9. SOA and Business Processes

9.1. Business Process Modeling
The BPMN diagram below models a simple business process of an insurance company to handle a contract request and prepare an insurance contract.

![BPMN Diagram](image)

a) Extend the BPMN diagram with an additional activity “Register Customer” performed in parallel to the “Preverification”, “Special Audit” and “Calculate Surcharge” activities by the “Customer Management” department of the Insurance Company.

b) Sketch the extended business process using Petri Nets.

c) Extend the Petri Net with an additional activity “Send Contract Online” performed as alternative to “Send Contract” by the “Contract Handling Department”.

d) Add an activity “Archive Contract” which should be performed in parallel to “Send Contract” and “Send Contract Online” by the “Contract Handling Department”.

9.2. Service-oriented Business Processes

a) Propose a set of services which can be used to map the business process discussed in 9.1 to an executable process.

b) Sketch the BPEL process corresponding to the extended business process discussed in 9.1. Name the relevant structured activities for modeling the structure of the business process.

c) Give an example for the definition of the mapping of a process activity to a service based on the concept of partner links.

9.3. Web-Service Standards

a) What is specified with the following standards: WS-Coordination, WS-AtomicTransaction, WS-BusinessActivity, XML Encryption, XML Signature, WS-Security, SAML

b) What is the benefit of using XML Encryption to encrypt parts of SOAP messages?

9.4. Technologies for Implementing a SOA

a) Name the key features of an Enterprise Service Bus and the Service Component Architecture.

b) What problem domains address both approaches?