

INTERMEDIATE EXAMINATION

June 2015

I-P2(OMS)

Syllabus 2008

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 two* questions from the rest.

1. (a) Choose the most correct alternative:

1×5

(i) $(\text{Total station time/cycle time} \times \text{Number of work stations}) \times 100$ is known as

(A) Line efficiency (B) Line smoothness (C) Balance delay of line (D) Station efficiency

(ii) The most powerful and popular method for solving linear programming problem is

(A) Simplex method (B) Graphical method (C) Transportation method (D) Assignment method

(iii) Most suitable layout for continuous production is

(A) Line layout (B) Process layout (C) Group technology (D) Matrix layout

(iv) The card, which is prepared by dispatching department to book the labour involved in each operation

(A) Labour card (B) Wage card (C) Credit card (D) Job card

(v) _____ are designed to take drills up to about 8/16 inch in diameter.

(A) Sensitive Drilling Machine (B) Pillar Drilling Machine (C) Radial Drilling Machine
(D) Multiple Spindle Drilling Machine

(b) Put an appropriate word in blank position:

1×5

(i) _____ systems replace human beings to read data from products and documents and interpret the data.

(ii) The user's expectation method of _____ provides a subjective feel of the market.

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

(iv) General purpose machines are less prone to _____.

(v) Turning means producing _____ surface on a job.

(c) Indicate whether the following are TRUE or FALSE.

1×4

- (i) A Jig is an appliance which holds the work when it is machined.
- (ii) Activity Sampling is not a technique of Job Evaluation.
- (iii) A good plant layout is one of the factors in effective utilisation of labour.
- (iv) Labour-intensive technology does not involve investment in huge capital intensive system.

2. (a) Kindly mention the various plant layout principles.

3

(b) State the Principal Parts of a Lathe.

3

(c) A company is considering the expansion of a manufacturing process by adding more 1 Ton capacity furnaces. Each batch (1ton) must undergo 30 minutes of furnace time, including load and unload operations. However the furnace is used only 80% of the time due to power restriction in other parts of the system. The required output for the new layout is to be 16 tons/shift (8 hours). Plant (system) efficiency is estimated at 50% of system capacity.

(i) Determine system capacity and the number of furnaces required.

(ii) Estimate the percentage of time, the furnaces will be idle.

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(d) The annual hand-made furniture show and sales occurs next month and the school of vocational studies is planning to make furniture for the sale. There are three wood working classes –I year, II year, III year at the school and they have decided to make three styles of chairs A, B and C. Each chair must receive work in each class and the time in hours for each chair in each class is given.

Chair	I year	II year	III year
A	2	4	3
B	3	3	2
C	2	1	4

In the next month there will be 120 hours available in first year class, 160 hours in the second year class and 100 hours in third year class to produce chairs. The teacher of the wood working class feels that a maximum of 40 chairs can be sold at the show. The teacher has determined that the profit from each type of chair will be A– ₹ 40, B– ₹ 35 and C– ₹ 30.

Formulate a linear programming model to determine how many chairs should be produced to maximise profit.

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3. (a) What are the objectives of Material Requirement Planning? 4
- (b) A company manufactures 100 units of a product everyday and sells it for ₹ 7 each. Direct material cost is ₹ 2 per unit and direct labour is paid ₹ 1 per unit. Overheads are ₹ 300 per day in total. A market research survey indicates that 200 units can be sold per day if the price can be brought down to ₹ 6. Production can be increased to this level, if an incentive scheme which would cost ₹ 125 per day to administer is implemented, giving the workmen proportionate increase in their earnings. Examine with appropriate calculations whether and, if so, how much gains are made by the company and the workmen. Comment on the social desirability of such incentive schemes. 4
- (c) The choice of technology depends on several factors, both internal and external to the organisation choosing the technology. List them. 4
- (d) A company planning to manufacture a household cooking range, has to decide on the location of the plant. Three locations are being considered viz., Patna, Ranchi, and Dhanbad. The fixed costs of the three location are estimated to be ₹ 30 lakh, ₹ 50 lakh, and ₹ 25 lakh per annum respectively. The variable costs are ₹ 300, ₹ 200 and ₹ 350 per unit respectively
- The expected sales price of the cooking range is ₹ 700 per unit Find out :
- (i) The range of annual production/sales volume for which each location is the most suitable and
- (ii) Which one of the three locations is the best location at a production/sales volume of 18000 units? 6
4. (a) A company has 50 identical machines in its facilities. The cost of preventive servicing (C_p) is ₹ 20, and the cost of repair after breakdown (C_r) is ₹ 100. The company seeks the minimum cost preventive servicing frequency and has collected the data on breakdown probabilities in the following table:

Probabilities of machine breakdown, by month:

Months after servicing that breakdown occurs(i)	Probability that breakdown will occur (P_i)	$i.P_i$
1	0.10	0.10
2	0.05	0.10
3	0.05	0.15
4	0.10	0.40
5	0.15	0.75
6	0.15	0.90
7	0.20	1.40
8	0.20	1.60
	1.00	5.40

- (b) Briefly list the advantages of CAD. 3
- (c) Briefly describe 'Auto Transformer'. 2
- (d) Expand the following: 1×5
- | | |
|-----------|----------|
| (i) SQC | (ii) UCL |
| (iii) CNC | (iv) VAM |
| (v) TQM | |

Information Systems

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

5. (a) Put an appropriate word in blank position: 5
- (i) The _____ is the concept of data integration by way of specialized data storage and retrieval technique.
- (ii) PROM chip is used to store program of _____ nature.
- (iii) Bootstrapping means loading _____ in Computer after the power is switching on.
- (iv) Errors in a program may be of two types, _____ and _____.
- (v) Documentation for program is known as Programming _____.
- (b) Expand the following: 5
- | | |
|--------------|-------------|
| (i) EDPA | (ii) DASD |
| (iii) EBCDIC | (iv) RADIUS |
| (v) MAC | |
- (c) Choose the most appropriate answer from the alternatives in the set: 4
- (i) 'Packet Switching' on the internet refers to
- (A) type of security
- (B) switching components
- (C) method of data movement
- (D) packet of hard copy of documents
- (ii) Point-of-Sale or POS pertains to
- (A) sales points plotted in computer graphics
- (B) sales between two location
- (C) a value that identifies the location of sales data in storage
- (D) an input-output device updating sales and inventory
- (iii) Vacuum Tube Techonology was used in which generation of Computers?
- (A) First
- (B) Second
- (C) Third
- (D) Fourth

- (iv) The files created during processing for an application area are
(A) Work File
(B) Transaction File
(C) Key File
(D) Master File
6. (a) Your job involves deciding the pricing of a product in an organization. List the information required for taking this decision. 3
(b) Describe the following computer frauds in a line. 5
(i) Trap door (ii) Hacking (iii) Virus (iv) Cracker (v) Super-zapping
(c) What is Data Base? State its characteristics. 2+6
(d) What are the types of Disk Drives? 2
7. (a) The commonly observed gap between the system expert and the management expert sometimes becomes a bottleneck in designing an effective MIS. Apart from the above, list other limiting factors for MIS. 6
(b) Indicate whether the following are TRUE or FALSE: 1×5
(i) Risk management program should be reactive rather than proactive.
(ii) Payroll is an example of transaction processing in an organization.
(iii) EDI's job is to receive and transit the documents among the trading partners.
(iv) Only executable files can be infected by virus.
(v) The basic aim of normalisation in data structure is to eliminate redundancy and inconsistent dependency.
(c) What is the purpose of Integration Testing? Mention the different types of Intergration Testing. 2+3
(d) Differentiate between Parallel Transmission and Serial Transmission. 2
8. (a) Write Shorts Notes on *any six*: 3×6
(i) Firewall
(ii) Advantages of Codification of data
(iii) Auditing around the computer and auditing through the computer
(iv) Integrative Approach to develop MIS
(v) Steps in decision making process
(vi) Magnetic Ink Character Recognition (MICR)
(vii) Features of High Level Languages
(viii) FTP