

Quality Assurance Procedures During Sample Evaluation

(Post Qualification Stage)

General Requirements:

- Domestic Preference for mass-produced goods for easier monitoring
- Require the manufacturer of the mass-produced and market goods Manufacturing Quality Assurance Certification issued by international or local certifying body such as but not limited to ISO, CI, ASTM, PS (for locally manufactured products), etc.
- The supplier shall submit certification under oath that the tools and equipment supplied is non-toxic, lead free, and mercury free.
- To ensure compliance to the material specifications, the procuring entity may conduct a random material test during contract implementation. The PIU will randomly select the specimen. The Supplier will shoulder the cost of material testing at any government accredited testing facilities. If the test result is not compliant to the technical specifications, the affected goods will be rejected. The supplier is required to replace the rejected goods of the same brand and compliant to the technical specifications. However, the material of the replacement goods shall be tested at the government accredited testing facilities and the cost will be charged to the supplier.
- The Inspection and Test Protocols shall serve as guide during sample evaluation.

Submission of Samples

The BAC shall set the location and time of the sample submission.

For Mass Production Items

I.) BLR-Developed - Science and Mathematics Equipment

The supplier shall submit (10) unit of newly manufactured unassembled and assembled samples for each mass-produced items/goods for evaluation to the place set by the BAC Secretariat and the BLR-Cebu inspectors/evaluators will evaluate the sample base on the Technical Drawing/Specifications as follows:

1. Evaluation Process
 - a. The ten (10) unassembled units shall be subjected to visual and dimensional inspection.
 - b. The ten (10) assembled units shall be subjected to visual and functionality testing.
 - c. At least two (2) assembled unit that passed the functionality testing shall be disassembled, and each part shall be subjected to visual and dimensional inspection.
2. Grounds for acceptance

- a. Each part of the ten (10) unassembled units should pass the visual and dimensional inspection; and
 - b. All ten (10) assembled units should pass the visual and functionality testing.
 - c. All parts of the disassembled units should pass the dimensional inspection.
3. Grounds for rejection
 - a. If anyone (1) part of the unassembled is not compliant to the technical specification, reject all the ten (10) unassembled units and the ten (10) assembled units is automatically rejected.
 - b. If one (1) assembled unit failed the functionality testing, reject all the ten (10) assembled units.
 - c. If any part of the disassembled unit is not compliant to the technical specification, reject the ten (10) assembled units.
4. Grounds for re-evaluation
 - a. For unassembled unit, submit another batch of 10 pieces of the rejected part(s) and subjected to evaluation process.
 - b. For assembled unit, submit another batch of 10 assembled units and subjected to evaluation process.
 - c. All the processes will be repeated until such time that all the units will be compliant to the technical specification and functionality testing.

II.) BLR-Developed – Storage Cabinets

The supplier shall submit (1) unit of newly manufactured unassembled (collapsed) storage cabinet, to the place set by the BAC Secretariat and the BLR-Cebu inspectors/evaluators will evaluate the sample base on the Technical Drawing/Specifications as follows:

1. The evaluation/inspection shall be based on the technical specification and the Inspection and Test Protocol for science and math equipment cabinets.
2. Conduct thorough evaluation of the unassembled (collapsed) one (1) unit cabinet based on the technical specifications.
3. Conduct visual evaluation. The material must conform to the technical specifications. There must be no deformities, dents, breakage, sharp edges, cracks, and other deficiencies/defects.
4. Do dimensional evaluation through linear measurement of length, width, height, thickness, etc.
5. The paint applied to the cabinet should be evaluated to determine compliance to the technical specifications, which is powder coating.
6. If the unassembled part(s) of the cabinet will pass the visual and dimensional inspection, the supplier shall assemble the parts for further evaluation.
7. The assembled cabinet will be subjected to stress test by moving it sideways, forward, and backward and tilt 30 degrees both ways from the vertical position. During stress test, if the assembled cabinet is found not sturdy and defects will be noted, it will be ground for rejection.

8. The approved samples will be stored at DepEd Central Office, Bureau of Learning Resources for the duration of the project/contract since it will be used as reference during the conduct of the pre-delivery inspection.

For Market Items

The supplier shall submit the samples of Market items/goods, to the place set by the BAC Secretariat and the BLR-Cebu inspectors/evaluators will evaluate the sample base on the Technical Specifications as follows:

1. The evaluation/inspection will be based on the technical specification and the Inspection and Test Protocol for science and math equipment.
2. The DepEd inspector assigned during the samples' evaluation shall be guided by the Inspection and Test Protocol for step-by-step conduct of the evaluation for each Science and Mathematics Equipment.
3. The item shall be accepted if it complies with the technical specifications, otherwise it will be rejected.
4. The approved samples will be stored at DepEd Central Office, Bureau of Learning Resources for the duration of the project/contract since it will be used as reference during the conduct of the pre-delivery inspection.

INSPECTION AND TEST PROTOCOL

Project Mass Production, Supply, and Delivery of Science and Mathematics Equipment Packages to Public Elementary Schools for
 Title: Grades 1 to 3 and Grades 4 to 6, Public Junior High Schools for Grades 7 to 10, and Public Senior High Schools for Grades 11 to
 12 (Core & STEM) 2022 Rebid and 2023 (REBID FOR LOTS 3-A,3-B,3-C, and 4-A, 4-B, 4-C)

A. General Inspection Protocol. This general protocol shall serve as guide in the conduct of the Evaluation Samples/predelivery inspection for all market items (where the following statement is applicable).

- a.) verify/evaluate the parameters of the goods or product as indicated in the specifications e.g. material, dimensions, capacity, power rating, etc.;
- b.) check the goods for any evidence of defects visually as follows:
 - i) rust formation
 - ii) cracked/broken parts
 - iii) warps/dents
 - iv) loose parts
 - v) discoloration
- c.) look into the completeness of parts/accessories;
- d.) all goods powered by dry cell (AA, AAA, etc.) shall be included with corresponding batteries ready for use;
- e.) the bidder shall unbox, set up (if applicable), and manipulate the goods to be evaluated and shall perform corresponding performance and/or functionality tests.
- f.) Markings and Labels shall be in English, with correct spelling, permanent.
- g.) For models with key card, verify and identify the structures if correct.
- h.) The bidder/supplier shall provide the materials and consumables.

Detailed Test and Inspection Protocol

| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
|--|------------------------------|---|
| LOT 3: GLASSWARES AND LAB TOOLS | | |
| 1 | Beaker, borosilicate, 250 mL | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>a). Visual inspection Check the visible attributes/parameters of the 250 mL beaker, borosilicate as per technical specifications</p> <p>b) Dimensional inspection Measure the dimensions as per technical specifications of the 250 mL beaker, borosilicate</p> <p>c) Scratch test Scratch using your thumb nails the brand, white graduations and inscriptions and other markings , to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings, If it wont peel off, it passed QC inspection. If not, it is relected</p> <p>d) Refractive-index test Submerge the glass into vegetable oil or glycerin to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerin, 1.473 are some liquids with similar refractive index as to borosilicate glass).</p> <p>e) Volumetric Test</p> <p>a) Fill the dry beaker sample with water up to the 200 mL mark . Measure all its contents of the beaker sample using a dry, standard 100 graduated cylinder up to 200 mL and transfer the water to another beaker , to check the accuracy and preciseness of the printed graduations as stipulated in the technical specifications, is met. The capacity must be 200 mL, tolerance: ±5%</p> <p>b) Measure 250 mL water using the standard 100 mL graduated cylinder and transfer all the contents to the beaker sample. The capacity must be 250 mL, tolerance: ±5%</p> |

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| | | <p>f) Functionality test</p> <ol style="list-style-type: none"> Place half- full of water in the 250 mL beaker. Use boiling stones or boiling sticks in liquids to facilitate even heating and boiling Heat the beaker with water up to its boiling point of 100°C and let it continue boiling for 3 more minutes up to 150°C to check and verify its resistance to thermal shock without breakage, it Passed QC inspection or if it fails to resist thermal shock, it is relected. <p>C. Needed Equipment and Material:</p> <ol style="list-style-type: none"> Digital vernier caliper Steel tape measure Graduated cylinder, 100 mL Funnel, glass Denatured alcohol Rag/tissue paper Glycerine (1 liter) Tripod Lighter Wire gauze Thermometer, partial immersion Hand gloves Face mask Safety goggles Boiling stones |
| 2 | Beaker, borosilicate, 50 mL | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>a). Visual inspection Check the visible attributes/parameters of the 50 mL borosilicate beaker as per technical specifications</p> <p>b) Dimensional inspection Measure the dimensions as per technical specifications of the 50 mL borosilicate beaker</p> <p>c) Scratch test Scratch using your thumb nails the brand, white graduations and inscriptions and other markings, to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it will not peel off, it passed QC inspection. if not, it is relected</p> <p>d) Refractive-index test Submerge the glass into vegetable oil or glycerin to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerin, 1.473 are some liquids with similar refractive index as to borosilicate glass).</p> <p>e). Volumetric Test</p> <ol style="list-style-type: none"> Fill the dry beaker sample with water up to its 40 mL mark. Measure all of its contents using a standard 10 mL graduated cylinder, to check the accuracy and preciseness of the printed graduations . The capacity must be 40 mL; tolerance: ±5% Measure 50 mL water using a standard dry graduated cylinder and transfer all the contents to the beaker sample, to verify whether the required minimum/maximum volumetric capacity as stipulated in the technical specifications , is met. The capacity must be 50 mL, tolerance: ±5% and it must not overflow. it passed QC inspection. If not it is relected <p>f) Functionality test</p> <ol style="list-style-type: none"> Place half- full water in the 50 mL beaker. Use boiling stones or boiling sticks in liquids to facilitate even heating and boiling Heat the beaker with water up to its boiling point of 100°C and let it continue boiling for 3 more minutes up to 150°C to check and verify its resistance to thermal shock without breakage, it Passed QC inspection or if it fails to resist thermal shock, it is relected <p>C. Needed Equipment and Material:</p> |

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| | | 1. Digital vernier caliper 2. Steel tape measure 3. Graduated cylinder, 10 mL 4. Graduated cylinder, 100 mL 5. Funnel, glass 6. Denatured alcohol 7. Rag/tissue paper 8. Glycerine (1 liter) 9. Tripod 10. Lighter 11. Wire gauze 12. Thermometer, partial immersion 13 Hand gloves 14. Safety goggles 15. Boiling stones, Detergent, sponge, water |
| 3 | Burette, 10 mL capacity (acid) | A. (Refer to General Inspection Protocol) B. Tests a). Visual inspection Check the visible attributes/parameters of the burette as per technical specifications b) Dimensional inspection Measure the dimensions as per technical specifications of the burette c) Scratch test. Scratch using your thumb nails the brand and white graduations and inscriptions and other markings of the distilling flask; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it won't peel off, it passed QC inspection. If not, it is rejected d) Refractive-index test. Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass e) Leak test Procedure: 1. Clean the burette. 2. Allow the temperature of burette and distilled water used for verification to equalize, 3. Note the water temperature. 4. The burette must be fixed in a vertical position in a burette clamp 5. Close the stopcock. 6. Initially fill the burette to a level a few millimetres above the zero mark/line with water. 7. With the key in one or other of the « closed » or shut off positions, the test time will last at least 30-51 minutes to ensure sufficiently accurate determination of water-tightness 8. If a drop appears, the stopcock may need to be tightened or cleaned. If the problem persists, the burette should be rejected. The rate of leakage for Class A burette shall not exceed one half of one scale subdivision in 30-51 min, it Passed QC inspection. If not, it is rejected |

Detailed Test and Inspection Protocol

| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
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| | | <p>f) Delivery time- is the time required for the free descent of the water meniscus, from the zero mark to the lowest numbered scale mark, with the stopcock fully open and with no restriction of flow.</p> <p>a) Fix/mount the burette in a vertical position using the burette clamp</p> <p>b) Close the stopcock.</p> <p>c) Fill initially the burette with distilled water way up the zero mark.</p> <p>d) Open the stopcock and slowly drain the liquid to set the zero point accurately, making sure the lower meniscus is up to zero mL/mark.</p> <p>d) Fully open the stopcock making sure its tip is not in contact with the wall of the receiving vessel but at the center .</p> <p>e) Drain the water into the beaker up to the lowest numbered scale mark with the stopcock fully open and with no restriction of flow.</p> <p>The delivery time determined in this way must be minimum- 70 sec . maximum: 100 sec</p> |
| | | <p>g) Functionality Test</p> <ol style="list-style-type: none"> 1. Add 0.33 mL of 12 N HCl to 10 ml of distilled water to obtain a 0.4 N HCl solution. 2. Set up the burette. 3. Fill the burette with 0.4 N hydrochloric acid slightly above the zero mark using a pipette to rinse its inside surface very well and align burette tube vertically. 4. Place a reading card at the back of the burette to take a more accurate initial reading at the level of the meniscus. 5. Drain the liquid to set the zero point accurately. 6. Pour 5 mL of the unknown NaOH solution in an Erlenmeyer flask using the 10 mL pipette and add three drops of phenolphthalein to get a pink color. Swirl the flask to mix all the substances. 7. Place the sheet of white paper under the flask for easiest recognition of the color change. 8. Begin the titration by adding HCl to the analyte. Open the stopcock and slowly add titrant to the sample in the flask 9. Gently keep swirling the flask with one hand while using the other hand to manipulate the burette adding the titrant simultaneously. Rinse the walls of the beaker and the tip of the burette with deionized water from a wash bottle when the endpoint is near. This ensures that all of the HCl delivered from the burette ends up in the reaction mixture. 10. The end point is reached when the pink color disappears and one drop changes the indicator color permanently from pink to colorless which lasts for at least 30 seconds 11. Take the reading of the burette. <p>C. Materials</p> <ul style="list-style-type: none"> Beaker, 250 mL Test tube, 16 x 150 Sodium hydroxide, 5 mL Hydrochloric acid, 10 mL, 0.4 M Watch glass Burette, base Erlenmeyer flask, 250 mL Phenolphthalein indicator Glycerine (1L) Stand setup assembly/tripod Stirring rod Hand gloves Safety goggles Face mask Detergent Sponge Rags/tissue paper |

Detailed Test and Inspection Protocol

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| | | Pipette, 10 mL with pipettor Graduated cylinder, 10 mL Distilled water, 1 L Buret reading card, 3 x 5 index card White paper Funnel |
| 4 | Burette, 10 mL capacity (base) | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>a) Visual inspection Check the visible attributes/parameters of the burette as per technical specifications</p> <p>b) Dimensional inspection Measure the dimensions as per technical specifications of the burette</p> <p>c) Scratch test. Scratch using your thumb nails the brand and white graduations and inscriptions and other markings of the distilling flask; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it won't peel off, it passed QC inspection. If not, it is</p> <p>d) Refractive-index test. Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass)</p> <p>e) Leak test Procedure: 1. Clean the burette. 2. Allow the temperature of burette and distilled water used for verification to equalize, 3. Note the water temperature. 4. The burette must be fixed in a vertical position in a burette clamp 5. Close the stopcock. 6. Initially fill the burette to a level a few millimetres above the zero mark/line with water. 7. With the key in one or other of the « closed » or shut off positions, the test time will last at least 30-51 minutes to ensure sufficiently accurate determination of water-tightness 8. If a drop appears, the stopcock may need to be tightened or cleaned. If the problem persists, the burette should be rejected.</p> <p>The rate of leakage for Class A burette shall not exceed one half of one scale subdivision in 30-51 min, it Passed QC inspection. If not, it is rejected</p> <p>f. Delivery time- is the time required for the free descent of the water meniscus, from the zero mark to the lowest numbered scale mark, with the stopcock fully open and with no restriction of flow. a) Fix/mount the burette in a vertical position using the burette clamp b) Close the stopcock. c) Fill initially the burette with distilled water way up the zero mark. d) Open the stopcock and slowly drain the liquid to set the zero point accurately, making sure the lower meniscus is up to zero mL/mark. e) Fully open the stopcock making sure its tip is not in contact with the wall of the receiving vessel but at the center . f) Drain the water into the beaker up to the lowest numbered scale mark with the stopcock fully open and with no restriction of flow.</p> <p>The delivery time determined in this way must be minimum- 70 sec .</p> |

Detailed Test and Inspection Protocol

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| | | <p>g) Functionality Test</p> <ol style="list-style-type: none"> 1. Set up the burette. Fill the burette with 0.4 M sodium hydroxide solution slightly above the zero mark using a pipette to rinse its inside surface very well and align burette tube vertically. Place a reading card at the back of the burette to take a more accurate initial reading at the level of the meniscus. Drain liquid to set the zero point accurately. 2. Pour 5 mL of the unknown HCl solution in an Erlenmeyer flask using the 10 mL burette and add three drops of phenolphthalein. Swirl the flask to mix all the substances. 9. Place the sheet of white paper under the flask for easiest recognition of the color change 4 Begin the titration by adding NaOH solution to the analyte. Open the Rotaflo stopcock and slowly add titrant to the sample in the flask 5. Gently keep swirling the flask with one hand while using the other hand to manipulate the burette adding the titrant simultaneously. Rinse the walls of the beaker and the tip of the burette with deionized water from a wash bottle when the endpoint is near. This ensures that all of the NaOH delivered from the burette ends up in the reaction mixture. 6. The end point is reached when one drop changes the indicator color permanently from colorless to a very slight pink which lasts for at least 30 seconds. Take the final reading. Volume of the base = Final - initial reading Make three or more trials. <p>C. Materials</p> <ul style="list-style-type: none"> Erlenmeyer flask, 250 mL Sodium hydroxide, 0.4 M Hydrochloric acid, 30 mL Phenolphthalein indicator Stirring rod Glycerine (1L) Stand setup assembly/tripod Graduated cylinder, 10 mL Burette reading card Hand gloves Safety goggles Face mask Detergent Sponge Rags/tissue paper, Pipette, 10 mL with pipettor Graduated cylinder, 10 mL Distilled water, 1 L Buret reading card, 3 x 5 index card White paper Funnel |
| 5 | Burner, Alcohol, glass, 150 ml. Capacity | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>a) Visual inspection Check the visible attributes/parameters of the alcohol burner, 150 mL, as per technical specifications</p> <p>b) Dimensional inspection Measure the dimensions as per technical specifications of the alcohol burner, 150 mL</p> <p>c) Volumetric Test Measure 150 mL of denatured alcohol, using a standard 100 mL graduated cylinder. Fill the alcohol burner using a funnel. This test is used to check and verify whether the required minimum/ maximum volumetric capacity of the glass, as stipulated in the technical specifications, is met. The capacity must be 150 mL</p> <p>d) Leak Test</p> <ol style="list-style-type: none"> 1. Place a piece of white paper on a table. |

Detailed Test and Inspection Protocol

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| | | <p>2. Place the alcohol lamp on top of the piece of paper. Observe. Expected Result: No leak of the alcohol on the piece of paper. This test is done to check if there is no leakage of the denatured alcohol inside the burner/lamp.</p> <p>e) Functionality (Heating) test Use the alcohol lamp for continuous heating of water for 20 minutes to test if it can resist thermal shock/withstand prolonged heating without breaking, it Passed QC inspection. If it failed to resist thermal shock and if the glass breaks. it is rejected</p> <p>C. Needed Equipment and Material:</p> <ol style="list-style-type: none"> 1. Digital vernier caliper 2. Tape rule 3. Graduated cylinder, 100 mL 4. Funnel, glass 5. Hand gloves 6. Safety goggles 7. Face mask 8. Denatured alcohol 9 Detergent |
| 6 | Burner, Bunsen | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection Check the visible attributes/parameters of the Bunsen burner as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the Bunsen burner</p> <p>Functionality test</p> <ol style="list-style-type: none"> 1. Install/connect the Bunsen burner to LPG tank. 2. Check for leaks especially on the Bunsen burner's serrated inlet tube and threaded gas needle valve using soap solution (soap or detergent). No bubbles formed, it passed QC inspection. If not, it is rejected 3. Close the air holes, a yellow flame (luminous) is produced. 4. Open the air holes, a blue flame (non-luminous) is produced. <p>Gas leak test before using the LPG tank</p> <ol style="list-style-type: none"> 1. Prepare a soap solution by mixing 5 mL detergent to 10 mL water; ensure that bubbles do not form during the preparation of the detergent. 2. Open the LPG tank control valve one-fourth turn counterclockwise. 3. Place the soap solution on both ends of the rubber hose and into the connection between the regulator and the LPG tank. 4. If bubbles are formed, it indicates that there is a leakage; 5. Shut off the LPG tank control valve. 6. Locate the leak and fix. 7. Repeat steps 1-3 to re-test the leakage. 8. After the re-test, if there is no more leakage, continue with the succeeding activity <p>C. Materials needed to perform inspection and test</p> <p>Digital vernier caliper Tape rule Stand set up assembly/tripod Lighter Beaker Detergent Water</p> |

Detailed Test and Inspection Protocol

| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
|----------|---|---|
| 7 | Cork Stopper # 5 (for Ø 16mm test tube) | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection Check the visible attributes/parameters of the cork stopper, #5 for 16 x 150 mm test tube, as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the cork stopper, #5 for 16 x 150 mm test tube</p> <p>Functionality Test Plug the cork stopper to a 16 mm test tube to check if it fits snugly into it. If it does, it passed Qc inspection. If not, it is rejected</p> <p>C. Materials needed to perform inspection and test protocol Tape rule, Vernier caliper, 16 x 150 mm test tube</p> |
| 8 | Crucible with lid/cover | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection Check the visible attributes/parameters of the crucible with lid/cover as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the crucible with lid/cover</p> <p>Volumetric test Measure 30 mL water and pour into it; to check and verify whether the its required minimum/maximum volumetric capacity as stipulated in the technical specifications, is met.</p> <p>Functionality test, by heating sugar until it melted to test its resistance to breakage of crucible.</p> <p>C. Materials needed to perform inspection and test protocol Steel tape/ ruler Vernier caliper Sugar Lighter Bunsen/alcohol burner Stand setup assembly LPG/match Burner Wire gauze Water</p> |
| 9 | Dish, Evaporating, 75 mL | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection Check the visible attributes/parameters of the evaporating dish, 75 mL as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the evaporating dish, 75 mL</p> <p>Function test by performing the evaporation of salt solution, to separate water from the salt crystals, with the salt residue remaining in the filter paper and the water evaporated, a to test for the functionality and the thermal shock resistance of the evaporating dish</p> <p>Volumetric test by measuring 75 mL of water using a standard 100 mL graduated cylinder and pouring all the contents into the evaporating dish sample, to check and verify whether the its required minimum/maximum volumetric capacity as stipulated in the technical specifications, is met.</p> <p>C. Materials needed to perform inspection and test Measuring tape/ ruler Caliper Stand setup assembly/tripod Alcohol/Bunsen Burner Wire gauze Evaporating dish</p> |

Detailed Test and Inspection Protocol

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| | | LPG/match Graduated cylinder, 100 mL Denatured alcohol Lighter Stirring rod Salt Water Spatula, Graduated cylinder, 100 mL |
| 10 | Distillation set-up: Condenser, Liebig- | A. (Refer to General Inspection Protocol) B. Tests Visual inspection Check the visible attributes/parameters of the Liebig condenser as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Liebig condenser Insert the rubber stopper to the distilling flask and to the Liebig condenser if there will be no leak or escape of the steam or rubber hose Scratch test: Scratch using your thumb nails the brand and inscriptions and other markings of the Liebig condenser; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it wont peel off, it passed QC inspection. If not, it is rejected Refractive-index test (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass) Refractive-index test. Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass) Functionality Test Assemble the distillation setup (Liebig Condenser, distilling flask, rubber hose, rubber stopper). Perform the distillation experiment (see attached procedure) The distillate shall be obtained (e.g. coffee to be distilled) without any breakaaae. C. Materials needed to perform inspection and test tape rule, heat source, stand, water source, glycerine (1L), coffee solution, rag/tissue paper, wire gauze, ring with stem, stand setup assembly, universal clamp, Bunsen burner, LPG |
| 11 | Distillation set-up: Distilling Flask, | A. (Refer to General Inspection Protocol) B. Tests visual inspection Check the visible attributes of the distilling flask, borosilicate, 250 mL, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the distilling flask, borosilicate, 250 mL Scratch test: Scratch using your thumb nails the brand and white graduations and inscriptions and other markings of the distilling flask; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it wont peel off, it passed QC inspection. If not, it is |

Detailed Test and Inspection Protocol

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|----------|--------------------------------------|--|
| | | <p>Refractive-index test. Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass)</p> <p>Volumetric Test Fill the 250 mL distilling flask with 250 mL water using a standard 100 mL graduated cylinder, to check if its volumetric capacity is met.</p> <p>Functionality Test . Assemble the distillation setup to perform distillation experiment (Liebig Condenser, distilling flask, rubber hose, rubber stopper). (See attached procedure).</p> <p>Distillate shall be obtained (e.g. coffee to be distilled) without any breakage .</p> <p>C. Materials needed to perform test and inspection tape rule, heat source, stand, water source, glycerine (1L), coffee solution, rag/tissue paper, wire gauze, ring with stem, stand setup assembly, universal clamp, Bunsen burner, LPG</p> |
| 12 | Double burette clamp | <p>A. (Refer to General Inspection Protocol)</p> <p>B. tests Visual inspection Check the visible attributes/parameters of the double burette clamp as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the double burette clamp Functionality Test Let the clamp hold the burettes (acid, base) securely and in place to check its functionality.</p> <p>C. Materials needed: Tape rule, Vernier caliper</p> |
| 13 | Electrolysis Apparatus, student-type | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests a) Do the refractive-index test for the four graduated 25 mL glass test tubes and beaker/glass jar (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass)</p> <p>b) Do the function test by performing the Electrolysis of Water experiment, to separate water into its elements to produce two part hydrogen and one part oxygen gases (2:1) ratio. (See attached procedure of the experiment on Electrolysis of Water), to check the accuracy and preciseness of the printed graduations and verify whether the required minimum/maximum volumetric capacity of the glass, as stipulated in the technical specifications, is met.</p> <p>c) Do volumetric test: i) Fill each of the two (2) graduated test tube samples up to their 25 mL mark, using a standard 10 mL graduated cylinder to check the accuracy and preciseness of the printed graduations b) Measure 27 mL water and fill the two graduated test tube samples. It wont overflow . it passed QC inspection. If not, it is relected ii) Measure 1000 mL of water using a standard 100 mL graduated cylinder and pour into glass jar sample, to test and verify its volumetric capacity and to check the accuracy and preciseness of the printed graduations and verify whether the required minimum/maximum volumetric capacity of the glass jar (1000 mL): as stipulated in the technical specifications, is met.</p> |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
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| | | <p>d) Do the scratch test: scratch using your thumb nails the white graduations and large white enamel marking spot of the 27 mL graduated test tubes and 1000 mL beaker to test for the peel and adhesion properties of embossed/enamelled brand and permanency of graduations, If they are peeled off, the item is rejected.</p> <p>C. Materials needed to perform inspection and test Tape rule 9 V battery Connecting wires Beaker, 250 mL Power supply with switch selector Stirring rod Sodium hydroxide solution Glycerine (1L)</p> |
| 14 | Flask, Erlenmeyer, borosilicate, narrow- | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests Visual inspection Check the visible attributes/parameters of the Erlenmeyer flask, 250 mL, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Erlenmeyer flask, 250 mL Scratch test: Scratch using your thumb nails the brand and white graduations and inscriptions and other markings of the glass jar and four (4) graduated test tubes; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it wont peel off, it passed QC inspection. If not, it is rejected.</p> <p>Refractive-index test (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate alass.</p> <p>Volumetric test, 1) Fill the flask up to its 200 mL mark. Measure all its contents using a standard graduated cylinder and transfer to a beaker, to check the accuracy and preciseness of the printed graduations and verify whether the required minimum/maximum volumetric capacity of the glass, as stipulated in the technical specifications, is met. The capacity must be 200 mL 2) Measure 250 mL water using a standard graduated cylinder and transfer all the contents to the Erlenmeyer flask sample, to check its volumetric capacity. The capacity must be 250 mL Use boiling stones 1. Fill the flask with half-full water 2. Heat the flask with water up to its boiling point of 100°C and let it continue boiling for 3 minutes, to check if it can resist thermal shock, it Passed QC inspection or its failure to resist thermal shock when the alass breaks. it is</p> <p>C. Materials needed to perform inspection and test Measuring tape/ ruler</p> |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
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| | | Boiling stones Measuring tape/ ruler Vernier Caliper, Graduated cylinder, 100 mL, Glycerine (1L)Measuring tape/ ruler Caliper Stand setup assembly/tripod Alcohol/Bunsen Burner Wire gauze Evaporating dish LPG/match Graduated cylinder, 100 mL Denatured alcohol Lighter Stirring rod Water Spatula, Stand setup assembly Wire gauze Universal clamp |
| 15 | Funnel, borosilicate, fluted | A. (Refer to General Inspection Protocol) B. Tests Visual inspection Check the visible attributes/parameters of the funnel, borosilicate, fluted, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the funnel, borosilicate, fluted Functionality test 1. Make a filter cone out of a filter paper and place it snugly in a funnel 2. Place a little sand and pour 10 mL water in beaker 3. Filter and collect in a flask Expected Result: The sand- water mixture must be separated The sand is retained on the filter paper as residue and the water as the filtrate passes through the filter paper and is collected in the flask C. Materials needed to perform inspection and test Measuring tape/ ruler Digital vernier caliper Graduated cylinder, 100 mL Erenmeyer flask, 250 mL Stirring rod Beaker, 250 mL Filter paper Pair of scissors Sand Tap Water |
| 16 | Glass Tubing, Ø 6 mm x Ø 4 mm x 1500 | A. (Refer to General Inspection Protocol) B. Tests Visual inspection Check the visible attributes/parameters of the glass tubing, Ø 6 mm x Ø 4 mm x 1219-1500 mm long as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the glass tubing Function test Cut a 1 foot glass tubing using the triangular file Fire polish the ends C. Materials needed to perform inspection and test |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
|----------|---------------------------------------|---|
| | | Tape rule Digital vernier caliper Triangular file Alcohol /Bunsen burner Funnel Denatured alcohol Lighter |
| 17 | Manometer, Open U-tube | A. (Refer to General Inspection Protocol) B. TESTS Visual inspection Check the visible attributes/parameters of the Open U-tube manometer, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Open U-tube manometer Leak Test for the rubber hose 1. Fill the rubber hose with water for at least a minute. Water must not leak. 2. Immerse the rubber hose in water. Gently blow air through the tube. There shall be no bubbles coming out from the rubber hose Functionality Test 1. Fill the U-tube manometer with colored water following instructions in the accompanying User's Manual. 2. The height/level of the colored water in the two (left and right) tubes must be the same. 3. Insert the rubber hose into the rifted tip of the U-tube manometer 3. Apply slight pressure onto the rubber hose. There is now a difference in the level of the left and right) tubes of the manometer colored water. The colored water inside the U-tube manometer moves up and down. 4. Allow the liquid to stop moving before taking the reading 5. Read the height/level difference between both the tubes (arms) 6. Record the height of the liquid in the left tube (arm). 7. Record the height of the liquid in the right tube (arm). 8. The pressure difference is measured by taking the difference between the two heights/levels of colored water. C. Materials needed to perform inspection and test Steel tape/ruler Vernier caliper Colored dye Water Beker, 250 mL Spatula Ruler |
| 18 | Mortar and Pestle, porcelain, 150 mL. | A. (Refer to General Inspection Protocol) B. Tests Check the visible attributes/parameters of the mortar and pestle, 150 mL, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the mortar and pestle, 150 mL Volumetric test Fill the mortar with 150 mL of water using a standard 100 mL graduated cylinder, to check its maximum volumetric capacity, as stipulated in the technical specifications, is met. Functionality test Cut a leaf into smaller pieces Use the mortar and pestle to extract the juice out of the leaf C. Materials needed to perform inspection and test Steel tape |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
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| | | Mortar and pestle Pair of scissors Graduated cylinder, 100 mL Beaker, 250 mL Water |
| 19 | Osmosis Apparatus | A. (Refer to General Inspection Protocol) B. Tests Visual inspection Check the visible attributes/parameters of the Osmosis apparatus, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Osmosis apparatus Functionality Test Set up the Osmosis apparatus and conduct experiment (See attached procedure on Osmosis experiment) Procedure: 1. Soak the animal membrane in water for at least 30 seconds and cover the thistle tube with it, and tie it with rubber band. Make sure that the membrane is smooth and tight against the lip of the thistle tube to prevent leakage 2. Fill the thistle tube funnel up to its neck with the 50 % sugar and remove trapped air using a barbecue stick 3. Invert and mount the thistle funnel in an upright position using the aluminum stand. Make sure that it does not touch the bottom of the jar. 4. Fill the jar with water up to the neck of the thistle funnel. Use the barbecue stick when there is a gap on the glass tube 5. Mark the initial level of the sugar solution with a marking pen 6. Mark the next level of the sugar solution in the thistle tube after 5 minutes 7. Monitor the change of the level of the sugar solution in the thistle tube every after 5 minutes for 20 minutes Expected Result: There is a continuous rise of the level of sugar solution in the thistle tube until rising of the level stops when equilibrium is reached. C. Materials Sugar solution, 50% Sugar, 10 g Tape rule Balance, digital Ruler Vernier caliper Stopwatch Beaker, 250 mL Barbecue stick Water Rubber band |
| 20 | Pipette, Beral, 1 mL | A. Inspection: 1. Shall comply with the design specifications. 2. There must be no leaks and cuts and other deficiencies on the item. 3. Shall provide a manufacturer's certificate of non-toxicity of plastic material. B. Volumetric Test: 1. Measure 1 mL of water using a standard 10 mL graduated cylinder to check its capacity. C. Materials Needed to Perform Inspection and Test: 1. Graduated cylinder, 10 mL 2. Steel Tape Measure 3. Water |
| 21 | Reagent Bottle, narrow-mouth, amber, | A. (Refer to General Inspection Protocol) B. Tests |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
|----------|-----------------------------|---|
| | | <p>Visual inspection Check the visible attributes/parameters of the reagent bottle, narrow mouth, amber, 250 mL , as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the reagent bottle, narrow-mouth, amber, 250 ml (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass.</p> <p>Volumetric test Measure 250 mL water using a standard 100 mL graduated cylinder and fill the reagent bottle sample, to check its capacity.</p> <p>Scratch test Scratch using your thumb nails the white large white markings and brand of the reagent bottle to test for the peel and adhesion properties of embossed brand and permanency of the big white enamel marking spot and other markings. If the marking spot and brand name and other markings are peeled off, the item is rejected.</p> <p>C. Materials needed to perform test and inspection Tape rule Digital vernier caliper Graduated cylinder, 100 mL</p> |
| 22 | Reagent Bottle, wide-mouth, | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests Visual inspection Check the visible attributes/parameters of the reagent bottle, wide mouth, clear, 250 mL , as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the reagent bottle, wide mouth, clear, 250 mL</p> <p>Scratch test Scratch using your thumb nails the white large white markings and brand of the reagent bottle to test for the peel and adhesion properties of embossed brand and permanency of the big white enamel marking spot and other markings. If the marking spot and brand name and other markings are peeled off, the item is rejected.</p> <p>Refractive index test (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass.</p> <p>Volumetric test Measure 250 mL water using a standard 100 mL graduated cylinder and fill the reagent bottle sample, to check its capacity.</p> <p>C. Materials needed to perform inspection and test Tape rule Vernier caliper Graduated cylinder, 100 mL Glycerine Hand gloves Face mask Stirring rod Safety goggles Detergent Sponge Rags/Tissue paper Water</p> |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
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| 23 | Rubber Stopper # 0 (for Ø 16mm test | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests visual inspection Check the visible attributes/parameters of the rubber stopper, #0, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the rubber stopper, #0 Hardness test by using the durometer. Hardness: 40 ± 5 Duro Fitting test to validate the level of performance and accuracy of the item by placing the bottom part of the rubber stopper into the mouth of a 16 mm x 150 mm test tube, and see if it fits well. It passed QC, if not, it failed QC.</p> <p>C. Materials needed to perform inspection and test Steel tape// ruler Digital vernier caliper Durometer</p> |
| 24 | Spoon-spatula, porcelain and glazed | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests visual inspection Check the visible attributes/parameters of the Spoon-spatula, porcelain and glazed, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Spoon-spatula, porcelain and glazed Functional test by transferring liquid or powder from one container to another Volumetric test i) Measure 0.3 mL of water using a standard 10 mL graduated cylinder ii) Pour the 0.3 mL water into the spoon portion This test is used to check and verify whether the required minimum/maximum volumetric capacity of the spoon, as stipulated in the technical specifications, is met</p> <p>C. Materials needed to perform inspection and test Vernier caliper Steel tape/ ruler, Graduated cylinder, 10 mL Water</p> |
| 25 | Stirring Rod | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests Visual inspection Check the visible attributes/parameters of the Stirring Rod, Ø 6 mm x 250 mm long, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Stirring Rod, Ø 6 mm x 250 mm long Functionality Test Mix salt and water using the stirring rod. A solution is formed, one phase. Refractive-index Test Submerge the glass into vegetable oil or glycerin to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerin, 1.473 are some liquids with similar refractive</p> |

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| | | <p>index as to borosilicate glass).</p> <p>C. Materials needed to perform inspection and test Tape rule Digital vernier caliper Glycerine (1L) Hand gloves Face mask Safety goggles Detergent Sponge, Rags/tissue paper</p> |
| 26 | Test tube brush | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection Check the visible attributes/parameters of the test tube brush, as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the test tube brush</p> <p>Function test by cleaning a test tube using the test tube brush</p> <p>C. Materials needed to perform inspection and test Vernier caliper Steel tape/ ruler Water Detergent, Rags/tissue paper</p> |
| 27 | Test Tube, borosilicate | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection Check the visible attributes/parameters of the test tube, borosilicate, \varnothing 16 x 150 mm long, as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the test tube, borosilicate, \varnothing 16 x 150 mm long</p> <p>Volumetric test Fill the test tube with 20 mL water using a standard graduated cylinder to check its capacity.</p> <p>Refractive-index test Submerge the glass into vegetable oil or glycerine to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass.</p> <p>Scratch test: Scratch using your thumb nails the white large white markings and brand of the test tubes to test for the peel and adhesion properties of embossed brand and permanency of the big white enamel marking spot and other markings. If the marking spot and brand name and other markings are peeled off, the item is rejected.</p> <p>Functionality (Boiling Point) Test: Fill the test tube half-full with water. Use boiling stones or boiling sticks in liquids to facilitate even heating and boiling. Heat to boiling and let it continue boiling for at least three more minutes to check and verify if it can resist thermal shock or withstand prolonged heating without breaking, it Passed QC inspection. or if it fails to resist thermal shock. it is rejected</p> <p>C. Materials needed to perform inspection and test protocol Tape rule Vernier caliper</p> |

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| | | Glycerine (1 L) Graduated cylinder, 10 mL Hand gloves Face mask Safety goggles Detergent Sponge Water |
| 28 | Tong, Beaker | A. Inspection: 1. Shall comply with the design specifications. B. Tests: 1. Performance Test: Do actual holding of heated beakers of different sizes. 2. Material Test: Chrome is highly polished and smooth, with a high luster finish and is magnetic. C. Materials Needed to Perform Inspection and Tests: 1. Steel tape measure 2. Different sizes of beakers 3. Magnet |
| 29 | Tong, Crucible | A. (Refer to General Inspection Protocol) B. Test visual inspection Check the visible attributes/parameters of the Crucible tong, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Crucible tong Functionality Test Check if it is easy to remove the lid from a crucible, transfer evaporating dish or pick small objects out of a reaction container using the tong. If it does, it passed. if not, reject it C. Needed tools and materials: Steel tape rule/ ruler Vernier caliper Steel tape/ ruler |
| 30 | Vial, screw-neck, 25 ml. (with screw- | A. (Refer to General Inspection Protocol) B. Tests visual inspection Check the visible attributes/parameters of the vial, screw-neck, 25 mL (with screw-type plastic cap), as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the vial, screw-neck, 25 mL (with screw-type plastic cap) Volumetric test Measure 25 mL water using the standard 10 mL graduated cylinder and transfer all the contents to the dry 25 mL vial sample, to check its volumetric capacity. It must not overflow and it passed QC inspection. If not, it is rejected Refractive-index test Submerge the glass into vegetable oil or glycerin to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerin, 1.473 are some liquids with similar refractive index as to borosilicate glass). C. Needed tools and materials: tape rule |

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| | | Vernier caliper Glycerine (1 L) Graduated cylinder, 10 mL Hand gloves Face mask Safety goggles Detergent Water Sponge Rags/tissue paper |
| 31 | Vial, screw-neck, 50 mL. (with screw- | A. (Refer to General Inspection Protocol) B. Tests visual inspection Check the visible attributes/parameters of the vial, screw-neck, 50 mL (with screw-type plastic cap), as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the vial, screw-neck, 50 mL (with screw-type plastic cap) Dimensional inspection Measure the dimensions as per technical specifications of the vial, screw-neck, 50 mL (with screw-type plastic cap) Volumetric test Fill the vial with 50 mL water using a standard 10 mL graduated cylinder to check its capacity Refractive-index test Submerge the glass into vegetable oil or glycerin to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerin, 1.473 are some liquids with similar refractive index as to borosilicate glass). C. Needed tools and materials: tape rule Vernier caliper Glycerine (1 L) Graduated cylinder, 10 mL Hand gloves Face mask Safety goggles Detergent Sponge Water Rags/tissue paper |
| 32 | Watch Glass, Ø 90 mm | A. (Refer to General Inspection Protocol) B. Tests visual inspection Check the visible attributes/parameters of the watch glass, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the watch glass Refractive-index Test Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass). Functionality Test |

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| | | Fill the watch glass with 5 mL acetone using a standard 10 mL graduated cylinder . Observe Fill the watch glass with 5 mL water and observe. The acetone evaporates faster than water since it is more volatile than water C. Needed tools and materials: Tape rule Vernier caliper Acetone Glycerine (1 L) Graduated cylinder, 10 mL Stirring rod Hand gloves Face mask Safety goggles Detergent Sponge Rags/tissue paper |
| LOT 4: SCIENCE POWERED DEVICES AND INSTRUMENTS | | |
| 1 | Balance, Toploading, Electronic | A. (Refer to General Inspection Protocol) B. Tests visual inspection Check the visible attributes/parameters of the Balance, Toploading, Electronic, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the Balance, Toploading, Electronic Functionality test a) Set up and operate the unit using the User's Manual . b) Place the balance on a sturdy, level surface. c) Get the bubble centered to ensure the balance is correctly level on the bench top d) First, before weighing , it needs to be "tared," or recalibrated to read 0.01 g. e) Press the button and turn it on f) Press the Tare button and release to effect this recalibration to check its accuracy . g) Place the 500 g calibration mass to be weighed at the center of the pan h) Take the reading i) Take three or more trials to verify the precision and functionality C. Materials needed to perform inspection and test Tape rule, Vernier caliper |
| 2 | Centrifuge | A. (Refer to General Inspection Protocol) B. Tests Visual inspection Check the visible attributes/parameters of the centrifuge, as per technical specifications Dimensional inspection Measure the dimensions as per technical specifications of the centrifuge Functionality Test Install, set up and operate the unit using the User's Manual. a) Remove the centrifuge from the box and inspect for any possible shipping damage. If the centrifuge appears to be damaged from shipping, it is rejected. b) Place the centrifuge on a sturdy, level surface. c) Turn the lid latch to the UNLOCK position ("U"). Open to verify that there are no loose objects or packing material in the tube chamber, and that the 8 large blue tube shields and the 8 smaller black tube shields are in place and seated in the angled 8-place rotor. The smaller tube shields can be removed when spinning larger test tubes |

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| | | <p>d) Verify that the power switch on the front of the unit is in the OFF position.</p> <p>e) Connect the 3-prong wall power cord to the AC power adapter, and then connect the AC power adapter to the back of the centrifuge.</p> <p>f) Plug the power cord into an approved and properly grounded outlet. Do not insert specimen test tubes prior to initial test run.</p> <p>g) Close the lid, turn the lid latch to the LOCKED position ("L") and turn power switch ON. For fixed unit, turn the timer to 10 minutes.</p> <p>h) Press RUN. If there is a smooth whirring sound and the unit accelerates with little or no vibration, your E8 centrifuge is ready to operate.</p> <p>The unit PASSED</p> <p>If there are loud, unusual sounds or if you experience excessive vibration,</p> |
| 3 | Electrical Conductivity (Conductivity | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>visual inspection Check the visible attributes/parameters of the Electrical Conductivity (Conductivity of Solutions) Apparatus, as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the Electrical Conductivity (Conductivity of Solutions) Apparatus</p> <p>Functionality test by performing the Electrical Conductivity of Substances, wherein conductors/electrolytes cause the bulbs to light while non-conductors/non-electrolyte will not cause the bulbs to light</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. Prepare 10% salt solution,(10 g salt, 90 g water) 2. Clean the electrode using sand paper 3. Fill the jar with the salt solution 4. Connect the ECA to the power source <p>Expected Result: The bulb will light up if (salt solution) electrolyte. If non-electrolyte, it will not light up(sugar)</p> <p>C. Materials needed to perform test and inspection</p> <p>Measuring tape/ ruler 2 Battery, AA Power supply (0-12 V) with switch selector Beaker, 250 mL Alligator clips Connecting wires Stirring rod 10% salt solution Sugar solution</p> |
| 4 | Laboratory Hot Plate with magnetic | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Tests</p> <p>Visual inspection/parameters Check the visible attributes/parameters of the Laboratory Hot Plate with magnetic stirrer, as per technical specifications</p> <p>Dimensional inspection Measure the dimensions as per technical specifications of the Laboratory Hot Plate with magnetic stirrer</p> <p>Functionality test</p> <p>a) Place half full water in a beaker. Use boiling stones or boiling sticks in liquids to facilitate even heating and boiling</p> <p>b) Heat the water up to its boiling point and let it continue boiling for three more minutes to check functionality</p> <p>Monitor the motor temperature based on NEMA Standards MG 1-2011, 12.43, defines temperature rise for motors in a maximum ambient of 40°C. *Its vibration is within the tolerance of the given motor rating without irregular noise in motor bearing and in other moving mechanical parts</p> |

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| | | <p>Endurance Test for a series of five Test Runs with one minute each to determine how the machine behaves under sustained use. Turn On and Off method is applied.</p> <p>Powder coating test</p> <p>Rub a ball of cotton with alcohol into the surface of the plate. If the color of the paint sticks to the cotton, it is not powder coated. Reject the item. If not, accept the item as it is powder coated.</p> <p>C. Materials needed to perform inspection and test</p> <ul style="list-style-type: none"> Steel / ruler Digital vernier caliper Stand setup assembly Beaker Wire gauze Boiling stones Ring with stem Alcohol burner Lighter Denatured alcohol |
| 5 | Microscope, Digital | <p>A. Inspection:</p> <ol style="list-style-type: none"> 1. Shall comply with the design specifications. 2. Move the stage clips left to right, to and fro to check if not defective 3. Check the completeness of the parts and accessories 4. Check for defects. 5. Shall comply in the submission of Training video as stated in the specifications. <p>B. Performance Test:</p> <p>Bidder's representative must do the demonstration on its operation during the sample evaluation.</p> <ol style="list-style-type: none"> a. Set-up the unit b. Perform sample snapshots c. Conduct short videos <p>C. Material Needed to Perform Inspection:</p> <ol style="list-style-type: none"> 1. Steel tape measure |
| 6 | Soil pH, Moisture, Sunlight Meter | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Functionality Test:</p> <ol style="list-style-type: none"> 1. Demonstrate the functions indicated in the technical specifications. 2. Look for a place outdoors where there is soil. 3. Stick into the soil the probe of the pH/moisture/light meter. 4. It shall show the weak and strong pH, weak and strong light, and weak and strong moisture. <p>C. Materials Needed to Perform Inspection and Tests:</p> <ol style="list-style-type: none"> 1. 1 steel rule/meter tape 2. 1 vernier caliper |
| 7 | Telescope, Astronomical (Reflecting) | <p>A. (Refer to General Inspection Protocol)</p> <p>B. Functionality Test:</p> <ol style="list-style-type: none"> 1. Measure the focal length-the effective physical length of the telescope: |

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| ITEM NO. | ITEM DESCRIPTION | INSPECTION and TEST PROCEDURES |
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| | | <p>a) using a meter tape measure the distance from the rear of the telescope where the primary mirror (objective) is fixed to the secondary mirror is fixed. The secondary mirror is directly below the eyepiece. The measured distance is the focal length of the telescope. (To get the actual measure, get the length between the primary mirror and below the eyepiece.)</p> <p>2. Manipulate the controls of the telescope as presented in the accompanying manual, these includes the cradles, latitude, leveling and balancing, alignment, azimuth lock, declination etc.</p> <p>3.The telescope unit should respond accordingly as discussed in the manual.</p> <p>C. Materials Needed to Perform Inspection and Tests:</p> <ol style="list-style-type: none"> 1. 1 steel rule/meter tape 2. 1 vernier caliper |