

# Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

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## 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) Choose the most appropriate alternative:

[8]

- i) Job evaluation determines
  - a. Relative worth of job holders;
  - b. Relative worth of various jobs;
  - c. Time taken for a job;
  - d. Bonus.
- ii) Specifying the order in which individual jobs are to be executed
  - a. Planning;
  - b. Loading;
  - c. Sequencing;
  - d. Routing.
- iii) Enameling is a
  - a. Heat Treatment Process;
  - b. Surface Treatment Process;
  - c. Machining Process;
  - d. Extrusion Process.
- iv) Capacity is
  - a. Long term concept;
  - b. Maximum available output;
  - c. Not related to cost of production;
  - d. All of the above.
- v) Machines are arranged in sequence of operations:
  - a. Product layout;
  - b. Process layout;
  - c. Fixed position layout;
  - d. Group layout.
- vi) Control chart for proportion of defectives is
  - a. c-chart;
  - b. N-chart;
  - c. X chart;
  - d. p chart.
- vii) Normal time means
  - a. Time required by a qualified worker to do a job under normal circumstances;
  - b. How much time should be taken to get incentive;
  - c. Time to do a job;

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

- d. Time required by any person to do a job.
- viii) Addition of value to raw materials through application of technology is
- Product;
  - Production;
  - Advancement;
  - Transformation.
- b) Fill in the blanks with more suitable word(s) given below: [6]
- Rucker plan is a -----incentive plan. (group/individual)
  - Ranking is a -----method. (Value Analysis/Job Evaluation)
  - Production management is a-----function. (staff/line)
  - Acceptance number is the maximum number of ----- items in a sample. (good/defective)
  - X chart is ----- chart. (mean/range)
  - Labour Rate Variance is Actual Rate minus Standard Rate multiplied by ----- hours. (Actual/Standard)

Answer:

- a)
- b.
  - c.
  - b.
  - b.
  - a.
  - d.
  - a.
  - b.
- b)
- Group.
  - Job evaluation.
  - Line.
  - Defective.
  - Mean.
  - Actual.

2.

- a) A firm is considering alternative locations for a new plant. It has attempted to study all costs at the various locations and finds the production costs of the following items vary from one location to another. The firm will finance the new plant from deposits, fetching 10% interest.

	A	B	C	D
Labour (per unit) (₹)	7.50	11.00	8.00	9.00
Plant construction cost (₹Crores)	4.6	3.9	4.0	4.8
Material & equipment (per unit) (₹)	4.30	6.00	4.00	5.50
Electricity (per yr.) (₹ Lakhs)	3.0	2.60	3.00	2.80
Water (per yr.) (₹ Lakhs)	0.7	0.6	0.7	0.7
Taxes (per year) (₹ Lakhs)	3.3	2.8	6.3	3.5
Transportation (Per unit) (₹)	0.20	1.00	1.00	0.50

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

The material and equipment includes a projected depreciation, but no interest. If the plant is designed to have an effective system capacity of 10,000 units per year and is expected to operate at 80% efficiency, what is the most economic location on the basis of actual output? [6]

- b) Describe Multipurpose and Single Purpose machine tools. Give examples of each of them. State the uses of these two types of machine tools. [2+1+2]
- c) Sunil works an eight hour day as a machine operator. He works with an average P.I. of 105%. A work sampling study determines that he is idle 20% of the day. Product record shows that he turned out 400 pieces of acceptable quality during the day. What is the standard time for the operation, if the job is given total Relaxation Allowance of 10%? [3]
- d) Find the machining cost of a M. S. bar on a lathe from the following data: R. P. M. of the Job = 500. Feed of tool per revolution of job = 0.5 mm. Depth of cut = 2 mm. Diameter of raw material = 60 mm. Diameter of finished job = 40 mm. Length of Job = 1000 mm. Machining cost = ₹ 9 per hour. [4]

**Answer:**

a)

Actual output = (System efficiency x System capacity)  
= 0.80 x 10,000 = 8,000 units / year.

	A	B	C	D
Fixed cost/year (₹ In lakhs)				
10% of investment	46.00	39.00	40.00	48.00
Electricity	3.00	2.60	3.00	2.80
Water	0.70	0.60	0.70	0.70
Taxes	3.30	2.80	6.30	3.50
Total	53.00	45.00	50.00	55.00
Variable cost/unit (₹)				
Material and equipment	4.30	6.00	4.00	5.50
Labour	7.50	11.00	8.00	9.00
Transportation	0.20	1.00	1.00	0.50
Total	12.00	18.00	13.00	15.00

Cost per site = Fixed cost + Variable Cost

A	= 53,00,000 + 8,000 x 12 = ₹ 53,96,000
B	= 45,00,000 + 8,000 x 18 = ₹ 46,44,000
C	= 50,00,000 + 8,000 x 13 = ₹ 51,04,000
D	= 55,00,000 + 8,000 x 15 = ₹ 56,20,000

The most economic location is B.

- b) A Multi-purpose Machine Tool is capable of doing a number of different types of operation. A Centre Lathe, a Milling Machine, a Grinding Machine, etc. are examples of Multi-purpose Machines.

A Single-purpose Machine is one that is capable of doing only one particular kind of operation, but is not restricted to one particular job. As for example, a Shell Turning Lathe

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

is designed especially for shell turning and is not adopted for general Lathe work. A Hobbing Machine, a Honing Machine, etc. are examples of Single-purpose Machines.

Although a Single-purpose Machine has restricted field of use, it can do the particular operation for which it is employed at great speed and with a high degree of accuracy. When a large number of interchangeable parts are to be quickly produced, Multi-purpose Machines are of great importance.

c) Observed time per piece =  $\frac{\text{Total time in mins.} \times \text{Working time\%}}{\text{No. of the pieces manufactured}}$

$$= \frac{8 \times 60 \times 0.80}{400} \text{ mins.} = 0.96 \text{ mins.}$$

Normal time per piece = Observed time x Performance Index (P.I.)  
=  $0.96 \times 1.05$   
= 1.008 mins.

Standard time per piece = Normal time + Allowances  
=  $1.008 + (1.008 \times 0.10)$   
= 1.1088 = 1.11 mins.

d) Number of revolutions in one traverse of 1000 mm. =  $1,000 \text{ mm.} / 0.5 \text{ mm.}$   
=  $10,000 / 5 = 2,000$

Total depth of cut =  $\frac{1}{2} (60 - 40) \text{ mm.} = 10 \text{ mm.}$

Depth of cut per traverse = 2 mm.

The number of transverse traverse over the job from end to end =  $10/2 \text{ times} = 5 \text{ times.}$

Thus the total number of revolutions of the job =  $2,000 \times 5 = 10,000$

R. P. M. of the job = 500

Machine time =  $10,000 / 500 \text{ min.} = 20 \text{ min.} = 1/3 \text{ hr.}$

Cost of machining =  $\text{₹ } 9 \times 1/3 = \text{₹ } 3.$

3.

a) The following data is available for a machine in a manufacturing unit:

Hours worked per day	8
Working days per month	52
Number of operators	1
Standard minutes per unit of production	
Machine time	22
Operator time	8
Total time per unit	30

(i) If plant is operated at 75% efficiency, and the operator is working at 100% efficiency, what is the output per month?

(ii) If machine productivity is increased by 5% over the existing level, what will be the output per month?

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

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- (iii) If operator efficiency is reduced by 20% over the existing level, what will be the output per month? [6]
- b) List the eight steps of Benchmarking Process. [4]
- c) State the objectives of Scheduling. [2]
- d) Describe Mean Absolute Deviation (MAD) and Bias. [3+3=6]

**Answer:**

**a)**

- (i) Hours worked per day = 8  
Working days per month = 25  
Hours worked per month =  $25 \times 8 = 200$  hrs.  
Machine time = 22 minutes  
Operator time = 8 minutes  
Total per unit = 30 minutes =  $\frac{1}{2}$  hr.  
No. of units produced/month/operator =  $\frac{200}{1/2} = 400$   
As the no. of operator is 1, monthly production = 400 units. As the plant operates at 75% efficiency.  
Monthly production =  $400 \times 75 / 100 = 300$  units.
- (ii) If machine productivity is increased by 5% i.e. Machine time =  $22 \times 100 / (100 + 5) = 20.95$  minutes.  
Then, total time =  $20.95 + 8 = 28.95$  minutes  
Monthly production =  $\frac{400 \times 30}{28.95} \times \frac{75}{100} = 311$  units
- (iii) If operator efficiency reduced by 20% i.e.  
Operator time =  $8 \times \frac{(100 + 20)}{100} = 8 \times 1.2 = 9.6$  minutes  
Total time =  $22 + 9.6 = 31.6$  minutes.  
Monthly production =  $\frac{400 \times 30}{31.6} \times \frac{75}{100} = 285$  units

- b)** The Benchmarking process consists of three general activities: Planning, Analysis, and Integration/action. Overall, the process follows the Plan-Do-Sudy-Act Cycle of all quality processes. It is recommended to use eight steps benchmarking process as mentioned below:

- Planning:      1. Select Benchmarking subject and appropriate team  
                    2. Identify performance indicators and Drivers  
                    3. Select Benchmark partners  
                    4. Determine data collection method and collect data
- Analysis:      5. Analyses performance gaps.

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

---

- Integration: 6. communicate Findings and identify projects to close gaps  
Action: 7. Implement plans and monitor results!  
8. Recalibrate benchmarks

### c) Objectives of Scheduling

- i) To prevent unbalanced use of time among departments and work centres or to evenly load all machines in the production line.
- ii) To utilize machines and labour in such a way that the output is produced within the established lead time so as to (a) deliver the products/services in time and (b) complete production in the shortest cycle time possible at minimum total cost of production.
- iii) To reduce idle time of labour and machines, which might be caused due to waiting for materials, waiting for movement, waiting for inspection and waiting for want of work.
- iv) To fix up delivery dates for various manufacturing activities and for the finished products.
- v) To increase the efficiency of production or productivity.

**d) Mean Absolute Deviation (MAD):** MAD is the ratio of sum of absolute deviations for all periods to the total number of periods studied. It is represented as below:

$$\text{MAD} = \frac{\text{Sum of absolute values}}{\text{Total number of periods studied}}$$
$$= \frac{\sum_{i=1}^n |\text{Forecasted demand} - \text{Actual Demand}|}{n}$$

Where n is the number of periods studied.

Actual demand is compared with forecasted demand for each period (i) when the forecast is accurate, actual demand equals to the forecasted demand and there is no error. The extent of error is worked out and recorded period by period and then summed up. Average (mean) size of the forecasting error is then determined by dividing the sum of all absolute deviations by the number of periods studied. Mean Absolute Deviation (MAD) is an average of the number of deviations recorded without considering the sign. MAD, therefore, expresses the extent of error.

**Bias:** Bias is worked out by using algebraic difference between forecasted and actual demands for all the periods. The algebraic differences are summed up and divided by the total number of periods studied. Bias is represented as:

$$\text{Bias} = \frac{\text{Sum of algebraic errors for all the periods}}{\text{Total number of periods studied}}$$
$$= \frac{\sum_{i=1}^n |\text{Forecasted demand} - \text{Actual Demand}|}{n}$$

Bias indicates the directional tendency of the forecast errors.

Forecast error functions in a similar manner as inputs to quality improvement. The process of measuring forecast accuracy resembles the process control problems. The ideal

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

forecast should have zero MAD and zero Bias. Usually trade off is attempted between MAD and Bias i.e., one must be kept low at the cost of the other. In general, focus should be on MAD. Lowering MAD to or near zero will automatically hold Bias low.

The essentials for effective forecasts are:

- It should be accurate enough to help the decision making process.
- It should provide timely indications of major shifts in process performance.
- It should be simple to use.
- It should be easily understandable.

4.

- a) A Mutual Fund has cash resources of ₹ 200 million for investment in a diversified portfolio. Table below shows the opportunities available, their estimated annual yields, risk factor and term period details.

Formulate a Linear Program Model to find the optimal portfolio that will maximize return, considering the following policy guidelines:

- All the funds available may be invested
- Weighted average period of at least five years as planning horizon.
- Weighted average risk factor not to exceed 0.20.
- Investment in real estate and speculative stocks to be not more than 25% of the monies invested in total.

Investment type	Annual yield (percentage)	Risk factor	Term period (years)
Bank deposit	9.5	0.02	6
Treasury notes	8.5	0.01	4
Corporate deposit	12.0	0.08	3
Blue-chip stock	15.0	0.25	5
Speculative stocks	32.5	0.45	3
Real estate	35.0	0.40	10

[5]

- b) State the characteristics of Just-in-time System.

[4]

- c) List the differences between CPM and PERT.

[3]

- d) Southern Naval Command of Indian Navy has 10 ships which arrive at Cochin Naval Base for repairs and other maintenance work with a negative exponential distribution of the inter-arrival times. The mean of these times is 15 days. The time for which a ship occupies a berth for repair-and-maintenance shows a negative exponential distribution with a mean of 25 days. If the average delay in the repair/maintenance of ships is to be kept below five days, how many berths should there be at the naval base?

[6]

Answer:

- a) Mathematical Formulation

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

Let  $x_1, x_2, x_3, x_4, x_5$  and  $x_6$  represent the six different investment alternatives, i.e.,  $x_1$  is bank deposit,  $x_2$  is treasury note,  $x_3$  corporate deposit,  $x_4$  blue chip stock,  $x_5$  speculative stock and  $x_6$  real estate. The objective is to maximize the annual yield of the investors (in number of units) given by the linear expression.

$$\text{Maximize } Z = 9.5x_1 + 8.5x_2 + 12.0x_3 + 15.0x_4 + 32.5x_5 + 35.0x_6$$

subject to the constraints:

$$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 \leq 1 \text{ (Investment decision)}$$

$$0.02x_2 + 0.01x_2 + 0.08x_3 + 0.25x_4 + 0.45x_5 + 0.40x_6 \leq 0.20 \text{ (weighted average risk of the portfolio)}$$

$$6x_1 + 4x_2 + 3x_3 + 5x_4 + 3x_5 + 10x_6 \geq 5 \text{ (weighted average length of investment)}$$

$$x_5 + x_6 \leq 0.25 \text{ (limit on investment in real estate and speculated stock)}$$

$$x_1, x_2, x_3, x_4, x_5, x_6 \geq 0 \text{ (non-negativity condition)}$$

**b)** JIT systems focus on reducing inefficiency and unproductive time in the production process to improve continuously the process and quality of the product or service. Employee involvement and inventory reductions are essential to JIT operations. An outline of the salient characteristics of JIT is:

- i) pull method of material flow
- ii) constantly high quality
- iii) small lot sizes
- iv) uniform workstation loads
- v) standardized components and work methods
- vi) close supplier ties
- vii) flexible workforce
- viii) line flow strategy
- ix) automated production and
- x) Preventive maintenance.

**c)** CPM originated from construction project while PERT evolved from R & D projects. Both CPM and PERT share the same approach for constructing the project network and for determining the critical path of the network.

There is some basic differences between PERT and CPM

PERT	CPM
1. Time estimate is probabilistic with uncertainty in time duration Three time estimates.	1. Time estimate is deterministic with known time durations. Single time estimate
2. Event oriented	2. Activity oriented
3. Focused on time	3. Focused on time-cost trade off
4. More suitable for new projects	4. More suited for repetitive projects
5. Most costly to maintain	5. Easy to maintain
6. Suitable for complex projects where uncertain timing is like research programmes	6. Suitable where problems of resource allocation exist like construction projects
7. Dummy activity required for proper	7. Use of dummy activity not necessary



## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

sequencing	
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- d) Average service time,  $T = 25$  days  
 Average time between calls of ships,  $U = 15$  days  
 Therefore, Service Factor,  $X = \frac{T}{T+U} = \frac{25}{25+15} = 0.625$

For  $X = 0.625$  and a population of 10, we have the following after interpolating from the Finite Queuing Tables:

M	D	F	M	D	F
9	0.016	0.999	4	0.967	0.639
8	0.098	0.991	3	0.998	0.481
7	0.298	0.963			
6	0.585	0.897			
5	0.839	0.784			

We can compute the average time a ship ("customer") waits in line,  $W$ , from the above data for different values of 'M' i.e. no. of berths.

$$W = \frac{T(1-F)}{XF}$$

M (No. of berths)	W (in days)
9	0.004
8	0.363
7	1.537
6	4.593
5	11.020
4	22.598
3	43.160

Sample Calculation:

For  $M = 7$ , we have  $F = 0.963$

Therefore,  $1 - F = 0.037$

Now,  $T = 25$  and  $X = 0.62$

$$\text{Therefore, } W = \frac{(25)(0.037)}{(0.625)(0.963)} = 1.537$$

Thus, the Naval Base should have six berths in order that the ships do not wait for more than five days for servicing.

### Section II: Information Systems

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

5.

a) Fill in the blanks:

[5]

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

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- i) ORACLE is a software package for -----.
  - ii) A computer network in which there is no host and in which all stations are equal is called a -----network.
  - iii) Eliminating errors of a program is called-----.
  - iv) Multiprogramming is processing of a number of programs simultaneously by using the technique of -----.
  - v) -----means browsing with any predetermined search material.
- b) Discuss briefly the following term with reference to Information Technology: [5]
- i) Stored Program Concept
  - ii) Reference files
  - iii) System decomposition
  - iv) Toggle
  - v) Virtual Memory
- c) Expand the following abbreviations: [4]
- i) INGRES
  - ii) B2C
  - iii) SQL
  - iv) WYSIWYG

### Answer:

- a)
- i) DBMS.
  - ii) Ring.
  - iii) Debugging.
  - iv) Time-sharing.
  - v) Surfing.
- b)
- i) Stored program concept: Computers can perform variety of mathematical calculations without error. They can sort data, merge lists, search files, make logical decisions and comparisons. However, computer is devoid of any original thinking. It is provided with a set of instructions. These instructions are stored in primary memory and executed under the command of the control unit of CPU. This is known as stored program concept.
  - ii) Reference files: These files contain keys of records in other files. In order to retrieve a record from a file, the reference file is first searched to find out in which file a record can be located.
  - iii) A computer system is difficult to comprehend when considered as a whole. Therefore, it is better that the system is decomposed or factored into sub systems. The boundaries and interfaces are defined, so that sum of the sub systems constitutes the entire system. This process of decomposition is continued with sub systems divided into smaller sub systems until the smallest sub systems are of manageable size. The sub systems resulting from this process generally form hierarchical structure.
  - iv) Toggle: It is a switch or control code that turns an event on or off by repeated action or use. It also means to turn something on or off by repeating the same action.

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

---

v) Virtual memory is a provision of secondary storage which acts as primary memory. When the size of main memory is less than required size for a program to run, the operating system enables it with the help of hard disk (main storage media). The system followed is breaking the programs and accommodating the part according to the size of main memory available and rest is stored in hard disk. When a part of program stored in hard disk is required for running the program, a part of the program stored in the main memory is transferred to hard disk and the required part is brought to main memory. This process is called swapping.

c)

- i) INGRES- Interactive Graphics Relational System.
- ii) B2C- Business to Customer.
- iii) SQL- Structured Query Language.
- iv) WYSIWYG- What You See Is What You Get.

6.

- a) **State the features of Inventory Management in SAP.** [5]
- b) **Explain “backup” of computer files. State why is it necessary to keep back up of computer file?** [3]
- c) **Describe Program Debugging. List the steps involved therein.** [4]
- d) **Discuss the characteristics of a good coding system.** [4]
- e) **State whether a Website is a product or a service?** [2]

**Answer:**

**a) Features of Inventory Management in SAP:**

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

**b)** The storage devices used, especially the disks, in a computer system are not very reliable being susceptible to becoming bad, which may be caused by "bad sectors", the storage location becoming partially bad. Also, the possibility of total disk failure, called "erasing" cannot be ruled out. All these would cause loss of the data/program stored. To avoid such a loss, a duplicate copy of the data and program files are kept in a separate storage device, which is called back ups. For example, the files from hard disks are backed up in floppies, tapes, or tape cartridges. A separate utility is used for creating

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

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backups, where the files which are being copied, are combined to make better utilization of the storage space.

- c) **Program Debugging:** Debugging is the form of testing activity which refers to correcting programming language syntax and diagnostic errors so that the program compiles cleanly and thus in this process, errors are found and then they are corrected.

Debugging consisting of following four steps:

- i) Inputting the source program to the compiler.
- ii) Letting the compiler find errors in the program.
- iii) Correcting lines of code that are erroneous.
- iv) Resubmitting the corrected source program as input to the compiler.

- d) **A good coding system should have the following characteristics:**

- i) **Individuality:** The code should be universally used over the entire organization.
- ii) **Convenience:** The code number should be short and simple and consists of digits or alphabets.
- iii) **Reliability:** Poor setting of parameters and hard coding may subsequently could result in the failure of a program.
- iv) **Robustness:** It refers to the process of taking into account all possible inputs and outputs of a program.
- v) **Efficiency:** It refers to the performance which should not be affected with the increase in input values.
- vi) **Usability:** It refers to a user-friendly interface and easy-to-understand.
- vii) **Readability:** The maintenance of program must be easier.

- e) There are different opinions about whether a Website is a product or a service. If a Web site is considered a product, according to law, proving negligence is unnecessary to hold the developer liable. But if a Website is a considered a service, then the contract law of the state in question would apply.

7.

- a) **State the major areas of computer-based applications.** [5]
- b) **List the steps for successful installation of an equipment.** [3]
- c) **State the benefit of Business Intelligence (BI).** [5]
- d) **Describe communication protocol. State its functions.** [5]

**Answer:**

- a) Major areas of computer-based applications are finance and accounting, marketing and sales, manufacturing, inventory/stock management, human resource management etc.
- i) **Finance and Accounting:** It helps forecasting revenues. It determines the procurement of funds and its optimum utilization and also managing other financial resources. The areas in Finance and accounting are:-General Ledger, cash management, accounts receivable/payable, fund management etc.
  - ii) **Marketing and Sales:** The marketing system facilitates the chances of order procurement by marketing the products of the company, creating new customers and advertising the products. The objective of this system is to maximize sale and ensure customer satisfaction.

- iii) **Production or Manufacturing:** The system generates production schedules and schedules of material requirements. It monitors the product quality, control the waste and try to utilize its full capacity for producing goods and services.
  - iv) **Inventory/Stores Management:** The system is used to regulate the maximum and minimum level of stocks, identification of important items in terms of stock value (ABC analysis), identification most moving items and also non moving items.
  - v) **Human Resource Management:** Less disputes, right utilization of manpower and quiet environment in this functional area ensure smooth conducting of business. HRM maintain the database of employee qualifications, experience and helps the management in allocating the people at right place.
- b) Following steps should be taken for successful installation of an equipment:**
- i) **Site preparation:** An appropriate location must be found to provide an operating environment for the equipment that will meet the vendor's temperature, humidity and dust control specifications. The electric lines should be checked to ensure that they are free of static or power fluctuation. The site layout should allow sufficient space for moving the equipment in and setting it for normal operation.
  - ii) **Equipment installation:** The equipment must be physically installed by the manufacturer, connected to the power source and wired to communication lines, if required.
  - iii) **Equipment check out:** The equipment must be turned on for testing under normal operating conditions, the implementation team should devise and run extensive tests of its own to ensure that equipments are in proper working condition.
- c) The benefits of Business Intelligence (BI) are as follows:**
- i) Time savings
  - ii) Single version of truth
  - iii) Improved strategies and plans
  - iv) Improved tactical decisions
  - v) More efficient processes
  - vi) Cost savings
  - vii) Faster, more accurate reporting
  - viii) Improved decision making
  - ix) Improved customer service
  - x) Increased revenue
- d) When two data communications equipments are connected together, they follow certain rules and conventions while transferring messages between them. Protocols are these procedure and rules for inter computer communication. Protocols are software that performs a variety of actions necessary for data transmission between the computers.**

Some of the functions of communication protocol:

1. Control on information transfer
2. Specification of structure and format of data
3. Recovery steps in case of error
4. Re-transmission

**8.**

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

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- a) State two negative effects of coding. [2]
- b) List the limitations of using flowcharts. [2]
- c) State the major attributes of judging a CPU. [2]
- d) Describe DBMS [Data Base Management System]. [3]
- e) Explain Business Process Re- engineering (BPR). [3]
- f) Describe EDI. State the uses of EDI. [6]

### Answer:

- a) Coding also has some negative effects:
  - i) Information is coarsened by forcing it all into categories – there might not be a category that matches what you want to record – e.g. hair colour
  - ii) The same can be true of rounding numbers – the intervals or numbers of categories is called the granularity – this needs to be chosen carefully to maintain the quality of the information.
- b) Limitation of using Flow chart are as follows:
  - i) Complex logic: Sometimes, the program logic is quite complicated. In that case, flowchart becomes complex.
  - ii) Alterations and Modifications: If alterations are required, the flowchart may require redrawing completely.
  - iii) Reproduction: As the flowchart symbols cannot be typed, reproduction of flowchart becomes a problem.
- c) The major attributes of a CPU are as follows :
  - i) Memory cycle time.
  - ii) Storage Capacity
  - iii) Number of data transfer channels
  - iv) Range of multi-programming capability
  - v) Real time processing capacity.
- d) A Database Management System (DBMS) is a collection of programs that enables users to create and maintain a database. The DBMS is hence a general-purpose software system that facilitates the processes of defining, constructing, and manipulating databases for various applications. Defining a database involves specifying the data types, structures, and constraints for the data to be stored in the database. Constructing the database is the process, of storing the data itself on some storage medium that is controlled by the DBMS. Manipulating a database includes such functions as querying the database to retrieve specific data, updating the database to reflect changes in the mini world, and generating reports from the data.

It is not necessary to use general-purpose DBMS software to implement a computerized database. We could write our own set of programs to create and maintain the database, in effect creating our own special-purpose DBMS software. In either case—whether we use a general-purpose DBMS or not—we usually have to employ a considerable amount of software to manipulate the database. We will call the database and DBMS software together a database system.
- e) BPR means not only change but radical change within a short period. This change is achieved by complete revamp of organizational structure, business process workflow, job description, performance measurement and adoption of information technology.

## Answer to PTP\_Intermediate\_Syllabus 2008\_Jun2015\_Set 3

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Some of Basic characteristics of BPR are:

- View business as a set of customer (both internal and external) oriented processes rather than a set of departmental functions.
- Processes must have clear cut ownership.
- Non value adding activities within a process should be eliminated.
- Gather information only once at the point of origin.

A successful BPR implementation brings significant improvement to productivity, customer service and bottom-line. There are pain and difficulties during implementation and instances where BPR efforts did not achieve desired result. Notwithstanding, the risk is worth taking. Otherwise, there will be greater risk of being overtaken by competitors who develop and progress rapidly through BPR.

f) Before 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, 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 EDI

EDI is used in following ways:

1. 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.
2. 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.