INTERMEDIATE EXAMINATION

December 2013

P–9(OMS)
Syllabus 2012

Operation Management and Information Systems

Time Allowed: 3 Hours

Full Marks: 100

The figures in the margin on the right side indicate full marks.

Operation Management

Answer Question No. 1 *which is compulsory and* any 4 questions *from the rest.*

1. (a) What are the two measures of Forecast Error? 1×12=12

(b) _____ is typically found wherever a particular bottleneck machine exists in the process of manufacturing.

(i) Load control

(ii) Block control

(iii) Flow control

(iv) Order control

(c) A department of a company has to process a large number of components/month. The process equipment time required is 30 minutes/component and the manual skilled manpower required is 10 minutes/component. The following additional data is available:

	availability/month	efficiency of utilization
Equipment hour	400	80%
Skilled manpower-hours	250	65%

What is the maximum possible production under the current conditions?

(d) In a firm, there are four workstations: A, B, C, & D working in series and their individual capacities in units per day are 400, 380, 350 and 410 respectively. The raw materials are fed to Machine A and the system output is obtained from Machine D. If the actual output is 320 units per day, what is the system efficiency?

(e) An analyst wants to obtain a cycle time estimate that is within ± 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) A firm uses ₹20,00,000 in capital and 20,000 labour hours per year to produce ₹2,00,00,000 in product. What is the partial productivity of labour?

(g) Solve the game by dominance property:

9	2
8	6
6	4

(h) Calculate EBQ from the details: Monthly demand –2000 units, Setting up costs per batch –₹100, cost of manufacture per unit –₹30, rate of interest –10% p.a.

(i) 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.

Please Turn Over

(j) The term 'Poka Yoke' is related to _____.
  (i) Material Requirement Planning
  (ii) Scheduling
  (iii) PDCA cycle
  (iv) Fool-proofing

(k) How are spare parts classified for stocking policy analysis?

(l) Give the formula for 'Throughput Time'.

2. (a) What is ASRS? 2

(b) For a network shown in figure, normal time, crash time, and normal costs are given in the table; construct the network by crashing it to optimum value and calculate the critical path, project duration, activities with least cost slope and optimum project cost. Indirect cost is given as ₹95 per day. 10

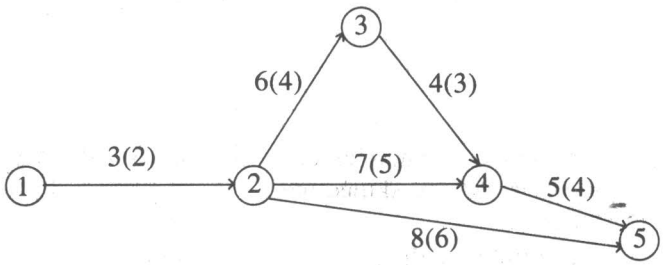

Table : Activity Relationship

Activity	Normal		Crash	
	Time (days)	Cost (₹)	Time (days)	Cost (₹)
1-2	3	300	2	400
2-3	6	480	4	520
2-4	7	2100	5	2500
2-5	8	400	6	600
3-4	4	320	3	360
4-5	5	500	4	520

3. (a) What are the limitations of Preventive Maintenance? 2

(b) A solicitor's firm employs typists on hourly piece-rate basis for daily work. There are four typists and their charges and speed are different. It has been agreed that only one job will be given to one typist and the typist is paid for a full hour even when he works for a fraction of an hour. Find the least cost allocation for the following data:

Typist	Rate/hour	Number of pages typed/hour	Job	No. of pages
A	4	8	P	102
B	3	10	Q	135
C	5	11	R	110
D	3	9	S	85

10