Junior Skills Malaysia 2019
Technical Description
Drone Operation

1. Introduction

Drones are being used for civil purposes in a growth business sector predicted to be worth billions of Ringgit over the next 10 years. They are rapidly growing segment of the global market in high-tech industries.They are also revolutionising everything from agriculture, land survey, infrastructure inspection to film-making and are increasingly being used to monitor, cargo delivery, research and conduct data gathering missions in surveying, mining, forestry, ecology, archaeology virtual reality and computer gaming. With the increase in tasks carried out by Drone, the question of training qualified personnel is relevant.

2. Skill

The Skill includes the management and operation, maintenance, detection and elimination of malfunctions of Drone, the use of technical equipment and equipment used to control the flight of Drone.

3. Competition Format

Age: This competition is open for all Malaysian citizen from 13 to 16 years old.

Section: This competition has two stages comprises of SECTION A and SECTION B

Trial number: Each competitors was given 3 rounds of attempt. Where each mission fly is given judge and mark given. The best result among these 3 attempts will be taken as final final marks.

Equipment: Each competitor required to bring their own drone and equipment that meet the standard specification provided by organizer in test project description.

4. Assessment

The test project and marking scheme for the competition is as detailed in the next page

5. General Guidance

Before being powered up, the Drone must comply with Safety standards, authority (JUPEM, CAAM & MCMC) regulations, industry guidelines and specifications. Flying in any part (module) of the Test Project will be permitted only for fully functional devices with securely fastened structural elements, integral wiring isolation and component arrangement, which will prevent any part of the Drone from hitting into the motor-propeller group.

PROHIBITED: Powering-up of the UAV with propellers installed outside of the flight zone.

6. SAFETY DURING PLANNED LANDING

Disarm the drone
Disable the Li-Po (Li-Ion) battery on the copter;
Disable the remote control;

Marking Scheme

Drone Operation

SECTION	CRITERIA	OBJECTIVES	ASSESSMENT TYPE	FULL MARK (60 marks)	TEST MARKS
A1	Assemble, Installation & configuration of drone 1. Assemble drone parts 2. Inspect each motor rotation direction 3. Battery health check & charging procedure 4. Connecting Drone to FPV Goggles 5. Test flight, hovering check 6. Test LOS (line of sight) flight - Yaw, Roll, Pitch up Pitch down, Forward and Backward.	UAV Modelling and fabrication	Judgment	 2 2 2 2 2 3	
A2	Obstacle Evasion 1. Gain points from successful pass 2. Complete lap 3. Landing accuracy	UAV Piloting	 Measurement Measurement Measurement	 20 5 5	
A3	FPV 1. FPV signal stability 2. Travel through the course in FPV Goggles 3. Perform video recording and save into SD Card	UAV Piloting	 Judgment Judgment	 5 5 5	
A4	Copter reassembly to a standard state	UAV Modelling and fabrication		2	

SECTION	CRITERIA	OBJECTIVES	ASSESSMENT TYPE	FULL MARK (60 marks)	TEST MARKS
B1	Assemble of drone 1. Install propellor according to specification 2. Install battery correctly	UAV Modelling and fabrication	Judgement	2 1	
B2	Drone Block Programming 1. Install scratch software for Tello 2. Binding between drone and controller 3. Able to use script / block programming 4. Compile, download and run script to attempt mission	UAV Programming and autonomous flight Navigation and flight mission preparation	Judgement	5 2 5 5	
B3	Precise flight over flight path 1. Pass FP1 2. Pass FP2 3. Pass FP3 4. Pass FP4	UAV Piloting UAV Programming and autonomous flight	Judgement	3 3 3 3	
B4	Obstacle evasion 1. Obstacle A 2. Obstacle B 3. Obstacle C 4. Obstacle D	UAV Piloting UAV Programming and autonomous flight	Judgement	3 3 3 3	
B5	Yawning precision 1. Y1 2. Y2 3. Y3	UAV Piloting UAV Programming and autonomous flight	Judgement	2 2 2	
B6	Landing on a narrow area on a marker	UAV Piloting UAV Programming and autonomous flight	Measurement	6	
B7	Copter disassembly to a standard state 1. Battery disassemble 2. Propellor disassemble	UAV operation and maintenance	Judgement	2 2	

Flight demonstration layout

1. Flight path and obstacle will be reveal during the competition day
2. The area of the demonstration area is about 500 square feet