

OPERATIONS MANAGEMENT

This test covers the use of system concepts to stress coordination, optimization, and control of materials, equipment and people to the management of all types of organizations. Topics include: logistics, production, purchasing, inventory control, quality control, and queuing. (3 s.h.) OPM-301-TE

This is a three-hour examination in which you must answer 100 multiple-choice questions (worth 1 point each). A passing score is **60** out of 100 points.

Some questions require calculations. You may bring a non-programmable calculator to the examination.

You should memorize the formulas for arithmetic mean, standard deviation, inventory control, economic order size and breakeven analysis. Also, you should be able to set up and solve equations for linear programming and PERT charts.

Here are the topics covered and their approximate importance on the test:

I. SYSTEMS MANAGEMENT (20%)

- A. Systems concepts
- B. Systems organization
- C. Operations strategy
- D. Process management
- E. Management of technology
- F. Work-force management

II. SYSTEMS DESIGN (20%)

- A. Location analysis
- B. Layout analysis
- C. Capacity analysis
- D. Work systems design and analysis

III. SYSTEMS PLANNING, ANALYSIS, AND CONTROL (60%)

- A. Optimization models and methods in production planning
(Linear programming, transportation models, CPM, PERT, queuing, Monte Carlo, etc.)
- B. Total quality management
- C. Statistical process control
- D. Supply-chain management
- E. Forecasting methods
- F. Aggregate planning
- G. Material requirement planning
- H. Just-In-Time systems
- I. Material requirement planning
- J. Work methods and measurements
- K. Managing projects
- L. Inventory management
- M. Scheduling
- N. Productivity and operations

Textbooks to help you prepare:

Chase, Richard B., et al. *Operations Management for Competitive Advantage*.
Current edition. Boston: McGraw-Hill

Krajewski, Lee J. and Larry P. Ritzman. *Operations Management: Strategy and Analysis*.
Current edition. Upper Saddle River, NJ: Prentice-Hall

Stevenson, William J.. *Operations Management*.
Current edition. Boston: McGraw-Hill

SAMPLE QUESTIONS

1. A system can best be described as
 - a. a plan, order, method or arrangement
 - b. a group of unconnected elements arranged randomly
 - c. an interrelated set of components arranged to accomplish an objective
 - d. continuous process and batch

2. The two basic types of production systems are
 - a. automated and manual
 - b. intermittent and non-intermittent process
 - c. normal and continuous process
 - d. continuous process and batch

3. Value analysis is a technique
 - a. to measure utility of purchased items
 - b. to reduce paperwork in a purchasing department
 - c. for lowering inventory levels
 - d. for calculating time-value of money

4. What technique deals with the problem of supplying sufficient facilities to production lines or individuals that require uneven service?
 - a. Supply-demand theory
 - b. PERT
 - c. Inventory theory
 - d. Queuing theory

5. A manufacturer has been receiving excessive numbers of defective standard machine parts from a vendor on a regular basis. The most effective way to design a formal inspection system for incoming parts is
 - a. queuing analysis
 - b. time series analysis
 - c. statistical quality control
 - d. regression analysis

6. A set of simultaneous equations that has more variables than constraints has
- no solution
 - an infinite number of solutions
 - a finite solution
 - an infinite solution
7. In a PERT/CPM network, computing the critical path requires
- determining the total project duration
 - assigning the earliest finish time for an activity as the earliest start time for the next
 - that the latest finishing time for an activity not delay the overall project beyond initial expectation
 - a sophisticated and complex computer program
8. At the completion of the forward and backward passes, the slack for an activity is given by the
- difference between early start and early finish
 - difference between early start and latest finish
 - difference between latest start and early finish
 - amount of idle labor on the critical path
9. A \bar{p} chart is used for
- batch sampling by attributes
 - batch sampling by variables
 - process sampling by attributes
 - process sampling by variables
10. Three products should be produced. The amount A of the first product should be no more than one-half the total production of all three products. This constraint would be written as
- $2A - 3B - C \geq 0$
 - $A/2 - B - C \leq 0$
 - $A - B/2 - C/2 \leq 0$
 - $A/2 - B/2 - C/2 \leq 0$
11. The operating characteristic (OC) curve shows the probability of
- rejection for every possible true percentage of defectives
 - acceptance for every possible true percentage of defectives
 - making type I errors for various percentages of defectives
 - none of the above
12. If an artificial variable remains in the solution with a positive value after the stopping criterion has been reached, the problem
- is infeasible
 - is optimal
 - needs a new basis
 - has more than one solution

13. The two sources of costs in queuing analysis are
- arrivals and departures
 - arrivals and idleness
 - waiting customers and capacity
 - equipment breakdowns and departures
14. A firm produces two products at a profit of \$5 and \$7, which require 12 units and 10 units, respectively, of a needed resource. The firm has 500 units of the resource available. The constraint(s) for the linear programming problem is(are)
- $5A + 7B \geq 22$
 - $5A + 12B \leq 7B + 10B$
 - $12A \leq 500$ and $10B \leq 500$
 - $12A + 10B \leq 500$
15. For one server model with Poisson arrivals at a rate of five customers per hour and exponential service at a rate of four customers per hour, the probability that the server is idle is
- 1/5
 - 4/5
 - 5/4
 - none of the above
16. Costs that decrease when inventory increases include
- cost of missed sales
 - cost of storage
 - quality costs
 - coordination costs
17. The search decision rule method of aggregate planning
- is an optimizing method
 - restricts the mathematical form of the cost equation
 - utilizes a "pattern search" technique
 - can be used only with quadratic cost functions
18. The range is
- a measure of central tendency
 - independent of the standard deviation
 - estimated from the mean
 - related to sigma for a normal distribution
19. When the flow of materials is variable,
- layout by process is most suitable
 - layout by product is most suitable
 - layout by fixed position is most suitable
 - line balancing is most suitable

20. A fixed interval system
- a. adds the same predetermined amount to inventory each time replenishment occurs
 - b. is suitable for joint replenishment items
 - c. is triggered at the reorder level
 - d. requires perpetual monitoring of inventory records

ANSWERS TO SAMPLE QUESTIONS

1. **c** 2. **b** 3. **a** 4. **d** 5. **c** 6. **b** 7. **b** 8. **a** 9. **c** 10. **d**
11. **b** 12. **a** 13. **c** 14. **d** 15. **d** 16. **a** 17. **c** 18. **d** 19. **a** 20. **b**