

Robotics Team 2022 Recruitment Interview Questions

Please pick ONE question from below and prepare your answer before coming to the interview session. (Don't worry too much if you are not confident with your answer or do not know how to answer. Just try your best!)

Remarks:

1. The interview will be conducted in English.
2. The time limit is 5 minutes.

Hints:

1. Google is your best friend.
2. You may use sketches, prototypes, flowcharts and/or any other tools to present your answer.

For questions 1, please take reference to the following figures. All dimensions are in millimetres.

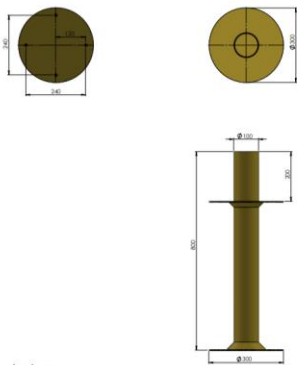


Fig. 1 Pole

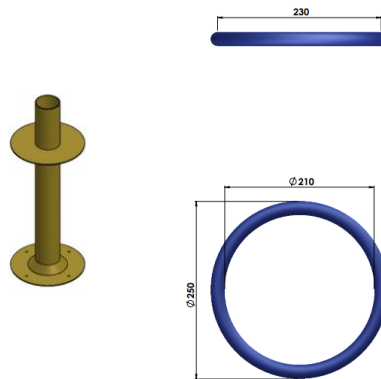


Fig. 2 Ring

- Note:
1. All dimension in mm.
2. Material- steel tube
- Note:
1. Material – Rubber hose
- Q1. Given the distance between the ring and the pole is 6m, design a mechanism to shoot the ring onto the pole.
 - Q2. What problems may occur on the electronics part of the robot if we need to place robots underwater? Suggest a way to solve the problem.
 - Q3. State and explain some possible reasons of sudden voltage drop. Suggest a way to solve the problem.
 - Q4. Can you briefly explain the functions of the following tools (select 3 from 5):
 - i. Multi-meter
 - ii. Soldering iron
 - iii. Oscilloscope
 - iv. E-load
 - v. Power supply
 - Q5. Given a 20cm diameter rubber ring, you are required to aim at a 1.6m tall pole. You may use any sort of sensors, how can you ensure the rings are thrown or aimed accurately and consistently while keeping the solution as simple as possible using software means?
 - Q6. Given C, C++, Python (CPython Implementation), and Java, which two languages will you choose for programming robotics applications? Describe the two different situations and explain why.
 - Q7. What is a PCB? Try to design a circuit to step down 12V to 5V. Please specify the components used.
 - Q8. What are the differences between reinforced carbon fibre, reinforced glass fibre and aluminium? Please choose one and explain its advantage.