INTERMEDIATE EXAMINATION

GROUP II

(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS

DECEMBER 2017

Paper- 9: OPERATION MANAGEMENT AND INFORMATION SYSTEMS

Time Allowed: 3 Hours **Full Marks: 100**

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

This paper contains 3 Sections.

All questions are compulsory,

All Section are compulsory, subject to instructions provided in each Section.

All workings must form part of your answer.

Assumptions, if any, must be clearly indicated.

SECTION – A

There are four questions in this Section, Which are compulsory,

1. Answer any five of the following questions. 2×5=10

(i) What are the functions of Production Control?
(ii) Identify principal functions of an operating system, with respect to Operations Management.
(iii) Provide the formula for Capacity of the Process.
(iv) What does a maintenance report indicate?
(v) Productivity is basically measured in two ways:_____ productivity and _____ Productivity.
(vi) Give the full form of:
(i) CASE
(ii) VDL
(vii) Mention the types of information that the Marketing Information system supplies.
(viii) In the context of information technology Act, 2000, define "originator".

Answer: 1

(a) **Functions of Production Control:** To:

(i) Provide for the production of parts, assemblies and products.
(ii) Co-ordinate, monitor and feedback to manufacturing mgmt.
(iii) Provide for optimum utilization of all resources
(iv) Achieve the broad objectives of low cost production and reliable customer service

(b) Principal functions of an operating system:
(i) manufacture, (ii) Transport (iii) Supply (iv) Service

(c) Capacity of the Process = $CN_1N_2N_3H$
C = Capacity of machine per hour
N_1 = Number of machines
N_2 = Number of shifts per day
N_3 = Number of days in the time period
H = Hours in each shift

(d) It is a document which indicates the various suggestions and recommendations given by inspection report. It includes feed back from operators also regarding the condition of the equipments or machines.

(e) 1. Partial 2. Total

(f) Give the full form of: (i) CASE = Computer Aided Software Engineering
(ii) VDL = View Definition Languare

(g) Marketing Information system supplies three types of information - Recurrent Information, Monitoring Information. Requested Information.

(h) In the context of Information Technology Act, 2000 an originator is a person who sends, generates, stores or transmits any electronic message or causes any electronic message to be sent, generated, stored or transmitted to any other person but does not include an intermediary.

2. Match list A with List B: 1×5= 5

List A	List B
(a) Decline Stage	**(i) Change for the better**
(b) Dispatching	**(ii) Analysis of Information from data warehouse**
(c) KAIZEN	**(iii) Profit margins touch a low level, and competition becomes severe**
(d) OLAP	**(iv) Money is transferred from one person's bank account to another person's bank account electronically rather than using a cheque or transferring cash.**
(e) EFT	**(v) Execution of Planning function**

Answer: 2

Match list A with List B:

List A	List B
(a) Decline Stage	(iii) Profit margins touch a low level, and competition becomes severe
(b) Dispatching	(v) Execution of Planning function
(c) KAIZEN	(i) Change for the better
(d) OLAP	(ii) Analysis of Information from data warehouse
(e) EFT	(iv) Money is transferred from one person's bank account to another person's bank account electronically rather than using a cheque or transferring cash.

3. State whether the following statement are 'Truer' or 'False': 1×5 = 5

(i) Latest start time is the latest occurrence time for the node at which activity arrow terminates.

(ii) The factories of future will be driven by computers used in CIM systems.

(iii) Just-in-time production uses a product layout with a continuous flow.

(iv) An objective of maintenance management is to maximize the repair time and repair cost.

(v) A Stochastic Model uses random inputs and gets the same output every time you calculate.

Answer: 3

(i) FALSE

(ii) TRUE

(iii) TRUE

(iv) FALSE

(v) FALSE

4. Fill in the blanks by a word or two: 1×5 = 5

(i) The term used to describe the difference between the cost of inputs and the value of outputs is _____.

(ii) The storage definition language is used to specify the _____.

(iii) In Regression and Correlation analysis, the ratio of explained variation to the total variation is called _____.

(iv) Expand OLAP— _____.

(v) In E-Commerce an entity _____ is like an electronic passport that authenticates identity of an entity.

Answer: 4

(i) Value – added.

(ii) Internal schema

(iii) Coefficient of determination

(iv) Online Analytical Processing

(v) Digital Signature Certificate

SECTION – B

There are four questions in this Section. Answer any three questions. 15 ×3= 45

5. (a) Describe various stages in the design process. 7

(b) An 8 hours work measurement study in a plant reveals the following: Units produced = 340 nos. Idle time = 17.5%. Performance rating = 130%. Allowance = 13% of normal time. Determine the standard time per unit produced. 8

Answer:

5(a) Stages in the design Process:

1. Ideas generation
2. Screening and selection
3. Initial design
4. Economic analysis
5. Prototype testing
6. Redesign/modifications
7. Final specification

5(b) Observed time for 340 units = Working time-Idle time
= 8 -(8 × 0.175) - 6.6 hours = **396 minutes** — (i)
Observed time per unit = **396/340 =1.164 minutes** — (ii)
Normal time per unit = (Observed time per unit) × (Observed Rating)/ (Standard Rating) = Observed time/unit × (Performance Rating) = 1.164 × (130/100)
=1.5132 minutes — (iii)
Standard time/unit = Normal time/unit + Allowances = 1.5132 + 13% of 1.5132
= 1.5132 [1 + (13/100)] **= 1.7099 minutes** —- (iv)

6. (a) "Quality Circles adoptions leads to benefits for an organization". List the benefits. 7

(b) A project consists of 8 activities.

Activity	Immediate Successor
Q	T
R	U
S	V
W	X

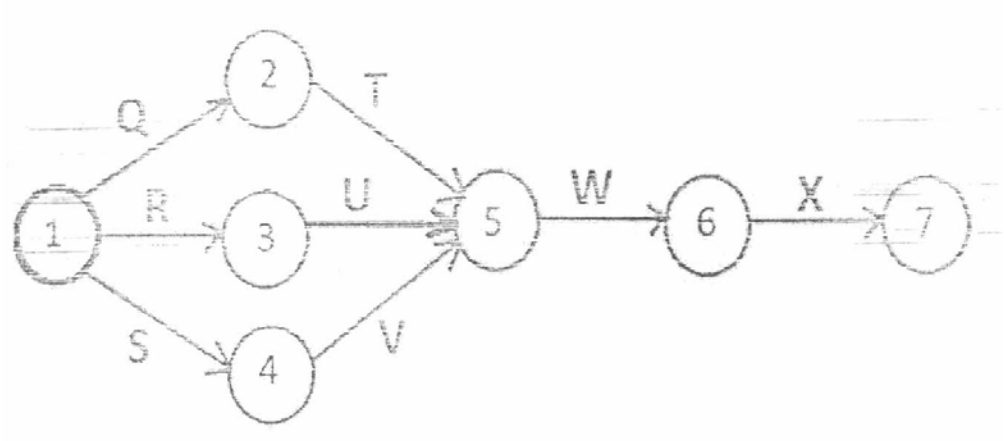
Activity "X" is the last operation of the project, and activity "W" is the immediate successor to T, U and V. Draw the network of the project. 8

Answer: (a)

Benefit for an organization:

1. Improves Productivity.
2. Improves Quality of product.
3. Reduces wastage.
4. Increases employee motivation.
5. Inspires more effective team work.
6. Develops harmonious superior-subordinate relationship.
7. Improves communication within organization
8. Develops a complete coherent problem solving environment.
(At least seven points are expected.)

(b) The network of the project:



7. (a) The demand for three months for 60 watt bulbs is given below:

Period	January	February	March
Demand	540	620	760

If the weight assigned to the period of January, February and March are 0.2, 0.3 and 0.45 respectively, forecast the demand for the month of April by using Weighted Moving Average Method. 6

(b) A Company XYZ has kept records of breakdown of its machine for a 300 day work in a year as shown below:

No of Breakdown	Frequency in days
0	45
1	140
2	65
3	35
4	15
Total	300

The firm estimates that each breakdown costs ₹620 and is considering adopting a preventive maintenance program which would cost ₹250 per day and limit the number of breakdown to an average of one per day. What is the expected annual savings from preventive maintenance program? 9

Answer: 7 (a)

$D_1 = 540$ $W_1 = 0.20$

$D_2 = 620$ $W_2 = 0.30$

$D_3 = 760$ $W_3 = 0.45$

The Weighted Moving Average = $W_1 \times D_1 \times W_2 \times D_2 \times W_3 \times D_3$

$= 540 \times 0.2 + 620 \times 0.3 + 760 \times 0.45 = 636$

Therefore the Demand for the month of April is 636 nos. of 60 watt bulbs.

(b) To determine the expected number of breakdowns per year:

No. of breakdown (x)	Frequency of breakdowns in days [f (x)]	Probability Distribution of breakdowns P(x)	Expected values of breakdowns XP(x)
0	45	45/300 = 0.1500	0
1	140	140/300 = 0.4667	0.4667
2	65	65/300 = 0.2167	0.4334
3	35	35/300 = 0.1167	0.35
4	15	15/300 = 0.0500	0.2
Total	300	1.000	Total: 1.4501

Total no. of breakdowns per day = **1.45** .... (i)

Cost of breakdown per day = 1.45 × 620 = ₹ 899/-.... (ii)

Cost of Preventive maintenance programme per day = ₹ 250 + 620 = ₹ 870/-(iii)

Expected annual savings from the preventive maintenance programme

= (899 - 870) × 300 days = 29 × 300 **= ₹ 8700/-**... **(iv)**

8. (a) Virtually each type of goods or service is made by using some variation of one of three process strategies." List the three strategies. Briefly explain each of them by giving suitable example. 1+2×3=7

(b) List down four Primary and four Secondary functions of maintenance. Identify eight objectives of maintenance management. 2+2+4 = 8

Answer: 8 (a)

Process strategies:

1. Process focus 2. Repetitive focus 3. Product focus

1. Process focus:

Provide high degree of product flexibility, designed to perform wide variety of activities, and handle frequent changes. Ex: Welding, grinding, painting

2. Repetitive focus:

Product-oriented production process, uses modules which are parts prepared often in mass process. Ex: Automobile & House hold appliance Assembly line.

3. Product locus:

Also called as continuous process, it is a facility organized around products, a product oriented, high volume, low variety process. Ex: Steel, Glass, Paper, Electric bulbs, chemicals, pharmaceuticals.

Answer: 8 (b)

List down Primary & Secondary functions of maintenance.

Primary functions:

1. Maintenance of plants & Equipments
2. Maintenance of Plant Buildings & grounds
3. Equipments Inspection & Lubrication
4. Utilities generation & distribution
5. Alterations to existing Equipments & Buildings
6. New Installation of Equipments & Buildings

Secondary functions:

1. Store keeping
2. Plant protection including fire protection
3. Wastage disposal
4. Salvage
5. Insurance administration
6. Janitorial services etc.

Objectives of maintenance management.

1. Minimize productive time loss
2. Minimize repair time & repair cost
3. Minimize loss due to production stoppage
4. Efficient use of maintenance personnel & equipments
5. Prolonging the life of capital assets
6. To keep all productive assets in good working condition
7. To maximize efficiency & economy in production
8. To minimize accidents through regular inspection.
9. To minimize total maintenance cost
10. To improve the quality of product and to improve productivity

SECTION – C

There are three questions in this Section. Answer any two questions. 15 ×2= 30

9. (a) State the advantages and disadvantages of coding. 4+4=8

(b) With respect to RDBMS, define the following in one or two sentences: 2+2=4

(i) Relational Algebra

(ii) Tuple

(c) From the following two relations of X and Y, find (X – Y): 3

Relation X

REGN_ID	NAME
1237	AMAR
1238	ARCHNA
1243	BISHNU
1265	NISHIT
1269	NITIN
1281	SAKSHI

Relation Y

REGN_ID	NAME
1238	ARCHNA
1264	NIMISH
1269	NITIN
1288	SHIVANI
1289	TRISHA

Answer: 9 (a) The advantages and disadvantages of coding.

Coding - Advantages

In formal ion is often coded because:

- It is quicker to enter into the computer
- it require less disc space to store, and less memory to process
- It can make processing easier - or possible - as there will be fewer responses
- It improves the consistency of the data as spelling mistakes are less likely
- Validation is easier to apply

Coding - Disadvantages

- 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
- 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.

Answer: 9 (b) With respect to RDBMS, the following terms mean:

(i) Relational Algebra:

It means collection of operations to generate new relations alter manipulating relations.

(ii) Tuple: In a formal relational model, a row is called a tuple.

Answer: 9 (c) (X – Y):

REGN ID	NAME
1237	AMAR
1243	BISHNU
1265	NISHIT
1281	SAKSHI

10. (a) Briefly describe basic features of MIS. 8

(b) What is 'System Testing' and how is it carried out? 1+6= 7

Answer: 10 (a)

Briefly describe basic features of MIS:

1. Management-oriented
2. Timeliness
3. Integrated
4. Simplicity
5. Reliability
6. Consistency
7. Relevance
8. Flexibility

Answer: 10 (b)

System Testing begins when the software as a whole is operational, The types of testing that might be carried out are as follows:

- Recovery Testing: Recovery testing is the forced failure of the software in a variety of ways to verify that recovery is properly performed.
- Security Testing: The six basic security concepts that need to be covered by security testing are - confidentiality, integrity, authentication authorization, availability and non-repudiation.
- Stress or Volume Testing: It involves testing beyond normal operational capacity.
- Performance Testing: In the computer industry, software performance testing is used to determine the speed or effectiveness of a computer, network, software program or device.

11. Write short notes on: 5 × 3= 15

(a) Main goals of E-Commerce

(b) Functional areas where transaction processing system is applied in an organisation

(c) Role of System Analysts and Application Programmers in DBMS

Answer: 11

(a) Main goals of E-Commerce:

E – Commerce helps in achieving following goals

(i) Reach new markets.
(ii) Create new products or services.
(iii) Build customer loyalty.
(iv) Enrich human capital.
(v) Make the best use of existing and emerging technologies.
(vi) Achieve market leadership and competitive advantage

(b) Functional areas where transaction processing system is applied in an organization:

- Payroll
- Accounts Receivable
- Bank Reconciliation
- Purchase Order Processing

- Sales Order Processing
- Inventory Control
- Job Costing etc.

(c) Role of System Analysts and Application Programmers in DBMS

System Analysts determine the requirements of end users, especially naive and parametric end users, and develop specifications for canned transactions that meet these requirements. Application programmers implement these specifications as programs; then they test, debug, document and maintain these canned transactions. Such analysts and programmers (called software engineers) should be familiar with the full range of capabilities provided by the DBMS to accomplish their tasks.