Module (AP) - This module provides the functionality to enter, monitor, maintain and process for payment of invoices and credit notes, that the organization received from its vendors. The key functionality of this module is as follows:

- i) Immediate registration of incoming invoices
- ii) Tracking & authorization of incoming invoices
- iii) Entry of order-based and sundry invoices
- iv) Automatic matching of invoices with receipts
- v) Separate procedure for approval of invoices that exceeded the user tolerances

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- vi) Self-Billing Invoices this is suitable for JIT environment where receipt of goods automatically generates approved invoices in the system which is paid through remittances and supplier need not send any invoice.
- vii) Accounts Classification for reconciliation.

Accounts Receivable Module (AR) - This module helps in tracking all the invoices that is awaiting payment from customers. The key functionalities of AR are:

- i) Accounts classification for reconciliation & control.
- ii) On-line credit management.
- iii) Reminder letters with varying degrees of severity.
- iv) Aging Analysis reports for review.
- v) Interest for late payments.
- vi) Customer statements.

8.

- a) Describe configuration. State the general Mode of Configuration. [2+2=4]
- b) Describe Information Technology. State its major components. [4]
- c) List the basic functions of a computer. [4]
- d) List the basic difference between Dumb Terminal and Intelligent Terminal. [2]
- e) List out the differences between debugging and testing. [4]

Answer:

- a) Configuration of an ERP system deals with handling of numerous usage controls, which can be switched off or switched on, so as to balance its functionalities to extant needs. First thing to happen is to install specific modules needed and configuring these modules, as per the scope of the project. Thousands of configuration tables are present, which define how the system should operate, how the data entry screen will look like, how the signals and messages will appear etc.

The above process is extremely complex, particularly for tier 1 vendors like SAP and Oracle. To alleviate this complexity, ERP vendors are creating pre configured modules suitable for a particular business vertical. ERP vendors are also developing automated pre configuration tools such as Orgware from Baan. SAP has also brought out "Accelerated SAP Solution" containing industry specific templates which can be tweaked for an individual company.

General Mode of Configuration:

- i) A function can be turned on or turned off or made optional.
- ii) XOR i.e. to chooses only one flow that fulfills the specified condition.
- iii) OR where a configuration supports optional activities or flow requiring all, none or some of the activities.
- iv) AND - indicate mandatory parallel flows.

Some configuration choices are irreversible e.g. if "negative inventory allowed" option is chosen, it can not be reversed at a latter stage. Some configurations are reversible e.g. purchase order quantity may exceed blanket order quantity or not. In some case if a specific choice is not made, configurable function can be switched on or off by default.

- b) In general, Information Technology is a combination of various techniques for data capture, data storing, data processing, data transmission, information retrieval and information display. In the modern age, since all these are done through computers, information technology is defined in terms of a collective reference to the combined

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fields of computers and information systems. A more formal definition of information technology is as follows :

'Information technology consists of hardware, software, database management, telecommunications, and other information processing technologies used in computer based information systems.'

The major components of information technology are as follows :

- (i) Computer hardware
- (ii) Computer software
- (iii) Database management
- (iv) Telecommunications.

c) Computer does the following four functions :

- Receive the input data through input devices
- Process the data with the help of CPU
- Generate the output through output devices
- Stores the input/output in storage devices

d) A dumb terminal is used for data entry only. It has the facility to communicate data to and from CPU. An intelligent terminal, on the other hand, has the following facilities :

- It has a CPU to control the function.
- It has buffer memory.
- It has the ability to attach the peripherals i.e. floppy disk, printer etc.

e)

Debugging	Testing
Process of eliminating errors.	Process of validating the logic of the program.
It is after the program is written.	It is after debugging
It is done with help of compiler or interpreter.	It is done with test data.
It is done to eliminate syntax errors.	It is done to remove logical errors.