Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA)

DIPLOMA IN SCIENCE LABORATORY TECHNOLOGY

YEAR I

Physics Techniques I

Record of Practical Assessment

Learner`s Name:_____

Learner`s NRC no.:_____

Learner`s TEVETA No.:_____

Assessment Period:_____

PREFACE

The Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) is an institution created under the Technical Education, Vocational and Entrepreneurship Training Act Number13 of 1998, as amended by the Technical Education, Vocational and Entrepreneurship Training (Amendment) Act Number 11 of 2005.

The Act among other things provides that TEVETA shall:

(a) regulate and conduct national examinations and assessments relating to technical education, vocational and entrepreneurship training;

(b) charge and collect fees in respect of examinations, assessments and other services provided by the Authority;

(c) award certificates to persons who succeed in examinations and assessments undertaken under this Act

(d) do all such things connected with or incidental to the functions of the Authority under this Act.

Through this mandate, the Assessment and Qualifications Division of TEVETA has developed Practical Assessment Tool Kits to enable learners achieve the competences that are congruent with the demand of the workplace tasks. These tool kits in part are also intended to ensure that similar conditions under which all students in TEVET are assessed and examined apply wherever the course is undertaken in Zambia.

The Trainers shall work with theLearnersto collect evidence of competence, using the benchmarks provided by the unit standards.During the year, the Learners shall be required to undertake a series of practical assessment tasks. It is the sum of all these assessments tasks that deems a Learner to be competent (or not).

This approach to assessment is not a one-off event but one that giveslearners many opportunities to demonstrate skill and allow for the capturing and recording of these demonstrations.

For the Learner to be deemed competent, they must demonstrate competency in every aspect of the practical tasks being undertaken. It must however be understood by the Trainer that Competency does not mean expert. It means that the candidate has attained sufficient skill and knowledge to perform the activity or service to a degree and quality that is acceptable to the industry and the customer in a time within which a competent person at the level could reasonably be expected to perform the task.

While this will be undertaken at institutional level, it is therefore envisaged that the Assessment principles of VALIDITY, RELIABILITY, FAIRENESS and FLEXIBILITY shall at all times be adhered to.

Pre-Assessment

Assessment process explained to the employee (✓ if Yes).	☐
Any appeal relating to the outcome of the assessment or the way in which the assessment was conducted shall be made through the company's *fair treatment policy* as explained to the employee (✓ if Yes).	☐

Employee/Trainee	**Assessor**	
Employee/Trainee name: _____ (Print) Employee/Trainee comments:	Assessor name: _____ (Print) Assessor comments:	
I fully understand the assessment and appeals process.	Theory assessment sighted and checked as satisfactory.	☐
Signature: _____ Date: _____	Signature: _____ Date: _____	

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Observation Checklist

1 PERFORM AN EXPERIMENT ON THE DETERMINATION THE RESULTANT FORCE USING PARALLELOGRAM LAW OF FORCE	**Satisfactory**			**Not Satisfactory**		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Forces board - Two pulleys - Three standard weight - Inextensible string - White plain paper - Drawing pins - Two clamps	☐	☐	☐	☐	☐	☐
b. Set up the apparatus correctly. This may include: - Putting the forces board on the flat horizontal bench - Clamping the two pulleys on the provisions provided on the forces board - Attaching the two weights to the ends of the string and letting the string pass over the two pulleys - Attaching the third weight to the thread and then attaching the free end of the string to the middle of the string joining the weights that are hanging on the pulleys	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly: This may include: - Allowing the weights to stop moving - Putting the white paper on the forces board using drawing pins such that the joint of the strings is on the centre of the white paper - Marking the positions of the strings on the paper (i.e one attached to lower weight and the two strings joining the other two weights). - Joining the mark along each string until they intersect at the centre. - Marking the value of the forces on each string - Completing the parallelogram using the upper lines	☐	☐	☐	☐	☐	☐
d. Interpreting the results correctly. This may include: - Comparing the diagonal to the value of the force on the weights downwards.	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

2 PERFORM AN EXPERIMENT ON THE VERIFICATION OF NEWTON'S SECOND LAW OF MOTION	**Satisfactory**			**Not Satisfactory**		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include:: - Ticker timer vibrator, - Carbonized tape - Run way - Trolley - Pulley - Drawing pins - Paper clips - a.c mains 240 V 50Hz supply	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This includes: - Putting the run way on the horizontal work bench - Attaching the free end of the carbonized tape to the wooden trolley using a drawing pin - Pushing the other end of the carbonized tape through the ticker timer and attaching this end to the pan for carrying weights. - Putting the ticker timer near the edge of the runway and pulling the trolley along the run way to the other end of the run way on the work bench.	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Putting a known weight in the pan (hold in position), switching on the power source and letting go of the weight down. - When the weights have landed on the ground switching off the power supply - Removing the used carbonized tape - Measuring the distance between the dots - Each dot is produced after 0.02 sec *($T = \frac{1}{f} = \frac{1}{50}\ 0.02s$)* - Measuring the distance occupied by 10 dots and along the tape - The velocity can be calculated from = distance / time taken - Recording the values of the adjacent velocities calculated along the tape - Calculating the acceleration - Repeating the experiment using two, three, four, five weights - Record the results	☐	☐	☐	☐	☐	☐

d. Interpreting the results correctly. This may include:
• Plotting a graph of force against acceleration, This includes
  ➢ Graph paper
  ➢ Pencil (HB)
  ➢ Transparent 30 cm ruler
  ➢ Deriving conclusion from the graph.
	☐	☐	☐	☐	☐	☐

e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

3 PERFORM AN EXPERIMENT ON MEASUREMENT OF VISCOSITY OF A LIQUID	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Measuring cylinder - Stop watch - Liquid - Thermometer - Meter ruler - Two rubber bands - Steel ball-bearing - Micrometer screw gauge	☐	☐	☐	☐	☐	☐
b. Set up the apparatus correctly. This may include: - Placing the measuring cylinder on a horizontal surface - Placing two rubber bands around the measuring cylinder at known distance apart (say 20 cm) using a meter ruler	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Filling a one-liter measuring cylinder with glycerol. - Releasing the steel ball – bearing from JUST above the fluid surface and allowing it to fall through the fluid - Using a stop watch to note the time for the steel ball to pass from the level of one band to that of the other. - Determining the velocity of the ball-bearing between the band and assuming that this is the terminal velocity. - Recording the temperature of the fluid and repeating the experiment with a ball bearing of different radii	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may includes: - From the equation $\eta = \frac{2gr^2(\rho_s - \rho_l)}{9v}$ Where $\rho_s =$ density of sphere (ball bearing) and $\rho_l =$ density of the liquid - Calculating the viscosity of the fluid	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

4 PERFORM AN EXPERIMENT ON HOOKE'S LAW	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Stand and clamp - Hookean spring - various standards weights - meter rule - weight pan	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include: - Place the stand and clamp on the flat horizontal work bench - Clamp a Hookean spring	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Measuring the initial length of the spring - Attaching a weight pan - Measuring the new length - Determining the extension produced - Recording the load and extension - Repeating the experiment for other weights and measuring the corresponding extensions to have a pair of 6 readings attaching the additional loads to the weight pan - Recording the results	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may includes: - Interpreting the results graphically - Plotting a graph of load versus against extension - HB pencil - Graph paper - Correct scale - Deriving the conclusion from the graph.	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

5 PERFORM AN EXPERIMENT TO VERIFY THE LAW OF FORCES (TRIANGLE, POLYGON LAWS)	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
i. Identify the apparatus correctly. This may include: - Forces board - Four weights - Inextensible strings - White plain paper - Drawing pins - Three pulleys	☐	☐	☐	☐	☐	☐
b. Set up the apparatus correctly. This may include: - Putting the forces board on the flat horizontal bench - Clamping three pulleys on the provisions provided on the forces board	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Joining three strings at one point and attaching the three weights to the ends of the strings - Letting the three strings hang over the three pulleys - Attaching the fourth weight to the thread and attaching the free end to joint of the three strings - Letting the joint of the four strings be on the centre of the forces board - Fixing the white paper on the forces board so that the joint of the strings is on the centre of the white paper - Allowing the weights to stop moving - Marking the positions of the strings on the paper attached	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Removing the white paper from the forces board - Joining marks on the paper with straight lines until they meet at the centre - Marking the value of the force on each line - Measuring the angles between the four lines - Starting with one of the line forces going say anticlockwise, drawing the next force at the tip of this first marinating the direction and magnitude. - Adding the third force to the second maintaining the magnitude and direction - Add the fourth force to the third force maintaining the magnitude and direction - Ensuring that the polygon is closed - Commenting on the vector diagram generated	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

6 PERFORM AN EXPERIMENT TO VERIFY THE LAW OF LEVERS	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Meter ruler - Inextensible string - Standard weights - Knife edge	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may includes: - Placing the knife edge on a horizontal bench - Placing a meter ruler of the knife edge and balancing it so that it is horizontal - Noting down the position of the pivot	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Attaching an inextensible string to the load and placing it on one side of the ruler without disturbing the position of the pivot. - Attaching another load on the other side of the ruler and balancing it in the horizontal position - Noting down the position of the strings supporting the weight on the ruler. - Recording all the readings - Repeating the experiment for other pairs of weights	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Working out the products of force by distance for each pair of weights - Commenting on the products for each pair of weights	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

7 PERFORM AN EXPERIMENT ON THE EFFICIENCY OF SIMPLE MACHINES	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Pulley system - Weights - Strings - Pulley - Load pan	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include: - Fix the upper block to the support - Attach an inextensible string to upper block through its hook and let it pass through the lower block back the top of upper block - Attach a load pan of known weight on the hook of the lower block - Attach the spring balance to the free of the inextensible string	☐	☐	☐	☐	☐	☐
c Run the experiment correctly. This may include: - Noting down the initial position of the load - Pulling the spring balance and noting down the force which **JUST** moves the load up - Noting down the length of the string that has be pull down by the effort/spring balance - From the reading of the spring balance determining the effort - Repeating the experiment using different loads and efforts. - Record the necessary data and interpret the results correctly.	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Calculating: • $Mechanicaladvantage = \frac{load}{Effort}$ • $Velocityratio = \frac{Distancemovedbyeffort}{Distancemovedbyload}$ • $Efficiency = \frac{Mechsnicaladvanatge}{velocityratio}\ 100\%$	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

8 PERFORM AN EXPERIMENT ON VERIFICATION OF ARCHIMEDES' PRINCIPLE	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Water - Eureka can - Stone - String - Graduated measuring cylinder, - Spring balance	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include: - Checking for the zero error on the spring balance. - Tying a thread to a stone and attaching the other end to the hook of the spring balance - Filling the Eureka can with water - Letting the water run stop flowing from the spout - Placing a graduated measuring cylinder below the spout.	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Measuring and recording the mass of the stone in air by raising the spring balance and suspending it from a support - Lowering the stone gently into water in the Eureka can until it is fully immersed - Measuring the mass of the stone in water and recording it - When the water has stopped coming out of the spout removing the stone from the Eureka can and recording the volume of water displaced.	☐	☐	☐	☐	☐	☐
d. Interpret results correctly. This may include: - Comparing the loss in mass of the stone to the mass of water displaced - Calculating the density of the stone from the mass of the stoned in air to the volume of water displaced	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

9 PERFORM AN EXPERIMENT ON MEASUREMENT OF SPECIFIC HEAT CAPACITY OF A SOLID BY ELECTRICAL METHOD	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Standard 1 kg block of copper with two holes - Thermometer - Heating element - Insulation (Cotton wool) - Variable DC power pack 12 V , - Timer - Copper wires for connection - Switch	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include: - Putting the thermometer and heater into their respective holes on the copper block - Putting the lagging around the copper block - Connecting the heater of known power rating to the power supply - a.c power source - Timer	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Noting down the initial temperature - Switching on the power supply and simultaneously starting the stop watch - Stabilizing the voltage throughout the experiment - Switching off the power say, 5 minutes and simultaneously switching off the stop watch - Taking the final reading of temperature when the thermometer reading has stabilized - Record the power rating of the heater and time taken to run the experiment	☐	☐	☐	☐	☐	☐
d. Interpreting the results correctly. This may include: - From power rating of the heater, time taken to heat the block and temperature difference, the specific heat capacity of copper can be determined - Calculating the specific heat capacity of copper from: **Heat given out = Heat gain by copper** $Pt = cm\Delta\theta$ $c = \frac{Pt}{m\Delta\theta} J/kgK$	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

10 PERFORM AN EXPERIMENT ON MEASUREMENT OF SPECIFIC HEAT CAPACITY OF A LIQUID (EG WATER) BY ELECTRICAL METHOD	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Distilled Water in a beaker - Copper calorimeter, with stirrer, lid and heating element of known power rating - Thermometer - Lagging material - a.c power source - Timer	☐	☐	☐	☐	☐	☐
b. Set up the apparatus correctly. This may include: - Lagging the copper calorimeter with cotton wool - Filling copper calorimeter with water until it is ½ full - Inserting the stirrer and thermometer into calorimeter - Connecting the power supply to the heating element - Supplying a steady voltage	☐	☐	☐	☐	☐	☐
c. Run the experiment accordingly. This may include: - Noting down the initial temperature of water in calorimeter - Simultaneously switching on the power and starting the stop watch - Stirring the water - Letting the water to heat up not to boiling point - Switching off the power source and noting down the final temperature of the mixture after stirring thoroughly - Recording the final steady temperature	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Assuming no heat was lost to the surroundings **Heat given out by the heater = heat gain by the calorimeter and water** $(\mathrm{Pt}) = (\mathbf{cm\Delta\theta})_{\mathbf{w}} + (\mathbf{cm\Delta\theta})_{\mathbf{cc}}$ $$C_w = \frac{Pt - (cm\Delta\theta)_{cc}}{m\Delta\theta_w} J/kgK$$	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

11 PERFORM AN EXPERIMENT ON MEASUREMENT OF SPECIFIC LATENT HEAT OF FUSION BY ELECTRICAL METHOD	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This includes: - Ice cubes - Calorimeter, stirrer and lid - Thermometer - Heater of known power rating - Timer - a.c power source	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include: - Pouring ice cubes into the calorimeter until ¾ full - Inserting the lid, immersion heater, stirrer and thermometer in place - Lagging the calorimeter - Connecting the immersion heater to the power supply	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Weighing the calorimeter and its contents - Switching on the power - Starting the stop watch when the ice starts to melt. This is noted when the thermometer reading has stabilized and start the stop watch - Continue heating and stirring until the thermometer reading **JUST** starts to rise and stop the stop watch. - Switching of the power supply and noting down the time taken for the temperature to be stable	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Calculating the specific latent heat lf from **Heat given out = heat gain** $Pt = l_f m$ $l_f = \frac{Pt}{m} J/kg$	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

12 PERFORM AN EXPERIMENT ON MEASUREMENT OF SPECIFIC LATENT HEAT OF VAPORIZATION BY ELECTRICAL METHOD	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Calorimeter with lid - Thermometer - Distilled water - Electronic balance - Immersion heater of known power rating - Timer - Lagging material - Copper connecting wires	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include: - Pouring water into the calorimeter until ¾ full - Inserting the lid, immersion heater, and thermometer in place - Lagging the calorimeter - Connecting the immersion heater to the power supply	☐	☐	☐	☐	☐	☐
c. Run the experiment correctly. This may include: - Weighing the calorimeter and its contents - Switching on the power - Starting the stop watch when the water starts to boil. This is noted when the thermometer reading has stabilized - Boiling the water for a given time say 10 minutes - Switching of the power supply and noting down the time - Weighting the calorimeter and its contents after cooling - Ensuring that The difference in mass of the calorimeter and its contents is the mass of water that evaporated - Recording all the necessary readings	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Calculating the specific latent heat lf from **Heat given out = Heat gain** $Pt = l_v m$ $l_v = \frac{Pt}{m} J/kg$	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

13 PERFORM AN EXPERIMENT ON MEASUREMENT OF FOCAL LENGTH OF A CONVEX LENS	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Optical bench - Convex lens - Lens holder - Light bulb - White screen - Meter ruler - object	☐	☐	☐	☐	☐	☐
b. Set up apparatus correctly. This may include - Placing the light source, the object, the lens in the holder and the screen in a straight line on the optical bench.	☐	☐	☐	☐	☐	☐
c. Running the experiment correctly. This may include: - Switching on the light source - Adjusting both the object and image distance until a sharp image is seen on the screen - Measuring the object distance u and image distance v and recording them - Repeating the experiment for other pairs of object and image distances until a set of say, five is obtained	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Using the lens equation $\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$ to calculate the focal length f - Commenting on the value of f - Working out the magnification	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

14 PERFORM AN EXPERIMENT TO MEASURE THE VELOCITY OF SOUND IN AIR USING A RESONANCE TUBE	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
ia Identify the apparatus correctly. This may include: - Stand and clamp - Open glass tube - Measuring cylinder - Tuning fork of known frequency - Thermometer	☐	☐	☐	☐	☐	☐
b. Set up apparatus appropriately. This may include: - Putting the stand and clamp in position - Putting water in the measuring cylinder - Clamping the open tube and let the other open end be in water	☐	☐	☐	☐	☐	☐
c. Running the experiment correctly. This may include: - Measuring the temperature of the surroundings - A tuning fork is made to vibrate and brought near the mouth of the open tube - The length of the air column is adjusted by raising the tube in the water until a point is found where a sound note is herd most. This is called resonance occurs and a loud note is produced. - At this point the frequency of the tuning fork is equal to the fundamental frequency of the air column in the tube - Measure the length of the air column - Record the length of the air column	☐	☐	☐	☐	☐	☐
d. Interpret the results without difficulty. This may include: - In its fundamental mode of wavelength λ is four times the length of the air column (l), that is $\lambda = 4l$ - Since $v = f\lambda = 4l$, the velocity of sound may be found	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

15 PERFORM AN EXPERIMENT ON DEPENDENCE OF RESISTANCE OF METALLIC CONDUCTOR ON LENGTH AND CROSS SECTIONAL AREA	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Standard nichrome wire (SWG 28) of various diameter - Micrometer screw gauge - Meter ruler - Voltmeter - Ammeter - Crocodile clips - Copper connecting wires - Variable power pack DC (0 – 12 V)	☐	☐	☐	☐	☐	☐
b. Set up apparatus appropriately. This may include: - Measuring 20cm of nichrome using a meter ruler - Measuring the diameter at least four different points along the 20cm length and record the values - Connecting the resistance wire and ammeter in series and the voltmeter across the m resistance wire - Connecting the whole set up to the power pack	☐	☐	☐	☐	☐	☐
c. Running the experiment correctly. This may include: - Switching on the power supply - Stabilizing the voltage across the resistance wire and current through the circuit - Noting down the reading of voltmeter and ammeter and record them for lengths increment of 20 cm up to 100 cm. - Repeating the experiment for other diameters of the same wire increment length of 20 cm up to 100cm lengths	☐	☐	☐	☐	☐	☐

d. Interpret the results correctly. This may include:
- Working out the average area of the wire
  ➢ Working out the resistance for each length from voltage and current for each length
  ➢ Working out the resistance and cross-sectional area for each length
- Plotting graphs of:
  ➢ Resistance versus length
  ➢ Resistance versus cross-sectional area
- Commenting on the relationship between cross-sectional area and resistance as noted from the graph
	☐	☐	☐	☐	☐	☐

e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor _____.

Trainee: _____

16 PERFORM AN EXPERIMENT ON MUTUAL INDUCTANCE CORRECTLY	Satisfactory			Not Satisfactory		
During observation of work activities, the candidate demonstrated that they can:						
a. Identify the apparatus correctly. This may include: - Two copper coils - Dry cells - Switch - Copper connecting wires - Centre zero galvanometer	☐	☐	☐	☐	☐	☐

b. Set up apparatus correctly. This may include:
- Connecting two circuit:
  ➢ One with the dry cell and switch to the copper coil in series
  ➢ The other circuit with copper coil and a centre zero galvanometer
- Placing the coils in such a manner that they side by side
	☐	☐	☐	☐	☐	☐

c. Running the experiment correctly. This may include: - Closing the circuit containing a the dry cell and note the direction of deflection of the galvanometer pointer in the other circuit - Opening the circuit in the circuit with the dry cell and note down the direction of the deflection of the galvanometer pointer.	☐	☐	☐	☐	☐	☐
d. Interpret the results correctly. This may include: - Commenting direction of deflection of the pointer during the opening and closing the circuit with dry cell	☐	☐	☐	☐	☐	☐
e. Identify the errors that may affect the experiment and how they can be avoided.	☐	☐	☐	☐	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

Final Assessment Summary

Note: refer to mapping document if required

Practical assessment summary		Satisfactory	Not Satisfactory
1.	Resultant force	☐	☐
2.	Newton's Second Law of Motion	☐	☐
3.	Viscosity of a Liquid	☐	☐
4.	Hooke's Law	☐	☐
5.	Law of Forces	☐	☐
6.	Law of Levers	☐	☐
7.	Efficiency of Simple Machines	☐	☐
8.	Archimedes' Principle	☐	☐
9.	Specific heat capacity of solid (electrical method)	☐	☐
10.	Specific heat capacity of liquid (electrical method)	☐	☐
11.	Specific latent heat of fusion	☐	☐
12.	Specific latent heat of vaporization	☐	☐
13.	Measurement of focal of convex lens	☐	☐
14.	Speed of sound by resonance method	☐	☐
15.	Resistance dependence on length and cross sectional area	☐	☐
16.	Mutual inductance	☐	☐

Assessor comments:

Signed: Assessor: Trainee:

Assessment Outcome

Satisfactory ☐

Not Satisfactory ☐

Employee/Trainee	**Assessor**
Employee/Trainee name: _____ (Print)	Assessor name: _____ (Print)
Employee/Trainee comments:	**Assessor comments:**
Signature: _____ Date: _____	Signature: _____ Date: _____

VALIDATION OF THE ASSESSMENT

NAME:…….. DATE:……..

POSITION: **PRINCIPAL/HEAD OF INSTITUTION** SIGNATURE:……..

NAME INSTITUTION:…….

STAMP: