**LEARNER SUMMATIVE ASSESSMENT TOOL: KNOWLEDGE MODULE 2:**

**KNOWLEDGE COMPONENT: LEARNER SUMMATIVE ASSESSMENT TOOL: KNOWLEDGE MODULE 2: SUGAR PROCESSING EQUIPMENT AND TECHNOLOGY**

**Occupational Certificate: Sugar Processing Machine Operator**

**LEARNER SUMMATIVE ASSESSMENT TOOL**

**KNOWLEDGE MODULE 2: SUGAR PROCESSING EQUIPMENT AND TECHNOLOGY**

**SUGAR PROCESSING EQUIPMENT AND TECHNOLOGY**

****

**OCCUPATIONAL CERTIFICATE: ID 98912: SUGAR PROCESSING MACHINE OPERATOR**

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1. STAKEHOLDER INFORMATION

|  |  |
| --- | --- |
| **LEARNER INFORMATION** | |
| **Name** |  |
| **Surname** |  |
| **ID number** |  |
| **Mobile phone contact number** |  |
| **E-mail address** |  |
| **Physical address** |  |
| **Postal address** |  |
| **Employer Name** |  |
| **Employer Contact Details** |  |

|  |  |
| --- | --- |
| **ASSESSOR DETAILS** | |
| **Name** |  |
| **Surname** |  |
| **Assessor ID** |  |
| **Project Name** | Occupational Certificate ID 98912::Sugar Processing Machine Operator |
| **Module No.** | **Module 2:Sugar Processing Equipment and Technology** |
| **Date of Assessment** |  |
| **Portfolio submission Date** |  |
| **Assessor Signature** |  |
| **Total Marks for Knowledge Module 2** | 153 marks |
| **Marks attained** |  |
| **Place:** |  |

|  |  |
| --- | --- |
| **MODERATOR DETAILS** | |
| **Moderator Name** |  |
| **Moderator ID** |  |
| **Moderator Signature** |  |
| **Date of Moderation** |  |

1. COMPETENCY SUMMARY OF ASSESSMENT

|  |  |  |  |
| --- | --- | --- | --- |
|  | | | |
| **Module 2** | **KM-2-KT01: Equipment hygiene and cleaning** | **C** | **NYC** |
| **1** | 1.1. Cleaning processes |  |  |
|  | 1.2.Cleaning materials and chemicals |  |  |
|  | 1.3. Equipment hygiene and product quality standards |  |  |
|  | 1.4. Causes of equipment contamination and general preventative and cleaning practices |  |  |
| **2** | **KM-2-KT02: Raw and refined sugar processing equipment and technology** | **C** | **NYC** |
|  | 2.1. Cane handling equipment |  |  |
|  | 2.2. Cane preparation equipment |  |  |
|  | 2.3. Juice processing equipment |  |  |
|  | 2.4. Crystallisation and crystal recovery equipment |  |  |
|  | 2.5. Ancillary boiler equipment |  |  |
| **3** | **KM-2-KT03: Introduction to mechanical systems** | **C** | **NYC** |
|  | 3.1. Material handling equipment (actuators, elevators, conveyors) |  |  |
|  | 3.2. Pumping systems (pipes, fittings, valves) |  |  |
|  | 3.3. Drives (direct and indirect drives) (motors, turbines, hydraulic, gear boxes, clutches) |  |  |
|  | 3.4. Scales |  |  |
|  | 3.5. Air moving equipment (fans, compressors, vacuum pump) |  |  |
| **4** | **KM-2-KT04: Introduction to process flow and control** | **C** | **NYC** |
|  | 4.1. Flow diagrams and symbols |  |  |
|  | 4.2. Instrumentation and control systems |  |  |
|  | 4.3. Process communication (Up-stream and down-stream) |  |  |
| **5** | **KM-2-KT05:** **Mechanical workshop practices** | **C** | **NYC** |
|  | 5.1. Tools and measuring equipment for lubricating and cleaning |  |  |
|  | 5.2. Mechanical workshop safety |  |  |
|  | 5.3. Basic engineering symbols. |  |  |
|  | 5.4. Use of equipment manuals |  |  |
|  | 5.5.Properties and use of lubricants, sealants, fasteners and locking devices |  |  |
| **6** | **KM-2-KT06:** **Maintenance** | **C** | **NYC** |
|  | 6.1. Preventative maintenance |  |  |
|  | 6.2. Care for assets |  |  |
| **7** | **KM-2-KT07:** **Energy, utilities and services** | **C** | **NYC** |
|  | 7.1. Steam |  |  |
|  | 7.2. Electricity |  |  |
|  | 7.3. Compressed air |  |  |
|  | 7.4. Water |  |  |

1. ASSESSMENT ALIGNMENT MATRIX (INTERGRATED OUTCOMES)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module No: 2** | **How it is assessed (Assessment methodology)** | **Where is it covered (learning material)** | **Where it is assessed** | | **First Submission** | | |
|  | **Summative** | **Formative** |
| **SAQA ID Number:** 98912 | Two methods of assessment are followed which are:  1. Summative assessment: written tests, knowledge questions using fundamental and reflexive questions.  2. Formative assessment: assignments, tasks, portfolio of evidence submitted and presentations. |  |  |  | **Clearly meets all the criteria** | **Meets some but not all criteria** | **Clearly does not meet any of the criteria** |
| **Title: Sugar processing equipment and technology** |  |  |  |  |  |  |
| **NQF level and credits:**  NQF Level 3: 24 Credits |  | Question 2.1 and 2.18 page 23 and 29 |  |  |  |  |
| **Topic: 1**  Equipment hygiene and cleaning | Page 12 | Question 2.2, 2.3 and 2.19 page 23-24 and 29 |  |  |  |  |
| **Assessment criteria**: The importance of equipment hygiene can be explained | Page 12-22 |  | Learning Activity 1.1 page 11-12 |  |  |  |
| **Assessment criteria**: Safe handling of cleaning chemical and empty containers can be explained |  |  | Learning Activity 1.2 page 13-19 |  |  |  |
| **Topic 2.**  **Raw and refined sugar processing equipment and technology** |  | Page 23 | Question 2.20 page 29 |  |  |  |  |
| **Assessment criteria:** Equipment components can be identified from diagrams of the equipment |  | Page 23-70 | Question 2.5 page 24 | Learning Activity 2.1 page 21-23 |  |  |  |
| **Assessment criteria:** The working principles of the equipment can be explained |  | Question 2.6 and 2.7page 25 |  |  |  |  |
| Question 2.21 and 2.22 page 30 |
| Question 2.23 page 30 |
| **Assessment criteria:** The operating principles of the equipment can be explained |  |  | Learning Activity 2.2 page 24-25 |  |  |  |
| **Assessment criteria:** Care for, cleaning and routine maintenance practices can be explained |  |  | Learning Activity 2.3 page 26-34 |  |  |  |
| **Topic 3.**  **Introduction to mechanical systems** |  | Page 70 | Question 2.24 page 31 |  |  |  |  |
| Question 2.25 page 31 |
| Question 2.26 page 31 |
| **Assessment criteria:** Equipment components can be identified from diagrams of the equipment |  | Page 70-158 | Question 2.8, 2.9,2.11, 2.13, 2.14 and 2.15 page 25-28 | Learning Activity 3.1 page 36-38 |  |  |  |
| Learning Activity 3.2.page 39-40 |
| Question 2.27 page 32 |
| Learning Activity 3.3 page 41-42 |
| **Assessment criteria:** The working principles of the equipment can be explained |  |  | Question 2.10 page 26 | Learning Activity 3.4 page 43-44 |  |  |  |
| Question 2.16 page 28 |
| Learning Activity 3.5 page 45-50 |
| Question 2.28 page 32 |
| Question 2.29 page 32 |
| Question 2.30 and 2.31page 33 |
| **Topic 4. Introduction to process flow and control** |  | Page 159 |  |  |  |  |  |
| **Assessment criteria:** Equipment and process stages can be identified from a flow diagram |  | Page 159-179 |  | Learning Activity 4.1 page 52-53 |  |  |  |
| **Assessment criteria:**Instrumentation and control systems can be identified and the uses explained |  | Question 2.32 page 33 | Learning Activity 4.2 page 54-56 |  |  |  |
| **Topic 5. Mechanical workshop practices** |  | Page 180 | Question 2.33 page 33 |  |  |  |  |
| **Assessment criteria:** The use of technical manuals and engineering symbols can be demonstrated |  | Page 180-211 |  | Learning Activity 5.1 page 58-61 |  |  |  |
| **Assessment criteria:**Workshop tools and measuring instruments can be identified and their uses explained |  |  |  |  |  |  |
| **Assessment criteria:** Workshop safety practices can be explained |  |  |  |  |  |  |
| **Assessment criteria:** Tools, equipment and materials used for lubrication and cleaning used for general equipment maintenance can be identified and their uses explained |  |  |  |  |  |  |
| **Topic 6.**  **Maintenance** |  | Page 212 |  |  |  |  |  |
| **Assessment criteria:** The importance of preventative maintenance and care for assets can be explained |  | Page 212-215 | Question 2.34page 34 | Learning Activity 6.1 page 63-65 |  |  |  |
| **Topic 7.**  **Energy, utilities and services** |  | Page 216 |  |  |  |  |  |
| **Assessment criteria:** The uses of energy, utilities and steam in the processing lines can be explained |  | Page216- 219 | Question 2.17 page 28 | Learning Activity 7.1 page 67-70 |  |  |  |

1. ASSESSMENT DECISION & EVIDENCE EVALUATION RECORD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Candidate's Name: - | | | | |
| Assessor's Name: - | | | | |
| **Practical assessment**  I declare that this assessment is my own demonstration.  Marks: The learner is either “Met requirements” or “did not meet requirements”. If the learner did not meet requirements in an area, then he or she must be reassessed.  **Learner achieved: Met requirements /Did not meet requirements** | | | | |
| **KNOWLEDGE MODULE 2:** **SUGAR PROCESSING EQUIPMENT AND TECHNOLOGY** | | | | |
| **Overall outcome:** | | | | |
| **Specific Outcome** | | **Met requirements** | **Did not meet requirements** | **Comments** |
| 1 |  |  |  |  |
| **Specific Outcome** | | **Met requirements** | **Did not meet requirements** | **Comments** |
| 2 |  |  |  |  |
| **Specific outcome** | | **Met requirements** | **Did not meet requirements** | **Comments** |
| 3 |  |  |  |  |
| **Specific outcome** | | **Met requirements** | **Did not meet requirements** | **Comments** |
| 4 |  |  |  |  |
|  |  |  |  |  |
| 5 |  |  |  |  |
| **Specific outcome** | | **Met requirements** | **Did not meet requirements** | **Comments** |
| 6 |  |  |  |  |
| **Specific outcome** | | **Met requirements** | **Did not meet requirements** | **Comments** |
| 7 |  |  |  |  |

1. OVERALL ASSESSMENT DECISION

|  |
| --- |
|  |
| **Assessor’s Comments:** |
| **Signature of Assessor:** |
| **Date:** |

1. Evidence of feedback

|  |  |  |
| --- | --- | --- |
| **Module No : 2**  **Level :3**  **Assessor :**……………………………………………………………………………  **Candidate :**…………………………………………………………………………..  **Date of final assessment:**……………………………………………………………. | | |
| **Evidence criteria** | **Achieved** | **Not** |
| 1. Constructive |  |  |
| 2. Timeous (according to Plan) |  |  |
| 3. Correct mode / medium |  |  |
| 4. Participative |  |  |
| 5. Developmental |  |  |
| 6. Accurate |  |  |
| 7. Specific |  |  |
| 8. Documented |  |  |
| 9. Directed to correct parties |  |  |
| **Signing off date:** …………………………………………….  ..........……………. ………………………………….  **Assessor Candidate** | | |

1. OVERALL RESULTS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OVERALL RESULT** | **Competent** | |  | |
| **Not Yet Competent** | |  | |
| Declaration by Candidate | | | | |
| I, …………………………………………………………………….declare that I am satisfied that the feedback given to me by the Assessor was relevant, sufficient and done in a constructive manner. I accept the assessment decisions and do realise that have no further questions relating to this particular assessment process. I do realise that after this assessment decision, the moderator will either uphold or reverse this assessment decision taken by the assessor. | | | | |
| **Candidate : \_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | **Assessor : \_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | **Moderator : \_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

1. ASSESSMENT REVIEW

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessor’s Name** | |  | | | | | | | **ID Number** | | | | |  | | |
| **Contact Details of Assessor** | | **Email** | |  | | | | | | | | | | | | |
| **Phone** | |  | | | | | | | | | | | | |
| **Fax** | |  | | | | | | | | | | | | |
| **PART 1** | | | | | | | | | | | | | | | | |
|  | **Review Criteria** | | **Valid** | | **Authentic** | **Current** | | **Consistent** | | | **Reliable** | | **Sufficient** | | | **Comments** |
| ***Please conduct an honest review of the Assessment Instruments used in this assessment:*** | | | | | | | | | | | | | | | | |
| 1 | Evidence Topic 1 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
| Practical Assignment | |
| Natural Occurring Evidence | |
| Reflection | |
| 2 | Evidence Topic 2 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
| Practical Assignment | |
| Natural Occurring Evidence | |
| Reflection | |
| 3 | Evidence Topic 3 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
| Practical Assignment | |
| Natural Occurring Evidence | |
| Reflection | |
| 4 | Evidence Topic 4 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
|  | Practical Assignment | |
|  | Natural Occurring Evidence | |
|  | Reflection | |
| 5 | Evidence Topic 5 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
| Practical Assignment | |
| Natural Occurring Evidence | |
| Reflection | |
| 6 | Evidence Topic 6 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
| Practical Assignment | |
| Natural Occurring Evidence | |
| Reflection | |
| 7 | Evidence Topic 7 | |  | |  |  | |  | | |  | |  | | |  |
|  | Knowledge Assignment | |  | |  |  | |  | | |  | |  | | |  |
| Practical Assignment | |
| Natural Occurring Evidence | |
| Reflection | |
| **PART 2** | | | | | | | | | | | | | | | | |
| **No** | **Review Criteria** | | | | | | | | | **Yes** | | **No** | | | **Remarks** | |
| 1 | Do you feel the candidate was appropriately selected and prepared for the RPL assessment? | | | | | | | | |  | |  | | |  | |
| 2 | Did the candidate interpret the evidence requirements appropriately? | | | | | | | | |  | |  | | |  | |
| 3 | Was the assessment free of potential assessment barriers such as language, literacy, access to resources? | | | | | | | | |  | |  | | |  | |
| 4 | Was the assessment evidence presented by the candidate valid, authentic, current and sufficient? | | | | | | | | |  | |  | | |  | |
| 5 | Was the candidate’s workplace access to evidence sufficiently supportive of the assessment strategy? | | | | | | | | |  | |  | | |  | |
| 6 | Do you feel you could make a fair, valid and reliable assessment decision? | | | | | | | | |  | |  | | |  | |
| **Recommendations** | | | | | | | | | | | | | | | | |
| ***(Feedback on Validity, authenticity, currency and sufficiency of candidate evidence.)*** | | | | | | | | | | | | | | | | |
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| **Assessor Signature** | | | | | | | **Date Review Completed** | | | | | | | | | |

1. FINAL DECISION

|  |
| --- |
| **I………………………………………………………. hereby declare Ms/Mr**  **………………………………………… Competent Not Yet Competent** |
| **FEEDBACK TO LEARNER:**  **……………………..………………………..………………………..……………………**  **……………………..………………………..………………………..………………………**  **……………………..………………………..………………………..………………………**  **……………………..………………………..………………………..………………………**  **SIGN: …………………………………… DATE: ……………………..........................** |
| **LEARNER FEEDBACK:**  **……………………..………………………..………………………..………………………**  **……………………..………………………..………………………..………………………**  **……………………..………………………..………………………..………………………**  **……………………..………………………..………………………..………………………**  **SIGN: ……………………………………… DATE: …………………….......................** |
| **MODERATOR FEEDBACK:**  **………………………..………………………..………………………..……………………**  **………………………..………………………..………………………..……………………**  **……………………..………………………..………………………..………………………**  **……………………..………………………..………………………..………………………**  **SIGN: …………………………………… DATE: ……………………........................** |

1. LEARNER FEEDBACK FORM

|  |  |  |  |
| --- | --- | --- | --- |
| **CRITERIA** | **EVIDENCE** | **CRITERIA** | **EVIDENCE** |
| How did your assessor encourage you and put you at ease during the assessment process? |  | Were you given clear and constructive feedback? |  |
| Were your assessor’s questions clear and pitched at the right level of language usage? |  | Did your assessor assess all the evidence provided by you? |  |
| Do you believe that all the assessment criteria and knowledge requirements of the standard you were being measured against were considered in your assessment? |  | Were you aware of any discrimination practice carried out by your assessor towards you? |  |

**LEARNER SIGNATURE:………………………………………………**

**DATE:.…………………………..**

1. SUMMATIVE ASSESSMENT INSTRUCTIONS

**Instructions**

* Work individually and answer all questions.
* Use a black pen and ensure that you complete the questions in your own handwriting.
* Time to spend on this assessment is **2 hours.**
* The marks you will attain for each question are shown in brackets.

1. WRITTEN ASSESSMENT

**Candidate instruction:** Complete the following multiple-choice questionnaire by marking the most appropriate response with an x in the space provided.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Scope of Assessment** | | **Exit Level Outcome/s** | | **Module/s** | |
|  | | **2.** **Sugar processing equipment and technology** | | **2** | |
| **Alignment – Learning Outcome**  **Award four marks for selection of valid “x”. Four marks = Competent** | | | | | |
| **2.1** | **Which of the following steps are part of sugar processing?** | | | | **Mark Allocation** | |
| **a** | 🞎 | | Extraction of juice | |  | |
| **b.** | 🞎 | | Concentration and Crystallization | |  | |
| **c.** | 🞎 | | Refining of sugar | |  | |
| **d.** | 🞎 | | All of the above | |  | |
| **e.** | 🞎 | | None | | 4 | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **2.2** | **What does CIP stand for?** | | **Mark Allocation** | |
| **a.** | 🞎 | Cleaning in processes | |  |
| **b.** | 🞎 | Compulsory Induction Programme | |  |
| **c.** | 🞎 | Cleaning in place | |  |
| **d.** | 🞎 | All of the above | |  |
| **e.** | 🞎 | None | | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.3** | **Which of the following parameters are used in cleaning?** | | **Mark Allocation** |
| **a.** | 🞎 | Mechanical force |  |
| **b.** | 🞎 | Thermal force |  |
| **c.** | 🞎 | Chemical force |  |
| **d.** | 🞎 | The time the forces act |  |
| **e.** | 🞎 | All of the above | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.4** | **Which of the following cane biosecurity zones covers areas for production of food products with normally no direct access to the products?** | | **Mark Allocation** |
| **a.** | 🞎 | Zone 1 |  |
| **b.** | 🞎 | Zone 2 |  |
| **c.** | 🞎 | Zone 3 |  |
| **d.** | 🞎 | Zone 4 |  |
| **e.** | 🞎 | None | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.5** | **The evaporator consists of?** | | **Mark Allocation** |
| **a.** | 🞎 | The dome |  |
| **b.** | 🞎 | Air line |  |
| **c.** | 🞎 | The condenser |  |
| **d.** | 🞎 | Injection water |  |
| **e.** | 🞎 | All of the above | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.6** | **Which of the following is the definition of a continuous pan?** | | **Mark Allocation** |
| **a.** | 🞎 | A single effect evaporator in which boiling occurs under vacuum |  |
| **b.** | 🞎 | A vertical cylindrical vessel consisting of a calandria and a vapour space |  |
| **c.** | 🞎 | A heating element of the pan and consists of a large number of cylindrical tubes fixed to the tube plate at both ends. |  |
| **d.** | 🞎 | A horizontal vessel with a number of compartments or cells (usually 12) connected in series |  |
| **e.** | 🞎 | A valve used to break vacuum during discharging or cutting of massecuite | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.7** | **The boiler system is made up of?** | | **Mark Allocation** |
| **a.** | 🞎 | Feed water system |  |
| **b.** | 🞎 | Steam system |  |
| **c.** | 🞎 | Fuel system |  |
| **d.** | 🞎 | All of the above |  |
| **e.** | 🞎 | None | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.8** | **What is a conveyor?** | | **Mark Allocation** |
| **a.** | 🞎 | a vertical transport vehicle that efficiently moves people or goods between floors of a building |  |
| **b.** | 🞎 | mechanical devices or assemblies that transport material with minimal effort |  |
| **c.** | 🞎 | a motor that converts energy into torque which then moves or controls a mechanism or a system into which it has been incorporated |  |
| **d.** | 🞎 | steel or wooden slats mounted on chains |  |
| **e.** | 🞎 | a flat steel table with channels in which chains with spikes (welded to the chain) run | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.9** | **What is black piping?** | | **Mark Allocation** |
| **a.** | 🞎 | Uncoated steel pipe |  |
| **b.** | 🞎 | Pipes that are portable or attached to a workbench |  |
| **c.** | 🞎 | Piping that has been coated with zinc for protection against corrosion |  |
| **d.** | 🞎 | It is a relatively new pipe joining system |  |
| **e.** | 🞎 | Pipes used for holding pipes in position | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **2.10** | **What are valves used for?** | | **Mark Allocation** |
| **a.** | 🞎 | transferring liquids or gases from one point to another, often with the help of pumps |  |
| **b.** | 🞎 | converting fluid power energy to rotary motion and force |  |
| **c.** | 🞎 | To regulate, isolate, control and shut off the flow of liquids and gases in a pipe line. |  |
| **d.** | 🞎 | harnesses the kinetic energy of some fluid such as water, steam, air, or combustion gases and turns this into the rotational motion of the device itself |  |
| **e.** | 🞎 | To transmit power, lubricate and to cool the system. | 4 |

|  |  |  |  |
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| **2.11** | **Which of the following is the correct definition of a motor?** | | **Mark Allocation** |
| **a.** | 🞎 | a device that tears the cane apart using large metal bars known as hammers |  |
| **b.** | 🞎 | A storage place for the hydraulic fluid until it is required for the operation of the system. |  |
| **c.** | 🞎 | a device that harnesses the kinetic energy of some fluid such as water, steam, air, or combustion gases and turns this into the rotational motion of the device itself |  |
| **d.** | 🞎 | a storage chamber in which fluid energy is accumulated and from which it can be withdrawn |  |
| **e.** | 🞎 | A machine, especially one powered by electricity or internal combustion that supplies motive power for a vehicle or for another device with moving parts. | 4 |

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| **2.12** | **A simple hydraulic system can operate with the following basic components?** | | **Mark Allocation** |
| **a.** | 🞎 | Reservoir |  |
| **b.** | 🞎 | Actuator |  |
| **c.** | 🞎 | Pump |  |
| **d.** | 🞎 | Pressure relief valve |  |
| **e.** | 🞎 | All of the above | 4 |

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| **2.13** | **Bevel gears are described as follows?** | | **Mark Allocation** |
| **a.** | 🞎 | A flat piece of material with gear teeth cut into it. |  |
| **b.** | 🞎 | the axes of the shafts are parallel and the teeth are cut straight across the blanks |  |
| **c.** | 🞎 | Are shaped like sections of cones, they are spur gears where the intersecting angle that the shaft makes is 90°. |  |
| **d.** | 🞎 | are inclined to the axis of rotation and create axial thrust |  |
| **e.** | 🞎 | They vary in ratio from 5:1 to 60:1 | 4 |

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| **2.14** | **What is a definition of a clutch?** | | **Mark Allocation** |
| **a.** | 🞎 | A devise that provides and accommodate a large flow of air or gas to various parts of a building or other structures |  |
| **b.** | 🞎 | A devise used for accurate massing (weighing) to an accuracy of four decimal places |  |
| **c.** | 🞎 | It is a device that allows two components to be engaged or disengaged, whilst one or both of the components is in motion |  |
| **d.** | 🞎 | a machine that squeezes a gas into a smaller volume and (often) pumps it somewhere else at the same time |  |
| **e.** | 🞎 | A device that uses mechanical force and motion to rise, transport, or compress fluids. | 4 |

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| **2.15** | **Which of the following are the three types of balances used in the laboratories of sugar mills?** | | **Mark Allocation** |
| **a.** | 🞎 | An analytical balance with a range from 0 to around 200g and a reading precision of 0,0001g. |  |
| **b.** | 🞎 | A light duty balance with a range from 0 to around 3000g and a reading precision of 0,01g. |  |
| **c.** | 🞎 | A heavy duty balance with a range from 0 to around 3000g and a reading precision of 0,1g. |  |
| **d.** | 🞎 | None |  |
| **e.** | 🞎 | All of the above | 4 |

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| **2.16** | **What is the function of the vacuum pumps?** | | **Mark Allocation** |
| **a.** | 🞎 | They allow liquid to flow in a single direction |  |
| **b.** | 🞎 | It moves a fluid (either liquid or gas) from one place to another |  |
| **c.** | 🞎 | They are required to remove the incondensable gases from evaporator and pan condensers |  |
| **d.** | 🞎 | It squeezes a gas into a smaller volume and (often) pumps it somewhere else at the same time |  |
| **e.** | 🞎 | It delivers the volume of liquid that is present in the cylinder every stroke | 4 |

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| **2.17** | **Which of the following are energy, utilities and services for sugar mill?** | | **Mark Allocation** |
| **a.** | 🞎 | Steam |  |
| **b.** | 🞎 | Electricity |  |
| **c.** | 🞎 | Water |  |
| **d.** | 🞎 | Compressed air |  |
| **e.** | 🞎 | All of the above | 4 |

**TRUE OR FALSE QUESTIONS:**

**Award one mark for each selection of valid “T/F”.**

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| **2.18** | **True or False: The following are some of the sugar processing equipment’s used in a sugar mill?** | | **Mark Allocation** |
| **a.** | 🞎 | Centrifugals |  |
| **b.** | 🞎 | Molasses |  |
| **c.** | 🞎 | Evaporators |  |
| **d.** | 🞎 | Shredders |  |
| **e.** | 🞎 | Refinery machinery | 5 |

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| **2.19** | **True or False: The following is a procedure used for cleaning a plant?** | | **Mark Allocation** |
| **a.** | 🞎 | Pre-rinse |  |
| **b.** | 🞎 | Alkali circulation |  |
| **c.** | 🞎 | Rinse |  |
| **d.** | 🞎 | Acid circulation |  |
| **e.** | 🞎 | Final rinse | 5 |

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| **2.20** | **True or False: Cane handling involves the following?** | | **Mark Allocation** |
| **a.** | 🞎 | Cane transport |  |
| **b.** | 🞎 | Cane shredding |  |
| **c.** | 🞎 | Weighing and off-loading |  |
| **d.** | 🞎 | Cane testing |  |
| **e.** | 🞎 | Diffusion | 5 |

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| **2.21** | **True or False: The following are criteria’s of a good filter operation?** | | **Mark Allocation** | |
| **a.** | 🞎 | Good retention | |  |
| **b.** | 🞎 | The Ph | |  |
| **c.** | 🞎 | Low pol % filter cake | |  |
| **d.** | 🞎 | Higher temperature | |  |
| **e.** | 🞎 | The time | | 5 |

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| **2.22** | **True or False: Molasses removal is more efficient when?** | | **Mark Allocation** | |
| **a.** | 🞎 | The time for spinning at high speed is longer | |  |
| **b.** | 🞎 | The size of the crystals is uniform | |  |
| **c.** | 🞎 | A centrifugal screen is worn or damaged | |  |
| **d.** | 🞎 | The crystals are bigger | |  |
| **e.** | 🞎 | The thickness of the massecuite wall is smaller | | 5 |

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| **2.23** | **True or False: The following is done to create a vacuum in a pan?** | | **Mark Allocation** | |
| **a.** | 🞎 | Open the vacuum breaker | |  |
| **b.** | 🞎 | Open the steaming valve fully and the blower and let the temperature rise to about 100°C | |  |
| **c.** | 🞎 | Close the discharge door and the vacuum breaker | |  |
| **d.** | 🞎 | Open the airline | |  |
| **e.** | 🞎 | Close the steaming our valve and steam blower | | 5 |

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| **2.24** | **True or False: The several types of actuators include?** | | **Mark Allocation** | |
| **a.** | 🞎 | Slat type | |  |
| **b.** | 🞎 | Hydraulic motors | |  |
| **c.** | 🞎 | Clutch/Brake | |  |
| **d.** | 🞎 | Rake type | |  |
| **e.** | 🞎 | Stepper motors | | 5 |

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| **2.25** | **True or False:** **The several types of conveyors include?** | | **Mark Allocation** | |
| **a.** | 🞎 | Pneumatic motors | |  |
| **b.** | 🞎 | Belt | |  |
| **c.** | 🞎 | Ball Transfer | |  |
| **d.** | 🞎 | [Servo motors](http://www.tigertek.com/servo-motor-repair.html) | |  |
| **e.** | 🞎 | Walking Beam | | 5 |

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| **2.26** | **True or False: The following are types of valves?** | | **Mark Allocation** | |
| **a.** | 🞎 | Gate valves | |  |
| **b.** | 🞎 | Diaphragm valves | |  |
| **c.** | 🞎 | Slide valves | |  |
| **d.** | 🞎 | Water valves | |  |
| **e.** | 🞎 | Wind valves | | 5 |

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| **2.27** | **True or False: The following safety measures are done when dismantling equipment (valves, gearbox or pumps)?** | | **Mark Allocation** | |
| **a.** | 🞎 | Make sure that the supervisor or plant operator knows that you are working on the equipment. | |  |
| **b.** | 🞎 | Isolate the equipment, remove appropriate fuses and lock-off the fuse box. | |  |
| **c.** | 🞎 | Disconnect all other services (e.g. gas, water, air) and ensure that these are sealed off. | |  |
| **d.** | 🞎 | Drain oil coolant sumps | |  |
| **e.** | 🞎 | leave partially dismantled equipment in a dangerous condition | | 5 |

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| **2.28** | **True or False: The following are the main functions of hydraulic fluids in the hydraulic system?** | | **Mark Allocation** |
| **a.** | 🞎 | To transmit power |  |
| **b.** | 🞎 | To cool the system |  |
| **c.** | 🞎 | To converts fluid energy to rotary motion and force |  |
| **d.** | 🞎 | To lubricate |  |
| **e.** | 🞎 | To harnesses the kinetic energy of some fluid such as water, steam, air, or combustion gases. | 5 |

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| **2.29** | **True or False: The following is the application for Spur gears?** | | **Mark Allocation** |
| **a.** | 🞎 | Where quiet operation is required |  |
| **b.** | 🞎 | Extensive use in motor vehicles |  |
| **c.** | 🞎 | Where medium speed reductions are required. |  |
| **d.** | 🞎 | Where end thrust is to be eliminated |  |
| **e.** | 🞎 | Used in the raising and lowering of tables in drilling, milling machines etc. | 5 |

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| **2.30** | **True or False: The advantages of a multi-plate clutch are?** | | **Mark Allocation** |
| **a.** | 🞎 | A considerable axial force is needed to keep the clutch engaged which results in a high end thrust |  |
| **b.** | 🞎 | Engagement is possible while machine is in motion |  |
| **c.** | 🞎 | Slip occurs between the engaging surfaces which results in wear |  |
| **d.** | 🞎 | A large torque can be transmitted |  |
| **e.** | 🞎 | Can be used where space is limited | 5 |

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| **2.31** | **True or False: During inspection of clutches the following should be noted?** | | **Mark Allocation** |
| **a.** | 🞎 | Excessive wear |  |
| **b.** | 🞎 | Worn clutch shaft |  |
| **c.** | 🞎 | Maximum Load Capacity |  |
| **d.** | 🞎 | Weak spring tension |  |
| **e.** | 🞎 | Drive Location | 5 |

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| **2.32** | **True or False: The goal of instrumentation and control is to improve?** | | **Mark Allocation** |
| **a.** | 🞎 | Productivity |  |
| **b.** | 🞎 | Optimization |  |
| **c.** | 🞎 | Stability |  |
| **d.** | 🞎 | Reliability |  |
| **e.** | 🞎 | Safety | 5 |

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| **2.33** | **True or False: The following are different types of liquid lubricants?** | | **Mark Allocation** |
| **a.** | 🞎 | Lubricity |  |
| **b.** | 🞎 | Thickener |  |
| **c.** | 🞎 | Viscosity Index |  |
| **d.** | 🞎 | Oxides |  |
| **e.** | 🞎 | Pour Point | 5 |

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| **2.34** | **True or False: The Important objectives of preventative maintenance are as follows.** | | **Mark Allocation** |
| **a.** | 🞎 | To minimize the possibility of unanticipated production interruptions by locating or uncovering any condition which may lead to it. |  |
| **b.** | 🞎 | To make plant equipment and machines always available and ready for use. |  |
| **c.** | 🞎 | To maintain the value of the equipment and machinery by conducting periodic inspection, repairs, overhauling, etc. |  |
| **d.** | 🞎 | To reduce the work content of maintenance jobs. |  |
| **e.** | 🞎 | To ensure safety of life and limbs of the workmen. | 5 |

1. FINAL MARKS

**TOTAL MARKS: 153**

**PASS MARK: 122**

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| **LEARNER MARKS** |  |
| **PERCENTAGE** |  |
| **ASSESSOR SIGNATURE:** | |