



**THE NATIONAL INSTITUTE OF ENGINEERING**  
(An Autonomous Institute Under VTU)  
**DEPARTMENT OF MECHANICAL ENGINEERING**  
Manandavadi Road, Mysuru-570008, Karnataka, India.  
**THE ROBOTICS CLUB @ NIE**

The recruitment test/interview for the **Robotics Club@ NIE** will have questions from the various topics mentioned below. We expect everyone to be thorough with the basics. The questions may also include topics such as logic development, aptitude and personal questions.

**ALL THE BEST!!**

**1. C Programming:**

Programming: Basic concepts of programming, Classification of programming languages, Structure of a program, Introduction to algorithms and flow charts, Logic development.

C language: Introduction to C, History of C, OOPS and POPS, Structure of C, File inclusion, C tokens, Operators and Expressions, Conditional statements, Loops, Introduction to arrays, Functions, Introduction to user-defined functions, Basic programs.

**CLUB @ NIE**

**2. Arduino:**

Introduction to Arduino: Arduino IDE, Advantages, Application and Limitations, Different Arduino boards and their architecture, Damage control of arduino, Difference between microcontrollers and microprocessors.

Arduino Programming: Basics of Arduino C/C++, Basic inbuilt functions with syntax, Basic syntaxes of I/O functions, Loops, Conditional statements, etc, Basic Programs.

**3. Motor and motor driver:**

Working Principle of motors, Types of motors, Application of motors, Introduction to motor driver, Types of motor drivers, Construction, Working and difference between L293D and L298N, Interfacing motor and motor driver, PWM, Basic program to code motor drivers to control motors with and without PWM. Introduction to servo and stepper motors.

#### **4. Arduino sensors:**

Introduction to sensors in general: Definitions of precision, accuracy, error, calibration, sensitivity and insensitivity, Characteristics of a good industrial sensor, Types of sensors with examples, Applications.

- a. Infrared Sensor: Introduction, Working principle and Characteristics of IR sensor, Application in real life, IR sensor in Line follower, PID, Basic coding of IR sensor to build a line follower.
- b. Ultrasonic Sensor: Introduction, Working principle and Characteristics of Ultrasonic sensor, Application in real life, Ultrasonic sensor in Maze solver, Basic coding of Ultrasonic sensor to construct a maze solver.
- c. ADXL sensor: Introduction, Working principle and Characteristics of ADXL sensor, Application in real life, ADXL in gesture controlled robot, Basic coding using ADXL.

#### **5. Designing a Robot**

Basics of engineering design, Introduction to CAD, Different projections and views in CAD, 3D/2D modelling of various objects, Knowledge of Equations of various geometries and Basic Mathematical concepts, Basics of kinematics and mechanics, Basics of circuit and electrical/electronic concepts.

