

Exam/(Partial)test. BIT Module 1.3 BIIT part BPM&EA
Bachelor (year 1) (B-BIT, B-TBK)(BMS, EEMCS)

Module/course code: 201300107 and 201300108

Date: 20 April 2017

Time: 13:45 – 15:30 (+25% for students who may use extra time)

Module-coördinator: Chintan Amrit

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Type of test:

- Closed book, multiple choice

Allowed aids during the test:

- No aids allowed

Attachments:

- Multiple choice form

Additional remarks:

- 34 multiple choice questions
- 10 pages including this front page
- Maximum score per question is 3 points
- Grade is calculated with formula $G = (P/102) * 9 + 1$, where P is the number of points scored with your answers to the questions
- Each multiple choice question has **at least one correct answer** (one of the presented choices is correct) and **may have more than one correct answer** (two or more of the presented options are correct).

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St. nr: _____

Exam BIT Module 1.3 Business Intelligence and IT, Part BPM & EA
Module code: 201300107; 201300108
Exam date: April 20, 2017

Instructions

This is a closed book exam – it is not allowed to consult any reading material.
Be sure to switch your mobile phone off and stow it in a closed bag.
Be sure to indicate name, program and student number on each sheet.

- 34 multiple choice questions
- Maximum score per question is 3 points
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Success!

Multiple choice questions

Question 1

Which of the following are used to *order* flow elements in a BPMN process?

- Lane
- Event
- Pool
- Sequence flow
- Message flow
- Gateway

Question 2

What connects a BPMN pool to a BPMN pool?

- Data associations
- Sequence flows
- Message flows
- Gateways

Question 3

Which statement(s) about BPMN is (are) true?

- Message flows are not used between pools
- Message flows are not used within pools
- Message flows are not used within lanes
- Sequence flows are not used between pools
- Sequence flows are not used within pools
- Sequence flows are not used within lanes

Question 4

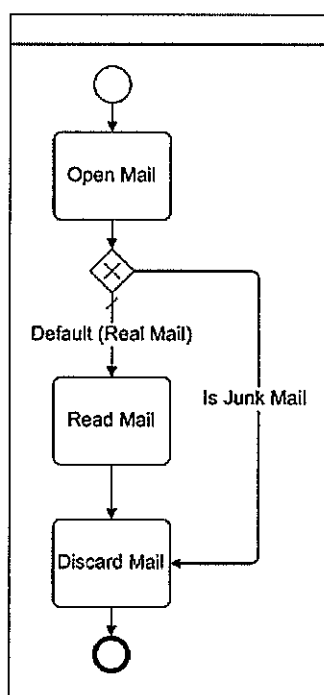
Which statement(s) about parallel gateways is (are) true?

- a. After the gateway, a condition defines the activities that may be performed at one time
- b. After the gateway each branch is determined by the downstream condition
- c. The sequence flow defines what is parallel
- d. All paths leaving the gateway are executed

Question 5

Consider the following process diagram. An alternative representation of the two sequence flows connecting to activity *Discard mail* would be using a gateway to merge the two sequence flows before connecting to the activity. Which gateway would be appropriate for this?

- a. Parallel gateway
- b. Exclusive gateway
- c. Inclusive gateway
- d. Complex gateway



Question 6

Consider a retail company that offers a range of products of multiple suppliers to customers. The customer selects a product from the online catalogue of the retailer, and the retailer then orders the selected product from the most suitable supplier. The interaction between the retailer and the suppliers is fully automated, i.e. a retailer application interoperates with a supplier application. The Internet (TCP/IP stack) is used to exchange messages between the retailer application and a supplier application. A message carries information about the ordered product and about choices concerning optional features of the product. The retailer and suppliers have agreed upon a common vocabulary for the products and available choices. Furthermore, the retailer and suppliers have agreed upon a set of structured messages and their binary encoding. What level of interoperability is achieved by having an agreed set of structured messages with encodings (choose the most complete answer)?

- a. Physical interoperability
- b. Pragmatic interoperability
- c. Process interoperability
- d. Semantic interoperability
- e. Syntactic interoperability

Question 7

Referring to the same example of retailer-supplier collaboration, what level of interoperability is achieved by having an agreed vocabulary (choose the most complete answer)?

- a. Physical interoperability
- b. Pragmatic interoperability
- c. Process interoperability
- d. Semantic interoperability
- e. Syntactic interoperability

Question 8

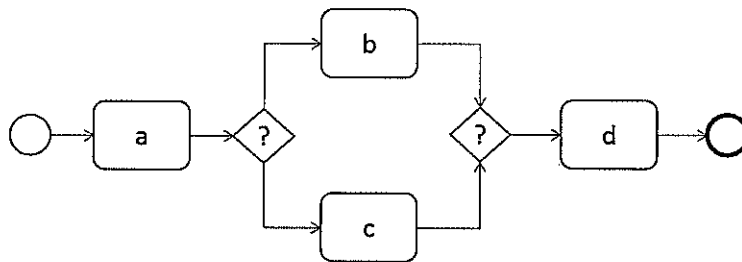
Referring to the same example of retailer-supplier collaboration, what level of interoperability is achieved by using the Internet as a common channel (choose the most complete answer)?

- a. Physical interoperability
- b. Pragmatic interoperability
- c. Process interoperability
- d. Semantic interoperability
- e. Syntactic interoperability

Question 9

Consider a workflow management system that executes many instances of a given workflow. The execution traces are recorded during these executions. An execution trace $\{x, y, z\}$ means that activities x, y, z were finalized in that specific order. Suppose that the following execution trace patterns were observed: $\{a, b, d\}$, $\{a, c, d\}$, $\{a, b, c, d\}$, $\{a, c, b, d\}$. Further suppose that the given workflow model looks like the process below. Which type(s) of gateway is (are) possible to branch sequence flows in this process?

- a. Exclusive gateway
- b. Parallel gateway
- c. Inclusive gateway
- d. None of the above: the observed patterns are not possible with either of the above-mentioned gateways



Question 10

For the same workflow management system, workflow model and execution traces, which type(s) of gateway is (are) possible to merge sequence flows in this process??

- a. Exclusive gateway
- b. Parallel gateway
- c. Inclusive gateway
- d. None of the above: the observed patterns are not possible with either of the above-mentioned gateways

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Question 11

Which statement(s) about workflow management systems (WfMS) is (are) true?

- a. A WfMS is process-aware
- b. A WfMS separates workflow definition from workflow execution
- c. A WfMS tightly couples application code with process code
- d. A WfMS automates message flows between different business processes
- e. A WfMS controls the execution of software applications and human tasks

Question 12

Which statement(s) about system workflows (is) are true?

- a. A system workflow consists entirely of activities that are performed by software applications
- b. A system workflow consists entirely of activities that are performed by people that have been assigned to the workflow management system
- c. A system workflow consists of activities that are performed by software applications and human workers
- d. A system workflow is responsible for the mechanism that makes the assignment of human resources to work items

Question 14

The guest lecture by CAPE Groep quotes Charles Darwin: "It's not the strongest who survive, nor the most intelligent, but the ones most adaptable to change." To which part of the theories does this relate best?

- a. VUCA
- b. YAML
- c. BPMN
- d. BPR

Question 15

Which of these roles, mentioned in the slides of the guest lecture by CAPE Groep, is NOT found in pure Scrum according to the Scrum guide?

- a. Architect
- b. Scrum master
- c. Product owner
- d. Developer

Question 16

While the guest lecture by BiZZdesign focused on Enterprise Architecture, it was shown that many disciplines are involved in enterprise change, which each have their own models. These include BMC, BMM, BPMN, UML, ERD, and DMN. To which type of abstraction, as described by Weske, does this relate?

- a. Horizontal
- b. Vertical
- c. Aggregation
- d. Inheritance

Question 17

BiZZdesign's guest lecture mentions several reasons to use models. According to the guest lecture, what is NOT a reason to use models?

- a. Models are a goal in itself
- b. Models create transparency
- c. Models facilitate alignment
- d. Models inform

Question 18

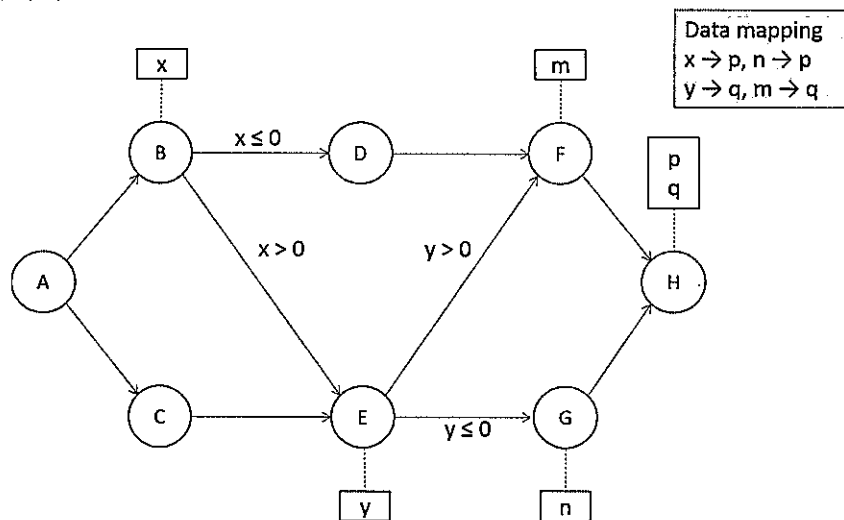
Which statement(s) is (are) true?

- a. Every P/T net can be expressed as an E/C net
- b. Every E/C net can be expressed as a P/T net
- c. Both are true
- d. Neither are true

Question 19

Consider the Activity net in the figure below. Assume all activities have an AT_LEAST_ONE join semantic. Note that x , y , m and n are output data items, and p and q are input data items. Activities can be in one of five states: *Not activated*, *Enabled* (all incoming flow connectors are signalled TRUE), *Running*, *Completed*, or *Skipped*. Which of these activities are always executed (choose the most complete answer)?

- a. A, B, and C
- b. A and H
- c. A, B, C, and H
- d. A, B, E, and H
- e. A, B, C, E, and H
- f. A, B, C, E, F, and H



Question 20

Consider the Activity net of the previous question. The execution of the Activity net is started, and execution events are recorded in a log. An execution event occurs if the execution of an activity either starts or ends. In case the execution of an activity ends, the result of the execution (the value in the output data container, if present) is also recorded. At some point in time the execution is stopped. This is the execution log until that point:

{start(A), end(A), start(B), end(B)[x=9]}.

Which activity (or activities) is (are) *enabled* (choose the most complete answer)?

- a. C
- b. A and B
- c. A, B, and C
- d. C, D, and E
- e. C and E

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Question 21

For the same Activity net and execution log, which activity (or activities) is (or are) *completed* (choose the most complete answer)?

- a. A
- b. B
- c. A and B
- d. A, B, and C
- e. A, B, C, D, and E
- f. A, B, C, and E

Question 22

For the same Activity net and execution log, which activity (or activities) is (or are) *running* (choose the most complete answer)?

- a. C
- b. D
- c. E
- d. C and E
- e. C, E, and F
- f. None of the above

Question 23

The execution of the same Activity net is resumed and after a short while stopped again. The resulting execution log looks like this:

{ start(A), end(A), start(B), end(B)[x=9] ... start(F)}.

Based on the partially shown execution log, for which activities is it clear that they are *completed* (choose the most complete answer)?

- a. A, B, and F
- b. A, B, C, and F
- c. A, B, and E
- d. A, B, C, and E
- e. A, B, C, E and F
- f. C and E

Question 24

For the same Activity net and last execution log, which activity (or activities) is (or are) part of a *dead path*?

- a. C
- b. D
- c. G
- d. C and D
- e. D and G
- f. C and G

Question 25

The execution of the same Activity net is again resumed and after a short while stopped. The resulting execution log looks now like this:

{ start(A), end(A), start(B), end(B)[x=9] ... start(F), end(F)[m=7], start(H)}.

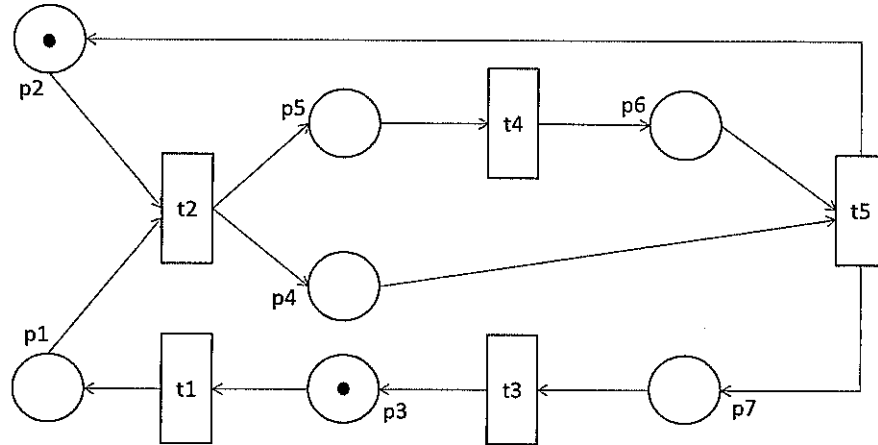
Which pair(s) of value assignments for p and q is (are) correct?

- a. p = (value of x), and q = (value of y)
- b. p = (value of n), and q = (value of y)
- c. p = (value of x), and q = (value of m)
- d. p = (value of n), and q = (value of m)

Question 25

Consider the Petri net in the figure below. If this is an E/C-Net, what is the maximum number of tokens in the network?

- a. 2
- b. 3
- c. 4
- d. 5



Question 26

For the same E/C-Net, how many different markings does the network have?

- a. 4
- b. 5
- c. 6
- d. 7

Question 27

For the same E/C-Net, which of the following two places never have tokens at the same time?

- a. p1 and p2
- b. p2 and p3
- c. p3 and p4
- d. p4 and p5
- e. p5 and p6
- f. p6 and p7

Question 28

Related to the same E/C-Net, what is the maximum number of transitions enabled at the same time?

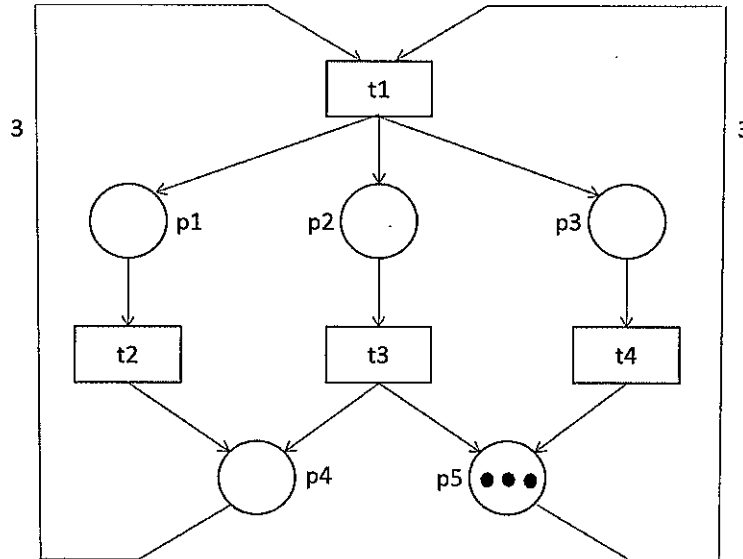
- a. 1
- b. 2
- c. 3
- d. 4

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Question 29

Consider the Petri net in the figure below. If this is an P/T-Net, what is the maximum number of tokens in the network?

- a. 3
- b. 4
- c. 5
- d. 6
- e. Infinite



Question 30

For the same P/T-Net, how many different markings does the network have?

- a. 8
- b. 10
- c. 11
- d. 14
- e. Infinite

Question 31

For the same P/T-Net, which of the following two transactions are never enabled at the same time?

- a. t1 and t2
- b. t2 and t3
- c. t2 and t4
- d. t3 and t4
- e. t1 and t4

Question 32

Related to the same P/T-Net, what is the maximum number of transitions enabled at the same time?

- a. 1
- b. 2
- c. 3
- d. 4

Question 33

Which of the following statements is false?

- a. Enterprise architecture is needed in complex organisations
- b. An enterprise architecture consists of models called architecture views or viewpoints
- c. Enterprise architecture is needed to understand the working of a software application
- d. Enterprise architecture is important for aligning the business strategy with the internal structure of the organization, its business processes and IT landscape

Question 34

Consider the model below. Which of these statements is true?

- a. The model contains several service layers
- b. The model covers the three layers and three aspects of the ArchiMate framework
- c. All interactions between the modeled actors go through an interface
- d. The model depicts the business model of a logistic company

