

TECHNOVANZA

Taking Technology to Society



INDIAN POST

Service Before Help

From the era of “kabootar ja ja ja....” to the era of “sandese aate hai....” it is pretty evident that letters have always been an integral part of general long distance communication. In ancient times the kings, emperors, & zamindars protected their land through the intelligence services of specially trained police or military agencies and courier services to convey and obtain their information through runners, messengers and even using pigeons in the most parts of India. The chief of secret service, known as ‘**Daakpaal**’, maintained the lines of communication.

Today, **Indian Post**, the primary postal service of India, offers us - Mail Services, Financial Services (banking and money remittance) and Insurance services besides a host of other products such as Philately, Retail Services. Aadhaar enrolment & updation, Post Office Passport Seva Kendra etc. are also incorporated with its core business of mail and parcel delivery.

The principal work of Indian post begins with collecting the letters from letter boxes via delivery trucks, this delivery truck goes to the **AMPC** (Automated Mail Processing Center) which is the head quarter of the Indian post located at Indira Gandhi Airport T-3. The letters and articles are separated via automation and manual work, as invert sort plan and outvert sort plan according to their respective delivery locations, namely the city area and the rural area. Online parcels and orders are some of the additional services provided by the Indian Post which are collected from **BNPL Hub** (Book Now Pay Later) and segregated via the same sort plan.

Indian Post has recently inducted a huge IT modernization project to provide more visibility and ease to the public, in accessing postal and other citizen centric services. **IPPB** (Indian Post Payments Bank) service is one such initiative by the Indian Post to reach out to distant rural areas for banking services. Opening of bank account with the help of Bio-metric machines and mobile number is one of the services which come under IPPB. This is meant to make the process accessible and less tedious for rural people.

Indian Post is changing its dimensions to serve the country and its citizen with aim to act as a Window to the World for Common Man. It is dedicated to be socially committed, technology driven, professionally managed and forward looking organization.



INTRODUCTION:

Team Specification: A team can consist of maximum 6 participants.
Students from different educational institutes can form a team.

CERTIFICATION:

1. Certificate of Participation will be awarded to all the teams.
2. Certificate of Excellence will be given to the top three teams.
3. Disqualified teams will not be considered for any certification.

Cash prize of INR 70,000 to be won.

FREE Registration for all the events and non-commercial exhibition.

CHARACTERS:

- Postman (Manual robot)
- Delivery Truck (Auto robot)

ARENA:

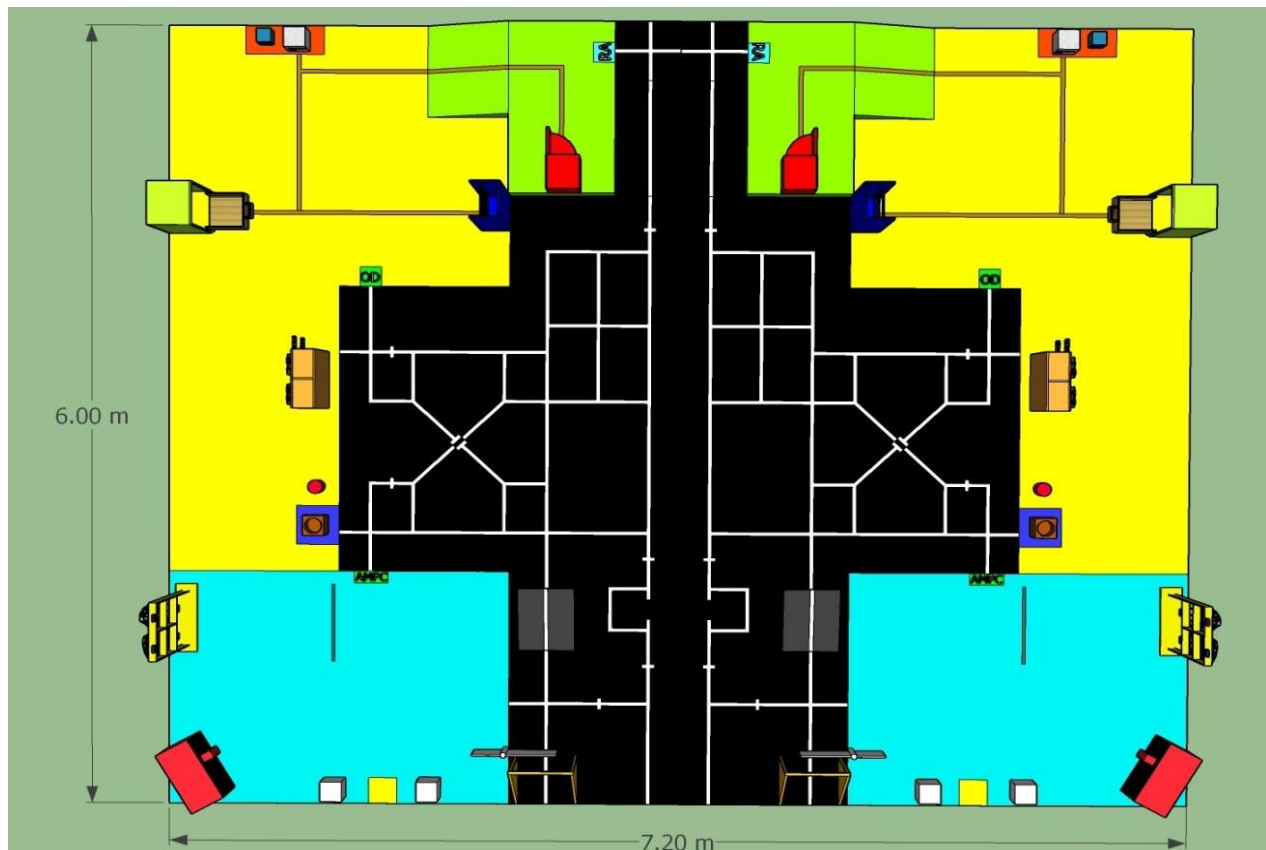
- The field consists of an area having dimension $7.2m \times 6m$.
- The game field consists of-
 1. Automated Mail Processing Unit (AMPC).
 2. Book Now Pay Later Hub (BNPL Hub).
 3. New Delhi (ND).
 4. Old Delhi (OD).
 5. Rural area (RA).
 6. Indian Post Payments Bank (IPPB).
 7. New Delhi Junction.



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FULL ARENA TOP VIEW:

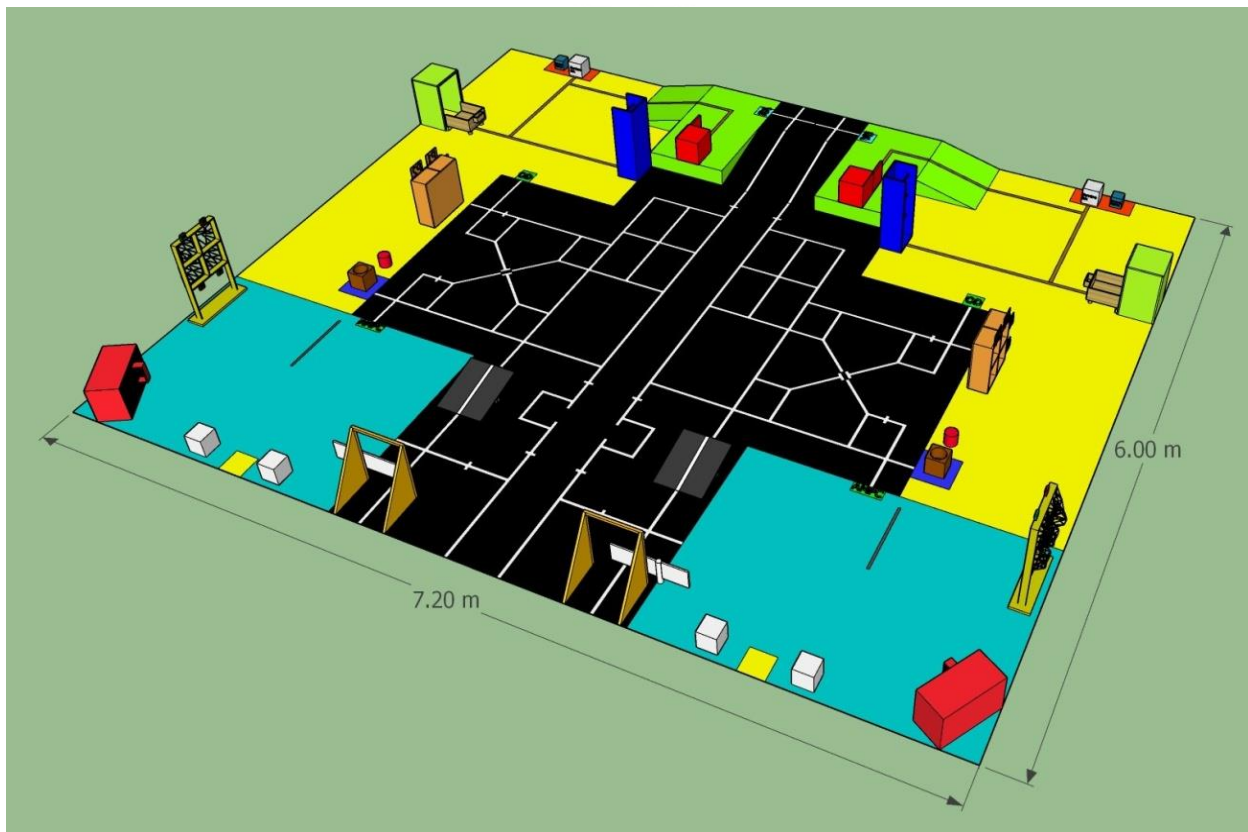




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FULL ARENA ISO-VIEW:

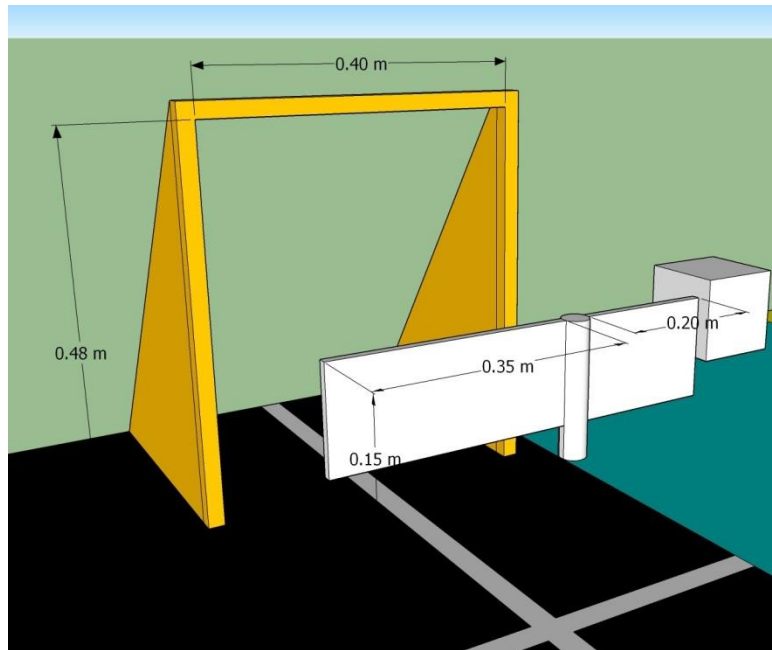


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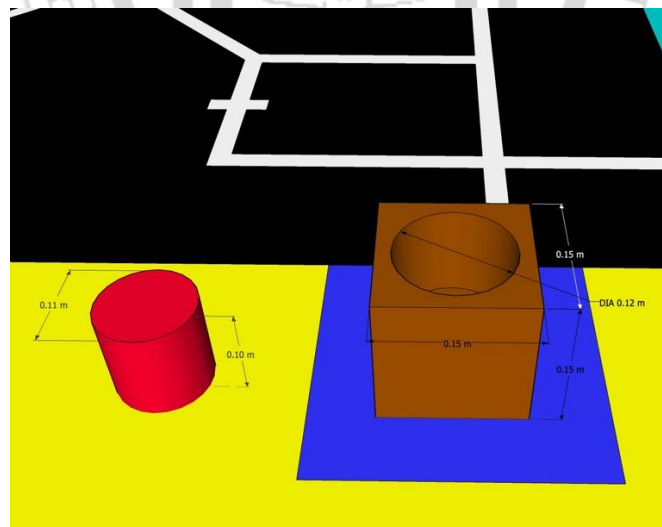


AUTO GODOWN:



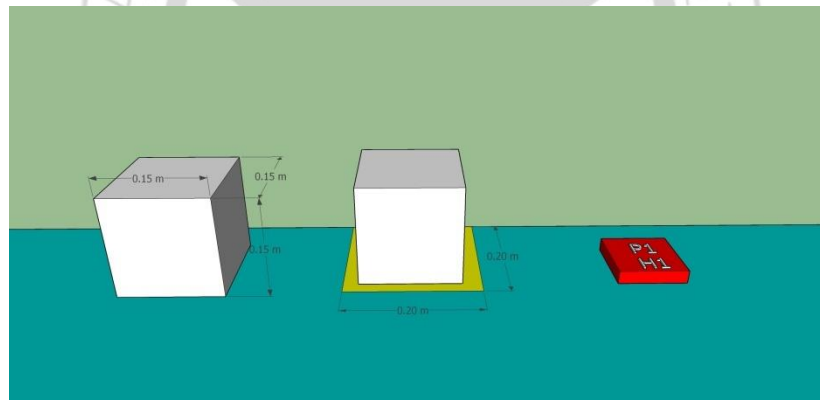
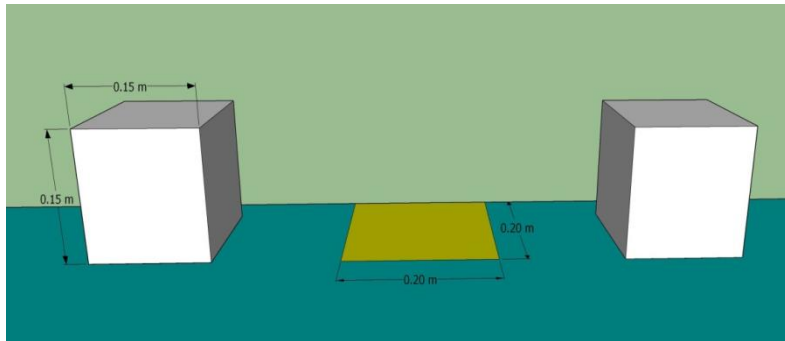
Manual Robot has to rotate the Auto Godown gate (extended in the Manual Arena) such that the part of gate in auto arena gets rotated to clear the passage for Auto Robot.

STAMPING OF ONLINE PARCEL(BNPL HUB):



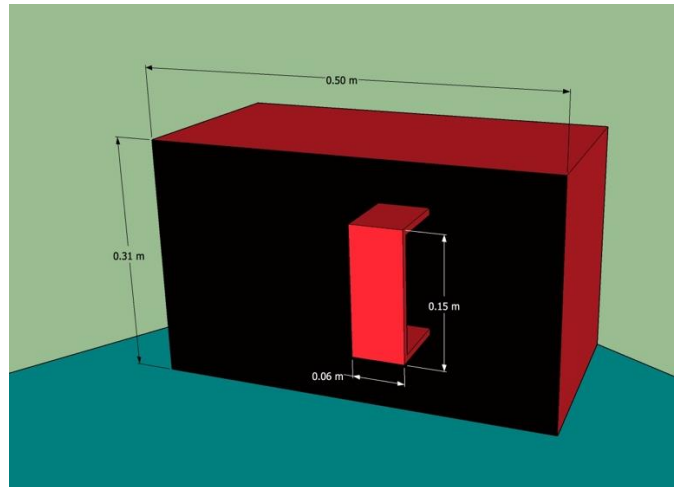
Manual Robot has to fill the cavity of the box with the stamp.

SEGREGATION:

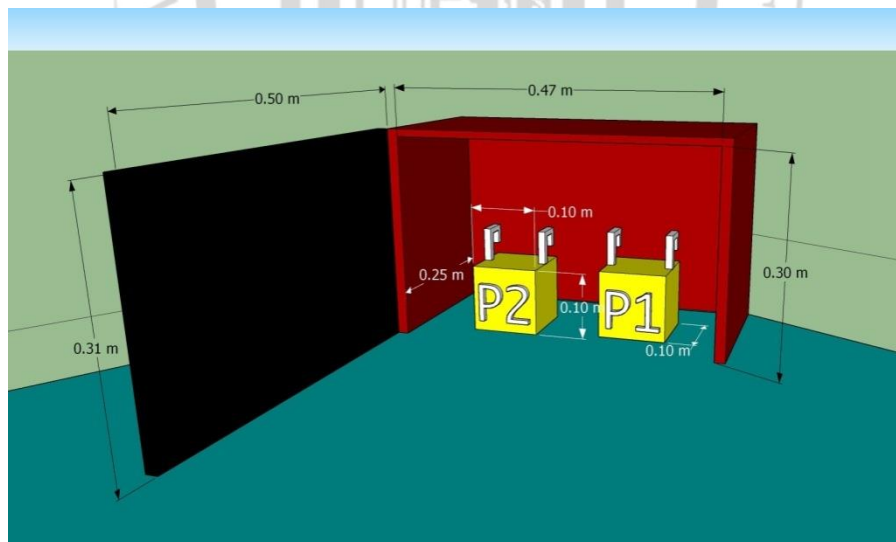


There will be two different boxes with different codes on them, covered by shells. Manual Robot has to uncover one of the shells and place it on the given spot to reveal one code.

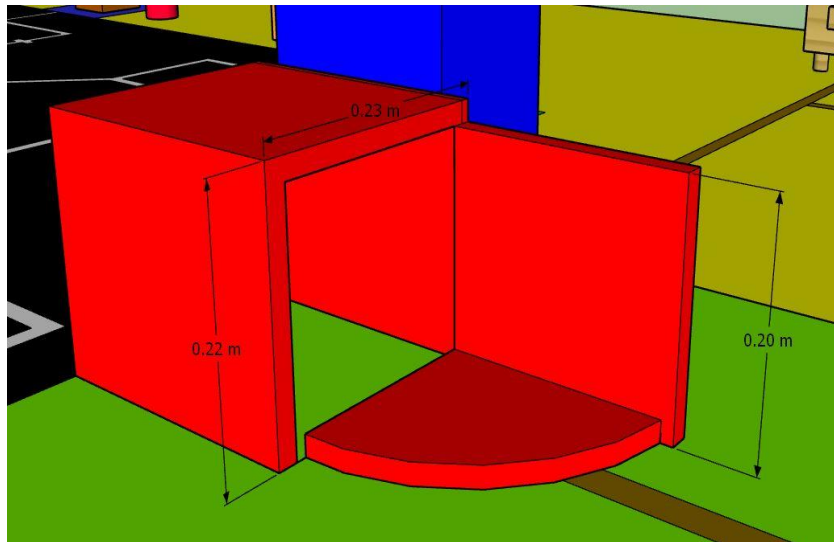
POSTBOX:



Manual Robot has to open the door of post box by pulling the handle of postbox door.

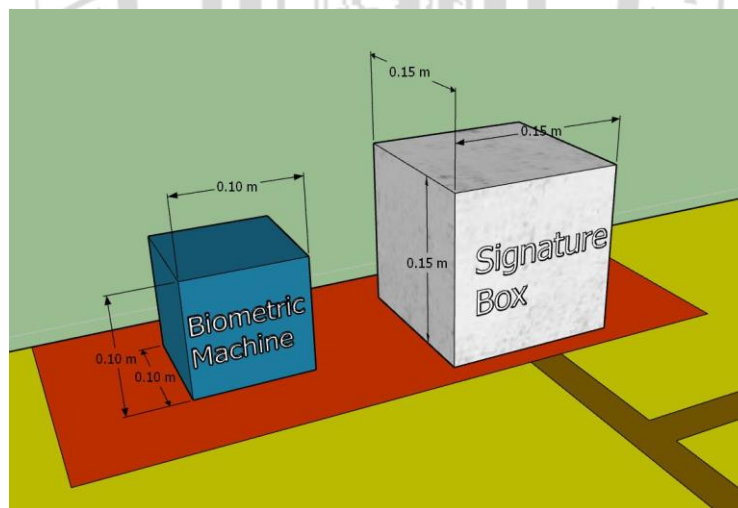


RURAL AREA - HOUSE 1(H1):



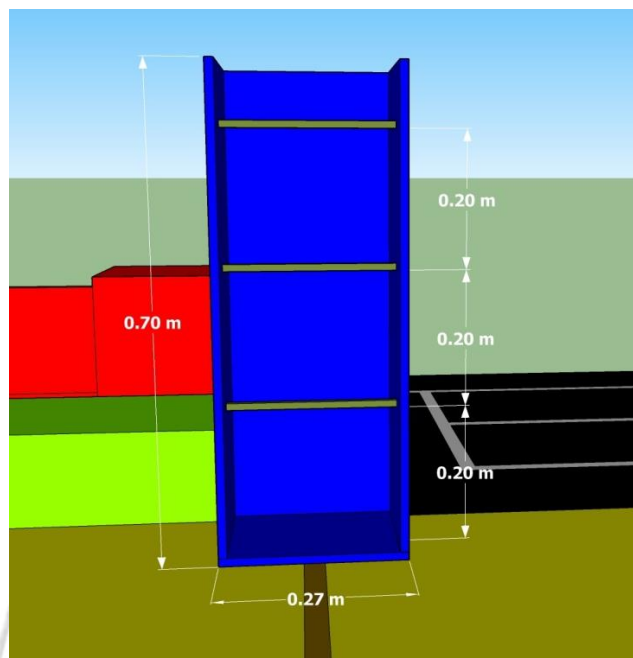
Manual Robot has to collect the parcel from auto robot at RA and deliver it by putting it on the base of the plank attached to the door of House and then rotate the door to close it.

BIOMETRIC AND SIGNATURE BOX (NODE):



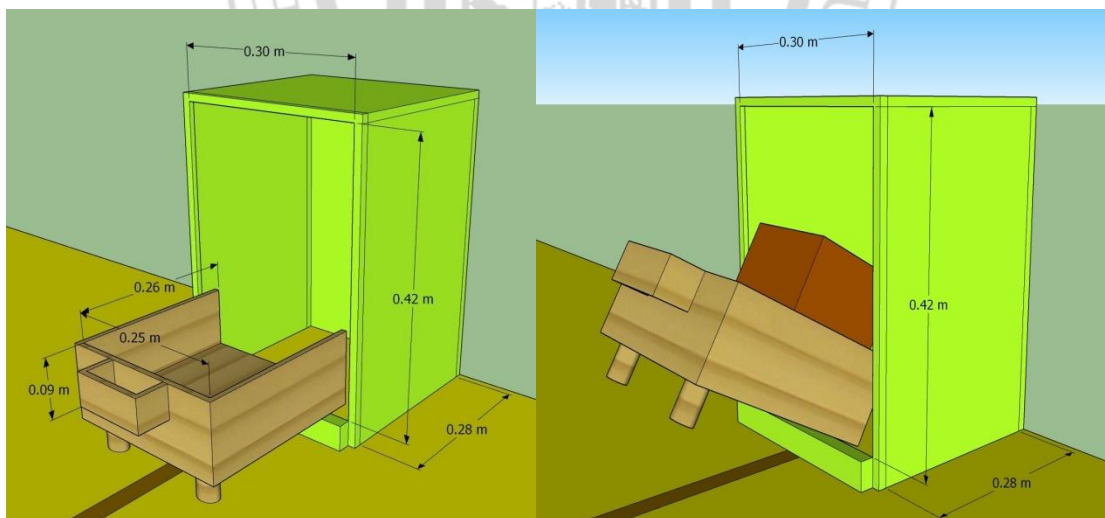


OLD DELHI - HOUSE 2(H2):



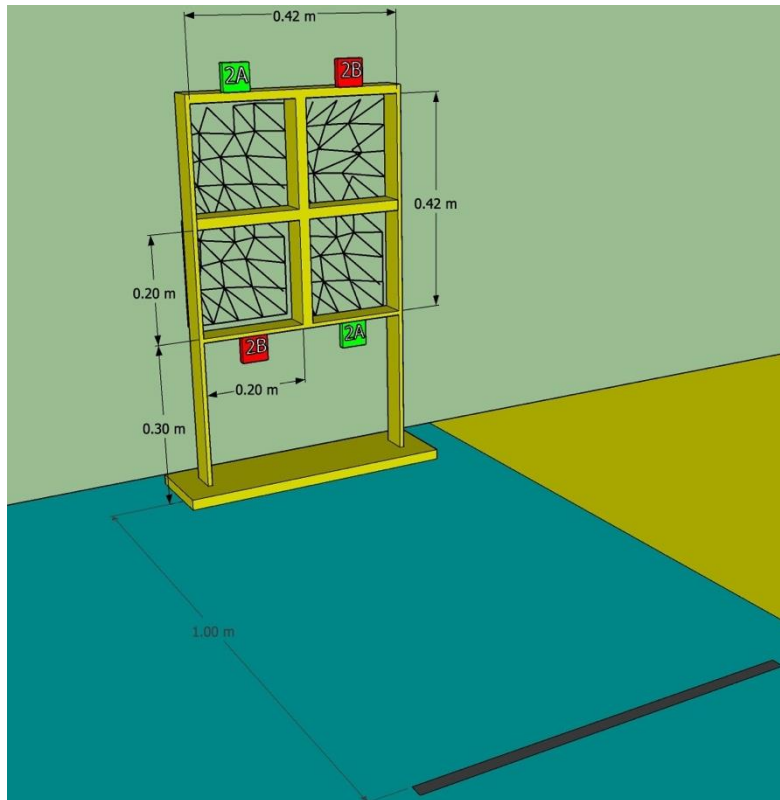
Manual Robot has to collect the parcel from auto robot at OD and hang it on one of the rods in House. There will be three rods on three levels of the House; manual robot will be given points according to the level on which the parcel is hung.

NEW DELHI - HOUSE 3(H3):



Manual Robot has to put the online parcel in the tray and incline it from the outer edge so that the parcel in it slides inside the house completely.

SORTING SQUARES:



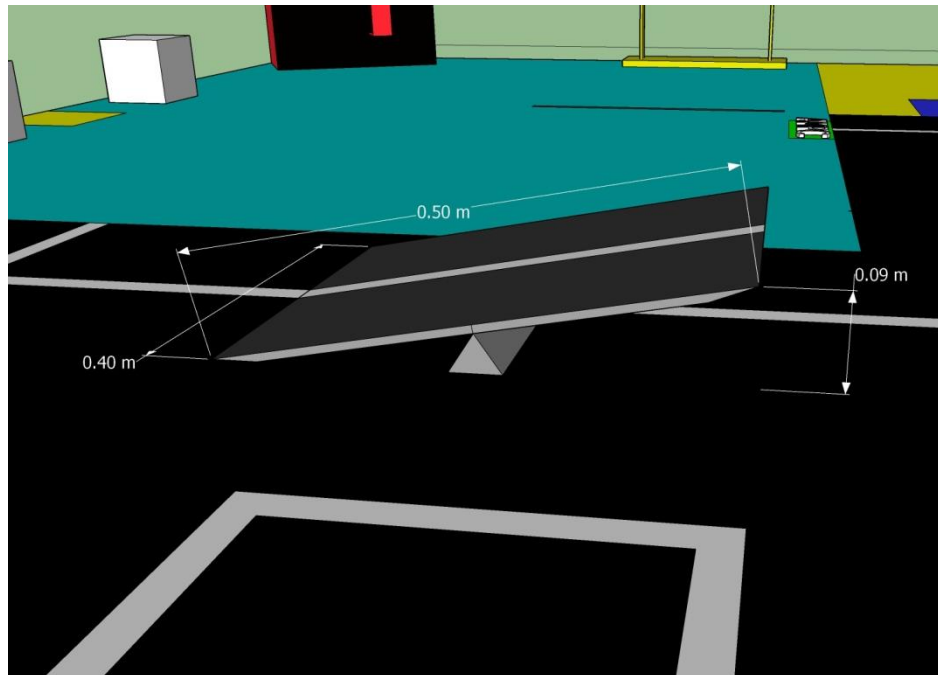
Manual Robot has to project the ball into one of the squares (named as 2A and 2B) to decide the tracing path sequence of the Auto Robot. The projectile motion should direct the ball into one of the square. Maximum 3 chances are allowed per participant.

FOR EXAMPLE:

1. If projectile ball passes through one of the squares named 2A then Auto Robot has to first move towards rural area (RA) and has to deliver the parcel at House1 and then it will move to Old Delhi (OD) for delivering the other parcel.
2. If projectile ball passes through one of the squares named 2B then Auto Robot has to first move towards Old Delhi (OD) and has to deliver the parcel at House2 and then it will move to rural area (RA) for delivering the other parcel.

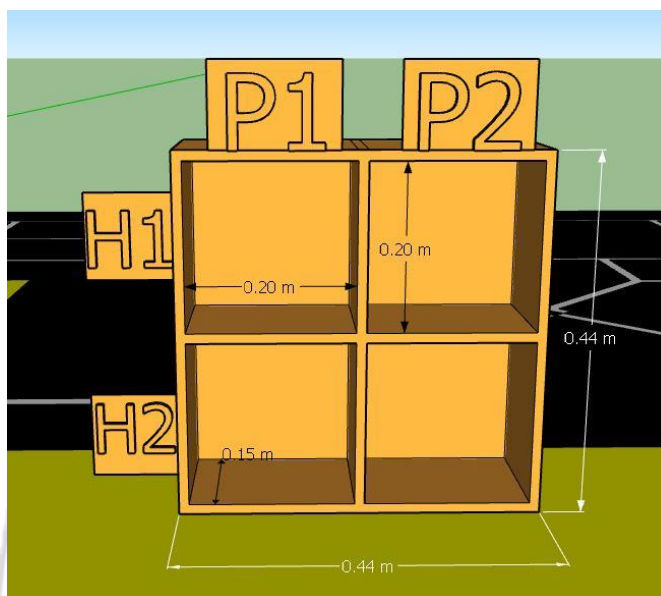
NOTE :Participants are not allowed to throw more than one ball at a time.

SEE-SAW:





IPPB BANK:

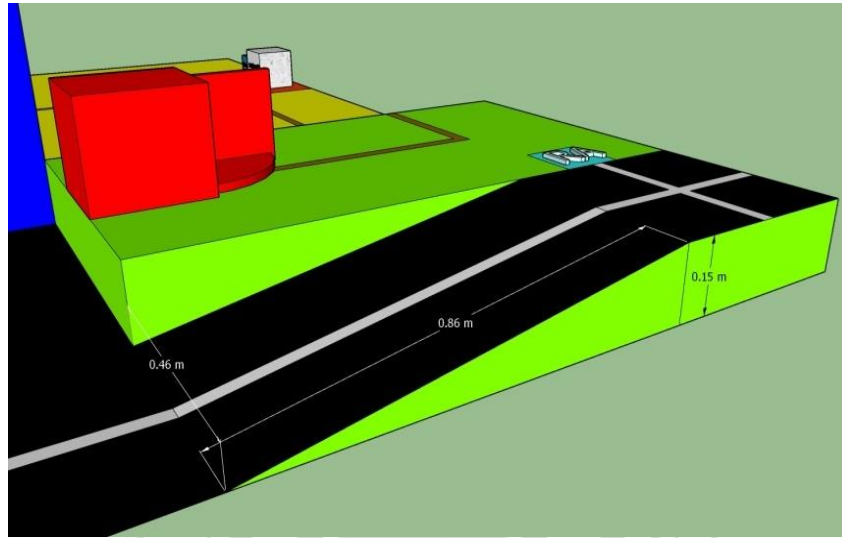


Manual Robot will put the Biometric box in one of the cavities which is complementary of the revealed code.

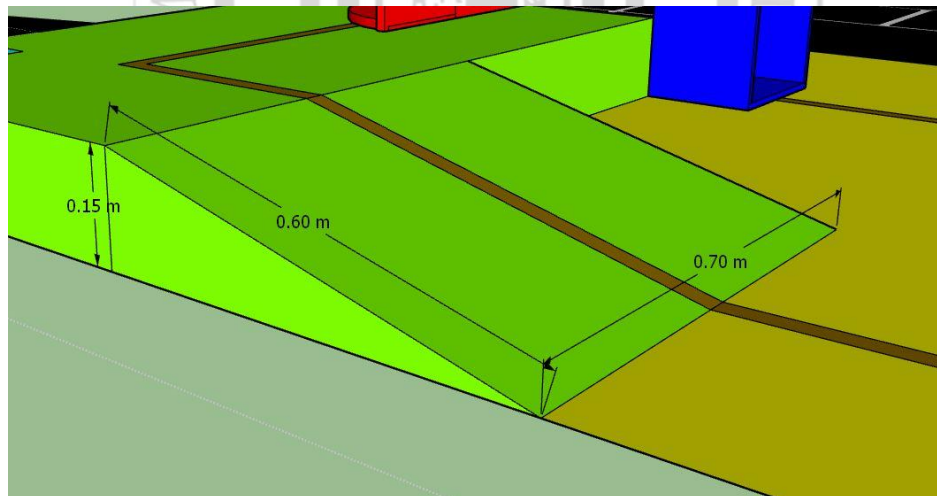
1. If the code provided by sorting plan is P1H1, the cavity in which Biometric machine is to be put is P2H2.
2. If the code provided by sorting plan is P1H2, the cavity in which Biometric machine is to be put is P2H1.
3. If the code provided by sorting plan is P2H2, the cavity in which Biometric machine is to be put is P1H1.
4. If the code provided by sorting plan is P2H1, the cavity in which Biometric machine is to be put is P1H2.



AUTO RAMP:



MANUAL RAMP:





GAMEPLAY:

1. **Manual Robot** will start its work as a **Postman**, in the region of **AMPC**. It will first rotate the auto-gate of Godown to clear the passage for the Auto robot.
2. **Auto Robot** will then start working as delivery truck & move towards the **AMPC**.
3. Meanwhile, **Manual Robot** will open the door of postbox to collect the parcels and put them on **Auto Robot** at **AMPC**.
4. **Manual Robot** will then, sort the parcels by opening one of the shell to reveal the code and put the shell on **Yellow spot**. (Sorting can be done **only after** putting **all** the parcels on Auto Robot at AMPC by Manual Robot).
5. **Manual Robot** will perform the projectile to decide the path of auto robot. **Auto Robot** will then, trace the path obtained from projectile to reach its first delivery location with parcels.
6. In **BNPL Hub**, **Manual Robot** will put a stamp on the online parcel and deliver it to **House 3(H3)**.
7. **Manual Robot** will then collect the parcel1 or parcel2 from the **Auto Robot** at **RA** or **OD** and deliver it to its respective address in Rural area (RA) and Old Delhi (OD).
8. **Auto Robot** will travel to its next delivery location.
9. **Manual Robot** will then deliver the remaining parcel from the **Auto Robot** to its respective location.
10. After all the parcels are delivered, **Manual Robot** will collect the confirmation signature box located at **Node** and put it on **Auto Robot** at **RA** or **OD**. (The signature box can be collected only after **all** the parcels are delivered to their respective locations.)
11. **Manual Robot** will collect the biometric box from the Node and put it in the bank at the position which is complimentary of the revealed code.

FINAL TASK: **Auto Robot** will travel to **reach** auto Godown via 4A or 4B.

EXAMPLE:

1. When Manual Robot opens the shell and if the box inside it indicates P1H1 then manual robot has to deliver parcel 1(P1) to House 1(H1).
2. While projecting, there are four squares named as 2A and 2B. Manual Robot has to project the ball in one of the square. If ball passes through square 2B then Auto robot has to follow the path to Old Delhi (Path 2B) with parcels and deliver the parcel P2 in H2
3. Then Auto Robot will move to its another delivery location (RA) and Manual Robot will collect that parcel P1 from Auto Robot and deliver it in House 1(H1) as mentioned above.
4. Manual Robot will put the biometric box at the position named as P2H2 in IPPB.



GAME RULES AND REGULATIONS

1. The maximum time given for completing the tasks is 5 minutes.
2. The operator of postman (Manual Robot) cannot be changed during the match.
3. Auto Robot is allowed to move in the Auto zone and Manual Robot is allowed to move in manual zone only.
4. Manual Robot must pick/place the parcels, signature box or biometric box appropriately in their respective locations.
5. If suppose Manual Robot drops any of the parcels, signature box or biometric box, it must restart the current task.
6. The projectile mechanism should be loaded before start of the match. Team should ensure that ball will not fall before performing projectile mechanism.
7. **Maximum 3 chances (with 1 load and 3 reload) will be given to Manual Robot to perform projectile.** If in case Manual Robot fails to throw the projectile ball through rings in these 3 chances, Auto Robot will not be able to perform its further tasks.
8. **The ball will be provided by organizers** (40mm table tennis ball).
9. **The first successful throw's outcome would be the final outcome. Manual Robot will not be allowed to use any further chances.**
10. **All 3 attempts need to be used successively without performing any other task in between.**
11. Auto Robot operator would be allowed to reload manual robot only after it reaches to the spot behind the projectile line.
12. In case of a wired robot (Manual Robot), the wire must slack at any point of time during the game. The total length of wire extending from the remote control to the Manual Robot must be of minimum 2.5 meters.
13. After starting the Auto Robot, the team- member who performs the starting action must leave the game arena immediately.
14. Both the Robots cannot enter the arena of the opponent's team.
15. Laptops/ personal computers are not allowed near the arena once the match starts. Other Wi-Fi, Bluetooth, etc devices must be switched off. The organizers hold the rights to check for these devices and their usage and disqualify the team.
16. **High pressure pneumatics, hydraulics , compressed air and piston mechanism are not allowed for projectile mechanism.**
17. The organizers may stop any Robot at any time if the task that it is being performed or is about to perform is of any dangerous or hazardous to people or equipment. No Robot is allowed to use any inflammable, combustible, explosive or potentially dangerous process.
18. Time measured by organizers will be final and will be used for scoring the teams. Time measured by any contestant by any other means is not acceptable for scoring. In case of any disputes/discrepancies, the organizer's decision will be final and binding. The organizer reserves the right to change any or all of the above rules as they deem fit.
Change in rules, if any will be highlighted on the website and notified to the registered team.

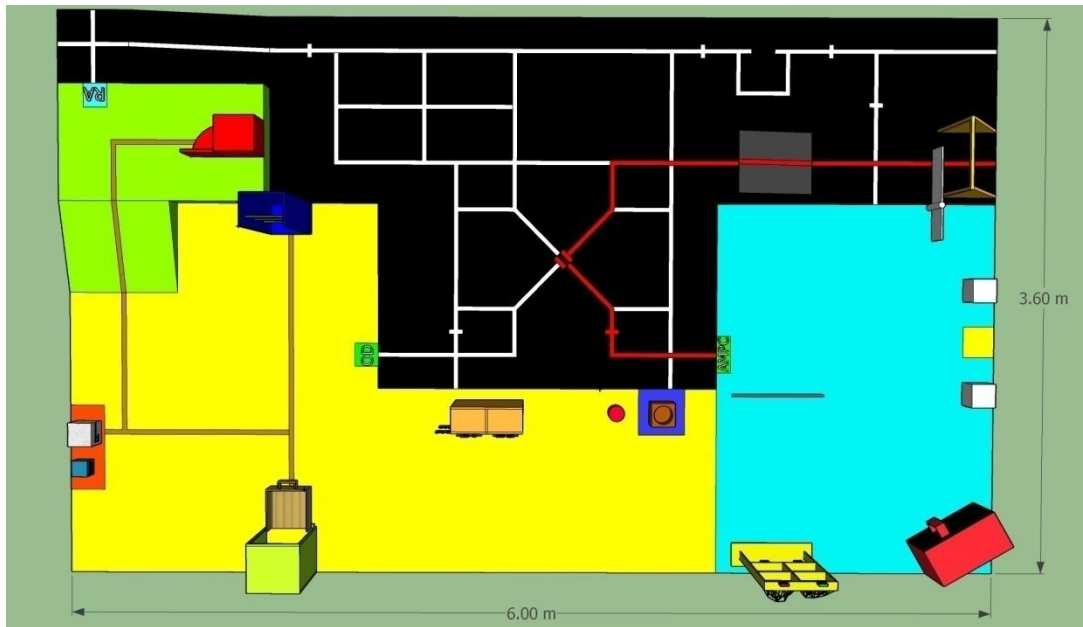
NOTE : ONLY MENTIONED PATHS ARE TO BE FOLLOWED.



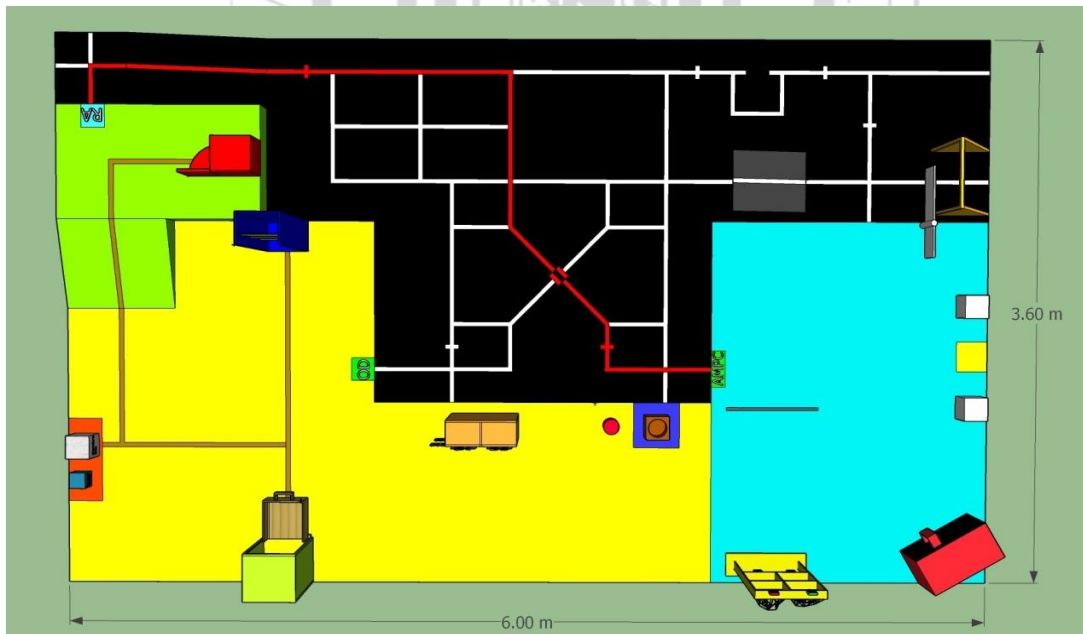
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PATH 1:



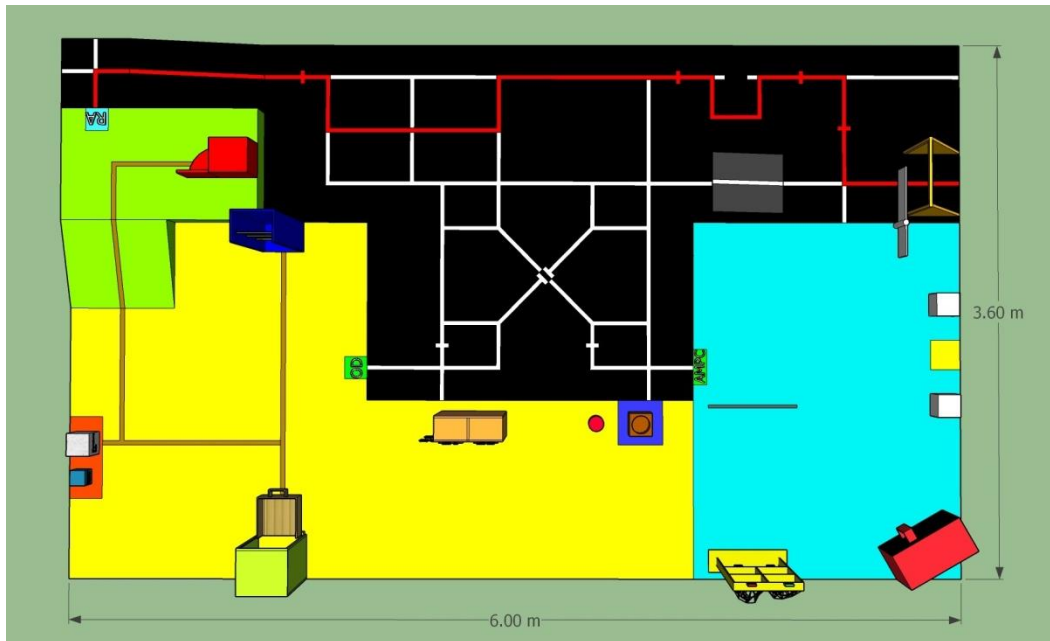
PATH 2A:



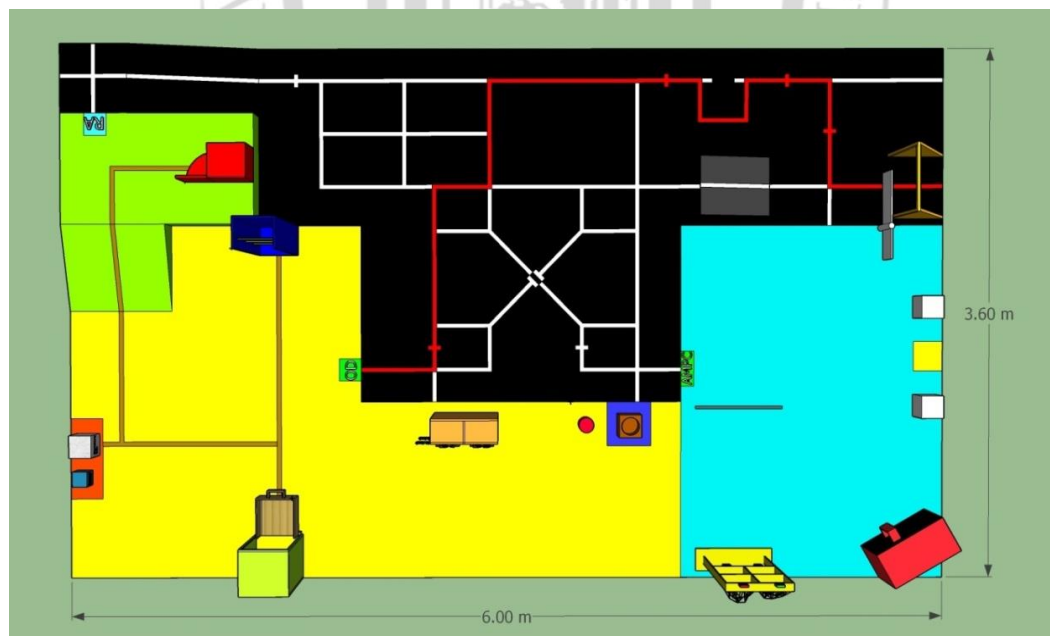
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PATH 4A:

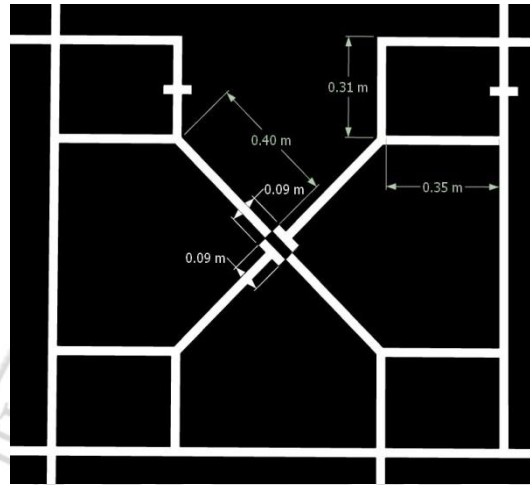


PATH 4B:

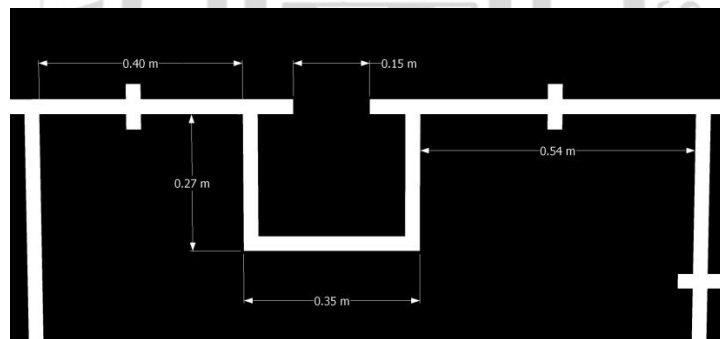




NEW DELHI JUNCTION:



BLIND PATH:



ALL COLOURS ARE GIVEN FOR REFERENCE ONLY AND MAY BE SUBJECT TO CHANGE.

HANDTOUCH FOR AUTO ROBOT IS ALLOWED AT FOLLOWING PLACES ONLY:

1. AUTO GODOWN(AG)
2. AUTOMATED MAIL PROCESSING CENTRE (AMPC)
3. RURAL AREA (RA)
4. OLD DELHI (OD)

Participants can ask organizers to select the code for Auto Robot. The switch used for this must be easily accessible and visible to the organizers.



SAFETY FOR THE ROBOTS:

1. All Robots must be designed and manufactured so as to cause no damage to any robots of the opposing team or to the game field. Combustible-fuel-driven engines, Explosives, high-pressure pneumatics (e.g. 1 mega Pascal), power-generating chemicals and undamped spring actuators (which make an action in less than half a second) are all prohibited for propulsion or expansion of Robot's size.
2. If a laser emitting device is used, it must be of class 2 or less. In deploying the laser, full care must be taken to protect all people at the venue from harm during all procedures. In particular, the laser beams must be oriented such that the beam will not be aimed sloping upwards, or horizontally to hit the eyes of sitting spectators.
3. All Robots must be designed and manufactured so as to pose no danger of any kind to any person at the venue.

RESTARTS:

1. If suppose the Auto Robot drops any parcel or signature box , it must restart from its previous destination.
2. If the Auto Robot doesn't choose the correct path then it must restart from starting point of that path.
3. In case of a restart, the timer will not be set back to zero and time will not be paused.
4. During restarts for the Auto Robot, a contestant cannot feed any information to it. However, participants are allowed to adjust sensors (gain, position etc.) and make minor repairs. A participant should not alter it in a manner that changes its weight (e.g. removal of bulky sensor array or switching to lighter batteries to get better speed).
5. Any restart for Auto Robot requires the approval of the organizers before it can be removed from the arena. If removed without approval, it will be considered as a violation.
6. If suppose Manual Robot drops any parcel or signature box , it must restart its current task.



ROBOT SPECIFICATIONS:

One Manual Robot (POSTMAN)

One Line follower Robot (DELIVERY TRUCK) are required for each team.

DELIVERY TRUCK (Auto Robot):

1. The Auto Robot must be completely autonomous and it must run on principles of line following.
2. The Auto Robot should not exceed the dimensions of size **35cm×35cm×35cm (l×b×h)**. Auto-bot can expand, stretch or extend within a cylinder of length 35cm considered from the top view. No stretch up in height is allowed.
3. The starting procedure of Auto Robot should be simple and should not involve giving it any manual force or impulse in any direction.
4. The weight of Auto Robot should not exceed **8 Kg**.
5. The Auto Robot must be single body and should not split into parts.
6. Only one Auto Robot is allowed.

POSTMAN (Manual Robot):

1. Teams should use wired or wireless remote control for controlling the Manual Robot.
2. Only one team member is allowed to control the robot in the game field.
3. Robot should not exceed the dimensions of **50cm×50cm×60cm (l×b×h)**. Manual robot can expand, stretch or extend without any limits after the start of the run.
4. Manual Robot is not allowed to leave anything behind or make any marks while traversing or damage the arena in any way. If it is found damaging the arena, the team will be immediately disqualified.
5. The Manual Robot cannot be constructed using readymade Lego kits or any readymade mechanism or readymade base/chassis. However, readymade gear assemblies can be used. Violating this clause will lead to disqualification of the team.
6. Only one Manual Robot is allowed.
7. **High pressure pneumatics, compressed air and piston mechanism are not allowed for projectile mechanism.**



POWER SUPPLY:

1. Both the robots must use an on-board power supply. External power supply is not allowed and will not be given.
2. The potential difference between any two points should not be greater than 24V DC.

CONTROLS:

1. Manual Robot (Postman) should receive signal from a remote control. It can be wired or wireless.
2. Auto Robot (Delivery Truck) cannot be controlled by wireless or wired controller.





JUDGING CRITERIA:

SR NO.	TASKS	POINTS
1.	Opening the door of Auto Godown by Manual Robot	5
2.	Tracing path 1 from Godown to AMPC by Auto Robot.	10
3	Opening the door of Postbox by Manual Robot.	10
4.	Picking and placing the parcel1 and parcel2 on Auto Robot at AMPC. (by Manual Robot) from Postbox.	10 (5 points for each box)
5.	Sorting and revealing the code and putting the Shell on Yellow spot by Manual Robot.	5
6.	Projecting the ball through either of the square by Manual Robot.	1 st chance -30 2 nd chance -25 3 rd chance -20
7.	Stamping, picking and delivering the online parcel to House 3(H3) in sequence by Manual Robot.	20

If the projectile path is:				
	Path 2A	or	Path 2B	
	Tasks	Points	Tasks	Points
8.	Auto Robot travelling through path 2A, with both the parcels.	20	Auto Robot travelling through path 2B, with both the parcels.	10
9.	Collecting the associated parcel from Auto Robot at RA and delivering it to House 1(H1) by Manual Robot.	10	Collecting the associated parcel from Auto Robot and hanging it at House 2(H2) by Manual Robot.	Level1-5 Or Level2-10 Or Level3-20



10.	Auto Robot travelling via path 3 with the remaining parcel from RA to OD.	10	Auto Robot travelling via path 3 with the remaining parcel from OD to RA.	20
11.	Collecting the associated parcel from Auto Robot at OD and hanging it at House2(H2) by Manual Robot.	Level1-5 Or Level2-10 Or Level3-20	Collecting the associated parcel from Auto Robot at RA and delivering it at House1(H1) by Manual Robot.	10
12.	Manual Robot collecting the signature box from Node and placing it on the Auto Robot at OD.	5	Manual Robot collecting the signature box from Node and placing it on the Auto Robot at RA.	5
13.	Auto Robot travelling through path 4B with the signature box to get back from OD to the Auto Godown.	15	Auto Robot travelling through path 4A with the signature box to get back from RA to the Auto Godown.	15
14.	Manual Robot will pick the biometric machine from Node and place it correctly in IPPB as per sorting code provided at Sorting plan .		10	



NOTE: AUTO ROBOT HAS TO FOLLOW EITHER PATH 2A OR PATH 2B, ACCORDING TO THE PROJECTILE TASK RESULT.

TOTAL POINTS: 180

TASKS THAT CAN BE SKIPPED:

1. Opening the door of postbox.
2. Opening the Godown gate.
3. Delivering parcel at House 1 by Manual Robot.
4. Skipping Path 1 by Auto Robot.

10 POINTS WILL BE DEDUCTED PER SKIPPED TASK.

BONUS TASKS:

1. Following the Blind path while returning to the Auto-Godown (via path 4A/4B) with signature box.

10 POINTS WILL BE AWARDED PER BONUS TASK.

VIOLATIONS:

1. The team with five Violations in a match will be disqualified. Negative scores may appear in some cases.
2. When the Violations occur, 10 points will be deducted from the team. The team must bring the violating Robot back to the point where the referee indicates. The violations are categorized as follows:
 - a) Any part of the Robot entering their respective restricted areas or opponents. The Auto Robot cannot enter in Manual robot and vice versa.
 - b) Other actions that infringe on the rules without mentioning in the Disqualification are considered as Violations.

DISQUALIFICATION:

1. A team will be disqualified if it commits any of the following actions during the match:
 - a) The team performs any acts that are not in the spirit of fair play.



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- b) The team fails to obey instructions or warnings issued by the referees.
 - c) Auto robots must not receive remote instructions from any human in the venue, sent via any form of RF or non-RF communication. During so will lead to disqualification.
 - d) The team has made five Violations in the same match.
2. Auto Robot is not allowed to leave anything behind or make any marks while traversing or damage the arena in the autonomous zone. Any Robot found damaging the arena will be disqualified immediately.

FINAL SCORE:

1. Team completing all the tasks first and correctly will be considered as winners.
2. If both the teams could not complete the tasks then team with maximum points will be winner.
3. The rules and the regulations for the tie break would be told by the organizers before the event.

IMPORTANT NOTE: LEGO, VEGA OR ANY OTHER TYPE OF READYMADE ROBOT KITS ARE NOT ALLOWED. IF FOUND SO, THE TEAM WILL BE DISQUALIFIED.

Rules mentioned above are subject to change any time. Participants should check for the latest updated PDFS on the official website of Technovanza'19. However, this draft is to be followed as the latest version. Technovanza reserves all right regarding rules and regulations.

Any ingenious exploitation of the mentioned/gameplay must be notified to and clarified with the organizers beforehand.

In case of any ambiguity, feel free to contact

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