



Knowledge & Vocation Test

on the completed modules of the Days of Robotics, covering Mechatronics, Robotics, and VR Technologies

1. Please write your name below.
2. Answer all questions to the best of your ability.

Name: _____

Good luck! Believe in yourself — you're ready for this!

Mechatronics

Choose the right option

- | | |
|--|---|
| <p>1 Can you be a robotics engineer without studying mechatronics?</p> <p>2 Mechatronics appeared as a science in the</p> <p>3 Kinematics is about</p> <p>4 Mechatronics is based on (you may choose multiple answers)</p> <p>5 Microcontroller (MCU) is</p> <p>6 What programming language is commonly used for programming microcontrollers?</p> <p>7 What is an approximate size of MEMS sensor sensing?</p> <p>8 Dynamics is about</p> | <p>a. Yes
b. No</p> <p>a. XIX century
b. XX century
c. XXI century</p> <p>a. Computer vision
b. Kinetic and potential energy
c. Motion</p> <p>a. Electronics
b. Programming
c. Chemistry
d. Mechanics
e. All of the above</p> <p>a. Small computer with peripherals
b. Power converter
c. Unit with multiple sensors
d. Memory unit</p> <p>a. Java
b. Python
c. C/C++
d. Java Script</p> <p>a. 1-10 micrometers
b. 1-10 millimeters
c. 1-10 centimeters</p> <p>a. Forces and momentums
b. Electricity
c. Digital interfaces</p> |
|--|---|

9 Which sensor allows obtaining robot position and orientation?

- d. Trajectory planning
- a. Gyroscope
- b. Accelerometer
- c. Barometer
- d. Magnetometer
- e. All of the above

10 How many Universities in Russia teach Mechatronics?

- a. 0-5
- b. 6-10
- c. 10-15
- d. More than 15

Is mechatronics interesting for you? Choose from 0 (No) to 5 (very interesting)

0 1 2 3 4 5

Robotics

Choose the right option

1 Today robotic systems are used in

- a. Power engineering
- b. Industrial production
- c. Transport
- d. Telecommunication
- e. Agriculture
- f. Heavy industry//social care
- g. All of the above

2 What is the main rule of robotics (according to Isaac Asimov)?

- a. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
- b. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
- c. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.
- d. All of the above

3 How different parts of robot interact?

- a. Using digital or analog interfaces
- b. Loud and clear
- c. Via mechanical transmissions
- d. With AI

4 Today robotic systems are mostly used in

- a. Power engineering
- b. Industrial production
- c. Transport
- d. Agriculture
- e. Heavy industry
- f. Social Care
- g. All of the above

5 What are the common parts of mobile robot?

- a. Sensors
- b. Microcontroller / Computer
- c. Actuators
- d. Mechanical transmissions
- e. Wires
- f. All of the above

- 6 Which of the following factors does not influence the autonomous vehicle control?
- 7 Which type of mobile robot is the best for any type of terrain?
- 8 What is the best way for a robot to find an exit from the maze?
- 9 Which of the following components is NOT part of Duckiebot?
- 10 What task does Duckietown solve in the context of teaching robotics?
- 11 Which of the following sensors is most commonly used in autonomous vehicles for object detection?

- a. Distance sensors
 b. GPS
 c. Body color
 d. Camera
- a. Ball bot
 b. Omni-wheel robot
 c. 4WS-4WD robot
 d. Crawler robot
- a. Take random directions
 b. Build maze map and find optimal trajectory
 c. Take one direction and go through walls
 d. Jump/fly over walls of the maze
- a. Camera
 b. Motors
 c. Wireless module
 d. Temperature sensor
- a. Managing complex algorithms
 b. Modeling urban traffic
 c. Learning programming languages
 d. Designing airplanes
- a. Temperature sensor
 b. Ultrasonic sensor
 c. Pressure sensor
 d. Camera

0 1 2 3 4 5

Would you like to get the robotic engineer education? Choose from 0 (No) to 5 (very interesting)

VR Technologies

- 1 Difference between virtual (VR) and augmented (AR) reality is in...
- 2 VR technical tools include
- 3 In future education VR will be used for
- 4 Can education in virtual reality replace reality studies

Choose the right option

- a. Use of optical devices
 b. Degree of immersion into artificial reality
 c. VR creates a fully artificial environment, AR augments the real scene with artificial objects
- a. Helmets
 b. Gauntlets
 c. Plate mails
- a. Remote Classes
 b. Practice In Realistic Conditions
 c. Passing Exams

- a. Yes
 b. No

Explain your choice:

- 5 Can VR/AR use different types/ranges of cameras?
- 6 Can VR/AR technologies be used in conjunction with Computer Vision?
- 7 Where can you get education on the VR technologies (use the Interactive map)?
- 8 Which course including VR technology studies would you take in Russian universities?
- a. Yes
b. No
c. Only AR
- a. Yes, they naturally complement each other
b. No
- a. Moscow
b. Vladivostok
c. Makhachkala
d. Kazan
e. Omsk
f. St. Petersburg
- a. Computer vision
b. Art & design
c. Predictive architecture
d. Development of computer games
e. Traffic modelling

Are professions with VR technology applications interesting for you? Choose from 0 (No) to 5 (very interesting)

0 1 2 3 4 5