EXAMINATIONS COUNCIL OF ESWATINI

JC

EXAMINATION REPORT

FOR

DESIGN AND TECHNOLOGY

YEAR

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Table of Contents

Subject Code:	Name of Subject:			Page No:
537	**Design and Technology**	**P1**	**……..**	**3-14**
537	**Design and Technology**	**P2**	**……..**	**15-16**

JC Design and Technology

Paper 537/01

General Comments

In 2020 there were about one thousand seven hundred and sixty-seven (1767) candidates who sat for the Design and Technology Paper 1, this shows a slight increase from the 2019 candidature. The level of performance was slightly lower compared to 2019. In general, candidates performed better in Section A than in Section B. Again question B2 and B3 proved to a popular choice with candidates. A substantial number of Candidates that opted for question B3 performed well. There were few candidates that opted for question B1, however, a majority of them performed well. It was observed that the number of candidates that attempted all three (3) questions in Section B was significantly low in the 2020 examinations compared to the previous years. It was also noted that in a majority of cases candidates in a centre were making the same choices in attempting the questions in section B. Some individual centres continue to shine year in year out, even for this year's examinations there were some centres that performed very well individually.

Section A

This section consisted of seventeen (17) compulsory questions worth thirty (30) marks. The questions were assessing knowledge, understanding, problem solving, communication and realisation skills; a majority of the questions were based on knowledge. Questions were from the three components of the syllabus: Resistant materials (RM), Graphics Products (GP) and Systems and Controls (SC).

Comments on Specific Questions

Question 1

Candidates were given a drawing of a commonly used tool. Candidates were expected to name the tool.

The expected response was a **trying square.** A majority of candidates were able to give the expected response. Other common responses were tee squares, tri square etc., however these responses could be not awarded with the one (1) mark allocated to the question.

Question 2

Candidates were shown a drawing of an eight sided road sign. For the question candidates were expected to name the specific shape of the sign board.

The expected response was **regular octagon**. A majority of candidates were able to give the expected response. There were some candidates that gave responses such octagonal prism, octagonal pyramid, polygon, stop sign, hexagon heptagon, however, these were not accepted.

Question 3

Candidates were given an image of part of a toy made from a 2mm thick plastic. Candidates were required to name one saw could be used for cutting the outside shape of the toy.

The expected response was one of the following: **coping saw, piercing saw, jig saw, fret saw, scroll saw etc.** The question was fairly done; a fair number of candidates were able to give the expected

response. There are those candidates that gave dissenting responses such as bow saw, pad saw, compass saw, curve cutting saw, and can be expected these were not accepted resulting in the loss of the allocated one (1) mark.

Question 4

Candidates were given an incomplete statement about brass.

Candidates were expected to fill in the blanks with **copper** and **zinc** which are the two metals that make up the alloy Brass. This question was fairly done; a majority of candidates were getting 1 mark as opposed to the allocated 2 marks. There were few candidates who were giving responses such as iron, bronze, non-ferrous, ferrous, aluminium, steel, metal, etc., unfortunately these responses could not attain any marks.

Question 5

For this candidates were given an image of a lock and a key. Candidates were then required to name the type of force experienced by the key being turned to lock and unlock.

The expected response was **torsion/twisting.** A majority of candidates were able to give the expected the response and were awarded the mandatory 1 mark. There were some that gave responses such as rotary, friction, pushing, oscillation etc., however, these responses were not awarded any mark.

Question 6

Candidates were given a drawing of a wooden work piece showing a marking out.

(a) Candidates were asked to name one marking out tool that could be used to mark out line A which was a gauge line.

The expected response was **marking gauge**. A majority of the candidates were able to give the expected response. There were some candidates that gave different responses such as marking knife, pencil, mortice gauge, odd-leg callipers, steel rule etc., and these responses were not awarded with marks.

(b) Candidates were required to name one tool that could be used to remove the waste.

The expected response was **Jack plane**. Very few candidates were able to give the expected response. A majority of candidates came up with unfavourable responses such as tenon saw, file, rasp, plough plane, chisel, plane etc., and these could not obtain the allocated 1 mark.

Question 7

For this question candidates were given two (2) drawings of a key holder. One was complete and the other was incomplete. Candidates were expected to complete the second key holder which was incomplete.

They were expected to find a centre using the existing circular end of the key holder. They would then use the centre to draw a circle which represented the hole in the key holder. Only a minority of the candidature was able to collect the maximum 2 marks allocated to this question. Most of the candidates only managed to get only 1 mark and most of these were simple drawing the circle representing the hole

without finding using proper construction to find the centre. Other candidates simple left the question unanswered, these led to the loss of the two (2) marks.

Question 8

Candidates were given a sketch of sheet metal held in a vice and being cut using cold chisel.

(a) Candidates were required to name tool A.

The expected response was a flat **cold chisel**. This question proved to be challenged, as many candidates could not manage to come up with the expected response and this resulted in the loss of the one mark. Common errors were firmer chisels, vice, chisel, dot punch, dot punch, diamond point, cross cut etc.

(b) For this question candidates were required to name the tool which was labelled B.

The expected response was **engineer's bench vice.** It was a small fraction of the candidature that was able to come up with the correct response. Others were giving responses such as vice grip, ball-pein, bench hook, folding bar, vice hook, bench holdfast, machine vice etc. Regrettably these responses were not awarded with a mark.

Question 9

Candidates were given required to state the two functions of the plastic coating on acrylic sheets.

The expected response was; marking out and to protect from scratch/dust. This question was fairly done; most candidates could only obtain 1 mark as opposed to the maximum two (2) marks. Other candidates came up with responses such as decorating, protect from moisture content/water, prevent breaking, protect from sunlight, protect from bending. However, these responses were not accepted.

Question 10

Candidates were given two drawings of a pencil organizer; one was an isometric projection and the other was an incomplete sectional view. Candidates were expected to complete the sectional view.

The expectation was that they would use two sets of hatching lines which were to be of equal distances. This question was poorly done. Very few candidates were able to amass the maximum three (3) marks. Most of the candidates could only attain 1 mark. Common errors committed by candidates were; drawing the hatching lines facing the same the direction yet there were two different parts which needed to hatched differently, secondly, most candidates could not draw the hatching lines to be equal distances.

Question 11

Candidates were given a drawing of a car pulling attachment which was to be threaded externally. Candidates were required name the two tools that could be used to cut the threads on the spigot.

The expected response was; **die and die holder/die stock.** This question was poorly done as most candidates failed to give the expected responses. Most candidates gave deviating responses such tap wrench, die and stock, external thread cutter, spigot, hack saw, drill and this led the loss of marks

Question 12

For this question candidates were given an image of a school chair made from plastic. Candidates were required to name one specific type of plastic that could be used to produce the school plastic chair.

The expected response was one the three answers namely; **polyester resin, PVC and polypropylene.** A very small fraction of the candidature was able to give the expected answer. Some candidates gave answers such as acrylic, thermoplastics, ABS, MF, PVA and these responses were not accepted leading the loss of the allocated 1 mark.

Question 13

Candidates were given an incomplete sketch of tenon saw. They were required to neatly complete sketch.

The expected response was a complete blade showing full length of the blade as well as the back. Secondly, a correct handle was to be neatly drawn to earn the other mark. This question was fairly done, with some candidates getting one (1) mark and some getting two (2) marks. Most candidates had challenges in sketching the handle. Some candidates took time rendering the sketch and this was not required and this did not earn them an extra mark.

Question 14

Candidates were given a drawing of a book shelf being mounted on the wall. Candidates were required to name the force acting upon the rawl bolts.

The expected response was **shear force** or **tension**. This question proved to be a challenge to many candidates, very few candidates were able to give expected response. A big number of candidates were giving dissenting responses such as compression, bending, torsion, pushing etc., and these were not awarded the allocated one (1) mark.

Question 15

Candidates were given a drawing of a sign post.

(a) Candidates were required to name the part labelled A on the drawing.

The expected response was **strut**. The question was well done as a majority of candidates were able to give the expected response and earning the allocated one (1) mark. There were few candidates that gave differing responses such as **supporter, hypotenuse, tie, bracket etc., and these were not accepted.**

(b) This question required candidates to state the function of Part A which was the strut.

The expected response was; **to make the structure rigid**. This question was very well done; a lot of candidates were able to give expected response. There were, however, some deviating responses such as resist compression, makes the sign strong and these were not accepted and could not earn the one (1) mark allocated to question.

Question 16

For this question candidates were shown three (3) types of rivets. Candidates were required to name the rivets.

The expected response was **countersunk, flat head and Snap head respectively.** This question was well done; a majority of candidates were able to amass the total of three (3) marks allocated to this question. There were a few candidates who gave dissenting responses such as countersunk screws, flat screws, pop rivet, semi-circle, semi-round, raised head and many others, unfortunately these were not accepted.

Question 17

Candidates were shown an image of a safety sign. Candidates were asked to state correct meaning of the sign.

The expected response was that **the sign means wear goggles.** This question was very well done a great majority of candidates were able to give the correct response. There were very few candidates who gave different responses such as close your eyes, wear safety clothing etc., and these were not awarded with the one (1) mark allocated to this question.

Section B

This section comprised of three (3) optional structured questions (B1, B2 and B3) based on Graphic products, Resistant Materials and Systems and Control respectively. Candidates had to answer any two questions of their choice. Each question was worth twenty (20) marks, in essence this section is worth forty (40) marks.

Question B1 – Graphic Products

Question 1

(a) Candidates were asked to give one reason for making a model.

The expected response was one of the following; **check the behaviour (functionality, proportionality, can be constructed, shape, visualise).** The question was well done; a majority of the candidates were able to produce the expected response. There were some, however, that gave dissenting responses such as to make it attractive, to sell, to make it final and these were not accepted and ended up losing the mark allocated to this question.

(b) Candidates were asked to give one material for making models.

The expected response was one of the following responses; **card**, **wood**, **cardboard**, **glass**, **plastic** and any other acceptable material. Again, a majority of candidates were able to give the expected response, making the question to be among the well answered questions. There were some candidates who gave paper as a response to this question, however, this was not accepted.

Question 2

Candidates were given a development of a geometrical solid. They were required to state correct name of the geometrical solid.

The expected response **square based pyramid**. A majority of the candidates were able to give the expected response earning the full marks allocated to this question, in essence the question was well done. There were very few candidates who gave other responses other than the expected; responses such as triangular prism, cuboid, pentagonal pyramid, square prism, octagonal prism etc., and were not accepted resulting in the loss of marks.

Question 3

Candidates were given a drawing of a coffee table. They were required to name the specific type of projection that had been used to present the coffee table.

The expected response was **two-point perspective drawing.** This question seemed to be a great challenge to a lot of candidates following that very few candidates were able to give the correct name of the projection. There were many far-off responses, responses such as isometric projection, first angle, one-point perspective, oblique etc., and were not awarded with any mark.

Question 4

For this question candidates were supposed to be given a model of a camera drawn in first angle projection. Candidates were to draw the model of the camera in isometric projection making X to be on the foreground.

Unfortunately, during the production of this paper the drawing of the camera was omitted, making it almost impossible for candidates to respond to the question.

Question 5

Candidates were given figure 4(a) which was a complete drawing of a grass cutting tractor. Again they were supposed to be given figure 4(b) which was to be an incomplete drawing of the tractor. Candidates were required to use geometrical construction to complete the drawing.

The expectation was that candidates would apply their knowledge on geometrical construction to complete the drawing. Only a minority of candidates were able to produce the expected response. Some candidates used freehand and this was not accepted. Some candidates drew the ellipse using compasses and this led to loss of marks, others simple did not attempt the question and this led to a huge loss of marks.

Question B2 – Resistant Materials

Question 1

Candidates were shown a method of filing. They were required to name the method.

The expected response was **cross filing/through filing.** This question was well done; a very large number of candidates was able to come up with expected response. There were very few who deviated from the expected response. The common errors were draw-filing, rocky filing, forward and backward filing, and these were not awarded with the allocated one (1) mark.

Question 2

For this question candidates were given a marking out tool.

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

The expected response was **mitre square.** This question proved to be challenge to most candidates, this follows that there were very few candidates who came up with the expected response. Others came up with responses such as sliding bevel, tee-square, try square, centre square and many more that were not accepted as a true response to the question.

(b) Candidates were asked to state the specific use of the tool (mitre square)

The expected response that **it is used for marking and testing lines at 45^0.** This question was poorly done, only a small number of candidates was able to come up with expected response. Others were giving responses such as to mark parallel lines to each other, testing squareness, marking angles less than 90^0 (very popular), and these responses were not accepted.

Question 3

For this question candidates were given an incomplete drawing a bevel edge chisel. They were required to complete the drawing.

The expectation was that candidates would show the correct tip of the bevel edged chisel which is different from a firmer chisel and also draw two parallel lines on the blade length to represent the bevels. Not very many candidates were able to performance the task. Other candidates made the sketch of a firmer chisel, others sketched only the tip, others simply left the question unanswered.

Question 4

For this question candidates were given an incomplete sketch of three-ply wood board.

(a) Candidates were asked to complete the sketch.

The expectation was that candidates would show the three equal layers representing three veneers making the three-ply wood board. The other expectation was that candidates would show that the core (inner layer) is laid at 90^0 to the outer layers. A majority of the candidates were equal to the task, managing to show all three layers arranged correctly. There were few candidates that produced responses that could not attain full marks. Some sketched block board, lamin board, some candidates sketched the three layers but did not show the direction of the grain and for this hindered them from attaining full marks.

(b) Candidates were asked to give one advantage of plywood over solid wood.

The expected response was one of the following; **equal strength in all directions, it is wide, can bend to shape, does not warp, does not shrink**. This question was not very well done, only a minority of the total candidature was able to come up with expected response. Other candidates gave responses such as light in weight, attractive, does not bend etc., and these were not accepted.

Question 5

Candidates were given a drawing of a CD display unit made from 3 mm acrylic.

(a) Candidates were required to give one property of acrylic.

The expected response was one of the properties related to the product shown, properties such as **hard, stiff, rigid and transparent**. Very few candidates were able to come up with correct response. Most candidates were giving general properties light in weight, wide range of colours, water resistant and yet for this question the expectation was that they would give one relevant to the given article.

(b) Candidates were asked to name one tool that could be used for cutting the back piece from a wider piece.

The expected response was any of the straight cutting saws such **as hack saw, panel saw, jig saw** etc. This question was poorly done, most candidates were not able to come up with expected response; instead they gave responses such as tenon saw, grinder, scroll saw etc. This resulted in the loss of marks.

(c) Candidates were asked to state what could be done to prevent the plastic from breaking when cutting the back piece.

The expected response was: **support the plastic with a scrap piece of wood**. This question was fairly done, almost half of the candidates were able to come up with expected response. There were those however, who came up with responses such as put in the vice, hold tight, put on flat surface, put on bench hook. These responses were not accepted and this resulted in the loss of the one (1) mark allocated to this question.

(d) Candidates were asked to name on tool that could be used to make the edges of the back piece to be smooth.

The expected response was one of the following: **file, scraper, plane, buffing, abrasive paper**. This question was well done; a majority of the candidates were able to give correct response. There were those few who deviating responses such as chisel, smoothing machine, hot air gun etc. and these could not attain the mark.

(e) Candidates were asked classify the joint which was used to join the front to the back of the CD display unit.

The expected response was **temporary method.** A very small fraction of the candidates was able to come up with the expected response. So many of the candidates gave stray answers such as hooking, lugging, gluing, lamination, mortice and tenon, and these were not rewarded with the allocated one (1) mark.

Question 6

Candidates were shown a child's toy made from plastic. They were required to state two reasons why plastic was a suitable material for the children's toys.

The expected response was any two of: **light in weight, non-toxic, resistant to corrosion, variety of colours**. This question was well done, a majority of the candidature was able to come up with correct and expected response. There were those however, who gave dissenting responses such as; does not break, durable, tough etc., and these were not awarded with any mark.

Question 7

Candidates were given a wooden box for carrying sandwiches.

(a) Candidates were asked to name one suitable hard wood that could be used for making the box.

The expected response was any of the following: meranti, saligna, acacia etc. This question was fairly done, almost half the total candidature were able to come up with right response. The other half came up with stray answers such as SAP, MDF, Supawood, Masonate, plywood etc., and obviously these responses could not obtain any mark.

(b) Candidates were asked to name one specific joint that could be used for corner B.

The expected response was any of the following joints: **barefaced mortice & tenon, dovetail, lap joint, dowelled joint, finger joint**. This question was poorly done; a majority of the candidates were not able to give expected response. Many candidates were giving deviating answers such housing joint, corner halving and many more that were not awarded the allocated one (1) mark.

(c) Candidates required to sketch an exploded view of the joint named in part (b).

The expectation was that candidates would draw the two parts of the joint separated with clear male and female, displaying high level of sketching. This question was fairly done. Approximately half of the total candidature was able to sketch the joint well amassing the two (2) marks. Some candidates drew a different joint from what they stated in (b), others lost a mark for showing one part clear and the other not so clear. Another set of candidates could not produce the exploded view.

Question B3 – Systems and Control

Question 1

Candidates were given a drawing of a mechanism for creating motion.

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

The expected response was **cam and follower, pear shaped cam** was also accepted. This question was fairly done, almost half of the total candidature was able produce the expected response attaining the allocated one (1) mark. The almost half of the candidature gave deviating responses such as off-centre cam, snail cam, cams and driven pulley and unfortunately these responses were not accepted resulting in the loss of marks.

(b) Candidates were asked to state the type of movement produced by the mechanism.

The expected response was **reciprocating.** A slightly less than half of the total candidature was able to come up with the correct response. Common deviating responses were oscillation and rotary and these were not awarded with marks.

(c) This question required candidates to name one machine where the shown mechanism had been applied.

The expected response was any common machine. The most common responses were the car engine, sewing machine, there were other responses that were accepted. Only a small fraction of the total candidature was able to give the expected response. Other candidates gave answers such as pillar drill, plough etc., and were not accepted resulting in the loss of the one (1) mark allocated to the question.

Question 2

Candidates were given a mechanism.

(a) Candidates were required to name the parts labelled A and B.

The expected response was A - **worm**, B - **worm wheel/wheel gear**. Only small minority of the total candidature was able to come up with correct response. Common wrong responses were rack and pinion, input and output, driver and driven etc., obviously these were not awarded with marks.

(b) Candidates were required to give two functions of the mechanism.

The expected responses were two of these**; to reduce speed, transfer rotary motion at 90^0, increase torque**. This question proved to be a challenges following that very few candidates were able to produce the expected response. Many candidates were giving other responses such for driving speed motion, increase speed, produce motion etc., which were not accepted leading to loss of marks.

Question 3

For this question candidates were given a drawing of a block making machine.

(a) This question asked candidates to give the mechanism that had been applied in the design of the block making machine.

The expected response was **levers.** A fair number of candidates were able to give the expected response. Another approximately half of the total candidature gave dissenting responses such as bell crank, linkages, triangulation, reverse motion, 1^{st} class lever, 3^{rd} class lever, and these could not attain the allocated mark.

(b) For this question candidates were required to give the advantage of the mechanism.

The expected response was **it makes work easier.** This question was poorly done by a greater percentage of the total candidature. A great number of candidates gave nonconforming responses such as balanced, strong, etc. and these were not accepted.

(c) This question required candidates to give a result of a situation whereby the lever was made shorter where B was.

The expected response was that **more effort would be required/more power applied**. This question proved to be a challenge as most candidates could not come up with the expected response to the question. Candidates gave responses such machine would not work, machine won't balance, machine will be heavy, unfortunately these responses were not accepted.

(d) Candidates were asked to give the type of force experienced part A when the block making machine was in operation.

The expected response was **Tension.** A majority of candidates were able to give the expected response. Other common responses that were off the mark were torsion, compression, pushing, friction force.

(e) For this question candidates were asked to name the parts labelled X, Y and Z in terms of effort, fulcrum and the load.

The expected response was **X – fulcrum, Y – load & Z - effort.** A majority of candidates were able to give the expected response. Common errors were that candidates would do a mismatch where e.g. Writing effort where there should be fulcrum and or vice versa, another mistake was that candidates would come up with other names (e.g. pivot, bell-crank) other than the given ones and these were not accepted resulting in the loss of marks.

Question 4

Candidates were given a sketch of a man using a pillar drill.

(a) Candidates were asked to give two motions experienced by the chuck as the pillar drill is used.

The expected response was **rotary** and **linear motion.** Quite a majority of the candidature was able to come up with expected response, in essence this question was well done. There were some, however, who gave deviating responses such as input and output, reciprocating, oscillation, moving up and down and unfortunately these responses were not accepted resulting in the loss of the one (1) mark allocated to the question.

(b) Candidates were required to name the type of mechanism that was used to transfer motion from the motor to the shaft.

The expected response was **Belt and pulley/Pulley**. A fair number of the total candidature was able to identify the mechanism that is fitted to transfer the motion between the two parts. Others gave dissenting responses such as bevel gear, rack and pinion etc., which were not accepted.

(c) Candidates were asked to the disadvantage of the mechanism stated in part (b).

The expected response was that **it slips under heavy load/torn easily.** Slightly less than half of the total candidature was able to come up with the expected response. Common responses that were not among the expected ones were that it reduces speed, easy to revers, transport force to machine and these were not awarded with the mark.

(d) Candidates were required to name the mechanism named A.

The expected response was **rack and pinion.** Only a minute number of candidates was able to come up with the expected response. Others gave differing responses such as idler gear (this was very popular), bevel gear, worm etc., and these were not accepted.

(e) Candidates were required to state function of the mechanism named in part (d) in the pillar drill.

The expected response was that to **raise and lower the table.** Only a minority of the total candidature was able to give the expected response. Others candidates gave dissenting responses such as transfer rotary motion, to move the drill up and down etc., and these responses were not awarded with any mark.

JC Design and Technology

Paper 537/02

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**.** The coursework is expected to be worked over the final two terms of the course. Candidate's folders were presented for marking.

Challenges and Recommendations

Generally, the performance indicated an incline in most centres. This also includes the work presentation that is displayed on the folio booklets. The quality of work presented by most candidates was impressive and did indicated an improvement to most centres. The folio booklets were used appropriately by almost all centres. However some centres did not complete all design processes indicated in the folio booklet. Teachers are advised to encourage candidates to keep the booklet neat before and during submission. Few candidates indicated little understanding of the syllabus requirements.

Comments on individual assessment objective

Theme analysis

This objective was a strength and was well done by most candidates. Most candidates defined the theme by giving at least one definition. Some candidates did not indicate their area of interest in the theme analysis and only indicated 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 candidates completed this objective. Centre assessment of this objective was reasonably accurate, although the situation and brief of some candidates was less informative and shallow. It is, however, vital that the identification of a need may be accompanied with evidence to prove the need to design.

Research into the design brief resulting in a specification

Most candidates performed well and there was a wide range of responses to this assessment objective. Very good work was seen, that demonstrated an excellent understanding of the requirements. However, candidates must research only on relevant materials instead of extracting exactly all the given information from the books. Candidates should note that research should have a variety or wide range of existing ideas; the ideas must not be on a single concept and also include relevant identified and collected data. However, it is no use pasting in photographs without making any qualifying comments by evaluating the existing idea (stating two advantages and two disadvantages). Candidates must also demonstrate the ability to make good judgments to show that learning has indeed taken place. It was good to note that most candidates included the specification in their research although to some candidates it was not clear and concise.

Generation of ideas.

Many candidates produced a wide range of ideas which were properly evaluated. Some candidates displayed good graphics skills. Candidates should be discouraged from focusing on a single concept and

producing ideas that are similar to the existing product. Candidates are advised to indicate the chosen idea and justify their choice. Common methods of drawing techniques including two dimension and pictorials were used by candidates effectively. Coloring and shading help improve quality of presentation. Other factors such as the 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 advised to indicate the key for the evaluation matrix.

Development of the proposed solution

This was the most challenging criterion to most candidates. Some candidates were drawing exploded views of the chosen idea instead of showing drawings that clear indicate changes suggested to improve the chosen idea and justify the changes. Although it is good that candidates made models, but some candidates lost marks because they did not test their models. Most candidates were able to produce appropriate evidence of testing and or trialing. Candidates are advised to draw and render the final idea taking into consideration the justified changes. It is advised that candidates make models, test them.

Planning for production

Some candidates produced good and clear working drawings. This was impressive in many folders. Few centres performed well in this criterion, candidates did not have working drawings, cutting list, Isometric and production plans. Few candidates came up with the flow chart which also did not indicate the sequence of operation. The usage of a pencil is advisable for drawings. However it is 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 sketches with notes that explains how the processes will be carried out.

Product Realization.

A good range of products were seen. The marker relies on the mark given by the internal moderator. However it was recognized that some centres had pictures as evidence of realization which helps in confirmation of the mark that has been awarded by the internal moderator. There was some lack of evidence of product making shown in this objective. **Candidates are advised to present clear and good quality samples of photographs to show various stages during the production of their artifact. Some pictures showed poor quality of craft-work in terms of construction and product finish. Correct guidance should be given to candidates to produce artifacts of good quality.**

It was unfortunate to some centres that the realization summery form had a mark for realization yet there was no picture as evidence of product realization. Candidates lost marks because external markers rely on both the pictures and the marks awarded by the internal moderator. **Centres are advised to capture different views of the product in a form of pictures.**

Testing and evaluation

Most candidates' testing was superficial in that it did not take into account the views of the users or show the product in the environment for which it was designed. Centres are advised to encourage candidates to test and evaluate their products against the specification.

In addition to the testing of the product, students are advised to evaluate their work. In most cases candidates were either evaluating or testing the product. Teachers must encourage candidates to do both. The use of photographs with comments to show evidence of testing is to be encouraged. Candidates must be encouraged to state future modification and justify their modifications.