Question 1) With reference to the MPLS network depicted in the following figure, specify (directly in the boxes in front of packets in the figure) the MPLS label(s) possibly prepended to each of the packets shown in the figure (leave the box blank if no MPLS header is used; in case more than one label is present, write on the outside the one at the top of the label stack). Consider packets to be in transit on the link close to which they are depicted. Consider that the address written on the top in the packets is the source one, while the address underneath is the destination one. (9 points)
**Question 2** Pictorially describe (i.e., with a drawing) the headers required to authenticate the header and encrypt the payload of an IPv4 packet. Graphically highlight the various elements needed to obtain the required protection. Moreover, depict in a similar way (highlighting relevant elements) the headers used when in addition addresses in the IPv4 header shall be encrypted. (7 points)
Question 3) A SIP user alice@iptel.org, already registered and connected to its own service provider, would like to make a phone call to another SIP user, bob@iptel.org. Assuming that the caller does not know yet the IP address of the callee, list all the messages sent and received by all the involved entities from the beginning of the call establishment procedure to the end of the call. Consider messages of all possible involved protocols. An answer based on a graphical representation is fine. (7 points)
Question 4) Describe IPv6 host autoconfiguration solutions discussing their principles (i.e., the deployment scenarios they address), explaining how corresponding mechanisms and procedures work and presenting the protocols involved and their role. (7 points)
Question 1) With reference to the MPLS network depicted in the following figure, specify (directly in the boxes in front of packets in the figure) the MPLS label(s) possibly prepended to each of the packets shown in the figure (leave the box blank if no MPLS header is used; in case more than one label is present, write on the outside the one at the top of the label stack). Consider packets to be in transit on the link close to which they are depicted. Consider that the address written on the top in the packets is the source one, while the address underneath is the destination one. (9 points)
Question 2) Pictorially describe (i.e., with a drawing) the headers required to authenticate the header and encrypt the payload of an IPv4 packet. Graphically highlight the various elements needed to obtain the required protection. Moreover, depict in a similar way (highlighting relevant elements) the headers used when in addition addresses in the IPv4 header shall be encrypted. (7 points)
Question 3) A SIP user alice@iptel.org, already registered and connected to its own service provider, would like to make a phone call to another SIP user, bob@iptel.org. Assuming that the caller does not know yet the IP address of the callee, list all the messages sent and received by all the involved entities from the beginning of the call establishment procedure to the end of the call. Consider messages of all possible involved protocols. An answer based on a graphical representation is fine. (7 points)
Question 4) Describe IPv6 host autoconfiguration solutions discussing their principles (i.e., the deployment scenarios they address), explaining how corresponding mechanisms and procedures work and presenting the protocols involved and their role. (7 points)
NOTES

i. Nothing else than what is needed to write (pen, eraser), a piece of ID, and possibly water and food can be taken at the seat where you take your exam. Please leave any other non allowed item you might have (coat, bag, phone, calculator, and any other object) at the front or back of the classroom.

ii. Only sheets of paper provided by who is administering the test can be used during the exam. The answers to all questions must be written exclusively on the same page of the question, which is the only material that will be graded. Do not forget to write your name and student ID in each one of the marked spaces on the exam paper.

iii. In case you will use whole pages or part of pages as a draft copy, please indicate it clearly and possibly cross out such parts before handing in the exam.

iv. The score assigned to answers varies from zero to the maximum score reported at the end of the question.

v. When answering questions, please feel free to use drawings whenever they can help expressing and clarifying the answer.

vi. Answers that are not understandable (for example because written badly or with bad handwriting) might be considered wrong.

vii. During the test, any communication with other classmates is prohibited and will cause the student to be sent away from the classroom.

viii. The instructors and the assistants that are present during the test are there for the sole purpose of verifying proper progress of the exam. Their role is not giving any support to the interpretation of the text, neither helping the students to correctly formulate the answers. Please avoid any such request.

Question 1) With reference to the MPLS network depicted in the following figure, specify (directly in the boxes in front of packets in the figure) the MPLS label(s) possibly prepended to each of the packets shown in the figure (leave the box blank if no MPLS header is used; in case more than one label is present, write on the outside the one at the top of the label stack). Consider packets to be in transit on the link close to which they are depicted. Consider that the address written on the top in the packets is the source one, while the address underneath is the destination one. (9 points)
Question 2) Pictorially describe (i.e., with a drawing) the headers required to authenticate the header and encrypt the payload of an IPv4 packet. Graphically highlight the various elements needed to obtain the required protection. Moreover, depict in a similar way (highlighting relevant elements) the headers used when in addition addresses in the IPv4 header shall be encrypted. (7 points)
Question 3) A SIP user alice@iptel.org, already registered and connected to its own service provider, would like to make a phone call to another SIP user, bob@iptel.org. Assuming that the caller does not know yet the IP address of the callee, list all the messages sent and received by all the involved entities from the beginning of the call establishment procedure to the end of the call. Consider messages of all possible involved protocols. An answer based on a graphical representation is fine. (7 points)
Question 4) Describe IPv6 host autoconfiguration solutions discussing their principles (i.e., the deployment scenarios they address), explaining how corresponding mechanisms and procedures work and presenting the protocols involved and their role. (7 points)
Question 1) With reference to the MPLS network depicted in the following figure, specify (directly in the boxes in front of packets in the figure) the MPLS label(s) possibly prepended to each of the packets shown in the figure (leave the box blank if no MPLS header is used; in case more than one label is present, write on the outside the one at the top of the label stack). Consider packets to be in transit on the link close to which they are depicted. Consider that the address written on the top in the packets is the source one, while the address underneath is the destination one. (9 points)
Question 2) Pictorially describe (i.e., with a drawing) the headers required to authenticate the header and encrypt the payload of an IPv4 packet. Graphically highlight the various elements needed to obtain the required protection. Moreover, depict in a similar way (highlighting relevant elements) the headers used when in addition addresses in the IPv4 header shall be encrypted. (7 points)
**Question 3** A SIP user alice@iptel.org, already registered and connected to its own service provider, would like to make a phone call to another SIP user, bob@iptel.org. Assuming that the caller does not know yet the IP address of the callee, list all the messages sent and received by all the involved entities from the beginning of the call establishment procedure to the end of the call. Consider messages of all possible involved protocols. An answer based on a graphical representation is fine. (7 points)
**Question 4)** Describe IPv6 host autoconfiguration solutions discussing their principles (i.e., the deployment scenarios they address), explaining how corresponding mechanisms and procedures work and presenting the protocols involved and their role. (7 points)
i. Nothing else than what is needed to write (pen, eraser), a piece of ID, and possibly water and food can be taken at the seat where you take your exam. Please leave any other non allowed item you might have (coat, bag, phone, calculator, and any other object) at the front or back of the classroom.
ii. Only sheets of paper provided by who is administering the test can be used during the exam. The answers to all questions must be written exclusively on the same page of the question, which is the only material that will be graded. Do not forget to write your name and student ID in each one of the marked spaces on the exam paper.
iii. In case you will use whole pages or part of pages as a draft copy, please indicate it clearly and possibly cross out such parts before handing in the exam.
iv. The score assigned to answers varies from zero to the maximum score reported at the end of the question.
v. When answering questions, please feel free to use drawings whenever they can help expressing and clarifying the answer.
vi. Answers that are not understandable (for example because written badly or with bad handwriting) might be considered wrong.
vii. During the test, any communication with other classmates is prohibited and will cause the student to be sent away from the classroom.
viii. The instructors and the assistants that are present during the test are there for the sole purpose of verifying proper progress of the exam. Their role is not giving any support to the interpretation of the text, neither helping the students to correctly formulate the answers. Please avoid any such request.

Question 1) With reference to the MPLS network depicted in the following figure, specify (directly in the boxes in front of packets in the figure) the MPLS label(s) possibly prepended to each of the packets shown in the figure (leave the box blank if no MPLS header is used; in case more than one label is present, write on the outside the one at the top of the label stack). Consider packets to be in transit on the link close to which they are depicted. Consider that the address written on the top in the packets is the source one, while the address underneath is the destination one. (9 points)
Question 2) Pictorially describe (i.e., with a drawing) the headers required to authenticate the header and encrypt the payload of an IPv4 packet. Graphically highlight the various elements needed to obtain the required protection. Moreover, depict in a similar way (highlighting relevant elements) the headers used when in addition addresses in the IPv4 header shall be encrypted. (7 points)
Question 3) A SIP user alice@iptel.org, already registered and connected to its own service provider, would like to make a phone call to another SIP user, bob@iptel.org. Assuming that the caller does not know yet the IP address of the callee, list all the messages sent and received by all the involved entities from the beginning of the call establishment procedure to the end of the call. Consider messages of all possible involved protocols. An answer based on a graphical representation is fine. (7 points)
**Question 4)** Describe IPv6 host autoconfiguration solutions discussing their principles (i.e., the deployment scenarios they address), explaining how corresponding mechanisms and procedures work and presenting the protocols involved and their role. (7 points)
NOTES
i. Nothing else than what is needed to write (pen, eraser), a piece of ID, and possibly water and food can be taken at the seat where you take your exam. Please leave any other non allowed item you might have (coat, bag, phone, calculator, and any other object) at the front or back of the classroom.
ii. Only sheets of paper provided by who is administering the test can be used during the exam. The answers to all questions must be written exclusively on the same page of the question, which is the only material that will be graded. Do not forget to write your name and student ID in each one of the marked spaces on the exam paper.
iii. In case you will use whole pages or part of pages as a draft copy, please indicate it clearly and possibly cross out such parts before handing in the exam.
iv. The score assigned to answers varies from zero to the maximum score reported at the end of the question.
v. When answering questions, please feel free to use drawings whenever they can help expressing and clarifying the answer.
vi. Answers that are not understandable (for example because written badly or with bad handwriting) might be considered wrong.
vii. During the test, any communication with other classmates is prohibited and will cause the student to be sent away from the classroom.
viii. The instructors and the assistants that are present during the test are there for the sole purpose of verifying proper progress of the exam. Their role is not giving any support to the interpretation of the text, neither helping the students to correctly formulate the answers. Please avoid any such request.

Question 1) With reference to the MPLS network depicted in the following figure, specify (directly in the boxes in front of packets in the figure) the MPLS label(s) possibly prepended to each of the packets shown in the figure (leave the box blank if no MPLS header is used; in case more than one label is present, write on the outside the one at the top of the label stack). Consider packets to be in transit on the link close to which they are depicted. Consider that the address written on the top in the packets is the source one, while the address underneath is the destination one. (9 points)
Question 2) Pictorially describe (i.e., with a drawing) the headers required to authenticate the header and encrypt the payload of an IPv4 packet. Graphically highlight the various elements needed to obtain the required protection. Moreover, depict in a similar way (highlighting relevant elements) the headers used when in addition addresses in the IPv4 header shall be encrypted. (7 points)
Question 3) A SIP user alice@iptel.org, already registered and connected to its own service provider, would like to make a phone call to another SIP user, bob@iptel.org. Assuming that the caller does not know yet the IP address of the callee, list all the messages sent and received by all the involved entities from the beginning of the call establishment procedure to the end of the call. Consider messages of all possible involved protocols. An answer based on a graphical representation is fine. (7 points)