

**PAPER 9 - OPERATIONS MANAGEMENT & INFORMATION SYSTEM**

## PTP\_Intermediate\_Syllabus2012\_Dec2015\_Set 2

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
<b>LEVEL B</b>	KNOWLEDGE  What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION  What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identify	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION  How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS  How you are expected to analyse the detail of what you have learned	Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
Construct		Build up or compile	
Prioritise		Place in order of priority or sequence for action	
Produce		Create or bring into existence	

Paper – 9 – Operations Management & Information Systems

Full Marks: 100

Time allowed-3hrs

This paper contains 3 questions. All questions are compulsory, subject to instruction provided against each question. All workings must form part of your answer. Assumptions, if any, must be clearly indicated.

Question No. 1: Answer all questions. [20 marks]

1. (a) State the need for Ergonomics.
- (b) List the three Principles of Motion Economy.
- (c) List the different Quality Circle techniques.
- (d) Discuss about Spare Parts.
- (e) An analyst wants to obtain a cycle time estimate that is within  $\pm 5\%$  of the true value. A preliminary run of 10 cycles took 50 minutes to complete and had a calculated standard deviation of 0.4 minutes. What is the coefficient of variation to be used for computing the sample size for the forthcoming time study?
- (f) Shin's Car Wash & Dry is an automatic, five-minute operation with a single bay. On a typical Saturday morning, cars arrive at a mean rate of ten per hour, with arrivals tending to follow a poisson distribution. Find the average number of cars in line.
- (g) Explain the term Electronic Financial Transaction.
- (h) List the General mode of configuration.
- (i) State the Main inputs in a share accounting system.
- (j) Write a note on Preliminary investigation in system development life cycle. [10  $\times$ 2=20]

Operations Management

Answer any three questions

2. (a) (i) Calculate five yearly moving averages for the following data -

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Value	123	140	110	98	104	133	95	105	150	135

(ii) Cost per unit (₹)

	Sales – counter 1	Sales – counter 2	Sales – counter 3	Sales – counter 4	Total Supplies
Source 1	48	60	56	58	14
Source 2	45	55	53	60	26
Sources 3	51	67	60	62	36
Total Demand	20	32	25	21	

Find the initial solution by Vogel's Approximation method. Is the initial solution feasible?

- (iii) Discuss the reasons for Product Design or Redesign. [5+7+4=16]

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2. (b) (i) A publishing house has bought out a new monthly magazine, which sells at ₹37.5 per copy. The cost of producing it is ₹30 per copy. The sales pattern of the magazine as estimated by a newsstand is as follows:

Demand Copies	Probability
0 < 300	0.18
300 < 600	0.32
600 < 900	0.25
900 < 1200	0.15
1200 < 1500	0.06
1500 < 1800	0.04

The newsstand has contracted for 750 copies of the magazine per month from the publisher. The unsold copies are returnable to the publisher who will take them back at cost less ₹4 per copy for handling charges.

The newsstand manager wants to simulate the demand and profitability. The following random number may be used for simulation:

27, 15, 56, 17, 98, 71, 51, 32, 62, 83, 96, 69.

You are required to –

- (1) Allocate random numbers to the demand pattern forecast by the newsstand.
- (2) Simulate twelve months sales and calculate the monthly and annual profit/loss.
- (3) Calculate the loss on lost sales.

(ii) The Mini Transport Company owns three mini buses, two of which are two years old while the third one is only a year old. Each of these buses was purchased for ₹80,000. The company contemplates replacing the three buses by two full-sized buses, each such bus containing 50% more seating capacity than a mini bus. Cost of each is ₹1,20,000. Using the following data on the running costs and the resale value of both the types of buses, state whether the mini buses be replaced by the full-sized buses. If not, state why?

Year	For a Mini Bus		For a Full-sized Bus	
	Running Cost	Resale Value	Running Cost	Resale Value
1	3,000	70,000	3,400	1,00,000
2	3,600	61,000	3,900	92,000
3	4,800	55,000	4,700	86,000
4	5,000	49,000	5,800	81,000
5	8,000	32,000	7,200	76,000
6	11,200	20,000	9,000	66,000
7	15,000	10,000	12,000	54,000
8	20,000	5,000	16,000	40,000

[(2+5+1)+8=16]

2. (c) (i) A BPO company is taking bids for 4 routes in the city to ply pick-up and drop cabs. Four companies have made bids as detailed below –

Bids for Routes (₹)

Company/Routes	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>
C <sub>1</sub>	4,000	5,000	-	-

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C <sub>2</sub>	-	4,000	-	4,000
C <sub>3</sub>	3,000	-	2,000	-
C <sub>4</sub>	-	-	4,000	5,000

Each bidder can be assigned only one route. Determine the minimum cost that the BPO should incur.

(ii) Calculate the standard time per article produced from the following data obtained by a work sampling study.

Total no. of observations = 2,500

No. of working observations = 2,100

No. of units produced in 100 hours duration = 6,000 numbers

Proportion of manual labour = 2/3

Proportion of machine time = 1/3

Observed rating factor = 115%

Total allowances = 12% of normal time

[9+7=16]

2. (d) (i) The time schedule for different activities of a project is given below:

Activity (i-j)	Time (in days)
1-2	8
1-3	10
1-4	8
2-3	10
2-6	16
3-5	17
4-5	18
4-6	14
5-6	9

(1) Draw the arrow diagram.

(2) Identify critical path and total project duration.

(3) Determine total, free and independent floats.

(ii) Describe Six Sigma as a key concept of Management.

[(4+1+5)+6=16]

### Information System

Answer any two questions.

3. (a) (i) Discuss the different angles through which the feasibility study of the system is conducted.

(ii) Explain the important symbols used in Flowchart.

(iii) Discuss the areas which would help in analyzing/investing the Present System.

[6+4+6=16]

3. (b) (i) "End users are the people whose jobs require access to the database for querying, updating and generating reports; the database primarily exists for their use." Explain the different categories of end users.

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(ii) Discuss the effects of using computer for MIS.

(iii) Write a note on Payroll accounting.

[6+5+5=16]

3. (c) (i) Discuss the features of Inventory Management in SAP.

(ii) 'There are several kinds of legal problems or disputes in E-Commerce specially in B2C Model covered under Law of Contract.' - Discuss.

(iii) Write a note on online banking or internet banking or e-banking.

[6+6+4=16]