UNIVERSITY OF TWENTE.

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: 10 April 2017
Time: 13:45 – 15:30 *(+25% for students who may use extra time)*
Module-coördinator: Chintan Amrit
Instructors: Marten van Sinderen, Lucas Meertens, Maria Iacob

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).

Name:_____

St. nr:_____

Exam BIT Module 1.3 Business Intelligence and IT, Part BPM & EA
Module code: 201300107; 201300108
Exam date: April 10, 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
- Grade is calculated with formula $G = (P/102)*9 + 1$, where P is the number of points scored with your answers to the questions
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Success!

Multiple choice questions

Question 1
A business process is enacted by a single organization, but it may interact with business processes performed by other organizations. How?
   a. Through defining a sequence flow between the business processes of these organizations
   b. Through defining common data artifacts with associations to activities in the business processes in these organizations
   c. Through defining a message flow between the business processes of these organizations
   d. Through defining data associations between the business processes of these organizations

Question 2
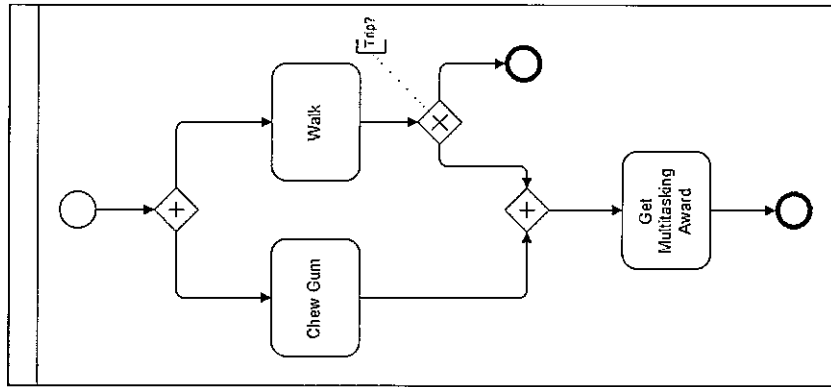What is an choreography in the context of business process modelling?
   a. A detailed view on the activities in the business process of an organization and the execution constraints on these activities
   b. An abstract view on the activities and their relationships in the business process of an organization
   c. A definition of minimal but sufficient constraints on participants to collaborate at a process level
   d. The definition of commitments and claims of participants in a collaboration

Question 3
Consider the following business process representing a person who attempts to walk and chew gum at the same time. Is this a sound process?
   a. Yes, because the process starts and ends, where the process end depends on whether the person trips (no multitasking award) or not
   b. Well, this depends on the interpretation of the activities and the gateway conditions
   c. No, because the process in deadlocked
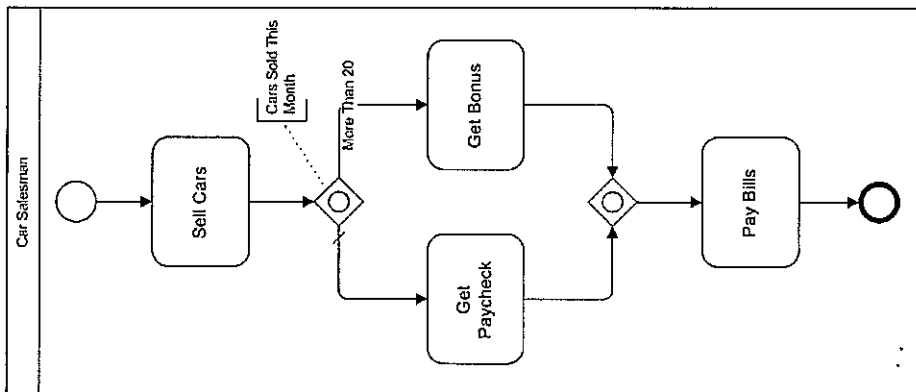   d. No, because the process is livelocked

Question 4

Consider the following business process model that intends to represent the situation where a salesperson may get a bonus based on his performance. The following requirements are specified by the salesmanager: (1) an employee gets a monthly paycheck if s/he sells 20 or less products; (2) an employee gets a monthly paycheck and a bonus if s/he sells more than 20 products. What can you say about this process model?

    a. The model is not structural sound, because there is a possibility of a deadlock
    b. The model is not structural sound, because there is a possibility of a livelock
    c. The model is structural sound, and satisfies the requirements on the process
    d. The model is structural sound but does not satisfy the requirements on the process

Question 5

Which is the starting point for the business process methodology (as presented by Weske)?

    a. Strategy and organization
    b. Process design
    c. Process landscape design
    d. Operations and controlling

Question 6

At a higher level of abstraction, multiple elements of a lower level of abstraction can be grouped and represented by a single artefact. For example, the coarse-grained "order management" activity might consist of many finer-grained activities, such as receiving an incoming order, checking the inventory, and confirming the order. What is the name of this type of abstraction, according to Weske?

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

Question 7

When handling abstraction, Weske states that providing a complete picture of a business process requires data modelling, function modelling, organization modelling, and modelling of the operational information technology landscape. Which of the following statements is about data modeling?

a. ... investigates the units of work that are being enacted in the context of business processes. The specification of the work can be done at different aggregation levels, from coarse-grained to fine-granular at the operational level that are realized by knowledge workers and information systems.
b. ... in business processes is important, because decisions made during a business process depend on particular values. Also dependencies between activities need to be taken into account in process design, to avoid situations in which an activity requires certain information not available at that time.
c. ... of a company is an important requirement. Activities in the business process can then be associated with particular roles or departments.
d. ... is necessary to be represent the functionality provided by information systems. Many activities in a business process are performed by or with the assistance of information systems.

Question 8

Which of the following statements is about function modeling?

a. ... investigates the units of work that are being enacted in the context of business processes. The specification of the work can be done at different aggregation levels, from coarse-grained to fine-granular at the operational level that are realized by knowledge workers and information systems.
b. ... in business processes is important, because decisions made during a business process depend on particular values. Also dependencies between activities need to be taken into account in process design, to avoid situations in which an activity requires certain information not available at that time.
c. ... of a company is an important requirement. Activities in the business process can then be associated with particular roles or departments.
d. ... is necessary to be represent the functionality provided by information systems. Many activities in a business process are performed by or with the assistance of information systems.

Question 9

Which of the following statements is about organization modeling?

a. ... investigates the units of work that are being enacted in the context of business processes. The specification of the work can be done at different aggregation levels, from coarse-grained to fine-granular at the operational level that are realized by knowledge workers and information systems.
b. ... in business processes is important, because decisions made during a business process depend on particular values. Also dependencies between activities need to be taken into account in process design, to avoid situations in which an activity requires certain information not available at that time.
c. ... of a company is an important requirement. Activities in the business process can then be associated with particular roles or departments.
d. ... is necessary to be represent the functionality provided by information systems. Many activities in a business process are performed by or with the assistance of information systems.

Question 10
Which of the following statements is about modelling of the operational information technology landscape?

a. ... investigates the units of work that are being enacted in the context of business processes. The specification of the work can be done at different aggregation levels, from coarse-grained to fine-granular at the operational level that are realized by knowledge workers and information systems.

b. ... in business processes is important, because decisions made during a business process depend on particular values. Also dependencies between activities need to be taken into account in process design, to avoid situations in which an activity requires certain information not available at that time.

c. ... of a company is an important requirement. Activities in the business process can then be associated with particular roles or departments.

d. ... is necessary to be represent the functionality provided by information systems. Many activities in a business process are performed by or with the assistance of information systems.

Question 11
Business functions and business processes are closely related. Porter's value chain shows part of this relation by identifying functions. Which type of process do NOT map to the functions in Porter's value chain?

a. Primary processes
b. Secondary processes
c. Tertiary processes
d. None of the above

Question 12
To be able to handle the VUCA world (Volatile, Uncertain, Complex, Ambiguous), organizations are attempting to apply agile methods. Currently, the agile framework used most is Scrum. Which of the following is NOT a role in Scrum according to the Scrum Guide?

a. Company owner
b. Product owner
c. Development team
d. Scrum master

Question 13
UML's MOF (Meta-Object Facility) identifies 4 model levels, from instance to meta-meta-model. It ends there, as the top level (meta-meta-model) is able to describe itself. Which of the options below present a good pairing of model level and example?

a. M3 (Meta-meta-model), for example: any tertiary process
b. M2 (Meta-model), for example: BPMN
c. M1 (Model), for example: Amber, the process modeling language of BiZZdesign
d. M0 (Instance), for example: $e=mc^2$

Question 14
When improving processes, measures need to be defined that measure the essential characteristics of a process. For example, the speed with which an order is processes, including a clear specification of how to measure it, and expected values. What are these types of measures called?

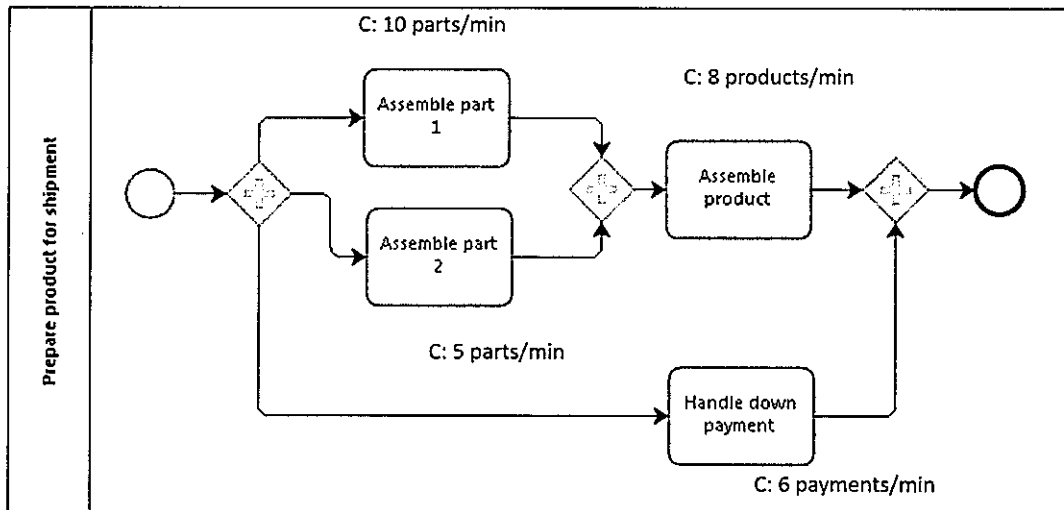a. KPI
b. AKA
c. CSF
d. BPM

Question 15

Automation of business processes can be used to improve the efficiency and effectiveness of the processes in their business context. Which of the following statements are true?

   a. Activity-level automation always leads to a more efficient business process
   b. Activity-level automation always leads to a more effective business process
   c. Activity-level automation is represented in BPMN with a subprocess
   d. Activity-level automation can lead to automation islands

Question 16

Consider the following representation of a process that prepares products. A product is made from two parts which are previously assembled and meanwhile a down-payment by the customer is handled. Assume the capacities of the activities are as indicated. Where is the likely first bottleneck of the process?

   a. Assemble part 1
   b. Assemble part 2
   c. Assemble product
   d. Handle down-payment

Question 17

Which of the following statements is true?

   a. Physical interoperability depends on syntactic interoperability
   b. Process interoperability depends on pragmatic interoperability
   c. Semantic operability depends on syntactic interoperability
   d. Process interoperability depends on syntactic interoperability
   e. Semantic interoperability depends on physical interoperability

Question 18

What are the levels of interoperability covered by the Internet (viewed from the perspective of a designer who wants to integrate software applications which have access to the Internet)?

   a. Only pragmatic interoperability
   b. Only physical interoperability
   c. Only syntactic interoperability
   d. Both syntactic and physical interoperability
   e. Process interoperability and all levels on which process interoperability depends

Question 19

We treated different kinds of middleware solutions to address the problems that businesses face when integrating their enterprise applications. Which of the following statements are true?
   a. Bridges provide higher level interoperability compared to queues
   b. Queues higher level interoperability compared to bridges
   c. Bridges and queues support the same level(s) of interoperability
   d. Queues are suitable to connect applications with real-time requirements
   e. Queues are suitable to connect applications with high reliability requirements
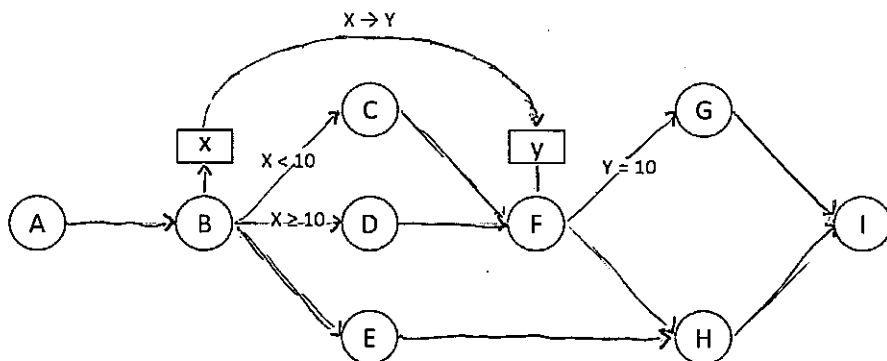
Question 20

Workflow management systems have a buildtime and a runtime component. Which of the following statements is/are true?
   a. At buildtime, the allocation of work to specific human actors has to be specified.
   ✗b. At buildtime, the progress of workflow instances has to be monitored.
   ✗c. At runtime, different instances of the same workflow should involve the same human actors.
   d. At runtime, different instances of the same workflow can have different execution logs.
   ✗e. At runtime, different instances of the same workflow should leave data in the same state.

Question 21

Consider the Activity net in the figure below. Assume all activities have an AT_LEAST_ONE join semantic. 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, E, H, and I
   b. A, B, C, D, E, F, H, and I
   c. A, B F, H, H and I
   d. A, B, E, F, H, and I
   e. A, B, C, D, E, F, H, and I

Question 22

Consider the Activity 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 is also recorded). This is the execution log until that point in time: {start(A), end(A), start(B), end(B)[x=9]}. Which activity (or activities) is (or 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 F

Question 23

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
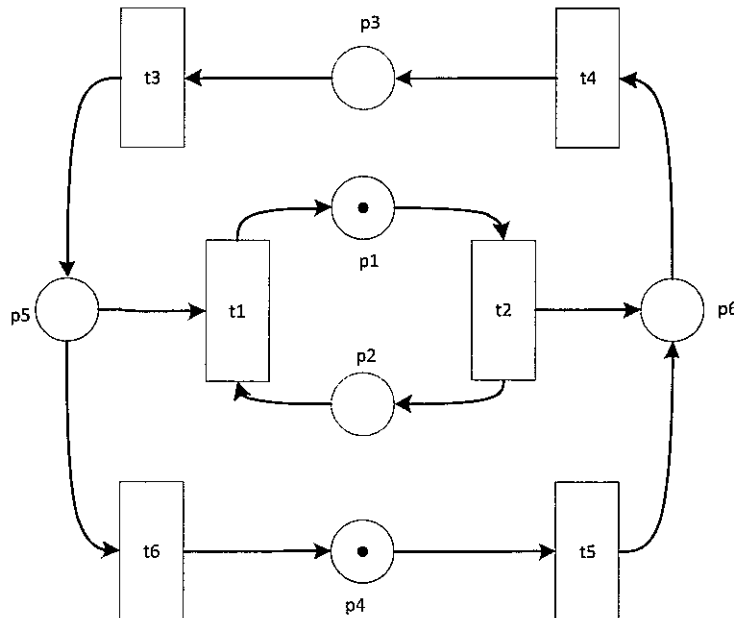   f. A, B, C, and E

Question 24

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 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. 8
   b. 10
   c. 11
   d. 14
   e. 17

Question 27
For the same E/C-Net, which of the following two transactions are never enabled at the same time?
   a. t1 and t2
   b. t2 and t3
   c. t3 and t4
   d. t4 and t5

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

Question 29
Consider the Petri net in the figure of Question 25. If this is an P/T-Net, what is the maximum number of tokens in the network?
   a. 2
   b. 3
   c. 4
   d. 5
   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. 17

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. t3 and t4
   d. t4 and t5

Question 32
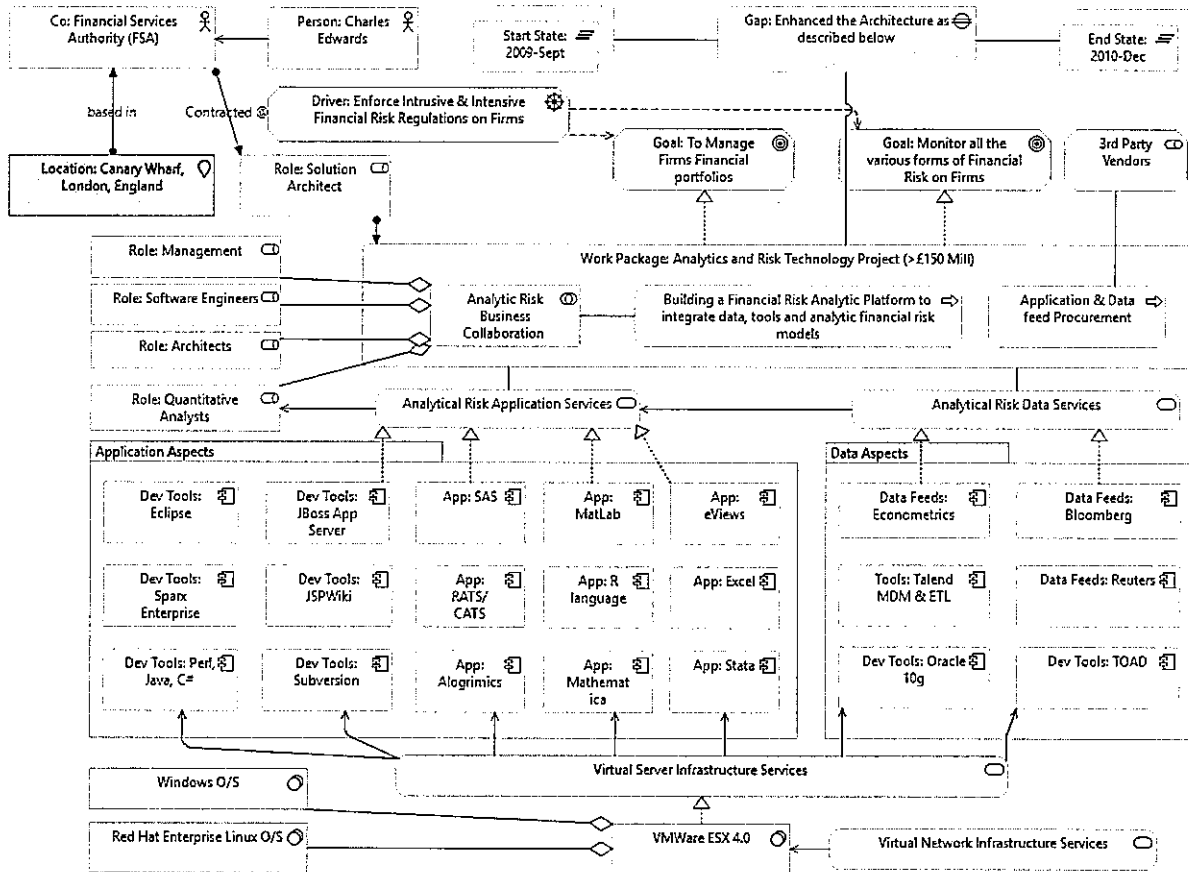Related to the same P/T-Net, what is the maximum number of transitions enabled at the same time?
   a. 1
   b. 2
   c. 3
   d. 4

Question 33

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

    a. The model contains concepts from all layers and aspects of the ArchiMate framework

    b. All interactions between the modeled roles go through an interface

    c. The model contains concepts from the ArchiMate core and extensions.

    d. The model contains business services.

Question 34

An architecture framework is:

    a. A way to classify for architecture views

    b. A way to develop and manage enterprise architecture

    c. A way to describe/specify enterprise architecture models

    d. All of the above