INTERMEDIATE EXAMINATION
GROUP II
(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS
DECEMBER 2014

Paper- 9 : OPERATION MANAGEMENT AND INFORMATION SYSTEMS

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

This paper contains 3 questions. All question are compulsory,
Subject to instruction provided against each question.
All workings must form part of your answer.
Assumptions, if any, must be clearly indicated.
The figure in the margin on the right side indicate full marks.

1. Answer all question: 2×10=20

(a) Distinguish between Regular Spares and Insurance Spares. 2
(b) Write the formula for Input Efficiency and Effectiveness. 2
(c) List the various steps in New Product Development. 2
(d) A worker is employed for 11 hours. During this period he takes 7 hours to complete a job with the standard time of 6 hours. Calculate the productivity of the worker as a percentage. 2
(e) What are the main functions of production planning? 2
(f) Expand LOB. Where is it applied? 2
(g) Define two types of data independence in the three-schema architecture under Data Base Management System. 2
(h) Expand CASE and list various CASE tools. 2
(i) On what basis the cost price for a standard item is calculated? 2
(j) Define the models used for representing the information. 2

Answer:

1. (a) Regular Spares are required regularly and so, in substantial numbers. Insurance Spares have a very high reliability and are required rarely.

(b) $\text{Input Efficiency} = \frac{\text{Actual Consumption}}{\text{Desired or standard consumption}}$

$\text{Effectiveness} = \frac{\text{Target Achieved}}{\text{Target Achievable}}$

(c) The steps in New Product Development are: (i) Exploration, (ii) Screening, (iii) Business Analysis, (iv) Development, (v) Testing, and (vi) Commercialisation.

(d) $\text{Productivity} = \frac{\text{Standard hours of output}}{\text{Clock hours scheduled}} = 6/11 \times 100 = 54.55\%$

(e) The main functions of production planning are: (i) Estimating, (ii) Routing, (iii) Scheduling, and (iv) Loading.

(f) LOB, when expanded, denotes Line of Balancing. When the work is of repetitive nature, LOB helps in planning the resource utilisation without creating clashes so that targeted output can be successfully achieved. This technique can be effectively used in the construction work of mass housing, high rise building, tunnels, etc.

(g) (i) Logical data independence: It is the capacity to change the conceptual schema without having to change external schemas or application programs.

(ii) Physical data independence: It is the capacity to change the internal schema without having to change the conceptual (or external) schemas.

(h) Expanded form of CASE is Computer Aided Software Engineering.

The various CASE tools are Layout Form and Screen Generator, Menu Generator, Report Generator and Code Generator.

(i) The cost price for standard item is calculated based on the following:

(1) Material cost: This may be latest procurement price or simulated purchase price.

(2) Operation cost which may consist of labor and machining cost.

(3) Subcontracting rate.

(4) Surcharges for coverage of overhead such as management cost / inspection cost.

(j) Models used for representing the Information:

(1) Iconic scale model: It is physical replica of the system based on different scale from original.

(2) Analytical model: It may be a model for a physical system but the model differs from actual system.

(3) Mathematical Model: It represents a data set in the form of graph, picture or frictional diagram. It uses highly mathematical or statistical algorithm to interpret data of huge volume with ease.

2. Answer any three question: 16×3=48

(a) (i) An engineering firm has a machine whose purchase price is ₹85,000. The expected maintenance costs and resale price in different years are as given below:

Year	1	2	3	4	5	6	7
Maintenance Cost (₹)	1200	1400	1800	2600	3200	4100	5200
Resale Value (₹ Thousand)	80	76	71	67	63	58	52

After what time interval should the machine be replaced: 6

(ii) List the advantages of Method Study. 6

(iii) State the four generic components of technological innovation. 4

(b) (i) XYZ manufacturing company planning to start its production activities has to decide on the location of the plant. Three locations are being considered: Location A, B and C. The following data are available:

	Location A	Location B	Location C

Fixed costs (₹ Lakhs per annum)	35	55	30
Variable cost (₹ per annum)	350	250	400

The expected sales price of the product is ₹750 per unit. Find out:

(A) The range of annual production/sales volume for which each location is most suitable, and

(B) Which one of the three is the best location at the production/sales volume of 22,000 units?

Clearly mention the assumptions, if any. 8

(ii) Justify your choice between 'Preventive Replacement' and 'Breakdown Replacement'. 3

(iii) Write a sentence or two on each of the various methods applied for finding the optimal solution for a given linear programming problem. What is 'non-negativity condition'? 4+1=5

(c) (i) Classify the functions of Production Planning & Control. 9

(ii) An Industrial Engineer, appointed to conduct a time-study for a job, has after observation, divided the job into 5 elements. He had noted the timings for four cycles of the job as below:

Element	Time in Minutes				Performance Rating (%)
	Cycle 1	Cycle 2	Cycle 3	Cycle 4	
1	1.327	1.254	1.351	1.269	85%
2	0.983	1.854	0.882	0.956	95%
3	1.894	1.821	1.928	1.963	100%
4	2.569	2.173	2.132	2.285	120%
5	1.358	1.139	2.561	1.438	100%

(A) Are there any outliners in the data i.e. probable errors in reading or recording data which should not be included in the analysis?

(B) Compute the basic time for the job. Also compute the standard time if a relaxation allowance of 13%, a contingency allowance of 4% and an incentive of 25% are applicable for the job. 1+6=7

(d) (i) What are the managerial considerations in Scheduling? 3

(ii) State the Eight Most Common Benchmarking Errors. 8

(iii) In a simulation operation, a firm's maintenance person received requests for service and provided service during an 8 hour period as shown below:

Request Arrival Time (Clock Time)	Service Time (Hours)
0.00	1.0
0.30	1.0
2.00	1.5
3.00	1.5
6.30	0.5

The maintenance labour cost is ₹150 per hour, and the delay time cost is ₹500 per hour. Find:

(A) The idle time cost for the maintenance person, and

(B) The delay time cost for the machinery. 5

Answer:

2. (a) (i) C = Cost of Machine = ₹85,000. Scrap value = S

Table: Determination of Optimal Replacement Period					
Year	Maintenance Cost, M_1 (₹)	Cum. Maintce. Cost, $\sum M_1$ (₹)	Net Capital Cost C- S (₹)	Total Cost T(n) (₹)	Average Cost A(n) (₹)
(i)	(ii)	(iii)	(iv)	(v) = (iii) + (iv)	(vi) = (v)/n
1	1,200	1,200	5,000	6,200	6,200
2	1,400	2,600	9,000	11,600	5,800
3	1,800	4,400	14,000	18,400	6,133
4	2,600	7,000	18,000	25,000	6,250
5	3,200	10,200	22,000	32,200	6,440
6	4,100	14,300	27,000	41,300	6,883
7	5,200	19,500	33,000	52,500	7,500

Here, minimum A(n) = ₹5,800, for n= 2, => The machine should be replaced every two years.

(ii) Advantages of Method Study:

1. Work simplification
2. Improved working method (cheaper method)
3. Better product quality
4. Improved workplace layout
5. Improved equipment design
6. Better working conditions/environment
7. Better material handling and lesser material handling cost
8. Improved work flow
9. Less fatigue to operator
10. Optimum utilization of all resources
11. Higher safety to workmen
12. Shorter production cycle time
13. Higher job satisfaction for workmen
14. Reduced material consumption and wastages
15. Reduced manufacturing cost and higher productivity

(iii) Four generic components of technological innovation are: basic research, applied research, development, and implementation.

- Basic research is research for the advancement of scientific knowledge that has no specific commercial uses. Basic research may, however, be in the field of present or potential interest to the company.
- Applied research is research for the advancement of scientific knowledge that has specific potential commercial uses.

- Development is technical activity concerned with translating basic or applied research results into products or processes.
- Implementation is activity concerned with designing and building pilot models, equipment, and facilities, and initiating the marketing channels for products or services emerging from research and development.

(b) (i) Total costs at the three locations = Fixed costs + Variable costs for a volume of 'X'

At Location A : TC_A = 35,00,000 + 350X

At Location B : TC_B = 55,00,000 + 250X

At Location C : TC_C = 30,00,000 + 400X

Assumptions : Let us assume Production Volume of 5,000; 10,000; 15,000; 20,000; and 25,000 units and also for 22,000 units as specified in the problem.

Volume	Location A					
	5,000 Units	10,000 Units	15,000 units	20,000 units	25,000 units	22,000 units
Fixed costs (₹)	35,00,000	35,00,000	35,00,000	35,00,000	35,00,000	35,00,000
Variable costs (₹)	350 ×5,000 =17,50,000	350 × 10,000 = 35,00,000	350 ×15,000 = 52,50,000	350 × 20,000 = 70,00,000	350 × 25,000 = 87,50,000	350 × 22,000 = 77,00,000
Total costs (₹)	52,50,000	70,00,000	87,50,000	105,00,000	122,50,000	112,00,000

Volume	Location B					
	5,000 Units	10,000 Units	15,000 units	20,000 units	25,000 units	22,000 units
Fixed costs (₹)	55,00,000	55,00,000	55,00,000	55,00,000	55,00,000	55,00,000
Variable costs (₹)	250 × 5,000 =12,50,000	250 ×10,000 = 25,00,000	250 ×15,000 = 37,50,000	250 × 20,000 = 50,00,000	250 × 25,000 = 62,50,000	250 × 22,000 = 55,00,000
Total costs (₹)	67,50,000	80,00,000	92,50,000	105,00,000	117,50,000	110,00,000

Volume	Location C					
	5,000 Units	10,000 Units	15,000 units	20,000 units	25,000 units	22,000 units
Fixed costs (₹)	30,00,000	30,00,000	30,00,000	30,00,000	30,00,000	30,00,000
Variable costs (₹)	400 × 5,000 = 20,00,000	400 ×10,000 = 40,00,000	400 ×15,000 = 60,00,000	400 × 20,000 = 80,00,000	400 × 25,000 = 100,00,000	400 × 22,000 = 88,00,000
Total costs (₹)	50,00,000	70,00,000	90,00,000	110,00,000	130,00,000	118,00,000

(A) The range of annual production/sales volume for which each location is most suitable, as evident from the above tables, may be derived as under –

- Upto 10,000 units: Location C
- Between 10,000 and 20,000 units: Location A
- Above 20,000 units: Location B

(B) For 22,000 units, Location B is preferred

(ii) Preventive replacement of parts and equipment at a certain periodicity, before they fail is many a time a prudent policy as the costs of replacement/repair following a breakdown of the components or equipment, outweigh that of preventive replacement. Thus, a cost comparison between preventive replacement and breakdown replacement/repair would many a time favour the choice of the former.

Breakdown repair/replacement is generally more costly as (a) breakdowns occur randomly and suddenly thus injecting an element of chaos and (b) a breakdown or failure of one component may lead to breakdowns or extra-wear of other components thus complicating or accentuating the situation. However, it should be noted that there are factors such as human safety which should also be kept in view while making a decision in such cases although such factors are usually non-quantifiable.

(iii) Methods applied for finding the optimal solution for a given linear programming problem:

(1) Graphic method: This method is generally used for solving the problems having two or three variables. Due to this limitation of handling only two or three variables at a time this method has limited application in industrial problems. In practice, two variable cases are easy to solve by this method because three dimensional geometry becomes too complicated to find accurate results.

(2) Simplex Method: This is the most powerful and popular method for solving linear programming problems. Any problem can be solved by this method which satisfies the conditions of linearity and certainty irrespective of the number of variables. It is an iterative procedure which ultimately gives the optimal solution.

(3) Transportation Method: This method is used to know the minimum cost of transportation of a product from various origins to different distribution and consumption centres.

(4) Assignment Method: This method is used to determine the optimum allocation of different jobs (n jobs) to different workers (n workers) in such a manner that the total cost/ total time for completing all the jobs is minimum (one job is to be assigned to one worker).

In a typical example, say, x_1 and x_2, being the number of units produced, cannot have negative values. Thus, both of them can assume values only greater-than-or-equal-to zero. This is the non-negativity condition, expressed symbolically as $x_1 \geq 0$ and $x_2 \geq 0$.

(c) (i) The functions of Production Planning and Control (PPC) can be classified under the following:

(a) Materials: Raw materials, spare parts and components which must be available in the correct quantities and specifications at the right time.

(b) Methods: It involves deciding the best sequence of operations for manufacturing the parts, building up sub-assemblies and major assemblies which in turn will make up the finished product, within the limitations of existing layout and workflow.

(c) Machines and Equipment: PPC is concerned with selection of machines and equipment and also with maintenance policy, procedure and schedules, replacement policy and tooling (Design and manufacture of tools).

(d) Routing: Routing prescribes the flow of work in the plant and is related to consideration of layout, of temporary storage locations for raw materials, components and semi-processed parts, and of material handling systems. Routing is a basic PPC function.

(e) Estimating: The processing times (both set up time and operation time per piece) required for the parts to be manufactured in-house are estimated and the standard time (both machine time and labour time) are established as performance standards.

(f) Loading and Scheduling: Machines have to be loaded according to their capacity and capability. Machine loading is carried out in conjunction with routing (as indicated in process layouts or operations analysis and routing sheets) to ensure smooth workflow and the prescribed feeds. Speeds of machines are adhered to as well as the estimated time (standard time which is the allowed time to do a job). Scheduling determines the utilisation of equipment and manpower and hence the efficiency of the plant. Scheduling determines the starting time and completion time for each and every operation for each and every part to be manufactured and sub-unit to be assembled so that the finish product is ready to be shipped to the customer as per the predetermined delivery schedules.

(g) Dispatching: This is concerned with the execution of planning functions. Production orders and instructions are released according to the schedule, sequences indicated in route sheets, and machine loading schedules are adhered to and authorisation is given for release of materials and tools to the operators to carry out the work.

(h) Expediting or Progressing: This means follow-up or keeping track of the progress made in completing the production as per schedules. This follows dispatching function logically.

(i) Inspection: This function relates to checking the quality of production and of evaluating the efficiency of the processes, methods and workers so that improvements can be made to achieve the desired level of quality.

(j) Evaluating or Controlling: The objective of evaluation or controlling is to improve performance. Methods and facilities are evaluated to improve their performance.

To sum up, we can state that PPC is a management tool, employed for the direction of the manufacturing operations and their co-ordination with other activities of the firm.

(ii) (A) The times for element # 2 in Cycle 2, and element #5 in Cycle 3 are outliners and should be disregarded as they vary very much as compared to the time values in other cycles.

(B) The basic time or normal times is calculated on the basis of data excluding the outliners as below:

Element	Mean Actual Time (Minutes)	Performance Rating (%)	Normal or Basic Time (Minutes)
1	1.3	85%	(1.3 × 85)/100= 1.105
2	0.940	95%	(0.94 × 95)/100 = 0.893
	1.902	100%	(1.902 × 100)/100= 1.902
4	2.290	120%	(2.29 × 120)/100 = 2.748
5	1.311	100%	(1.311×100)/100= 1.311

Normal Time for the total job which includes all five elements = 7.959 minutes.

Calculation of the Standard Time:

Standard Time for the job = Normal Time + Allowances

= 7.959 (1+0.13+0.04) = 9.312 minutes.

If 25% incentive allowance is given, total time allowed under incentive scheme

= 9.312 (1+0.25) = 11.640 minutes.

(d) (i) Managerial Considerations in Scheduling:

In general there are six criteria that may be used in evaluating different possible schedules. They are:

(a) Providing the product or service when the customer wants it.

(b) Minimising the length of time taken to produce that product or service (referred to as flow time)

(c) Minimising the level of work-in-progress (WIP) inventories

(d) Minimising the amount of idle time of equipment or machine.

(e) Minimising the amount of idle time of employees and

(f) Minimising costs

(ii) The Eight Most Common Benchmarking Errors:

1. Lack of Self-Knowledge: Unless own operations are thoroughly analysed, the benchmarking efforts will not pay off. One has to know how things work in a company, how effective current processes are, and what factors are critical. That's why internal benchmarking is an important first step.

2. Benchmarking everything: Be selective. Benchmarking another company's employee food service will usually not be worth the time, energy, and cost. Own TQM effort as a whole will point out the areas where benchmarking is most likely to pay off.

3. Benchmarking projects are broad instead of being focused. The more specific the project, the easier it is and the more likely it will generate useful ideas. Benchmark a successful company's hiring procedures, not their entire human resources operations. Focus on accounts receivable handling, not the accounting department as a whole.

4. Benchmarking produces reports, not action. Studies have indicated that 50% of benchmarking projects result in no specific changes. The process is not an academic exercise. It should be geared toward generating and implementing actual changes.

5. Benchmarking is not continuous. Benchmarking is a process. Even before one reaches the benchmark one has set, one should take another look at partner's performance, or at other companies. New goals should be established and new techniques adopted. The process never ends.

6. Looking at the numbers, not the issues. While the measures are important, they are not the heart of the process. At some companies, benchmarking is used to set goals, but not to generate the important changes needed to meet them.

7. Participants are not motivated. Make sure benchmarking team members have the time to do the job. Even if the project is simply added on their regular jobs, make sure each has a stake in the success of the project. Benchmarking should not be considered as "busy work" to be assigned to a group of low-level employees.

8. Too much data. Action is what's important, not information for its own sake. Benchmarking success should not be considered by quantity of information. It is necessary to always focus on key issues.

(iii)

Request Arrival Time (Clock Time)	Repair Time for one person		Repair Time (Clock Time)		Machine down time (hours)		
	Hours	Minutes	Begins	Ends	Waiting Time	Repair Time	Total Time
0.00	1.0	60	0.00	1.00	0.0	1.0	1.0
0.30	1.0	60	1.00	2.00	0.5	1.0	1.5
2.00	1.5	90	2.00	3.30	0.0	1.5	1.5
3.00	1.5	90	3.30	5.00	0.5	1.5	2.0
6.30	0.5	30	6.30	7.00	0.0	0.5	0.5
Total	5.5	330			1.0	5.5	6.5

(A) Idle time for the maintenance person = 8 – 5.5 = 2.5 hrs.
Idle time cost for the maintenance person = 2.5 × 150 = ₹375

(B) Delay time or Waiting time = 1 hr.
Delay time cost for the machinery = 1 × 500 = ₹500

2. Answer any two question: 16×2=32

(a) (i) State the important factors which should be considered while designing the user outputs. 6

(ii) What are the various intangible benefit of ERP system? 5

(iii) What are the main reasons for the spread of E-commerce? 5

(b) (i) Define Executive Information System and list the special features of EIS. 2+4=6

(ii) From the following two relations of X and Y, find X- Y. 4

RELATION X	
UID	**OCCUPATION**
A15	**STUDENT**
A 16	**BUSINESS**
A 25	**STUDENT**
A 38	**BUSINESS**

RELATION Y	
UID	**OCCUPATION**
A16	**BUSINESS**
A 17	**BUSINESS**
A 32	**STUDENT**
A 58	**BUSINESS**

(iii) List major categories of Flow Charts. What are the benefits of Flow charts and limitations of using these Charts? 2+2+2=6

(c) (i) What is meant by BPR? What are its basic characteristics and what could be the effect of implementation? 1+2+2=5

(ii) Discuss about the prerequisites of an effective MIS. 6

(iii) Write one sentence only to explain each of the following terms used in a DBMS: 1×5=5

(a) Tuple

(b) Attribute

(c) Domain
(d) Graphical User Interface
(e) Backup Utility

Answer:

2. (a) (i) The important factors which should be considered while designing user outputs are explained below:
   (a) Content: Only the required information should be included in various outputs because too much content can cause managers to waste time in selecting the information that they need. For example, the contents of a weekly report of a sales manager might consist of sales persons and the amount of each product sold by each sales persons.
   (b) Form: Content can be presented in various forms - quantitative, non-quantitative, text, graphics, video and audio. Many managers prefer summary information in chart form such as pie chart, line chart, bar chart etc.
   (c) Output volume: It is better to use high-speed printer which are fast in case the volume is heavy.
   (d) Timeliness: Some outputs are required on a regular, periodic basis – perhaps daily, weekly, monthly, at the end of a quarter or annually.
   (e) Media: A variety of output media are available in the market e.g. video display, microfilm, magnetic tape/disk, pen drive, e-mail, voice output.
   (f) Format: The manner in which data are physically arranged is referred to as format.

   (ii) Intangible benefits of ERP system:
   (1) Integration of information resulting efficiency, transparency and effective MIS.
   (2) Error reduction, accuracy of inventory record.
   (3) Improved customer service, on time shipment, shorter order to shipment cycle.
   (4) Establishment of standardized procedures.
   (5) Improved accounting control and shorter sales to cash cycle.
   (6) Legal and regulatory compliance.

   (iii) Main Reasons for the Spread of E-commerce:
   (a) Digital convergence, i.e., it means that due to digital revolution almost all digital devices can communicate with one another.
   (b) Today's E-commerce is available to anyone, anywhere in the world, anytime 24/7 (24 hours a day, 7 days a week).
   (c) It helps in bringing about positive changes in an organization.
   (d) People are now having a widespread access to IT and Personal Computers (PCs).
   (e) E-commerce helps in reducing operating costs and increasing profit Margins due to global operations.
   (f) Demand for customized products and services is increasing.

   (b) (i) An Executive Information System (EIS) is special type MIS meant for top management of an organization. In other words, it is a Decision Support System (DSS) for Executives. Executive decisions are of three types - strategic planning, tactical planning and 'fire-fighting'.

According to CIMA:

An Executive Information System (EIS) is a set of procedure designed to allow senior managers to gather and evaluate information relating to the organization and its environment.

Following are the special features of an EIS:

- It is a specially designed tool to feed executives information need.
- It is an easy - to - use and screen based software.
- It provides the executives the facilities of on-line analysis tools like time series analysis, regression analysis etc.
- It is not limited to internal data only. Access to external sources of data is also provided.
- It provides the facilities to connect to internet.
- Information is presented in summary format.
- It is a comprehensive Information System and work in conjunction with DSS.

(ii) Solution: X – Y =

UID	OCCUPATION
A15	STUDENT
A25	STUDENT
A3 8	BUSINESS

(iii) Flow charts are divided into four major categories:

- Document flowchart - showing a document- flow through systems.
- Data flowchart - showing data flows in a system,
- System flowchart - showing controls at a physical or resource level.
- Program flowchart - showing the controls in a program in a system.

Benefits of Flowchart

- Communication: Flowcharts are better way of communicating the logic of a system and easily understandable.
- Effective analysis: With the help of flowchart, problem can be analyzed in more effective way.
- Proper documentation: Program flowcharts serve as a good program documentation.
- Efficient Coding: The flowcharts act as a guide during the systems analysis and program development phase.
- Proper Debugging: The flowchart helps in debugging process.
- Efficient Program Maintenance: The maintenance of operating program becomes easy with the help of flowchart. It helps the programmer to put efforts more efficiently on that part.

Limitations of Using Flowcharts

- Complex logic: Sometimes, the program logic is quite complicated. In that case, flowchart becomes complex.
- Alterations and Modifications: If alterations are required, the flowchart may

require redrawing completely.

- Reproduction: As the flowchart symbols cannot be typed, reproduction of flowchart becomes a problem.

(c) (i) Expanded form of BPR is Business Process Re-engineering. It means not only change but radical change within a short period. This change is achieved by complete revamp of organizational structure, business process workflow, job description, performance measurement and adoption of information technology.

Some of Basic characteristics of BPR are:

- View business as a set of customer (both internal and external) oriented Processes rather than a set of departmental functions.
- Processes must have clear cut ownership.
- Non value adding activities within a process should be eliminated.
- Gather information only once at the point of origin.

A successful BPR implementation brings significant improvement to productivity, customer service and bottom-line. There are pain and difficulties during implementation and instances where BPR efforts did not achieve desired result. Notwithstanding, the risk is worth taking. Otherwise, there will be greater risk of being overtaken by competitors who develop and progress rapidly through BPR.

(ii) The following are pre-requisites of an effective MIS:

- Database - The data in database is organised in such a way that access to the data is improved and redundancy is reduced. Such a database is capable of meeting information requirements of its executives, which is necessary for planning, organising and controlling the operations of the business.
- Qualified System and Management Staff- MIS should be managed by qualified officers. The organizational management base should comprise of two categories of officers (i) System and Computer experts and (ii) Management experts
- Support of Top Management - An MIS becomes effective only if it receives the full support of top management. To gain the support of top management, the officer should place before them all the supporting facts and state clearly the benefits which will accrue from it to the organization.
- Control and Maintenance of MIS- Sometimes users develop their own procedures or shortcut methods to use the system, which reduces its effectiveness. Maintenance is closely related to control

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

(b) Attribute : A column header is called an attribute.

(c) Domain : The data type describing the types of values, appearing in each column is called a domain.

(d) Graphical User Interface : A graphical interface (GUI) typically displays a schema to the user in diagrammatic form.

(e) Backup: A backup utility creates a backup copy of the database, usually by dumping the entire database onto tape.