QUALIFICATION FILE

Kisan Drone Operator

☒ Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship

☐ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

☐ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☒ Future Skills ☐ OEM

NCrF/NSQF Level: 3

Submitted By:

Agriculture Skill Council of India

Unit No. 101, First Floor, Greenwoods Plaza, Block 'B', Greenwoods City, Sector 45, Gurugram -122009, Haryana.

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Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">Kisan Drone Operator</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Agriculture</td></tr>
<tr><td>3.</td><td>Type of Qualification: ☐ New ☑ Revised ☐ Has Electives/Options
☐OEM</td><td>NQR Code & version of previous qualification:
(change to previous, once approved)
QG-04-AG-00515-2023-V1.1-ASCI & Version 1.1</td><td>Qualification Name of existing/previous version:
Kisan Drone Operator</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name
(Wherever applicable)</td><td colspan="2">NA</td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code &Version
(Will be issued after NSQC approval)</td><td>QG-03-AG-00515-2024-V2-ASCI & Version 2</td><td>6. NCrF/NSQF Level: 3</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other (Wherever applicable specify multiple entry/exits also & provide details in annexure)</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">A Kisan Drone Operator/pilot is responsible for operating the drone for spraying pesticides/fertilizers. The individual is also responsible for carrying out regular maintenance of drone and relevant equipment associated with it.</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1</td><td>Grade 10 Pass</td><td>NA (as per DGCA)</td></tr>
</table>
b. Age: 18</td></tr>
<tr><td>10.</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>9</td><td>11. Common Cost Norm Category (I/II/III) (wherever applicable): I</td></tr>
<tr><td>12.</td><td>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="2">1. No License required, DGCA approved RPTO provides Remote Pilot Certificate (RPC) to candidates who clear the flying examination taken by DGCA certified instructor
2. Candidate to be trained and assessed on AGR/N1039 at RPTO as per DGCA guidelines</td></tr>
</table>

<table>
<tr><td>13.</td><td>Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td colspan="2">☒Offline ☐Online ☐Blended
<table>
<tr><th>Training Delivery Modes</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>OJT Mandatory (Hours)</th><th>OJT Recommended (Hours)</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (offline)</td><td>95:30</td><td>84:30</td><td>90</td><td></td><td>270</td></tr>
<tr><td>Online</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
(Refer Blended Learning Annexure for details)</td></tr>
<tr><td>14.</td><td>Aligned to NCO/ISCO Code/s (if no code is available mention the same)</td><td colspan="2">NCO-2015/ 7233.2800, 7233.9900</td></tr>
<tr><td>15.</td><td>Progression path after attaining the qualification (Please show Professional and Academic progression)</td><td colspan="2">Kisan Drone Operator (L3) → Entrepreneur (L4)
Kisan Drone Operator (L3) → Drone Service Provider (L4)</td></tr>
<tr><td>16.</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td colspan="2">Hindi</td></tr>
<tr><td>17.</td><td>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</td><td colspan="2">☐ Yes ☒ No URLs of similar Qualifications:</td></tr>
<tr><td>18.</td><td>Is the Job Role Amenable to Persons with Disability</td><td colspan="2">☒Yes ☐ No
If “Yes”, specify applicable type of Disability: LD, SHI</td></tr>
<tr><td>19.</td><td>How Participation of Women will be Encouraged</td><td colspan="2">Endeavour to include women in the batches</td></tr>
<tr><td>20.</td><td>Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)</td><td colspan="2">☒ Yes ☐ No
(Covered in DGT/VSQ/N0101)</td></tr>
<tr><td>21.</td><td>Is Qualification Suitable to be Offered in Schools/Colleges</td><td colspan="2">Schools ☐ Yes ☑ No Colleges ☒ Yes ☐ No</td></tr>
<tr><td>22.</td><td>Name and Contact Details of Submitting / Awarding Body SPOC
(In case of CS or MS, provide details of both Lead AB & Supporting ABs)</td><td colspan="2">Name: Ms Priyanka Prakash
Email: priyanka@asci-india.com Contact No.: 0124-4670029
Website: www.asci-india.com</td></tr>
<tr><td>23.</td><td>Final Approval Date by NSQC: 15-03-2024</td><td>24. Validity Duration: 3 years post NSQC Approval</td><td>25. Next Review Date: 15-03-2027</td></tr>
</table>

Section 2: Module Summary

NOS/s of Qualifications

(In exceptional cases these could be described as components)

Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

***Th.**-Theory **Pr.**-Practical **OJT**-On the Job **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**-Project*

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/ NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.	AGR/N1039: Undertake drone flying ensuring adherence to laws/procedures* (To be assessed at the RPTO as per the DGCA rules/regulations)	AGR/N1039 (v1.0)	Core	3	1	20:30	9:30			30	5			5	10	5
2.	AGR/N1030: Carry out drone based pesticide and crop nutrient application	AGR/N1030 (v2.0)	Core	3	2	15	45			60	18	24		18	60	45
3.	AGR/N1020: Ensure adherence of precautionary measures before, during and post-operation for drone based pesticide application	AGR/N1020 (v2.0)	Core	3	2	30	30			60	16	16		18	50	45
4.	Employability Skills (30 Hours)	DGT/VSQ/N0101 (V1.0)	Non-Core	3	1	30				30	20	30			50	5
5.	OJT (Man.)				3			90		90						
Duration (in Hours) / Total Marks					**9**	**95.30**	**84.30**	**90**		**270**	**59**	**70**		**41**	**170**	**100**

Assessment - Minimum Qualifying Percentage

*Please specify **any one** of the following:*

Minimum Pass Percentage – Aggregate at qualification level: 50% *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

Minimum Pass Percentage – NOS/Module-wise: ___% *(Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)*

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	**At Training Centre (TC):** (i) A Graduate and above holding Remote Pilot Certificate (DGCA-Certified Drone Pilot) in appropriate Drone Category (from Agriculture usage perspective) OR (ii) 12th Pass holding Remote Pilot Certificate (DGCA-Certified Drone Pilot) in appropriate Drone Category (from Agriculture usage perspective) with 1 year relevant experience post RPC Certification The proposed trainers at TC (Drone Pilot certificate holders) would undergo Training of Trainers (ToT) through Agriculture Skill Council of India (ASCI) on the NOSs covering the agriculture and related aspects and Generic/ Platform Skills. **At RPTO:** ● Only the Individuals certified by DGCA as 'Instructors' will be conducting training on the DGCA mandatory syllabus at RPTO. The DGCA mandatory syllabus and flight related training at RPTO would be as per DGCA norms.
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Graduate and above (Agriculture/ related field) having Drone Flying Certificate (called Remote Pilot Certificate) in appropriate drone category with preferably 1 year experience in Agriculture and/ or its related fields
3.	**Tools and Equipment Required for Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	NA

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate and above with RPC Certificate (DGCA-Certified Drone Pilot) in appropriate Drone Category (from Agriculture usage perspective) For DGCA mandatory syllabus, assessor to be DGCA Certified Instructor Looking at the current bandwith / availability RPTOs and RPC holders, the requisite number of Trainers/Assessors for implementing Kisan Drone Operator training and assessment. Therefore, it is recommended to have provision of "Dual Certification" of the instructors/drone flying certificate holders with both Trainer and Assessor

		certification. The Dual Certification would strengthen the available pool and ensure timely training and assessment on the Kisan Drone Operator qualification. However, it should be ensured that the assigned trainer for a batch at a respective TC/TP not assigned as an Assessor for the same or other batches at the same designated TP/TC.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Diploma/Graduate (It is mandatory for a proctor to have technical knowledge/IT knowledge Once a proctor has been on-boarded by any AA, they are oriented about skill ecosystem along with do's and don'ts .)
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate and above (Agriculture/ related field) having Drone Flying Certificate (called Remote Pilot Certificate) in appropriate drone category with preferably 1 year experience in Agriculture and/ or its related fields
4.	**Assessment Mode** *(Specify the assessment mode)*	**Offline**
5.	**Tools and Equipment Required for Assessment**	☑ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No):** The SSC was advised to look into the future skills qualifications and also a workshop has been organized by Ministry of Civil Aviation on application and usage of drones in various sectors as per national mandate announced by GoI. The government has ambitious plans to make India a global hub for drone technology by the year 2030. To skill the candidates on Drone Operation on pesticide/fertilizer Spraying, a qualification has been developed with the guidance of the Drone Federation of India and DGCA
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** The SSC was advised to look into the future skills qualifications and also a workshop has been organized by Ministry of Civil Aviation on application and usage of drones in various sectors as per national mandate announced by GoI. The government has ambitious plans to make India a global hub for drone technology by the year 2030. To skill the candidates on Drone Operation on pesticide/fertilizer Spraying, a qualification has been developed with the guidance of the Drone Federation of India and DGCA
3.	**Government /Industry initiatives/ requirement (Yes/No):** Yes, Government Initiative, part of PMKVY 4.0
4.	**Number of Industry validation provided:** 6
5.	**Estimated nos. of persons to be trained and employed:** 1500/year
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** Awaited from Joint Secretary, Ministry of Civil Aviation

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors *(Mandatory)*	*Annexure-1*

2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	*Annexure-2*
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	*Annexure-5*
4.	**Annexure:** Assessment Strategy *(Mandatory)*	*Annexure-6*
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	*NA*
6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	*NA*
7.	**Annexure:** Acronym and Glossary *(Optional)*	
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	*Annexure-7*
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	*Drone Service Provider (L4)*
10.	**Supporting Document:** Occupational Map *(Mandatory)*	*Annexure-8*
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	*Annexure-9*
12.	**Any other document you wish to submit:**	

Annexure 1: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	The individual will have knowledge of dynamics and principles of drone operation, laws pertaining to drone operation, components of drone, ATC procedures & Radiotelephony techniques, Rotorcraft & Hybrid operations and Aerodynamics, pesticides spraying and fertilizer	Possesses Knowledge involving a defined range of standard procedures, uses limited discretion and judgement over a range of known responses to familiar problems.	3
Professional and Technical Skills/ Expertise/ Professional Knowledge	• The individual is able to • Carry out drone flying as per the laws/procedures • Carry out drone based pesticide and crop nutrient application	Can apply the required knowledge for Identification of the problem and issues within the range of familiar contexts	3

	• Ensure adherence to precautionary measures before, during and post-operation for drone-based pesticide application • knowledge on various type of activities undertaken by drone in agriculture usage		
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	The individual works individually or as a team to operate drone for spraying pesticides, crop nutrients	Is a drone operator, with broad employability skills	3
Broad Learning Outcomes/Core Skill	The individual is able to plan and prioritize tasks to ensure timely completion and take quick decisions to deal with workplace emergencies/ accidents and also identify possible disruptions to work and take appropriate preventive measures.	Is able to carry out Range of tasks related to drone operation and provide applicable solutions	3
Responsibility	The individual is responsible for operating drone for spraying pesticides and fertilizers. The individual is also responsible for carrying out regular maintenance of drone and relevant equipment.	Takes responsibility for delivery and quality of own work with tangible output. Can plan routine and predictable tasks within a specific field.	3

Annexure 2: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 30

Tools & Equipment at TC:

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Small/Medium type certified Agriculture Drone	No	1
2	Nozzle System/Spray Nozzle	Set	1
3	Drone's Remote-control system	Nos	1
4	Batteries	Set	1
5	Battery charge	Nos	1
6	Drone Assembly/Maintenance Tool Kit	Set	1
7	Container for preparing spray composition	Nos	1
8	Applicable Fertilizers/ Pesticide	KG	3
9	PPE Equipment for candidates	Nos	10

Note: Tools & Equipment at RPTO- All mandatory equipment, tools and parameters as per norms laid down by DGCA for type and size of drone

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. White board
2. Marker
3. Overhead projector
4. Laptop
5. Internet access

Annexure 3: Industry Validations Summary

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile *(if available)*
1	AVPL International	Mr Himanshu Sharma	CEO	Haryana	9871696248	info@avplinternational.com	
2	Ultimate Energy Resource Pvt Ltd	Mr Sahil Wali	Director	Bhopal	6264902261	sahil@ecocapita.in	
3	DRIISHYA Ltd	Dr S.K. Yadav	Chief Instructor	Karnal	9466147011	driishya2021@gmail.com	
4	Mahindra & Mahindra	Mr Soumitra Choudhury	Head-Training	Nagpur	9766699020	206897@mahindra.com	
5	IIT Mandi iHub and HCL Foundation	Ms Volga Verma	General Manager	Mandi (H.P)	7807114921	volga@ihubiitmandi.in	
6	Multiplex Drone Pvt Ltd	Mr H Honne Gowda	CEO	Bengaluru	9880305181	ceo@multiplexdrone.com	

Annexure 4: Training & Employment Details

Training and Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2024	1500	200	500	50		

2025	1500	200	500	50		
2026	1500	200	500	50		

Data to be provided year-wise for next 3 years

Training, Assessment, Certification, and Placement Data for previous versions of qualifications: NA

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed
2.0	2023-24	74	51	51		22	22	22					

Applicable for revised qualifications only, data to be provided year-wise for past 3 years.

List Schemes in which the previous version of Qualification was implemented:

1. PMKVY

Content availability for previous versions of qualifications:

☑ Participant Handbook ☑ Facilitator Guide ☐ Digital Content ☐ Qualification Handbook ☐ Any Other:

Languages in which Content is available: English

Annexure 5: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
AGR/N1039: Undertake drone flying ensuring adherence to laws/procedures* (To be assessed at the RPTO as per the DGCA rules/regulations)	*Comprehend the dynamics and principles of drone operation*	2			2
	PC1. comprehend various stakeholders & their laws (Basic) as per drone Rules 2021 and drone				
	(Amendment) Rules, 2022 notified by Ministry of Civil Aviation				
	PC2. follow the basic principles of flight while operating a drone				
	PC3. follow the ATC procedures & Radiotelephony (non FRTOL) techniques				
	PC4. comprehend the Fixed-wing, Rotorcraft & Hybrid operations and Aerodynamics				
	Prepare for drone operation and carry out drone flying as per the requirement	3			3
	PC5. assess the effects of weather and meteorology in drone operations				
	PC6. undertake necessary measures for hazardous weather avoidance				
	PC7. Carry out drone equipment maintenance and basic assembly				
	PC8. Carry out risk assessment & analysis - Safety Management / TEM				
	PC9. Carry out installation & utilization of payload and analysis of data				
	PC10. Perform pre-start checks				
	PC11. Carry out drone flying as per the requirement				
	TOTAL MARKS	**5**			**5**
AGR/N1030: Carry out drone based pesticide and crop nutrient application	*Prepare the drone for application of pesticides and fertilizers*	**3**	**4**		**3**
	PC1. select appropriate drones which can carry suitably sized reservoirs, which can be filled with fertilizers, herbicides, or pesticides for crop spraying	-	-		-

	PC2. identify appropriate software and technology with reference to different farming practices for drone utilization in various agriculture activities				
	PC3. attach the nozzle system in an efficient manner for continuity in spray swath during spray from minimum permitted height above the uniformly distributed crop				
	PC4. make appropriate setting in drone software to self-adjust its altitude and speed for spraying on desired height above the crop.				
	PC5. Track the fields and fix the coordinates appropriately				
	PC6. ensure GPS and map accuracy of the drone to demarcate the target area boundary and safety/buffer margins				
	PC7. plan the appropriate route for the drone operation				
	PC8. check obstacle presence in the area of operation and make necessary mapping and adjustments in software or peripherals				
	PC9. make appropriate route adjustment as per applicable and available options in the software like row spacing, row number, borders indentation, obstacle boundary distance, route type and setting etc.				
	PC10. ensure for leak proof drone spray system to avoid any dripping of pesticides/ agrochemicals				
	PC11. calibrate the drone spray system to ensure recommended accuracy on amount of input to be sprayed				
	PC12. Inspect the field to know the extent of pest/disease/weeds infestation				
	Apply pesticides and fertilizers using the drone	**3**	**4**		**3**
	PC13. select /use the agrochemicals duly included in SOP prepared by MoA				
	PC14. Follow critical parameters while applying infield by manual spraying or auto piloting				
	PC15. ensure compatibility of selected agrochemicals with drone spray system and nozzles for the desired dilution to ensure stability of agrochemical solubility formulation				
	PC16. Ensure proper formulation and their management				
	PC17. Adhere to agrochemical safety guidelines prescribed by the manufacturer for their safe handling				

	PC18. Follow recommended spray schedule at various/ critical crop growth and infestation stages as per crop protection guidelines				
	PC19. dilute the agrochemical in clean water as per recommendations by the manufacturing company using appropriate PPE				
	PC20. perform crop spraying in safer and cost- effective way by its autonomous and pre- programmed run on specific schedules and routes.				
	PC21. Operate drone to apply soil/crop nutrients in the form/concentration of the nutrients being sprayed/ broadcasted using sensors/ spraying systems installed				
	PC22. Ensure efficient fertigation use of water using drone (depending on the sprayer system of the drone)				
	PC23. Use different kinds of sprayer nozzles depending on the form and concentration of the nutrients to be applied				
	PC24. Evaluate residue and bio efficacy effects	-	-		-
	PC25. Follow safe application standard	-	-		-
	PC26. use the available advance feature of the software for accurate movement of drone and its control as per manifested various parameters like battery discharge or low voltage in the area of operation				
	PC27. identify and resolve common error messages and corrections by debugging of Software appropriately				
	PC28. ensure the drone is at home position after task completion				
	Safeguard the non-target while pesticide application	**3**	**4**		**3**
	PC29. Maintain sufficient buffer zone to counter agrichemical drift between the adjacent farm or different crops to avoid spray on non-target considering the severity of the agrochemical on the non-targets				
	PC30. maintain suitable distance from the drone and avoid windward direction as much as possible during the spray operation				

	PC31. Conduct Drone based spray operations at an appropriate distance from water bodies, residential areas, fodder crops, public utilities, dairy, poultry etc.as per DGCA or other concerned authority guidelines and ensure no human or animal movement within or in the close proximity of the farm during and immediately after the spray operations.				
	Drone, sensors data processing software and soil nutrient spraying system	**3**	**4**		**3**
	PC32. Use Recommended Dose of Fertilizer (RDF) Protocol to assess the soil nutrient status and post- process the data to generate the GPS tagged precision nutrient requirements map of the field as an input logic to the nutrient spraying drone with the help of soil indices				
	PC33. Use real-time operation protocol to live process the data from multispectral camera for spraying the nutrients simultaneously				
	PC34. Use electrostatic nozzle to avoid drift during the operation				
	PC35. assist end user to understand the report and to enhance decision making through accurate, reliable and timely information that have been obtained by ICT-driven tools and technologies				
	Precautions for storage of crop nutrients/ pesticides	**3**	**4**		**3**
	PC36. Maintain written inventory of all materials and with proper labelling				
	PC37. Ensure crop nutrients, herbicides, pesticides are separately stored in a secured building with absorbent spill kits in all liquid storage areas and regularly inspect				
	PC38. Ensure provision of emergency eyewash and emergency drench showers within or near the storage area, and dispose the excess or obsolete materials or chemicals in accordance with rules and regulations of manufacturer and state law				
	Undertake post operation drone maintenance	**3**	**4**		**3**
	PC39. examine the drone, their peripherals and relevant attachments post completion of operation for signs of wear and tear or damage				

	PC40. perform maintenance as per the respective manufacturer's instructions using appropriate and recommended tools and equipment				
	PC41. coordinate with the manufacturer to resolve any manufacturing-related issues experienced while drone operation				
	PC42. schedule periodic maintenance of drone, their peripherals and relevant attachments as per the maintenance schedule suggested by their respective manufacturers				
	NOS Total	**18**	**24**		**18**
AGR/N1020: Ensure adherence of precautionary measures before, during and post-operation for drone based pesticide application	*Undertake pre-application precautionary measures*	**5**	**5**		**5**
	PC1. confirm not to fly in the drone-forbidden area (airport or electronic station)				
	PC2. adhere to the local aviation laws and regulations in area of operation				
	PC3. ensure that No alcoholic drinks have been taken within 8 hours preceding operation				
	PC4. calibrate drone spray system to ensue nozzle output and accurate application of labelled rates				
	PC5. check that drone is in good condition and there is no leak in the spraying system				
	PC6. confirm place for take-off and landing, tank mix operations etc.				
	PC7. check and mark the obstacles (wall, trees) around the field for safe operation				
	PC8. set up at least buffer zone (as specified by DGCA) between drone treatment and the non- target crop				
	PC9. confirm water sources and do not spray pesticides near water sources (less than 100 m) to avoid polluting water sources				
	PC10. Confirm selectivity nature of plant protection chemicals, especially herbicides				
	Follow precautionary measures during application	**5**	**5**		**5**
	PC11. adhere to health and safety guidelines carefully				
	PC12. wear appropriate personal protective equipment(ppes while solution preparation and spraying				
	PC13. avoid eating, drinking or smoking while solution preparation and carrying out spraying operation				
	PC14. confirm the flying route to minimize turn around				

	PC15. ensure that operation team always stay at the downwind end of the field and backlight direction				
	PC16. spray with pure water first to test operation for at least 5 min				
	PC17. follow two step dilutions to fully dissolve the pesticide				
	PC18. adopt proper pressure for optimized droplet spectrum (>l00pm).				
	PC19. check appropriate weather conditions for e.g wind speed, temperature, relative humidity etc.				
	PC20. ensure appropriate flying height for the target crop, flying speed etc.				
	PC21. avoid walking through crop which has been contaminated by drifting spray				
	PC22. ensure not to spray during active bee foraging period of the day				
	PC23. abide by the product label requirements and take effective measures to avoid any associated risks				
	PC24. use anti-drift nozzle to decrease/avoid drift to human, environment, flowering nectar crop, non-target organisms such as fish, birds and silkworm etc.				
	Adhere to post application precautionary measures	**4**	**2**		**4**
	PC25. ensure timely evacuation and transfer to fresh air post completion of the pesticide spray operation				
	PC26. rinse the empty container appropriately to avoid any contamination for next operation				
	PC27. dispose off the waste/ spills safely at appropriate place in correct manner as per the legal regulations and law				
	PC28. ensure that hazardous waste is never burnt or buried				
	PC29. dispose empty containers as per the insecticide rule 1971 and never leave empty containers in the field				
	PC30. set up warning signs in the spray area for reminding people				
	PC31. take a shower and put on clean cloths	-	-		-
	PC32. ensure that leakage of remaining plant protection products is prevented in the process of transport				
	PC33. store the plant protection products securely away from unauthorized people, animals and food				
	PC34. follow the maintenance schedule of drone and their peripherals as prescribed by drone manufacturers				
	Administer appropriate emergency procedures	**2**	**4**		**4**

	PC35. follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to the location of emergency, as per the workplace requirements				
	PC36. use emergency equipment in accordance with manufacturer's specifications and workplace requirements				
	PC37. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques				
	PC38. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate				
	PC39. report details of first aid administered in accordance with workplace procedures				
	NOS Total	**16**	**16**		**18**
DGT/VSQ/N0101: Employability Skills (30 Hours)	*Introduction to Employability Skills*	*1*	*1*	-	-
	PC1. understand the significance of employability skills in meeting the job requirements				
	Constitutional values – Citizenship	*1*	*1*	-	-
	PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices				
	Becoming a Professional in the 21st Century	*1*	*3*	-	-
	PC3. explain 21st Century Skills such as Self- Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.				
	Basic English Skills	*2*	*3*	-	-
	PC4. speak with others using some basic English phrases or sentences				
	Communication Skills	*1*	*1*	-	-
	PC5. follow good manners while communicating with others				
	PC6. work with others in a team				
	Diversity & Inclusion	*1*	*1*	-	-
	PC7. communicate and behave appropriately with all genders and PwD				
	PC8. report any issues related to sexual harassment				

	Financial and Legal Literacy	*3*	*4*	*-*	*-*
	PC9. use various financial products and services safely and securely				
	PC10. calculate income, expenses, savings etc.				
	PC11. approach the concerned authorities for any exploitation as per legal rights and laws				
	Essential Digital Skills	*4*	*6*	*-*	*-*
	PC12. operate digital devices and use its features and applications securely and safely				
	PC13. use internet and social media platforms securely and safely				
	Entrepreneurship	*3*	*5*	*-*	*-*
	PC14. identify and assess opportunities for potential business				
	PC15. identify sources for arranging money and associated financial and legal challenges				
	Customer Service	*2*	*2*	*-*	*-*
	PC16. identify different types of customers				
	PC17. identify customer needs and address them appropriately				
	PC18. follow appropriate hygiene and grooming standards				
	Getting ready for apprenticeship & Jobs	*1*	*3*	*-*	*-*
	PC19. create a basic biodata				
	PC20. search for suitable jobs and apply				
	PC21. identify and register apprenticeship opportunities as per requirement				
	Total Marks	**20**	**30**	**-**	**-**
	Grand Total	**59**	**70**		**41**

Annexure 6: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

1. Assessment System Overview

In Agriculture Sector it is of ultimate importance that individuals dealing with crop production or livestock have the requisite knowledge and competencies to undertake the task. Based on the Assessment Criteria, SSC in association with empanelled AAs, define the test structure for the given job roles to cover the required skills and competencies. Assessment strategy consists of the following:

***The Assessment of DGCA syllabus will be undertaken at RPTO by DGCA approved Instructor**

1. Multiple Choice Questions : To assess basic knowledge (Objective/Subjective)
2. Viva : To assess awareness on processes (Oral and/or written questioning)
3. Practical : To evaluate skills and identify competencies.(Observation)

Assessments for knowledge and awareness on processes may be conducted through 'real time' internet based evaluation or by conducting the same 'offline' through TABs. Skills and competencies are to be assessed by conducting 'practical' on ground through qualified and ToA certified assessors.

While it is important that an individual has adequate knowledge and skills to perform a specific task, weight age for different aspects for assessment are given as follows:

Multiple Choice Questions: 20%-30%, depending on the specific QP

Viva: 20%

Practical: 50% - 60% (Involves demonstrations of applications and presentations of procedures/tasks and other components)

Assessment will be carried out by certified assessors through empanelled assessment partners. Based on the results of assessment; ASCI will certify the learners/candidates

The assessment at the Training Centre would not cover the assessment of Core flying NOS_AGR/N1039: Undertake Drone Flying ensuring adherence to laws/procedures, which is being imparted and assessed at the RPTO as per DGCA rules/ regulations but would only cover the other balance NOSs.

2. Testing Environment

Assessments are conducted on laptops, Mobiles and android tablets via both offline and online mode depending on the internet connectivity at assessment location.

In remote locations/villages, assessments get delivered through tablets without the requirement of Internet.

- Multilingual assessments (ASCI is conducting assessments in 13 + languages pan India)
- Rubric driven assessments in Practical/Viva sections and responses recorded accordingly
- All responses, data, records and feedback stored digitally on cloud
- Advanced auto-proctoring features – photographs, time-stamp, geographic-tagging, toggle-screen/copy-paste disabled, etc.
- Android based monitoring system
- End to end process from allocation of a batch to final result upload, there is no manual intervention
- Assessment will normally be fixed for a day after the end date of training / within 7 days of completion of training.
- Assessment will be conducted at the training venue
- Room where assessment is conducted will be set with proper seating arrangements with enough space to curb copying or other unethical activities
- Question bank of theory and practical will be prepared by ASCI /assessment agency and approved ASCI. Only from approved Question Bank assessment agency will prepare the question paper. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on his theoretical knowledge of the subject.
- The theory, practical and viva assessments will be carried out on same day. In case of more number of candidates, number of assessors and venue facilitation be increased and facilitated
- ***Assessments for DGCA mandatory training syllabus will be undertaken at RPTO by DGCA certified Drone Instructor.***

Assessment			
Assessment Type	**Formative or Summative**	**Strategies**	**Examples**
Theory	Summative	MCQ/Written exam	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks/Demonstration	Practical application /Demonstration /Application tasks
Viva	Summative	Questioning and Probing	Mock interviews on usability of job roles/advantages /importance of adherence to procedures. Viva will be used to gauge trainee's confidence and correct knowledge in handling job situation

The question paper pre-loaded in the computer /Tablet and it will be in the language as requested by the training partner.

3. Assessment Quality Assurance framework

Assessment Framework and Design:

Based on the Assessment Criteria, SSC in association with AAs will define the test structure for the given roles to cover the required skills and competencies. ASCI offer a bouquet of tools for multi- dimensional evaluation of candidates covering language, cognitive skills, behavioral traits and domain knowledge.

Theoretical Knowledge - Item constructs and types are determined by theoretical understanding of the testing objectives and published research about the item-types and constructs that have shown statistical validity towards measuring the construct. Test item types which have been reported to be coachable are not included. Based on these, items are developed by domain experts. They are provided with comprehensive guidelines of testing objectives of each question and other quality measures.

Type – Questions based on Knowledge Required, Case-based practical scenario questions and automated simulation based questions.

Practical Skills - The practical assessments are developed taking into consideration two aspects: what practical tasks is the candidate expected to perform on the job and what aspects of the job cannot be judged through theoretical assessments. The candidates shall be asked to perform either an entire task or a set of subtasks depending on the nature of the job role

Type – Standardized rubrics for evaluation against set of tasks in a demo/practical task

Viva Voce - Those practical tasks which cannot be performed due to time or resource constraints are evaluated through the viva mode. Practical tasks are backed up with Viva for thorough assessment and complete evaluation

Type – Procedural questions, do's and don'ts, subjective questions to check understanding of practical tasks.

Assessor has to go through orientation program organized by Assessment Agency. The training would give an overview to the assessors on the overall framework of QP evaluation. Assessor shall be given a NOS and PC level overview of each QP as applicable. Overall structure of assessment and objectivity of the marking scheme will be explained to them. The giving of marks will be driven by an objective framework which will maintain standardization of marking scheme.

4. Type of Evidence and Evidence Gathering Protocol:

During the assessment the evidences collected by AAs and ASCI are:

- Geo Tagging to track ongoing assessment
- AA's coordinator emails the list of documents and evidences (photos and videos) to the assessor one day prior to the assessment. List is mentioned below:
    - Signed Attendance sheet
    - Assessor feedback sheet
    - Candidate feedback sheet
    - Assessment checklist for assessor
    - Candidate Aadhar/ID card verification
    - Pictures of classroom, labs to check the availability of adequate equipment's and tool to conduct the training and assessment

- Pictures and videos of Assessment, training feedback and infrastructure.

- Apart from the Assessor, Technical assistant popularly known as Proctor also ensures the proper documentation and they verify each other's tasks.
- To validate their work on the day of assessment, regular calls and video calls are done.
- On-boarding and training of assessor and proctor is done on timely basis to ensure that quality of the assessment should be maintained.
- Training covers the understanding of QP, NSQF level, NOS and assessment structure

5. Methods of Validation

- Morning Check (Pre-Assessment): Backend team of AA calls and confirms assessor/technical spoc event status. Assessor/Technical spoc are instructed to reach the centre on time by 9:30 AM / as decided with TC and delay should be highlighted to the Training Partner in advance.
- Video Calls: Random video calls are made to the technical spoc/assessor so as to keep check on assessment quality and ensure assessment is carried out in fair and transparent manner
- Aadhar verification of candidates
- Evening Check (Post Assessment): Calls are made to the ground team to ensure event is over by what time and the documentation is done in proper manner or not.
- TP Calling: To keep check on malpractice activity, independent audit team calls to TP on recorded line to take confirmation if there was any malpractice activity observed in assessment on part of AA/SSC team. If calls are not connected, email is send to TP Spoc for taking their confirmation
- Video and Picture Evidence: Backend team collects video and pictures for assessment on real time basis and highlights any issue like, Students sitting idle/trainer allowed for helping out candidates during assessment.
- Surprise Visit: Time to time SSC/AA Audit team can visit the assessment location and do surprise audit for assessment process carried out by ground team.
- Geo Tagging: On day of assessment, each technical spoc is required to login in our internal app which is Geo tagged. Any deviation with centre address needs to be highlighted to assessment team on real-time basis.

Method for assessment documentation, archiving, and Access:

- ASCI has fully automated result generation process in association with multiple AAs
- Theory, Practical and Viva marks forms the basis of the results and encrypted files generated to avoid data manipulation. All responses captured and stored in System with Time-Stamps at the end of AAs and SSC. NOS-wise and PC-wise scores can be generated.
- Maker Checker concept: 1 person prepares results and other audit result which is internally approved by AA at first and then gets vetted at the end of SSC
- All soft copy of documents is received from the on-ground tech team over mail. The same are downloaded by our internal backend team and saved in Repository. The repository consists of scheme wise folders. These scheme wise folders have job role specific folders. These specific folders have Year wise and Month wise folders where all documents are saved in Batch specific folders. All Hard copies are filed and stored in storeroom.
- **Result Review & Recheck Mechanism –**
- Time stamped assessment logs
- Answer/Endorsement sheets for each candidate
- Attendance Sheet
- Feedback Forms: Assessor feedback form, Candidate feedback form, TP feedback form

- The results for each of the candidate shall be stored and available for review (retained for 5 years/ till conclusion of project or scheme)

Annexure: Acronym and Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf