INTERNATIONAL MEB

ROBOT

COMPETITION

17ᵗʰ INTERNATIONAL MEB ROBOT COMPETITION

DESIGN-BUILD

(JUNIOR) CATEGORY RULES

2025

Education, Technology, Production from Roots to the Future

CONTENTS

DESIGN&BUILD (JUNIOR) RULES

1. INTRODUCTION

1.1. Objective

This competition is based on competing professional skills, knowledges and programming experiences of students. Teams will provide all the products, materials, hand tools and laptops which are announced by the organization in the specifications necessary for robot construction in their province where their schools are located before the competition and will keep them ready with them. No materials will be given to the teams before the competition, only an envelope containing the information of the track where the robot will compete and the rules of the competition will be given and they will be asked to race them in competition area.

2. Competition Format and Evaluation

2.1. Application Process

Competition applications are made according to the process and principles specified in the Application Guide. Competitors who meet the conditions specified in the Application Guide will be able to participate in the competitions.

2.2. Competition Stages and Evaluation

2.2.1. Competition stages:

The competition will last for three days and teams will consist of two competitors. On the first day, all teams will participate in the qualification exam at the same time. The teams that pass the qualification exam will settle at their tables determined by lot on the second day in the morning and make preparations for designing and programming their robots. In the afternoon of the same day, the teams will program their robots with the computers provided by the organisation and make them ready for the competition by testing them on the test track. At the end of the period, the robots will be delivered to the referees and the final ranking will be determined by the final races to be held in front of the audience on the third day.

2.2.2. Evaluation

The evaluation criteria will be announced to the teams just before the competition starts.

2.3. Tasks definitions and Success Criteria

The game principles will be announced to the teams just before the start of the competition.

Competition rules, how the competition will be carried out and scored will be announced to the teams just before the competition starts. The prepared robots will compete on the competition track in the order of draw.

2.3.1. Competency Exam

Competency exam will be held at first day of competition. All team members will sit the exam at the same time. Participation in the exam with a single team member will not be possible.

Exam will consists of multiple choice questions which are related with the following topics.

- Basic Electric & Electronics ,

- Basic Digital Electronics,

- Arduino

- Basic Arduino Programming.

*** You can see sample questions at Appendix-1.

Teams will be sorted according to their scores at the end of exam.

If teams have same scores , the team which gives its exam sheet earlier will be listed upper than other.

If teams are still equal, the one has lower average age will be listed upper than other. Only 40 teams from top of list will get right to join "**design**" session of the competition.

2.3.2. Designing

Teams that successfully pass the qualification exam will be placed on the tables where they will work according to the order of lots. Competitor teams will design their robots and make them ready for programming within the specified time after they move to the work areas reserved for them. Teams will be present at the tables with all the materials they bring with them. The characteristics of the track/platform where the competition will be held and the

tasks of the robot will be given to the competitor teams in a sealed envelope just before the competition starts.

2.3.3. Programming

The teams will make their robots ready for the competition by programming them with the computer given to them by the organisation within the specified period and trying them on the test track. At the end of the period, the referee committee will receive the robots from the competitors and will deliver them again on the third day at the time of the final competition. The ranking list will be announced by the referees at the end of the competition.

2.3.4. Racing

The final races will be held in the indoor hall according to the order of draw in front of the audience.

3. Robot Specifications

Robots move autonomously.

While designing robot, using any kind of module except modules announced by organization is not allowed.

Using any kind of communication modules such as wireless, bluetooth, etc is strictly forbidden.

Power unit; Using any kind of power supply on robot except LI-PO battery which announced by organization will not be allowed.

4. Other Rules

- The Tournament Committee reserves the right to change the rules when necessary without giving a reason.

- The computers to be used in the competition will be formatted by the school assigned by Kayseri Provincial Directorate of National Education and will be brought to the competition area in a re-installed and working condition.

- Contestants; computers, mobile phones, tablets, USB sticks, external discs, smart watches, etc. electronic devices will not be allowed to be brought with them.

- The computers that will be given to the participants by the competition organisation in the competition area will have the operating system, office application program, pdf reader program and the Arduino IDE program downloaded from https://www.arduino.cc/en/Main/Software and the necessary libraries installed. Programming will only be done using this programme. There will be no different applications and programmes other than these software. Computers will be examined by the referee committee before the competition.

- Before the start of the competition, the following products and materials to be used in robot construction will be available at the work tables and the robot will be built using the product groups specified in the list.

5. Equipments

Some of the materials will be provided by the organisation. Other materials will be brought by the competitors. Teams will be able to have twice as many materials ready with them as the specified quantities of other materials other than Tool Box and Hand Tools. (For example, RGB Colour Sensor is specified as 1 piece and if desired, maximum 2 pieces can be brought).

5.1. Materials to be provided by the Organisation.

- **Motors;**

*DC Gear Motor 6V   2 pieces *(will be given by organization)*

- **Others**

*DC Motor Bracket   2 pieces *(will be given by organization)*

*Wheel   2 pieces *(will be given by organization)*

*Robot Body   1 pieces *(will be given by organization)*

*Ball Caster   1 pieces *(will be given by organization)*

5.2. Materials that Competitor Teams should bring with them

- **Mainboards:**

Open source microcontroller board

DC motor driver shield (double motor driver board)

- **Sensors:**

Line Sensor array (8 sensor)	1 piece,	Analog signal
4-Line sensor array	1 piece	
Object detection Sensor	3 pieces	2-450cm Ultrasonic distance sensor

- **Batteries;**

LI-PO Battery	1 piece	7.4V
LI-PO Charger	1 piece	

- **Others;**

Sensor holder	3 pieces

- **Tool Box and Tools:**

Inside tool box, there will be the following tools;

Tool Box	1 piece	15"
Bread Board	1 piece	
Jumper Cables	2 pieces	male- male, female- male 40pin 100mm
Mini Plier	1 piece	
Screwdriver set	1 piece	
Screw-Nut Set	1 piece	M2 YHB Screw, Nut and Washer in sufficient quantity
USB cable (1 meter)	1 piece	compatible with board
Double sided Tape	1 piece	

6. CONTACT

The general rules regarding the competition applications and the Labyrinth Master Category are included in the 'Application Guide'. The Application Guide must be read before making an application.

Competitors should make their questions by selecting their categories from the information menu after logging into the robot.meb.gov.tr system. Questions other than category messages will not be answered and no responsibility will be accepted.

Appendix-1 SAMPLE QUESTIONS;

S-1) What is the value of resistance which has following color code: Red – Green – Yellow – Silver?

a)2 KΩ   b) 200 KΩ   c) 250 KΩ   d) 2 MΩ

S-2) Which one is the symbol of diode?

a)   b)   c)   d)

 S-3) Which one is not present in a simple electric circuit?

a)Battery   b) Cable   c) Bulb   d) Fuse

S-4) Task of which of following circuit component is incorrect?

a) Battery generates electric engery
b) The connection cable prevents the passage of electrical energy.
c) The light bulb converts electrical energy into light energy.
d) The switch controls the passage of electrical energy.

S-5) Below are simple electrical circuits with identical batteries and lamps.
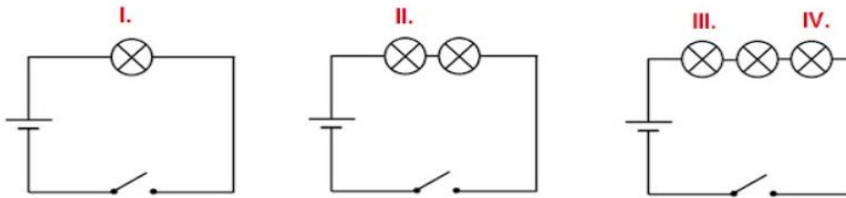
When switch is turned on, which of lamp gives the brightest light?

a) I   b) II   c) III   d) IV

S-6) Which one is correct statement to activate output pin 3 of Arduino?

a) digitalWrite(3,LOW);   b) digitalWrite(3,SET);

c) digitalWrite(3,HIGH);   d) digitalWrite(3,high);

S-7) Which script can be used to define all pins of Arduino from 3 to 9 as output?

a) for(int i=0;i<10;i++)   b) for(int i=0;i<10;i++)
    pinMode(i,output);   pinMode(i,OUTPUT);

c) for(int i=3;i<10;i++)   d) for(int i=3;i<10;i++)
    pinMode(i,output);   pinMode(i,OUTPUT);