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ESWATINI**

**JC**

**EXAMINATION REPORT**

**FOR**

**DESIGN AND TECHNOLOGY**

**YEAR**

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## JC DESIGN AND TECHNOLOGY

<b>Paper 537/01</b>
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### **General Comments**

In 2022 there were one thousand eight hundred and twenty one (1821) candidates who sat for the Design and Technology Paper 1, this indicates a huge decline from the number of candidates who sat for this paper in 2021. However, the general performance was slightly above than that of the previous year. Candidates were required to answer all questions in Section B for the second time running. It was observed even this year that candidates were able to finish the paper on time. In general candidates performed much better in Section A than in Section B, and as it has always been the case in the previous years, most candidates performed better in B3 than in B1 and B2. One thing peculiar that was observed in 2022 was that candidates were throwing responses all over the place, they misplaced responses that would have been correct elsewhere in the paper. This resulted in poor performance by most candidates who seemed to have the necessary knowledge and information to perform well.

### **Section A**

This section consisted of twenty questions (20) worth 40 marks. These were questions that required short answers. The questions were from the different components of the syllabus: Resistant Materials (RM), Graphics (GP) and Systems and Control (SC). This section was assessing the following objectives; knowledge and understanding, problem solving, communication and realization.

## Comments on Specific Questions

### SECTION A

#### Question 1

**For this question candidates were presented with a set of Graphic Product equipment. They were asked to name those that were labelled A,B,C and D.**

The expected response was **A – pencil, B – drawing board, C- 45° set square and lastly D – Tee square.**

- A -** a majority of candidates were able to give the correct response. There were few however, who gave deviating responses. One of the deviating responses was ruler, and unfortunately, they could not be awarded with the 1 mark mandated for this question.
- B -** For this question there were not many candidates who were able to give the expected response. Others were giving responses such as drawing desk, drawing table, white board etc., and these were not accepted leading to the loss of the 1 mark.
- C -** A majority of candidates were able to give the expected response, there were some however, who gave differing responses such as 60°, 30° set square, ruler, tri square or set square without stating the angle. This resulted in candidates losing the mandated mark.
- D -** Even for this majority of the candidates were able to attain the one mark assigned to this question. There were some, though, that gave dissenting responses such as try square, ruler, set square etc., and this resulted in the loss of the mark.

#### Question 2

**Candidates were given an images of two tools used in Design and Technology.**

**E - Candidates were asked to name the tool.**

The expected response was **ball-pein hammer**. Only a minority of the total candidature were able to give the expected response to the question. A bigger share of the candidature were giving responses such as Warrington hammer, claw hammer, etc., and these were not accepted by the examiners.

**F - Candidates were asked to name the given tool.**

The expected response was **Cordless/rechargeable electric drill/electrical hand drill**. It was only a small fraction of the total candidature was able to give the correct response to this question. A lot of candidates confused the drill for a heat gun and glue gun, others were giving other responses such as driller, etc., unfortunately these were not accepted.

#### Question 3

**For this question candidates were given an image of a plastic held between pieces wood and ready for linear bending. They were asked to name one piece of equipment that could be used for heating the plastic.**

The expected response was **strip heater or hot air gun/heat gun**. A small number of the total candidature was able give the correct response. A bigger share was giving deviating responses such as Bunsen burner, heater, gun light, oven etc., and these were not accepted.

#### Question 4

**Candidates were given an image of a peg. They were then asked to name the class in which the peg belong.**

The expected response was **Class 1** or **1<sup>st</sup> Class**. A fair number of candidates were able to give the correct response. There were those, however, that gave responses such as 3<sup>rd</sup> class, 2<sup>nd</sup> class unfortunately these could not attain the mark set aside for this question.

#### Question 5

**Candidates were asked to describe a situation in the workshop where the goggles and ear defenders could be used.**

The expected response was drilling, grinding and other relevant situations for goggles. For the ear defenders it was when using noise producing machines e.g. drilling, etc. This question was well answered by a majority of candidates. They were able to describe the situations well. Only a minute fraction gave deviating responses which were not accepted.

#### Question 6

**For this question candidates were given a drawing of hinge.**

**(a) Candidates asked to name the type of hinge that was shown.**

The expected response was butt hinge. It was a bigger fraction of the total candidature that was able to give the expected response to this question. Only a few number of candidates gave dissenting responses such as door hinge, piano hinge, flat hinge, back flap hinge etc., and these were not awarded with the mark designated for this question.

**(b) Candidates were required to give a situation where this hinge could be used.**

The expected response was **hanging doors/cupboard doors**. This question was well answered, a huge majority of the candidates were on point when it comes to the expected response. Very few candidates left the question unanswered.

#### Question 7

**For this question candidates were given road sign. Candidates were required to name the geometrical shape of the road sign.**

The expected response was **irregular pentagon**. Only a small number of candidates were able to give the expected response, other candidates gave dissenting responses such children crossing the road, polygon, heptagon, zebra crossing, trapezium etc., and these responses could not be awarded with the one (1) mark designated for this question.

#### Question 8

**For this question candidates were given two items used in assembly.**

The expected responses were **nut** and **washer** respectively. Only a fair number of candidates was able to give the expected response; others were giving different responses such bolt and nut, bhawodi, bolt and wacshiel, nut support, spacer etc., however, these were not accepted resulting in the loss of the one (1) mark designated for this question.

#### Question 9

**Candidates were given an image of a threaded piece of metal. Candidates were then requested to name one tool that could be used to produce the internal threads.**

The expected response was **taps**. Very few candidates were able to give the expected response. A lot of candidates were giving very many and varied responses which were off at a tangent, responses such as die, drill, screw, pilot, wrench etc., unfortunately these could not attain the one (1) allocated to this question.

### Question 10

**Candidates were given a small wooden frame. Candidates were then required to name one tool that could be used to test for square-ness of the frame.**

The expected response was **try square** or **use of diagonals**. This question was well done; a majority of candidates were able to give the correct and expected response. There were very few that gave dissenting responses such as easy to ruler, set square, tee square etc. and these were not awarded with the mark.

### Question 11

**Candidates were given a sketch of a plastic money box.**

**(a) Candidates were requested to name one suitable thermo-plastic that could be suitable for making box.**

The expected response was **ABS/PVC/acrylic**. Only a small number of candidates were able to give the correct response. A majority of other candidates gave varying responses such as thermosetting, wet plastic, others simple left the question without an attempt.

**(b) For this question candidates were asked to name the process of producing the box.**

The expected response was **vacuum forming** or **press forming**. The performance by majority of the candidates in the question was very poor. A lot of responses given by candidates were not congruent with what was expected.

### Question 12

**For this question candidates were given a graphical representation of the number 2. They were then given another incomplete graphical representation of the number 2. They were requested to complete the drawing using constructions.**

The expectation was that candidates would extend the top horizontal line, construct a perpendicular, then bisect the  $90^\circ$  formed by the perpendicular line to get  $45^\circ$ . They were then expected to extend  $45^\circ$  line to meet with the arc in turn complete the figure 2. A very small number of the total candidature was able to produce the expected outcome. A majority of the candidates simple drew the missing line without the necessary construction and this resulted in a huge loss of marks.

### Question 13

**Candidates were given an intricate shape marked out of a piece of plastic, it was to be cut out. Candidates were then asked to name a suitable saw that could be used to cut out the shape.**

The expected response was one of the following; **coping saw** or **piercing saw**.

**However, scroll saw and jig saw** were accepted even though learners at this level were not expected to use these two tools. A fair number of the total candidature was able to give the expected response. The other fraction gave dissenting responses such as panel saw, hack saw, bow saw and others which were not welcome for this question.

### Question 14

**For this question candidates were presented with an image showing three pieces of wood joined together to make a wide board.**

**(a) Candidates were asked to name a suitable device that could be used to hold of wood together when gluing.**

The expected response was **sash cramps**. Candidates' performance on this question was very poor a majority of the candidates could not produce the expected response. There were many deviating responses such G-cramp, F-cramp and others and unfortunately this could not be awarded with the mark.

**(b) Candidates were required to show the pieces of wood could be held during the gluing process.**

Candidates were expected to sketch at **least three sash cramps, with the one in middle facing the opposite direction**. The performance on this question was disastrous, only a few number of candidates was able to give the expected response. A majority of candidates made sketches of G-cramps, F-cramps others simple left the question unanswered.

#### Question 15

**Candidates were given a drawing of a lantern which was used to provide light outside a house.**

**(a) Candidates were required to name one type of finish that could be applied on the steel part of the lantern.**

The expected response was either **oil paint or bluing**. There were very few number of candidates who were able to give the expected response. Many were giving dissenting responses such as **vanish, polish, etc.**, paint alone was not accepted because not every paint was applicable in this situation.

**(b) For this question candidates were required to sketch a development of the top part of the mild steel lantern.**

The expectation was that candidates would draw the development with five panels, 4 blending lines and the vent. Performance by candidates on this question was disastrous. A majority of candidates simple drew the same 3D image which was given, and they couldn't be awarded with marks. Others left the question unanswered.

#### Question 16

**For this question candidates were given an illustration of a construction site with lots of items. They were then asked to identify one product that had linkages.**

The expected response was either **TLB/Concrete mixer**. The performance by candidates in this question was magnificent a majority of candidates were on point. Very few gave divergent responses from what was expected, responses such as 4 wheel pulley, wheel barrow etc.

#### Question 17

**Candidates were given an image of a plastic gutter.**

The expected response was either Resistant to weathering, resistant corrosion, light in weight, stiff and hard. There were few candidates who were able to give the expected responses, many were giving varying responses such a last longer, durable, resist water etc., and these could not be awarded with the one (1) mark set aside for this question.

#### Question 18

**Candidates were given a sketch of tool used for cutting materials. Candidates were then asked to name the given tool.**

The expected response was **straight tinsnips/straight shears/snips**. It was only a small fraction of the total candidature that was able to give the expected response. The other fraction of the candidature gave different responses such as holding scissors, metal scissors, tang, pliers, pincers etc. however, these other responses were not awarded with the one (1) mark.

### Question 19

For this question candidates were given an image of a wooden computer stand.

**(a) Candidates were required to name one hardwood that would be suitable for making the computer stand.**

The expected response was **saligna/meranti**. Slightly less than half of candidates were able to come up with expected response, in essence this question was poorly done. There were many varying responses which were off at a tangent, responses such as gagane, SAP, superwood, MDF, Melamine etc., and these could not attain the mark.

**(b) Candidates were required to name one method that could be used to join the top and the sides.**

The expected response was **housing joint, dowelled joint and butt with screws**. It was only a minority of the total candidature that was able to give the correct response. A bigger portion of the candidates were giving responses which were not congruent with the expectation; they were giving responses such as tenon joint, nailing, gluing etc., and these were not accepted.

**(c) Candidates were asked to suggest one type of finish that could be applied to the computer stand without changing the colour.**

The expected response was **clear varnish/polish/linseed**. Many candidates were able to give the expected response, the performance of candidates on this question was superb. Very few were giving deviating responses such as paint, spray, sanding sealer etc., and these were not accepted.

### Question 20

**Candidates were given a drawing of a holding tool. Candidates were required to name the tool.**

The expected response was **G-cramp**. A bigger majority of candidates was able to give the expected response, it was only a few who gave dissenting responses. Some of the dissenting responses were F-cramp, C-cramp, holder etc., and unfortunately they not awarded with the mark allocated to this question.



## SECTION B

This section comprised of three (3) structured questions (B1, B2 and B3) based on Graphic Products, Resistant Materials and Systems and Control. Candidates had to answer all questions. Each question was worth twenty marks (20) making the total of this section to be sixty (60) marks.

### B1 – Graphic Products

#### Question 1

**Candidates were given a solid geometry object. They were then required to state the correct name of the object.**

The expected response was **Cube**. Only a smaller percentage of the total candidature was able to give the expected response. Most of the candidates went astray giving responses such as cuboid, box, isometric square etc., and this resulted in losing the one (1) mark reserved for this question.

#### Question 2

**For this question candidates were given triangle ABC.**

**(a) Candidates were required to use geometrical construction to draw the triangle on the space to the right.**

The expectation was that candidates would start by drawing line AB to be 70mm, then from end B of the line construct an angle of  $60^{\circ}$  and then bisect it to get the  $30^{\circ}$  angle. Then project the  $30^{\circ}$  line make it long, marking the distance 60mm along this line using a compass. The last step was to join point A on line AB and the 60mm mark along the  $30^{\circ}$  line. Very few candidates were able to get maximum points on this question. Many candidates simply drew the triangle without proper construction and this led to a great loss of marks.

**(b) Candidates were asked to the correct name of the triangle drawn in (a).**

The expected response was **scalene triangle**. It was only a fair number of candidates that was able to give the expected response. Other candidates were giving dissenting responses such as scalene, right angled triangle, acute triangle etc., and these were not awarded the mark.

#### Question 3

**For this question candidates were given a drawing of a complete of the logo and an incomplete drawing of the same.**

Candidates were expected to start by drawing the circle given Centre O, then join OP with a faint line. Next step was to bisect OP, then draw a semi-circle. Where the semi-circle cut the circle would be the point of contact for the tangent which was to be drawn from point P to complete the logo. There were very few candidates that were able to do all the necessary steps to achieve the intended outcome. A greater fraction of the candidature drew the circle and then a straight line from point P to the circle without proper construction and this resulted in a great loss of marks.

#### Question 4

**Candidates were given a table with symbols of projection. Candidates were required to complete the table by stating the correct names of the symbol of projection.**

The expected response was **First angle projection** and **Third Angle projection**. It was a fair number of candidates that was able to produce the required response. The other portion of the candidature were giving different responses such as first class, second class, some were swapping the responses where they were supposed to write first angle they would write third angle and vice versa.

### Question 5

For this question candidates were given two views of a cone made from card.

**(a) Candidates were required to use geometrical construction in drawing a development of the cone.**

The expectation was that candidates would divide the plan into twelve equal parts. Then they would also draw an arc equal in radius to distance from the apex to the base with the centre point being the apex, this arc would be made to stretch to almost above the apex. Then using a compass they would then take the distance of one division on the plan and then step that distance twelve times on the arc drawn earlier. They were also expected to number the twelve divisions. There were very few candidates that managed to give the expected response. Some were redrawing the front view, some did some rendering others simple left the question unanswered.

**(b) Candidates were required to give the correct name of the drawing produced in (a).**

The expected response was **development/net**. Again it was a small minority of the total candidature that managed to come up with the expected response. Some were giving responses such cone, cylinder, pyramid etc., and these were not awarded with the mark.

### Question 6

**Candidates were given two drawings of a housing joint; one exploded and one assembled. They were then asked to give the correct name of type of drawing in Fig.(b).**

The expected response was **assembly drawing**. Only a minority of the total candidature was able to give the expected response. The majority of candidates were giving many different responses such as oblique, isometric, housing joint, exploded etc., and these could not attain the (1) mark allocated to this question.

## B2 – Resistant Materials

### Question 1

Candidates were given an image of a tool used in Design and Technology.

**(a) Candidates were required to name the given tool.**

The expected response **hack saw**. This question was well answered as a majority of the candidates were able to give the expected response. There were those few candidates, however, who gave deviating responses such as metal saw, rip saw, coping saw etc., and these were obviously not awarded with the mark.

**(b) For this question candidates were asked to the use of the tool.**

The expected response was; **for cutting pieces of plastics and metals**. Only a fair number of candidates was able to give the expected response. The rest of the candidates gave varying responses such cutting wood, cutting curves etc., and such effort could not be awarded the mark allocated to this question.

### Question 2

Candidates were shown a marking out tool.

**(a) Candidates were asked to name the tool.**

The expected response was **marking gauge**. This question was well answered, a majority of the candidates were able to give recognize the marking gauge. There were some though who missed it and gave responses such a mortise gauge, mallet etc., and these responses could not be awarded the mark.

**(b) For this question candidates were asked to state the specific use of the given tool.**

The expected response was; **marking parallel lines to a true edge of a piece of wood or plastic.** Only a smaller fraction of the total candidature was able to come up with the expected response. Some were giving the response but they were not specific leaving the 'to a true edge' part and this resulted in the loss of the mark. Others just missed the point altogether.

**(c) Candidates were asked to state the name of the part labelled I.**

The expected response was **spur/pin.** There were fewer candidates that were able to give the expected response others were giving responses such as nail, scribe, marker etc., and all these responses were off at a tangent and couldn't get any reward.

**Question 3**

**Candidates were given a drawing of mobile cloth hanger.**

**(a) Candidates were required to suggest one type of ferrous metal that can be used for making the rail.**

The expected response was **mild steel** and **stainless steel.** It was a fair number of candidates that were able to give the expected response. Others gave many different answers such iron, aluminum, copper etc., and these responses could not be awarded with the one mark available for the question.

**(b) Candidates were asked to name one suitable joint that could be used at part B.**

The expected response was one of the following; mortice and tenon, tee halving, tee bridge, dowelled and dovetail halving joint. It was a smaller fraction of the total candidature that was able to come up with the expected joint. The rest of the candidates were giving many different responses that were not accepted by the examiners.

**(c) Candidates were asked to sketch the joint they had named in (a).**

The expectation was that candidates would sketch an exploded view of the joint showing clearly the male part and the female part. Not very many candidates managed to produce the expected sketch. A good number of the candidates sketched the rack and the bottom of the cloth hanger and for this they could get awarded.

**Question 4**

**Candidates were given a drawing of piece of acrylic sheet.**

**(a) For this question candidates were asked to name two tools that could be used in the marking out that was shown.**

The expected response was any two of the following: try square, steel rule, felt tip pen, pencil, dot punch, centre punch, compass and tape measure. This question was fairly done, a fair number of candidates was able to produce the expected response. The Other candidates were giving many different responses which were not required for this question, responses such mortise gauge, marking gauge etc., and these could not be awarded with marks.

**(b) Candidates were required state how cracking of the plastic can be prevented when drilling through holes**

The expected response was; **by supporting with masking tape/clamping on a piece of wood.** They were fewer candidates that were able to give the expected the response, others were giving dissenting responses such as drilling slowly, hold it firmly, drill bit by bit etc., unfortunately these were not awarded with marks.

### Question 5

**Candidates were given a drawing of a desk tidy made from plastic. They were then asked to show by means of a sketch how the design could be improved to stop the pencils from falling off when lifting the desk tidy.**

The expectation was that candidates would show a wider base probably with blind holes to stop the pencils from falling off. This question was not well answered, less than half of the total candidature were able to produce the expected sketch. Some of the sketch were did not communicate enough, some were not suitable solutions to the problem.

### Question 6

**For this question candidates were required to name the two classes in which timber is divided.**

The expected response was **hardwood** and **softwoods**. A majority of the candidates were unable to give the two classes of timber. A lot of them were giving responses such as seasoning, conversion, man-made, quarter sawing etc., and these were not awarded with marks.

### Question 7

**Candidates were given a drawing of two pieces of tinplate to be joined together.**

**(a) For this question candidates were asked to name the type of joint.**

The expected response was **lap joint**. Again less than half of the total candidature was able to correct name the joint. Other candidates were giving responses such housing, riveting, glue, welding etc., unfortunately these were not awarded with the mark.

**(b) Candidates were asked to state how the joint name in (a) could made strong other than riveting.**

The expected response **soft soldering**. A majority of candidates were giving responses such riveting, welding, gluing, bolt and nut etc., and these were not accepted by examiners resulting in candidates not being awarded with the one mark allocated to this question.

### Question 8

**Candidates were given an image of a wooden box. They were then required to name the type of hinge that could be used to fix the lid on to the carcass.**

The expected response was **piano hinge**. This question was well answered as a majority of the candidates were to give a positive response. There were fewer candidates who gave dissenting responses such as long hinge, butt hinge, door hinge etc., and these response could not be rewarded as they were off at a tangent.

## B3 – Systems and Control

### Question 1

**Candidates were given an image of a part of machine.**

**(a) Candidates were asked to define a mechanism.**

The expected response was; **a system of parts working together in a machine or device that changes input into desired motion/to make job easy**. This question was fairly done, almost half of the candidature was able to respond positively to the question. There were those however, who gave dissenting responses other simple left the space unattended.

**(b) Candidates were required name the type of mechanism that had been used for the machine in figure 1.**

The expected response was **belt** and **pulley**. This question was poorly done, as many candidates were unable to identify the mechanism. A majority of them were giving responses such as gears, pulley, mechanism driver and these were not rewarded with the mark.

**(c) Candidates required to give one advantage of the mechanism stated in (b)**

The expected response was that **belt may slip/energy loss**. There were fewer candidates who managed give the expected response. A majority of candidates were giving many different responses such as it snaps, it breaks, needs electricity etc., and these could not attain the mark set apart for this question.

**(d) Candidates were required to give the names of parts labelled J and K.**

The expected response **J – belt and K – pulley**. Again this question was poorly done, less than half of the candidature was able to give a positive response. A majority of the candidates were swopping the answers, some gave answers such driver, driven and this resulted in them losing the mark.

**Question 2**

**Candidates were given a drawing of a racking structure used in a shop.**

**(a) Candidates were asked to identify and state the weakness of the structure.**

The expected response was; **can collapse because it is not rigid**. This question was fairly done, as reasonable amount of candidates were able to give the expected response. Some candidates were citing that the structure was weak because it had no base, some were saying the structure was tall and thin, some saying because it had holes etc., and unfortunately these responses could not be rewarded.

**(b) This question required candidates to state the type of force that will act on the structure once in use.**

The expected response was one of the following: **static load/bending/compression**. There were fewer candidates who were able to come up the expected response. A majority of candidates gave dissenting responses such as force of gravity, pull force, tension etc., unfortunately these could not be rewarded with the mark.

**(c) Candidates were asked to show on the diagram how the problem identified could be solved.**

The expectation was that candidates would add a member to form triangulation so that the structure could be rigid. This question was poorly done, only a minority of the candidates were able to come up the expected response. Most of the candidates left the question unanswered.

**Question 3**

**Candidates were given a drawing showing two parts of a mechanism.**

**(a) Candidates were asked to name the mechanism.**

The expected response **Off-centre cam/eccentric**. There were fewer candidates who were able to give the expected response, other candidates gave deviating responses such cam and follower, pear shape cam, spur gears, rotary mechanism etc.

**(b) This question required candidates to name the parts labelled L and M.**

The expected response was **L- Roller follower, M-Cam**. This question was fairly done as almost half of the candidates were able to come up the expected response. The other half of the total candidature gave dissenting responses such as oscillation, some candidates swopped the answers around, others left the question unanswered.

**(c) Candidates were asked to name the motions experienced by L and M.**

The expected response was **L-reciprocation, M-rotary**. A fair number of candidates was able to give the expected response. Other candidates gave many different responses such as oscillation, up and down, clockwise and anti-clockwise, rotation etc., and were not awarded with the mark.

**Question 4**

**Candidates were given an image of a bicycle.**

**(a) Candidates were asked to name the type of mechanism used to produce the movement in the bicycle.**

The expected response was **sprocket and chain**. There were fewer candidates that were able to give the expected. The majority of candidates were giving many different responses such as chain, chain driver, pulley, pulley and belt, bevel gear etc., and these were not accepted by the examiners.

**(b) Candidates were asked to give the main advantage of the mechanism stated in (a).**

The expected response was; **does not slip**. It was slightly less than half of the total candidature that was able to give expected response, the rest of the candidates were giving many different responses such as last longer, move faster, move slowly etc.,

**Question 5**

**Candidates were given two parts of a mechanism.**

**(a) Candidates were required to state the correct name of the mechanism.**

The expected response was **bevel gears**. This question was poorly done as it was only a minority that was able to give the expected response. The majority of the candidates gave dissenting responses such worm gear, rack and pinion, etc., others simply left the question unanswered resulting in losing the one mark set apart for this question.

**(b) Candidates were required to give the function of the mechanism stated in (a).**

The expected response was; **transfer rotary motion between two shafts at 90°**. It was only a small minority that was able to come up with the expected response. The majority of the candidates were giving very many different responses which were not accepted by the examiners.

**(c) For this question candidates were asked to give one machine found in the workshop that uses this type of mechanism.**

The expected response was **portable hand drill, pillar drill**. This question was well done, it was an overwhelming majority that was able to give the expected response. There were very few candidates that deviated from expected response and those were giving responses such as car engine, sewing machine etc., and obviously lost the mark.

**Question 6**

**Candidates were given an image of an old model of an overhead projector.**

**(a) Candidates were asked to name the type of mechanism that enables height adjustment of the reflector along the shaft.**

The expected response was **rack and pinion**. The performance of candidates in this question was very poor, very few candidates were able to identify a mechanism that would be fitted to create the up and down movement of the reflector. Other responses that were given by the candidates were linkages, oscillation, projector etc., unfortunately these could not be awarded with the mark reserved for this question.

**(b) Candidates were required to name the type of motion produced by the reflector head as it is moved up along the shaft.**

The expected response was **linear** motion. It was a smaller fraction of the total candidature that was able to give the expected response, a bigger share of the candidates were off at a tangent giving responses such as oscillation, reciprocation, move and down, reverse motion etc., and because of this they could not be rewarded with the mark.

**Paper 537/02****COURSEWORK**

One hundred and seven (107) Centres registered candidates for the coursework. Of the Centres, one thousand eight hundred and fifty-two (1852) were registered but one thousand seven hundred and forty nine (1749) submitted work for this year's examination. This number indicates a decrease when compared to the number of candidates who registered for the examination in the year 2021. One hundred and three (103) candidates did not submit their coursework.

The coursework for Junior Certificate is similar to EGCSE in that it is a school-based component of the syllabus that is compulsory to all candidates registered for Design and Technology. Each candidate undertakes a personally identified project centered on the chosen prescribed theme (**CONTAINERS**). The coursework is expected to be worked over the final two terms of the year. Candidates' folders are then presented for marking.

**CHALLENGES AND RECOMMENDATIONS**

Generally, the performance indicated a decline in most centres. This also included the work presentation that was displayed on the folio booklets. Most work presented by the candidates was average and indicated a decline in performance for most centres. A whole lot of centres submitted work that had some unattended sections of the design process. However, some few centres performed exceptionally well. Centres need to be reminded that when candidates undertake this component, it is an examination. Therefore, candidates should be the ones doing the work from start to finish. No one else needs to do the work on behalf of the candidates, be it written or sketching work.

**REALIZATION ASSESSMENT FORM**

This year, a product realization assessment form was sent to centres for the assessment of the model. Candidates were required to produce a model instead of an artefact or product. The model realization carried 30 marks. The assessment form was to be used when marking the model. In the envelope from the centres to ECESWA, the expectation was that it would carry the folios, the register and the assessment form. However, some centres did not send the assessment form, and this resulted in the loss of the 30 marks designated for the making of the model. Worth noting also was the absence of evidence showing the model being tested.

**COMMENTS ON INDIVIDUAL ASSESSMENT OBJECTIVES****Theme analysis**

This objective was well done by most candidates. Most candidates defined the theme by providing three definitions which was highly commendable. Candidates are advised to define the theme without using the key words of the theme. Few candidates did not indicate their area of interest in the theme analysis and some indicated very few general areas. Candidates must be advised to clearly indicate the area of interest and also write the area of interest in the space provided. In some centres, candidates provided theme analysis (bubble charts) with limited links (must have at least three links).

**Identification of the need**

Almost all centres completed this objective. Centre assessment of this objective was reasonably accurate, although the design brief of some few candidates did not indicate that they were intending to design and make a model as per the instructions of this year's coursework. It is worth noting that some centres showed less initiative in terms of adventure, hence many candidates were designing around



one concept in one centre. So much work must be done in broadening the scope or opportunities of designing under the given theme.

### **Research into design brief resulting in specifications**

Very good work was seen that demonstrated an excellent understanding of the requirements. Candidates should note that research should cover a wide range of existing ideas; ideas must not be of single concept and also include relevant identified and collected data. However, it is no use pasting in pictures without making meaningful evaluation of the existing ideas (stating two advantages and two disadvantages). Most candidates' conclusion on existing ideas lacked meaning. They did not draw their conclusion in relation to the design brief. Some were choosing best ideas instead of concluding on the existing ideas. It was good to note that most candidates included the design specifications in their research, although to some candidates it was less specific. Design specifications has many sub-topics, however, function is the most important. It is highly recommended that the function should not be left out when providing specifications.

### **Generation of ideas**

Many candidates produced a wide range of ideas which were properly evaluated. Some candidates displayed good graphic skill. Candidates should be discouraged from focusing on a single concept and producing ideas similar to the existing products. Candidates are advised to indicate their chosen idea and justify their choice. Candidates used common methods of drawing techniques, including two-dimensional and pictorials, effectively. Colouring and shading help improve the quality of presentation. Other factors such as availability of resources should be considered when deciding the final project. Candidates who did not only annotate possible ideas, but also did not indicate constructional details lost marks. Candidates are also advised to produce a key for the evaluation matrix. A lot of candidates lost marks due to failing to provide evaluation notes of the possible solutions against the specifications. In this space, most candidates repeated the specifications instead of commenting on how each idea performs against each specification.

### **Development of proposed solution**

Even this year, this objective was a challenge to most candidates. Most candidates were drawing exploded views and showing constructional details instead of showing details that clearly indicate suggested changes to improve the chosen idea and justify the changes. It is commended that most candidates made mock-ups, however, some candidates lost marks because they did not test their mock-ups. Candidates are advised to draw and render the final idea with all justified changes included. It is advised that candidates should make mock-ups and test them. Only a few candidates made reasoned decisions about form, materials, construction methods etc.

### **Planning for production**

A few candidates produced some good clear working drawings. This was not impressive in many folders. Few centres performed well in this section. Candidates did not have well drawn, well dimensioned working drawing. In some instances, some centres did not produce the planning for the production part. The usage of a pencil is advisable for drawings. It is also advisable to state the scale, correct dimensions and method of projection if orthographic projection is used. Candidates are encouraged to include tools needed to produce the artifact and the processes involved.

### **Product realization**

The level of performance in general was quite low for this objective. Some centres did not make the model while others used the mock up again as a final mode. All these resulted in the loss of marks.

However, some centres did well in this objective. Candidates should be encouraged to produce models of good standard and quality.

### **Testing and evaluation**

This objective was not achieved well also. Most candidates' testing was superficial in that it did not consider the environment for which it was designed. The use of pictures with comments to show the evidence for testing must be encouraged. Centres are advised to encourage candidates to evaluate their products against the specifications. Many candidates lost marks in this section because they never evaluated but their response was simply re-writing their design specifications. In this section candidates are also required to state future modifications and justify their modifications. Centres should encourage candidates to suggest modifications relevant to the product. In addition, such suggestions should seek to improve the product.