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| --- | --- | --- | --- | --- |
| Task. No.: | 1 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which of the following is Not an input device for a robot? |

|  |  |  |
| --- | --- | --- |
| A |  | Lidar |
| B |  | Camera |
| C |  | IMU |
| D |  | Raspberry Pi |
| E |  | Ultrasonic |

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| Task. No.: | 2 | Points: | 1 | **One answer is correct.** |

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| --- |
| What is the difference between robot programming and other conventional programming languages? |

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| A |  | Robot programming is low-level programming in which the architecture's robot should be known in advance. |
| B |  | Robot programming is based on robot input and output devices. |
| C |  | Robot programming is more structured and documented. |
| D |  | Robot programming is more challenging for development, debugging, and testing. |
| E |  | All of the above. |

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| Task. No.: | 3 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which of the following is not a ROS distribution? |

|  |  |  |
| --- | --- | --- |
| A |  | Ubuntu |
| B |  | Noetic |
| C |  | Melodic |
| D |  | Kinetic |
| E |  | Indigo |

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| Task. No.: | 4 | Points: | 1 | **One answer is correct.** |

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| What is the advantage of ROS2 over ROS1? |

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| --- | --- | --- |
| A |  | Higher robot security |
| B |  | Real time control |
| C |  | Minimal dependencies |
| D |  | Increased distributed processing |
| E |  | All of the above. |

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| Task. No.: | 5 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which of the following is Not true about robot operating system (ROS)? |

|  |  |  |
| --- | --- | --- |
| A |  | ROS supports third-party libraries such as OpenCV. |
| B |  | ROS supports popular programming languages such as Python. |
| C |  | ROS is a real operating system. |
| D |  | ROS has GUI tools such as rviz. |
| E |  | ROS is open source. |

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| Task. No.: | 6 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which of the following is the most important node in ROS? |

|  |  |  |
| --- | --- | --- |
| A |  | server |
| B |  | client |
| C |  | publisher |
| D |  | subscriber |
| E |  | master |

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| Task. No.: | 7 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which of the following can be used to process later the data from a robot? |

|  |  |  |
| --- | --- | --- |
| A |  | ROS bags |
| B |  | ROS services |
| C |  | ROS nodes |
| D |  | ROS topics |
| E |  | ROS messages |

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| Task. No.: | 8 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which command is used to print a message in a topic? |

|  |  |  |
| --- | --- | --- |
| A |  | rostopic pub |
| B |  | rostopic echo |
| C |  | rostopic list |
| D |  | rostopic print |
| E |  | rostopic info |

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| Task. No.: | 9 | Points: | 1 | **One answer is correct.** |

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| --- |
| What is the topic name in the following command? |

|  |  |  |
| --- | --- | --- |
| A |  | pub |
| B |  | chatter |
| C |  | Std\_msgs |
| D |  | String |
| E |  | Uwindsor |

|  |
| --- |
| smoz@smox-VirtualBox:~$ rostopic pub chatter std_msgs/String Uwindsor |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 10 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which command is used to run a node in ROS? |

|  |  |  |
| --- | --- | --- |
| A |  | roscore |
| B |  | rosparam |
| C |  | rostoipc |
| D |  | rosnode |
| E |  | rosrun |

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| Task. No.: | 11 | Points: | 1 | **One answer is correct.** |

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| --- |
| The smallest unit of processor running in ROS is called…. |

|  |  |  |
| --- | --- | --- |
| A |  | package |
| B |  | message |
| C |  | node |
| D |  | action |
| E |  | service |

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| Task. No.: | 12 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which command is used to execute multiple nodes? |

|  |  |  |
| --- | --- | --- |
| A |  | roscore |
| B |  | rosrun |
| C |  | ros wiki |
| D |  | roslaunch |
| E |  | rostopic |

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| Task. No.: | 13 | Points: | 1 | **One answer is correct.** |

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| --- |
| User-created packages and packages published by other developers packages are kept in the …. |

|  |  |  |
| --- | --- | --- |
| A |  | workspace |
| B |  | src folder |
| C |  | devel folder |
| D |  | build folder |
| E |  | metapackage |

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| Task. No.: | 14 | Points: | 1 | **One answer is correct.** |

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| --- |
| The build environment by Catkin command is described in the…. |

|  |  |  |
| --- | --- | --- |
| A |  | bashrc file |
| B |  | CMakeLists file |
| C |  | xml file |
| D |  | srv file |
| E |  | msg file |

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| Task. No.: | 15 | Points: | 1 | **One answer is correct.** |

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| --- |
| What is the name of the created package in the following command line? |

|  |  |  |
| --- | --- | --- |
| A |  | rob\_nav |
| B |  | std\_msgs |
| C |  | roscpp |
| D |  | rospack |
| E |  | roslib |

|  |
| --- |
| smoz@smox-VirtualBox:~$ catkin_create_pkg rob_nab std_msgs roscpp rospack roslib |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 16 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| The package.xml file contains….. |

|  |  |  |
| --- | --- | --- |
| A |  | Author name |
| B |  | license |
| C |  | dependent packages |
| D |  | version |
| E |  | All of the above |

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| Task. No.: | 17 | Points: | 1 | **One answer is correct.** |

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| --- |
| When building the package with *catkin\_make* command, you should be in the….. |

|  |  |  |
| --- | --- | --- |
| A |  | src folder |
| B |  | workspace folder |
| C |  | build folder |
| D |  | devel folder |
| E |  | root |

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| Task. No.: | 18 | Points: | 1 | **Two answers are correct.** |

|  |
| --- |
| Which of the following communication methods between nodes is asynchronous? |

|  |  |  |
| --- | --- | --- |
| A |  | topic |
| B |  | service |
| C |  | action |
| D |  | parameters |
| E |  |  |

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| --- | --- | --- | --- | --- |
| Task. No.: | 19 | Points: | 1 | **One answer is correct.** |

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| --- |
| Which of the following communication methods between nodes is unidirectional? |

|  |  |  |
| --- | --- | --- |
| A |  | topic |
| B |  | service |
| C |  | action |
| D |  | parameters |
| E |  |  |

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| --- | --- | --- | --- | --- |
| Task. No.: | 20 | Points: | 1 | **One answer is correct.** |

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| --- |
| When a service has long response time, we should use….instead. |

|  |  |  |
| --- | --- | --- |
| A |  | topic |
| B |  | service |
| C |  | action |
| D |  | parameters |
| E |  |  |

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| --- | --- | --- | --- | --- |
| Task. No.: | 21 | Points: | 1 | **Two answers are correct.** |

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| --- |
| In the following command line, what does ‘anonymous=True’ mean? |

|  |  |  |
| --- | --- | --- |
| A |  | rospy will choose a unique name for the ‘talker’ node. |
| B |  | multiple ‘talker’ nodes can run simultaneously. |
| C |  | an anonymous user can initiate the node. |
| D |  | only the author of the code can initiate the node. |
| E |  | None of the above. |

|  |
| --- |
| rospy.ini_node('talker', anonymous=True) |

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| --- | --- | --- | --- | --- |
| Task. No.: | 22 | Points: | 1 | **One answer is correct.** |

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| --- |
| In the following command line, which of the following is True about “quee\_size’ parameter? |

|  |  |  |
| --- | --- | --- |
| A |  | It is needed because topic in ROS is asynchronous. |
| B |  | If it is set to a small value, we may loss some messages. |
| C |  | If it is set to a large value, we need a large memory to keep messages. |
| D |  | All of the above |
| E |  |  |

|  |
| --- |
| pub = rospy.Publisher('chatter', String, queue_size=10) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 23 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| Consider the output of *rossrv show* command, which of the following is True? |

|  |  |  |
| --- | --- | --- |
| A |  | Server sends three integers to the client. |
| B |  | Client sends one integer to server and server sends back two integers to the client in response. |
| C |  | Client sends three integers to server, called a,b, and results. |
| D |  | Client sends two integers to server and server sends back an integer to the client in response. |
| E |  |  |

|  |
| --- |
| int64 a int64 b --- int64 result |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 24 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| Consider the following message type, which of the following is False? |

|  |  |  |
| --- | --- | --- |
| A |  | It belongs to a ROS service communication. |
| B |  | It belongs to a ROS action communication. |
| C |  | The goal is and integer. |
| D |  | The feedback is an array of integers. |
| E |  | The result is an array of integers. |

|  |
| --- |
| int32 order --- int32[] sequence --- int32[] sequence |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 25 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| Which of the following is False about this launch file. |

|  |  |  |
| --- | --- | --- |
| A |  | It launches only one node. |
| B |  | *Name* and *type* fields should always be the same. |
| C |  | When we run this launch file, we do not need to run *roscore*. |
| D |  | The node is in the *rospy\_tutorials* package. |
| E |  |  |

|  |
| --- |
| <launch> <node name="talker" pkg="rospy_tutorials" type="talker" /> </launch> |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 26 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| It is used to set the parameter value in a launch file? |

|  |  |  |
| --- | --- | --- |
| A |  | <env> |
| B |  | <arg> |
| C |  | <test> |
| D |  | <rosparam> |
| E |  | <param> |

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| --- | --- | --- | --- | --- |
| Task. No.: | 27 | Points: | 1 | **One answer is correct.** |

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| --- |
| What is the value of *timing* parameter? |

|  |  |  |
| --- | --- | --- |
| A |  | Not defined. |
| B |  | 10 |
| C |  | 20 |
| D |  | 30 |
| E |  |  |

|  |
| --- |
| <launch> <arg name="update_period" default="10" /> <param name="timing" value="$(arg update_period)"/> </launch> $ roslaunch my_package my_package.launch update_period:=30 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 28 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| Which of the following simulators does show the environment from robot point of view? |

|  |  |  |
| --- | --- | --- |
| A |  | Rviz |
| B |  | Gazebo |
| C |  | RoboDK |
| D |  | CoppeliaSim |
| E |  | SimSpark |

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| Task. No.: | 29 | Points: | 1 | **One answer is correct.** |

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| --- |
| This image shows the content of…. |

|  |  |  |
| --- | --- | --- |
| A |  | pgm file |
| B |  | yaml file |
| C |  | launch file |
| D |  | message file |
| E |  | XML file |

|  |
| --- |
| image: map.pgm resolution: 0.050000 origin: (-10.000000, -10.000000, 0. negate: 0 occupied.thresh: 0.65 free_thresh: 0.196 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task. No.: | 30 | Points: | 1 | **One answer is correct.** |

|  |
| --- |
| The image of the environment map is in the …. |

|  |  |  |  |
| --- | --- | --- | --- |
| A |  | pgm file |  |
| B |  | yaml file |  |
| C |  | launch file |  |
| D |  | mpeg file |  |
| E |  | jpeg file |  |

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| Task. No.: | 31 | Points: | 1 | **One answer is correct.** |

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| OpenCV and ROS…. |

|  |  |  |  |
| --- | --- | --- | --- |
| A |  | Are computer vision frameworks. |  |
| B |  | Can be used interchangeably. |  |
| C |  | Are incompatible. |  |
| D |  | Can communicate with *cv\_bridge* library. |  |
| E |  |  |  |

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