Junior Engineer Drone (R& D)_ELE/Q6703_V1.0_NSQF Level: 5.5- Theory										
NOS	Sr No	Type of Question	Marking	Difficulty Level (Easy/ Medium/ Difficult)	Question Text	Option - 1	Option - 2	Option - 3	Option - 4	Correct Answer
ELE/N6705.R & D in the field of Drones & its components	1	SCB	5	Hard	Which of the following communication protocols is most commonly used for long-range control and telemetry in commercial drones?	Bluetooth	Wi-Fi 2.4 GHz	4G/LTE or 900 MHz/2.4 GHz spread spectrum	Infrared	3
	2	LCB	3	Medium	A drone is used to inspect power lines and detect corona discharge. Which segment does this application belong to?	Agriculture	Infrastructure & utilities	Construction	Logistics	2
	3	DCB	2	Easy	Which of the following drone application segments primarily relies on multispectral and thermal sensors to assess crop health, irrigation issues, and pest infestation?	A) Infrastructure inspection	B) Precision agriculture	C) Package delivery	D) Search & rescue	2
	4	LCB	4	Medium	The modern quadcopter configuration gained popularity due to advances in MEMS sensors and flight controllers. Which historical development was most critical for enabling stable multirotor flight?	Invention of the internal combustion engine	Development of the Kalman filter for sensor fusion and low-cost IMUs	Invention of the GPS satellite system	First manned helicopter flight	2
	5	DCB	1	Easy	Which of the following is widely regarded as the first unmanned aerial vehicle (UAV) used in a combat role, developed during World War I?	A) Radioplane OQ-2	B) Kettering Bug	C) General Atomics MQ-1 Predator	D) DJI Phantom 1	2
	6	SCB	6	Hard	A skill gap study in the drone sector reveals that most engineering graduates have theoretical knowledge but lack hands-on experience with flight controllers and firmware tuning. What is the most effective solution for industry?	Increase classroom lectures on drone history	Introduce project-based training with actual drone hardware and simulators	Reduce the number of drone courses	Hire only foreign-trained engineers	2
	7	LCB	4	Medium	A use case study for a search-and-rescue drone requires a flight endurance of 60 minutes, thermal camera, and transmission range of 10 km. Which design trade-off is most critical?	Battery capacity vs. weight vs. motor efficiency	Colour of the drone vs. visibility	Propeller material vs. cost	Landing gear type vs. aesthetics	1
	8	LCB	3	Medium	Which of the following is NOT a primary component of a typical quadcopter?	Electronic Speed Controller (ESC)	Flight Controller (FC)	Tire pressure monitoring system	Brushless DC motor	3
	9	DCB	2	Easy	Which of the following components is primarily responsible for converting the DC power from the drone's battery into three-phase AC power to drive the brushless DC (BLDC) motors at varying speeds?	A) Flight controller	B) Electronic Speed Controller (ESC)	C) Power Distribution Board (PDB)	D) Inertial Measurement Unit (IMU)	2
	10	LCB	4	Medium	Which open-source software is widely used for drone simulation with realistic physics, sensor models, and support for ROS?	Microsoft Flight Simulator	Gazebo with ArduPilot or PX4 SITL	AutoCAD	SolidWorks	2
	11	LCB	4	Medium	During a hands-on session, you connect a Pixhawk flight controller to Mission Planner. The GPS shows 3D fix but the drone will not arm because of "bad GPS health". What is the most likely first troubleshooting step?	Replace the GPS module	Check the GPS baud rate and ensure the compass is calibrated and not experiencing interference	Reflash the firmware	Increase the arming check timeout	2
	12	DCB	2	Easy	In the open-source ArduPilot / Mission Planner software environment, which parameter would you adjust to change the responsiveness of the drone's roll, pitch, and yaw stick inputs without altering the underlying stabilisation gains?	A) RLL_RATE_P	B) THR_MID	C) RC_FEEL_RP	D) COMPASS_USE	3
	13	DCB	2	Easy	When developing design requirements for a drone intended for long-endurance mapping of agricultural fields, which two requirements are typically the most critical trade-off pair?	A) Maximum speed vs. colour depth of camera	B) Flight time vs. payload weight (battery vs. sensor)	C) GPS accuracy vs. propeller diameter	D) Radio frequency vs. landing gear height	2
	14	LCB	3	Medium	You are developing design requirements for a drone that must carry a 1.5 kg payload for 40 minutes. Which of the following is the most critical requirement that drives the entire design?	Colour of the drone	Minimum thrust-to-weight ratio (>1.5) and power-to-weight ratio to meet endurance	Type of USB connector	Size of the landing pad	2
ELE/N6706.Development of Prototype for Manufacturing	15	LCB	4	Medium	You are developing a new agricultural drone. The existing model has a flight time of 25 minutes and a spray tank of 10 litres. The new model targets 35 minutes and 15 litres. Besides these, what is the most important difference to analyze?	The colour of the drone body	The change in payload capacity and its impact on motor and battery selection	The brand of the GPS module	The packaging box design	2
	16	SCB	6	Hard	The research team provides a requirement: "The drone must hover at 10 meters altitude for 30 minutes with a 2 kg payload in 15 km/h winds." As a Junior Engineer, what is your most important next step?	Immediately start designing the frame	Translate this requirement into measurable engineering parameters (thrust, power, stability margins) and seek	Order a ready-made drone	Assume the research team will handle all details	2
	17	DCB	2	Easy	You need to alter an existing motor mount to accommodate a larger motor. What is the correct procedure for updating the manufacturing drawing?	Modify the drawing directly and send it to production	Redline the existing drawing, document the change with a revision number and reason, then submit for approval	Delete the old drawing and create a new one from scratch	Only inform the production team verbally	2
	18	LCB	4	Medium	After completing a design drawing, who is the correct authority to approve it before release?	Any senior colleague	The design development team lead or designated approver as per the organization's quality	The customer	The production manager	2
	19	DCB	2	Easy	For a drone designed for commercial use in India, which of the following regulations must your design comply with?	Only ISO 9001	DGCA (Directorate General of Civil Aviation) regulations for drones, including no-fly zone restrictions and maximum altitude	IEEE 802.11	OSHA standards	2

	20	DCB	2	Easy	Your aerodynamic design calls for a complex curved airfoil that can only be manufactured using 5-axis CNC. Your organization has only 3-axis CNC and manual layup. What should you do?	Proceed with the design and outsource without checking	Revise the airfoil design to be manufacturable in-house, or propose a manufacturing partnership after cost-benefit analysis	Ignore manufacturing capabilities	Redesign the entire drone	2
	21	LCB	3	Medium	The design development team has reviewed your drawing and marked it "approved with minor changes". What is your next step?	Implement the minor changes, then get final sign-off from the Lead before release	Ignore the changes and send for production	Send the unmodified drawing to the Lead	Start manufacturing immediately	1
	22	DCB	2	Easy	In a standard drone R&D design workflow, which document or artefact is typically required to be signed or digitally approved by the Lead after the design development team completes its review of a technical drawing?	A) Bill of Materials (BOM)	B) Drawing approval sheet / sign-off form	C) Test flight log	D) User manual draft	2
	23	SCB	5	Hard	During prototype assembly, the team finds that a bracket does not fit because the drawing shows a dimension of 45.2 mm but the actual machined part is 45.0 mm. The tolerance on the drawing is ±0.2 mm. What is your action to ensure accuracy and consistency?	Blame the machining team	Check if the drawing's dimension is correct and if the part is within tolerance; if yes, document the fit issue as a design improvement for next revision; if no, correct the drawing	Force the part to fit by filing	Redesign the entire bracket	2
ELE/N7007.Practical Aspect of Drones and Simulation Techniques	24	DCB	2	Easy	Why is a drone simulator important for a drone operator?	It reduces the cost of batteries	It allows safe practice of emergency procedures without risking the drone	It increases flight time	It replaces the need for real flight training	2
	25	LCB	4	Medium	Which type of drone simulator is most suitable for training first-person view (FPV) racing pilots?	Fixed-wing simulator	Multirotor simulator with low-latency FPV mode	Helicopter simulator	Commercial airliner simulator	2
	26	SCB	6	Hard	You are setting up a drone simulator from scratch. After installing the software, you connect your radio transmitter via USB, but the software does not recognize any inputs. What is the most likely first step to troubleshoot?	Reinstall the operating system	Calibrate the transmitter in the simulator's settings and ensure the correct USB driver is installed	Replace the transmitter	Restart the drone	2
	27	DCB	2	Easy	In a multi-drone simulation exercise, what does "coordination for flight" primarily involve?	All operators flying the same pattern	Clear communication of flight plans, deconfliction of airspace, and adherence to assigned altitudes	Competing for the fastest time	Ignoring other drones	2
	28	LCB	4	Medium	In a simulator, you are landing a drone on a moving boat deck. What is the most critical factor to judge?	The boat's colour	Relative velocity and landing pad alignment	The drone's battery colour	Wind direction only	2
	29	DCB	2	Easy	A training exercise requires you to fly a figure-eight pattern around two virtual towers while maintaining a constant altitude of 10 m and a speed of 5 m/s. You are judged on deviation from path and altitude. What skill is primarily being tested?	Maximum speed control	Coordinated turns and precise throttle/pitch management for altitude hold	Battery management	Waypoint programming	2
DGT/VSQ/N0102. Employability Skills (60 Hours)	30	DCB	2	Easy	How should you dispose of a damaged lithium-polymer (LiPo) battery used in drone prototyping?	Throw it in the regular trash	Burn it to destroy the cells	Dispose at an authorized e-waste or battery recycling facility	Bury it in the ground	3
	31	LCB	4	Medium	You receive an email: “Please update the motor mount drawing to increase the hole diameter from 3 mm to 4 mm and re-submit by Friday.” What should you do?	Ignore the email	Read and understand: modify the drawing as instructed and re-submit	Change the hole diameter to 5 mm	Delete the email	2
	32	DCB	2	Easy	What is the main difference between a job and a career for a drone engineer?	A job is permanent, a career is temporary	A job is a specific role for earning money; a career is a long-term	A job pays more than a career	There is no difference	2
	33	SCB	6	Hard	Your employer withholds your salary for two months without any valid reason. What is the correct legal step?	Quit silently	First discuss with HR, then file a complaint with the Labour Commissioner under the Payment of Wages Act	Deduct money from the company’s tools	Post on social media only	2
	34	DCB	2	Easy	You are considering starting a drone design consultancy. Which of the following is a correct step to assess opportunities?	Open a shop immediately without any research	Research local demand, competition, customer pain points, and required investment before starting	Copy a competitor’s exact model	Only ask friends for advice	2
	35	LCB	4	Medium	Which section is essential in a professional CV for a drone R&D engineer?	Favourite movies list	Contact information, work experience, technical skills (e.g., CAD, simulation, embedded systems), projects, and education	List of all tools owned	Family members' names	2