**UNIVERSITY OF COLOMBO, SRI LANKA**

## UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)**

*Academic Year 2005/2006 – 1ˢᵗ Year Examination – Semester 1*

# IT1402: Systems Analysis and Design
*Multiple Choice Question Paper*

**5ᵗʰ March, 2006**
**(TWO HOURS)**

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**Important Instructions :**

- The duration of the paper is 2 (two) hours.

- The medium of instruction and questions is English.

- The paper has **50 questions** and **11 pages**.

- All questions are of the MCQ (Multiple Choice Questions) type.

- All questions should be answered.

- Each question will have 5 (five) choices with **one or more** correct answers.

- All questions will carry equal marks.

- There will be a penalty for incorrect responses to discourage guessing.

- The mark given for a question will vary from −1 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).

- Answers should be marked on the special answer sheet provided.

- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.

- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

1) Which of the following statements accurately describes an Information System?

(a) An Information System is an arrangement of people, data processes, information representation and information technology that interact to support day-to-day operations in a business.
(b) An Information System is a contemporary term that describes the combination of computer technology with telecommunication technology.
(c) An Information System is an arrangement of information representation and information technology that interacts to support day-to-day operations in a business.
(d) An Information System is an arrangement of data processes, information representation and information technology that interacts to support day-to-day operations in a business.
(e) An Information System is a contemporary term that describes the combination of information technology with telecommunication technology.

2) Which of the following groups of people are considered as stakeholders of an information system?

(a) System builders                    (b) Business customers
(c) Government                          (d) System users
(e) System owners

3) Which of the following activity/activities is/are carried out by a systems analyst?

(a) Systems design          (b) Requirement identification          (c) Systems Coding
(d) Systems building        (e) Quality management

4) Which of the following skill(s) is/are required by a systems analyst?

(a) Programming Language skills          (b) Communication skills
(c) Technical skills                     (d) Business process re-engineering skills
(e) Management skills

5) The statements given below are associated with the activity of outsourcing. Identify the correct statement(s) from among them:

(a) Ownership of IT assets is not transferred to the outsourcer.
(b) Outsourcing is the act of contracting with the outside vendor to assume responsibility for IT functions.
(c) Outsourcers do not assume responsibility for an organization's information systems development.
(d) Outsourcing is done by the organization for which the system is developed.
(e) Outsourcers do not require a systems analyst.

6) Which of the following factors do/does not necessarily contribute to the failure of particular systems development project?

(a) Lack of management involvement          (b) Weak testing
(c) A project that spans multiple departments          (d) Lack of user involvement
(e) A project that uses technologies from different vendors

7) Each of the blanks labelled **A – E** of the paragraph given below has to be filled with the most appropriate word selected from the phrases labelled (i) – (v).

    (i).    Distributed systems
    (ii).    Centralized systems
    (iii).    Personal computers
    (iv).    A multi-user computer
    (v).    Network computing systems

….**A**….. are a multi-tired solution in which the presentation and presentation logic layers are implemented in client-side web browsers using content downloaded from a web server. ….**B**…. are systems that use ...**C**….. to process data. ….**D**… use ….**E**….. to process data and may or may not have data, processes or interfaces.

| | | | | | |
|---|---|---|---|---|---|
| (a) | A – (i) | B – (ii) | C – (iii) | D – (v) | E – (iv) |
| (b) | A – (i) | B – (ii) | C – (iii) | D – (i) | E – (iv) |
| (c) | A – (v) | B – (ii) | C – (iv) | D – (i) | E – (iii) |
| (d) | A – (i) | B – (i) | C – (iii) | D – (ii) | E – (iv) |
| (e) | A – (v) | B – (i) | C – (iv) | D – (ii) | E – (iii) |

8) Which of the following is/are not a step/steps in the linear system development cycle?

| | | |
|---|---|---|
| (a) Testing design | (b) Prototyping | (c) Requirements definition |
| (d) Development | (e) Post-installation | |

9) Given below are some statements associated with the linear model. Identify the correct statement(s) from among them.

(a) The linear model is suited for problems which are not well defined.
(b) The linear model is best suited for problems which are highly structured.
(c) The linear model is suited when trying out new technologies.
(d) The linear model has a post installation phase.
(e) The linear cycles makes it easy to keep user involvement since the project progress is highly visible.

10) Given below are some statements associated with the problem definition phase of the linear model. Identify the correct statement(s) from among them.

(a) The problem definition phase produces a document written using technical terminology of the system analyst.
(b) The problem statement is a document that contains the problems faced by the organization.
(c) The problem definition phase produces a document that is a broad statement of user requirements.
(d) The problem definition phase does not specify the resources allocated to the project.
(e) The direction of the project is set by the problem definition phase.

11) Which of the following is/are an activity/activities in the Boehm's spiral model?

| | | |
|---|---|---|
| (a) Requirement analysis | (b) Object oriented design | (c) Risk analysis |
| (d) Prototype ready | (e) Structured design | |

12) Which of the following is/are not considered a(as) feasibility factor(s) when developing an information system?

| | | |
|---|---|---|
| (a) Economic | (b) Application | (c) Schedule |
| (d) Technical | (e) Management | |

13) Given below are some statements associated with the feasibility study of an information system. Identify the correct statement(s) from among them.

> (a) Feasibility is carried out only at the beginning of a project.
> (b) Operation feasibility considers how the people feel about the system/project.
> (c) Management feasibility considers whether the project is manageable.
> (d) A project is never abandoned upon the results of a feasibility study.
> (e) The feasibility study is carried out by the systems analyst.

14) Given below are some statements associated with cost-benefit analysis. Identify the correct statement(s) from among them.

> (a) Cost-benefit analysis is not a key consideration when deciding to proceed with the development of an information system.
> (b) Variable costs occur in proportion to some usage factor.
> (c) Overheads costs include utility costs and building rent.
> (d) Tangible benefits are believed to be difficult or impossible to quantify.
> (e) Intangible benefits can be easily quantified.

15) Which of the following is/are not considered during the cost-benefit analysis of an information system development project?

> (a) Personnel costs  (b) Computer usage  (c) Training costs
> (d) Clients staff costs  (e) Cost of new computer hardware and software

16) Which of the following is a/are fact finding method(s)?

> (a) Site visits  (b) Prototyping  (c) Study of similar systems
> (d) Business analysis  (e) Joint requirement planning

17) Which of the following is a/are document(s) used for fact finding?

> (a) Company's customer list  (b) Company's employee list  (c) Customer complaints
> (d) Samples of the company databases  (e) The company's mission statement and plan

18) Which of the following is a/are disadvantage(s) of fact finding through observation?

> (a) People may let you see only what they want you to see.
> (b) Observations always provide an accurate measure of the work volume.
> (c) They cannot be used to validate already gathered data.
> (d) Data gathering through observations may be highly unreliable.
> (e) Some system activities may take place at odd times.

19) Given below are some statements associated with requirement discovery methods. Identify the correct statement(s) from among them.

> (a) Questionnaires provide a relatively cheap way of fact finding from a large number of individuals.
> (b) Interviewing is a relatively low cost method of fact finding than other fact finding methods.
> (c) Success of the interview does not depend on the human relation skills of the systems analyst.
> (d) Observations allow the system analyst to do work measurements.
> (e) Interviewing does not become impractical due to the location of the interviewees.

20) Prototyping

> (a) is most effective for small scale projects.
> (b) ensures getting the design right the first time.
> (c) is the execution of the standard systems development cycle using CASE tools.
> (d) is used to verify if a key process is feasible.
> (e) involves an iterative development process with minimum end use involvement.

21) Column **A** contains some key words associated with cost-benefit analysis. A word from Column **A** has to be matched with the most appropriate phrase from Column **B**.

| | Column A | | Column B |
|---|---|---|---|
| (i) | Brainstorming | A | Sampling aimed at reducing the variance of the estimates. |
| (ii) | Work sampling | B | Relationship between people and the space around them. |
| (iii) | Randomization | C | A technique to generate ideas during a meeting. |
| (iv) | Stratification | D | A large number of observations taken at random intervals. |
| (v) | Proxemics | E | Sampling according to a predetermined pattern. |

The correct matching is

| | | | | | |
|---|---|---|---|---|---|
| (a) | (i) & C | (ii) & D | (iii) & E | (iv) & A | (v) & B |
| (b) | (i) & D | (ii) & C | (iii) & A | (iv) & B | (v) & E |
| (c) | (i) & C | (ii) & D | (iii) & A | (iv) & E | (v) & B |
| (d) | (i) & D | (ii) & C | (iii) & E | (iv) & A | (v) & B |
| (e) | (i) & C | (ii) & D | (iii) & E | (iv) & B | (v) & A |

**The blanks in the Questions 22 – 26 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (v). Note that one word/phrase may be used in more than one instance.**

> (i). Sponsor
> (ii). Facilitator
> (iii). Scribe(s)
> (iv). User(s) and Manager(s)
> (v). IT staff

What is the most appropriate way of filling?

22) The ……….. is the individual who is usually responsible for leading the joint requirement planning session.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

23) The participants of the joint requirement planning session are usually chosen by the project ………….

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

24) The ………………… do/does not speak unless invited to. He/They primarily listen(s) to the requirements voiced by the users and managers.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

25) | The …………………… is/are responsible for establishing the ground rules for the joint requirement planning session.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

26) | The role of the …………… is to communicate business rules and requirements, review design prototypes and make acceptance decisions.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

27) | Each of the blanks labelled **A – E** of the paragraph given below has to be filled with the most appropriate word selected from the phrases labelled (i) – (v). Note that one word or phrase might be used more than once.

(i).    Open-ended boxes(s)
(ii).   Square(s)
(iii).  Circle(s)
(iv).  Rounded rectangle(s)
(v).   Arrow(s)

In the Gane and Sarson notation of a data flow diagram …**A**…. depict(s) the processors, ….**B**…. depict(s) external agents, ….**C**…. represent(s) data flows, ….**D**…. represent(s) data stores and …**E**…. represent(s) inputs and outputs.

| | | | | | |
|---|---|---|---|---|---|
| (a) | **A** – (iv) | **B** – (ii) | **C** – (v) | **D** – (ii) | **E** – (ii) |
| (b) | **A** – (iii) | **B** – (ii) | **C** – (v) | **D** – (i) | **E** – (ii) |
| (c) | **A** – (iv) | **B** – (ii) | **C** – (v) | **D** – (i) | **E** – (v) |
| (d) | **A** – (iii) | **B** – (iv) | **C** – (v) | **D** – (ii) | **E** – (v) |
| (e) | **A** – (iii) | **B** – (iv) | **C** – (v) | **D** – (i) | **E** – (ii) |

28) | Following are some statements associated with data flow diagrams. Identify the correct statement(s) from among them.

(a) All processes in a DFD do not have to be decomposed.
(b) DFDs are used to model complex interfaces.
(c) DFDs are used to represent only functional processing, data stores and data movements between functions.
(d) DFDs depict only processes which can be decomposed.
(e) DFDs do not show external data sources and external data sinks.

29) | Given below are some statements associated with data flow diagrams. Identify the correct statement(s) from among them.

(a) Data flows in a DFD may be bidirectional.
(b) The level 0 DFD only consists of the main process.
(c) The level 0 DFD is the same as the context diagram.
(d) Data can flow directly from a data store to an external agent.
(e) Every process in a DFD must connect to two other processes.

30) Given below are some statements associated with process modelling. Identify the correct statement(s) from among them.

> (a) An event diagram is constructed to validate each event.
> (b) System diagrams are constructed by merging functional decomposition diagrams.
> (c) Primitive diagrams are constructed for those events which require additional processing details.
> (d) The context data flow diagram is constructed to establish the initial project scope.
> (e) The Functional decomposition diagram is compiled to identify and confirm business events.

31) Select the activities which are most appropriate for batch processing.

> (a) Producing a delivery note                (b) Sending out utility bills
> (c) Sending an online registration notification    (d) Updating bank savings books
> (e) Sending out monthly magazines

32) Given below are some statements associated with structured English used for process description. Identify the correct statement(s) from among them.

> (a) The body of every process in structured English starts with BEGIN and ends with END.
> (b) The only decision structure in structured English is IF-THEN-ELSE.
> (c) REPEAT-UNTIL is the only repetition structure in structured English.
> (d) DO, OF, FOR are some key words used in structured English.
> (e) Structured English uses arithmetic and Boolean operators.

33) Given below are some statements associated with decision tables used for process description. Identify the correct statement(s) from among them.

> (a) Decision tables cannot be used when the specified process selects one of the possible sets of actions using a set of complex rules.
> (b) Decision tables are divided into two parts, the conditions and actions.
> (c) A single row of a decision table corresponds to one condition combination.
> (d) It is better to use decision tables than structured English when processes repeat themselves.
> (e) A single column of a decision table corresponds to one action.
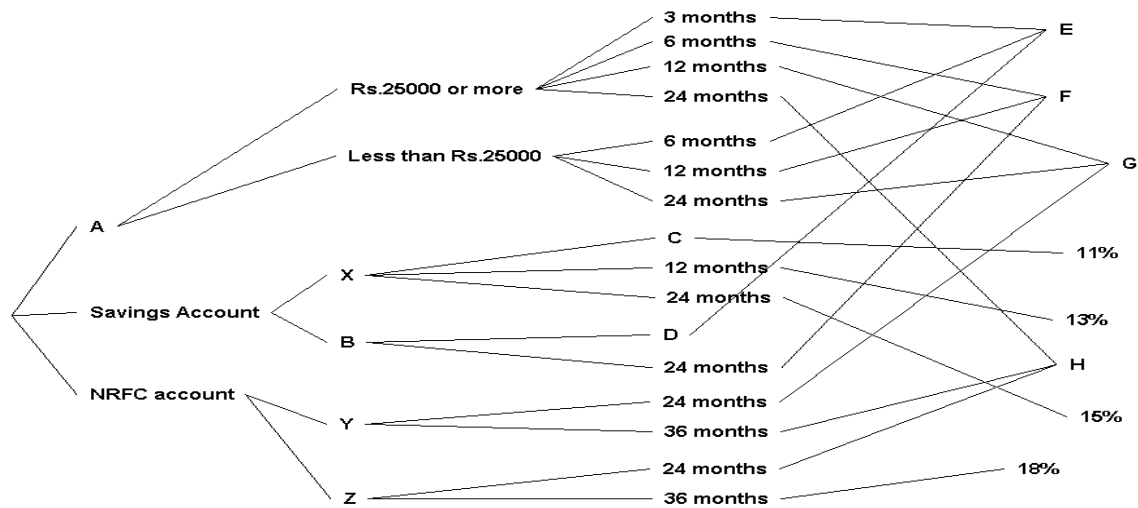
**Consider the problem and the decision tree given below to answer the question nos. 34 and 35.**

**SL Bank has introduced a special scheme to promote its customers to invest in the bank's fixed deposit (FD) schemes. The bank intends to have a different interest scheme for different account types, duration of the fixed deposit and the account balance of their bank accounts.**

**If the account is a current account and the account balance is Rs.25,000/- or more, the bank pays 10% interest for a 3 month FD, 12% interest for a 6 months FD, 14% interest for a 12 month FD and 16% for a 24 month FD. If the account is a current account and the account balance less than Rs.25,000/-, the bank pays 10% interest for a 6 months FD, 12% interest for a 12 month FD and 14% for a 24 month FD.**

**If the account is a savings account and the account balance is Rs.15,000/- or more, the bank pays 11% interest for a 6 month FD, 13% interest for a 12 month FD and 15% for a 24 month FD. If the account is a savings account and the account balance less than Rs.15,000/-, the bank pays 10% interest for a 12 month FD and 12% for a 24 month FD.**

**If the account is a NRFC account and the account balance is US $500 or more, the bank pays 16% interest for a 24 month FD and 18% for a 36 month FD. If the account is a NRFC account and the account balance less than US $500, the bank pays 14% interest for a 24 months FD, 16% interest for a 36 month FD.**

3 months
6 months
12 months
24 months

6 months
12 months
24 months

E
F
G

Rs.25000 or more

Less than Rs.25000

A

C
12 months
24 months

D
24 months

X

Savings Account

B

NRFC account

24 months
36 months

24 months
36 months

Y

Z

11%

13%

H

15%

18%

34)  A match for each of the entries marked **A** to **F** of the decision tree has to be found from the following table of rows marked (i) to (x).

(i).     10%
(ii).    12 months
(iii).   14%
(iv).    Savings account
(v).     Current account
(vi).    Less than Rs.15000
(vii).   6 months
(viii).  Rs.15000 or more
(ix).    12%
(x).     3 months

The correct matching is

| | | | | | | |
|---|---|---|---|---|---|---|
| (a) | A – (iv) | B – (vi) | C – (ii) | D – (vii) | E – (i) | F – (i) |
| (b) | A – (v) | B – (vi) | C – (vii) | D – (ii) | E – (iii) | F – (ix) |
| (c) | A – (v) | B – (viii) | C – (ii) | D – (x) | E – (iii) | F – (i) |
| (d) | A – (v) | B – (vi) | C – (vii) | D – (ii) | E – (i) | F – (ix) |
| (e) | A – (v) | B – (viii) | C – (ii) | D – (x) | E – (ix) | F – (iii) |

35)  Select the most appropriate entries for X, Y, Z, G and H respectively;

(a) Rs.15000 or more, Less than US$500, US$500 or more, 14%, 16%
(b) Rs.15000 or more, US$500 or more, Less than US$500, 14%, 12%
(c) Less than Rs.15000, US$500 or more, Less than US$500, 12%, 14%
(d) Rs.15000 or more, Less than US$500, US$500 or more, 14%, 16%
(e) Rs.15000 or more, US$500 or more, Less than US$500, 14%, 16%

36)  Given below are some statements associated with data modelling. Identify the correct statement(s) from among them.

(a) Data modeling depicts the data flow in a system.
(b) Data modeling physically models a system's data.
(c) Data modeling is also called database modeling.
(d) Data modeling is a technique for organizing and documenting a system's data.
(e) Data modeling is also called an entity-relationship diagram.

37) Given below are some statements associated with Entity Relationship Diagrams. Identify the correct statement(s) from among them.

| |
|---|
| (a) Entities of an ER diagrams must have a primary key. |
| (b) ER diagrams do not depict the data type of the attribute. |
| (c) ER diagrams cannot model entities which are concepts. |
| (d) A compound attribute is made up of other attributes. |
| (e) ER diagrams physically represent data. |

**The blanks in the Questions 38 – 41 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (v). Note that one word/phrase may be used in more than one instance.**

(i). Candidate key
(ii). Concatenated key
(iii). Alternate key
(iv). Primary key
(v). Subsetting criteria

What is the most appropriate way of filling?

38) The ………… is a single attribute commonly used to uniquely identify a single entity instance.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

39) The ………… is a group of attributes used to identify a single entity instance.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

40) The ………….. is referred to as the secondary key.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

41) The …………. is the attribute that is most likely to become the primary key.

| | | |
|---|---|---|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |

42) Following are some statements associated with Object modelling. Identify the correct statement(s) from among them.

| |
|---|
| (a) Unified modeling language is used to code designed objects. |
| (b) An object is something that is or is capable of being seen, touched, or otherwise sensed, and about which users store data and associate behavior. |
| (c) A class subtype is an objects instance which stores attributes which are common to one or more supertypes of the object. |
| (d) Attributes are the data which represents characteristics of interest about an object. |
| (e) Multiplicity defines the relationships between objects of one class with objects of another class. |

43) Given below are some statements associated with structure charts. Identify the correct statement(s) from among them.

> (a) Each process has only a number for identification.
> (b) A software model derived from the structured design is called a structure chart.
> (c) The arrow with the filled circle end depicts passed data.
> (d) The arrow with the empty circle end depicts control data.
> (e) The structure chart is derived from studying the flow of data through the program.

44) Given below are some statements associated with prototyping. Identify the correct statement(s) from among them.

> (a) The scope and the complexity of the system can quickly expand beyond original plans.
> (b) Prototyping decreases creativity since it does not allow quick feedback.
> (c) An approved prototype is equivalent to a paper design specification.
> (d) Prototypes negate the requirement for the system analysis phase.
> (e) Numerous design issues are not addressed by prototyping.

45) Given below are some statements associated with system interfaces. Identify the correct statement(s) from among them.

> (a) Most often, reports and other outputs are directly printed to a file.
> (b) The systems designer can work closely with system users to develop input, output and dialog specifications.
> (c) Editing controls does not ensure accuracy of input data.
> (d) It is not necessary that the system users provide feedback on all the input/output prototypes.
> (e) The designer need not anticipate every little error that the end user might make.

46) Each of the blanks labelled **A – E** of the paragraph given below has to be filled with the most appropriate word selected from among the phrases labelled (i) – (v). Note that one word or phrase might be used more than once.

> (i).     Application logic layer
> (ii).    Presentation logic layer
> (iii).   Presentation layer
> (iv).    Data layer
> (v).     Data manipulation layer

The ....**A**.... does the editing of input data and formatting of output data. The ....**B**..... is the actual user interface. The commands and logic required to store and retrieve data are included in the ....**C**.... The .....**D**.... includes all the logic and processing required to support the actual business program. The ....**E**..... is the actual data store.

| | | | | | |
|---|---|---|---|---|---|
| (a) | **A** – (iv) | **B** – (iii) | **C** – (i) | **D** – (ii) | **E** – (v) |
| (b) | **A** – (ii) | **B** – (iii) | **C** – (v) | **D** – (i) | **E** – (iv) |
| (c) | **A** – (i) | **B** – (ii) | **C** – (iv) | **D** – (iii) | **E** – (v) |
| (d) | **A** – (i) | **B** – (iii) | **C** – (iv) | **D** – (ii) | **E** – (v) |
| (e) | **A** – (iii) | **B** – (ii) | **C** – (v) | **D** – (i) | **E** – (iv) |

47) A project is considered successful if

> (a) the system was delivered on time.
> (b) minimum time was spent for requirement gathering and designing the system.
> (c) the system was delivered within budget.
> (d) the system development process had a maximum impact on the ongoing business process.
> (e) the system meets at least some of the customer's requirement.

48) Given below are some statements associated with forward and reverse engineering. Identify the correct statement(s) from among them.

> (a) Reverse engineering can be used to improve poorly designed systems.
> (b) Reverse engineering requires the system analyst to draw system models from scratch or templates.
> (c) Reverse engineering allows a case tool to read the program code and transform that code into a representative system model.
> (d) Forward engineering does not require the system analyst to draw system models.
> (e) CASE tools which allow bidirectional engineering are said to provide for round-trip engineering.

49) Given below are some statements associated with CASE. Identify the correct statement(s) from among them.

> (a) CASE tools are software programs.
> (b) CASE tools complicate the system development process.
> (c) System models can be stored in the CASE repository.
> (d) CASE tools do not allow the translation of system models into application programs.
> (e) CASE products require high powered server machines.

50) Which of the following are not CASE facilities?

> (a) Diagramming tools     (b) Prototyping tools     (c) Quality management tools
> (d) Description tools     (e) System analysing tools

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