CIVIONICS

Segmental concrete bridge construction has become a very important method in spanning deep valleys, wide water crossings, and across highways and existing facilities without the use of costly and often environmentally sensitive false work.

Problem Statement:

Build a manual robot which can lift the pre-cast segments of the bridge and join them together. Once the bridge is complete there should be another robot ready to cross the valley over the completed bridge. The bot should be able to move in the arena without hitting the support towers placed.

Arena Specifications:

No. of segments: 6:- 3 on each side of the supporting column.

Dimensions of the segments:

Length: 10 cm

Width: 15 cm

Height: 4 cm (See picture for better understanding)

Dimension of supporting structure:

Column: Height: 25cm Base: Length: 9cm Width:5cm

Cantilevers: Length: 30cm on each side Cross-section: 9cmX4cm

There will be inclined ramps on both the sides from ground level to the height of segments paced on cantilever supports.

Task:

There are 3 parts of the task

Casting Yard: It is the area where the pre-cast segments are kept. First robot has to lift the segments one by one from casting yard and take them to the site.

Site: Where the construction work is going on. Robot has to lift the segment and hang it over the cantilever such that segments fit around the cantilever support. (Further explained in the pictures)

Completion: Second robot should cross the completed bridge.

Marking Scheme:

1. **Total time taken by the team (t in sec).**
2. **No. of segments attached (N).**
3. **No. of segments covered by the other robot (n). In this case, there is no restriction that the second robot has to cover the segments only after completion of first's task.**
4. **Total Marks = nX50+NX100-(480-t)X100/60.**

Robot specifications:

1. **The bot should be manually controlled with the required mechanical setup to perform the given task.**
2. **The main bot (referred to as first) should be able to fit inside a box of 35cm X 25cm X 30cm before the commencement of each task.**
3. **For the other bot (referred to as second) there is no restriction on size however it must be able to pass the bridge.**
4. **Dimensions may exceed once the event begins.**

5. **Wires (if any) connecting the bot to the control system must be held slack through the event.**
6. **Lego kits and complete car bases are not allowed.**

Note: Segments can be freely inserted into supporting cantilever frame with gentle force.

Rules:

1. **Maximum team size 5 members per team. No two teams may have any common member.**
2. **Total Time: 8 min**
3. **The bot must not cause any damage to the arena. In event of any damage, the team would be liable for disqualification.**
4. **The participants will be provided with 220 Volts, 50Hz standard AC supply. Participants will have to themselves arrange for any other power supply required for their robot.**
5. **Teams cannot tinker with their bots in the arena.**
6. **The decision of the CIVIONICS Team shall be final and binding.**

For any general queries mail to submissions@megalith.co.in

For more information visit: www.megalith.co.in

For more details, contact:

Aditya Singh : 07501378194 : adi@megalith.co.in

Sreeman Mypati : 09441766518 : sreeman@megalith.co.in