EXAMINATIONS COUNCIL OF ESWATINI

EPCSE

EXAMINATION REPORT

FOR

TECHNICAL STUDIES (5925)

YEAR

2022

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EPCSE TECHNICAL STUDIES

Paper 5925/02

General Comments

This paper consists of two components namely Graphics which is found in **Section A** and Resistant materials in **Section B**. The overall performance was not up to the expected standard and this could be attributed to a number of factors. The interruptions to teaching and learning caused by COVID 19 and nationwide riots in the two years prior to the sitting definitely had a negative impact on the performance.

Candidates were expected to attempt all questions from both sections. The Graphics (**Section A**) component proved to be a challenge as some candidates left a number of questions unanswered. The Resistant Materials Component (**Section B**) was fairly done and most candidates scooped good marks to make up for the shortfall experienced in **Section A**.

Comments on Specific Questions

Section A

Question 1

A table with names of conventional symbols was shown and candidates were expected to give the correct symbols in the spaces provided.

Candidates were expected to produce conventional symbols for Diameter, Centre line, 3rd angle projection, distance across corners and internal thread. Very few candidates were able to produce the correct symbol or 3d angle and diameter and only one (1) out of 50 (fifty) got it right for centre line and internal thread. **This suggests that educators have to pay attention to this topic as it proved to be a challenge to most learners across all centres**.

Question 2

A round plate with 5 holes and a boss was show. The fifth hole at the centre of the plate had threads and a boss. A plane X-X cuts through the threaded hole/ boss and two other aligned holes and candidates were expected to sketch a sectional end elevation. Only one candidate had an idea of what was expected. This one candidate got the orientation of the view wrong and

he also failed to section the threaded hole correctly but he at least did produce a sectional end

elevation, the rest of the candidates either did not attempt the question or simply copied the given views as they were. **Centres are urged to pay attention to sections and orthographic projection in general.**

Question 3

Candidates were expected to draw in one-point perspective a simple step block. Candidates were given corner T as a starting point and a vanishing point (VP) Because there was no corner T shown on the orthographic views there were two possible solutions, one with steps facing VP and one with steps facing away from VP towards T.

Most candidates failed draw the correct height, width and length. Some candidates drew the block in two-point perspective by adding their own vanishing point. **Only one centre was able to correctly answer this one. Centres have to ensure they pay special attention to this topic as it proved to be a challenge to most candidates.**

Question 4

Candidates were expected to reproduce the given polygon ABCD given that AB=60, ABC=45^0, vertical distance of C from AB=20, BCD=120^0 and AD=70. Almost all candidates failed to geometrically construct the two angles. Only one candidate was able to geometrically produce corner C correctly at 20mm away from line AB. To ensure that point C was in the correct position candidates were expected to first draw a parallel line 20mm away from AB and then geometrically construct a 45^0 angle at B. Candidates failed to draw the parallel that is 20mm away from AB which resulted in a wrong position of point C. **Centres are encouraged to put emphasis on the use of geometric constructional methods.**

Question 5

Candidates were expected to convert the given orthographic views to an isometric free-hand sketch, ensuring that corner Z is placed on the foreground. Most candidates were able to figure out how the toy looks like in isometric. However, a lot of candidates failed to position corner Z on the foreground while others used drawing instruments. **This is one question that was attempted by most candidates and a majority scored good marks**.

Question 6

Most candidates must have found this question challenging because they did not attempt it. From the few that attempted this question only two candidates were able to draw the surface development of the pyramid correctly**. From the look of things most centres were not able to cover this topic and if they did they were not thorough on it because this is the most basic frustum but candidates failed to score marks on it.**

Section B

Question 1

(a) **(i)** Meaning of ferrous metal – most candidates got this correct. A few candidates responded by saying ferrous metals are metals that conduct electricity and they easily rust. Much as these are properties of ferrous metals but the expected response was (metals that contain iron). Remember not all ferrous metals rust and there are also nonferrous metals that are good conductors of electricity.

(ii) Two examples of ferrous metals – Well answered even though there were candidates who simply wrote steel instead of listing the different types of steel.

(b) This question was about joining of metals using a rivet

(i) The correct answer was a Snap head rivet and less than half the candidature gave the correct response.

(ii) The hammer used is a ball pein hammer and the most common response given was a claw hammer

(c) **(i)** The expected response was “The chuck key can fly off and cause an injury to the user or people around” which most candidates got correctly.

(iii) Candidates gave a variety of responses but all bordered around workshop users falling and getting hurt due to the floor being slippery

(d) **(i)** The correct response should have been a centre punch. There were candidates who wrote dot punch but they were few and about two wrote scriber. By merely looking at the point/tip angle one can tell that is was 90^0 which far more than the point angle of a scriber and a dot punch

(ii) The feature X is diamond knurling and candidates who simply wrote knurling were awarded the full mark but very few candidates gave the correct answer.

(iv) Only one candidate gave the correct response by saying the improve grip.

Question 2

(a) This question was about shaping of plastics

(i) Most candidates wrote non-toxic which was accepted as credible. There are other properties of polystyrene that candidates could have listed to get the full mark like: keeps food warm, hygienic, light in weight. Well done though.

(ii) Injection moulding – plastic granules are fed into a hopper and heated until it melts, the mould is warmed, a plunger is used to push (inject) the molten (fused) plastic into the mould, pressure is maintained to prevent the plastic creeping back during setting. Allow to set, open and remove the moulding (container).

All candidates failed to mention injection moulding let alone explain the process or steps followed to produce the container. Most candidates listed steps followed in vacuum forming.

(b) Candidates were required to give uses of an outside caliper, G cramp and folding bars. Some candidates gave the names of the tools instead of their uses, otherwise this was a well done question even though there were a few that did not know the use of the folding bars.

(c) Candidates were expected to make a sketch of a piece of metal held in a vice with a file placed across. Arrows showing the file moving along the piece were to be shown. **However, most candidates were not able to draw the arrows indicating the direction of the movement which differentiates draw filing from cross filing.**

Question 3

(a) This question was about the lathe.

(i) All 50 candidates didn't know the importance of a clearance angle on turning tools.

A clearance angle enables the tool to cut into the work. Without the clearance angle the tool tends to rub on the work piece creating friction.

(ii) All candidates could not differentiate between right and left hand cutting tools.

When held towards the observer, the cutting edge of a right hand cutting tool is located on the right side while that of a left hand cutting tool is located on the left.

(iii) This question was poorly done as well which suggests that lathe work has to be given some attention by all centres in future.

(b) **(i)** All candidates failed to score a mark on this one which is an indication that centres may have not adequately covered joining of metals.

(ii) The most common response was that the fire bricks are for preventing fire yet the bricks are meant to retain heat within the joint.

(iii) The reason for applying a flux is to clean a joint/remove to make the solder to stick as solder does not stick to a dirty surface. Most candidates got this one correct.

(iv) An apron is for protecting clothing from heat, dirt and chemicals while goggles are for protecting eyes from intense light. Almost all candidates scored the two marks.

Question 4

(a) A good majority scored all four marks on the parts of a cabinet and only a few got less than two marks. This was one question that was well done by almost all candidates.

(b) Most candidates were able to produce good sketches of a housing joint while others opted for dowelled joint. Well answered question.

(c) Any two manufactured boards – another well done question as almost all candidates listed the correct manufactured boards. However, it was observed that some candidates listed manufactured boards that are not in the syllabus.

(d) All candidates were able to state one safety precaution to be observed when spray painting the cabinet but most failed to give the justification. Teachers are advised to give their learners reasons for observing safety measures in the workshop to ensure they adhere to them.

Question 5

(a) Most candidates scored the full mark for door D2 (paneled door) and very few were able to get a mark for door D1. The correct name for D2 is Framed, ledged, braced and battened door. The few that were awarded the mark mentioned at least three of the four components of the door. Otherwise not a single candidate was able to mention all the four. This door is made of a frame around battens and is strengthened with a brace and ledges.

(b) This question was well done as most candidates were able to score a minimum of two out of three marks on offer. The expected responses were: to provide security/protection, to provide access into the building, to provide privacy.

(c) **(i)** The expected response was (to avoid cupping). Most candidates wrote – to avoid bending and were duly awarded the full mark because this was the closest credible response.

(ii) Almost all candidates were able to give the advantages of manufactured boards. Well done.

(d) This question required candidates to complete the given drawings by adding strips and veneers to represent a lamin-board and a block-board. Some candidates added thin strips for the block and wider strips for a lamin-board when the opposite was expected. The other option was to add dimensions to the strips (up to 12.5mm thick for lamin-board and up to 25mm thick for block-board) and add veneers on both faces of each board.

Question 6

(a) The stationery machine shown in fig. 15 is a combination planer (surfacer/thicknesser). Very few candidates attempted this question which may suggest that they were not familiar with the machine. The few that were able to get something out of this question responded by writing thicknesser or planer. Such candidates were awarded one mark because the response was deemed incomplete.

(b) Students have to use the machine under the supervision of a teacher because they have not fully acquired the mastery of operating it so the teacher should be there to monitor and provide guidance on safe usage. A majority of the candidates gave responses that warranted they be awarded full marks.

(c) Most candidates were able to give credible responses which all bordered around producing edges that are square or at right angles to the face side.

(d) Most candidates scooped one mark out of the possible two because they gave only one safety precaution instead of two. They all talked about avoiding loose clothing when working with revolving machinery which was deemed credible. Other acceptable responses are: The use of a push stick, ensuring that the guard is always in position, feed stock slowly, ensure blade is sharp,

plane with the grain etc.

(c) A good majority was able to make a sketch of a rebate and were duly credited with one mark and sketching a rebate proved to be a challenge to most candidates.

Question 7

(a) Candidates were expected to give two properties of acrylic. Acceptable responses were: hard, stiff, glass clear, durable outdoors, scratches easily. Almost all candidates were able to give two correct properties.

(b) A felt pen does not scratch the plastic – most candidates scooped the one mark on offer.

(c) The plastic cover on acrylic sheets is meant for protection against scratches – most candidates scooped all the two marks.

(d) Another well done part of the question as a good majority of the candidates were able to produce surface developments of the tray showing clearly outlines, handles and bend lines.

EPCSE TECHNICAL STUDIES
Paper 5925/03

EPCSE Technical studies is a coursework paper and a school based component of the syllabus that is compulsory to all candidates registered for EPCSE Technical Studies. Each candidate undertakes a personally identified project based on a theme. A total of 51 candidates registered for the 2022 EPCSE Technical Studies. Some centres had no candidate taking this course.

Most candidates were able to complete the project on time however there was a serious concern of the quality of work presented by some centres. Some candidates presented portfolios that were not easy to follow. A more structured approach following the assessment criteria is recommended so that candidates meet examination expectations. It was noted that candidates rush to make the actual products without having gone through all the design stages. Most candidates presented finished products without working drawings and cutting lists. Candidates should be advised that in design each stage is informed by the previous stage. Some candidates could not access full marks per section because of shallow or irrelevant information. In some instances it was clear that the candidates were not properly guided throughout the project.

Comments on Specific Questions

Stage 1 – Proposal

- It was noted especially in this section, that candidates in some centres present similar work which was tantamount to malpractice according to examination rules and standards. Candidates should be advised to desist from this kind of malpractice.
- Candidates should be advised that this stage informs stage 2 and 3 of the practical examination. The proposal should stimulate the need for design.
- Candidates should be advised that the need for design should be generated from the analysis of the theme. Most candidates did not show the area of interest in the theme that leads to problem identification.
- Most candidates were able to generate a meaningful design brief with all the three basic elements i.e. user, function and location however some could not link the design brief with the problem statement.
- Most candidates demonstrated minimal understanding of how to describe methodologies and time frames to be undertaken in executing the task. Some presented unrealistic time frames.
- Candidates should be advised to use proper referencing styles to acknowledge sourced information.

Stage2 – Investigation and Development

Research and Specification

- Some candidates seemed not to understand that research should lead to information and key points to take one forward to the next stage of design. Candidates would drop pictures from the internet without critically analyzing and evaluating them. Candidates must be encouraged to collect relevant data as they research which must align with the design brief.
- Most candidates did not give a summary of information gathered from the research. The summary should state the insight of research that will inform the exploration new ideas.
- The level of research by most candidates is compromised by the tendency of reproducing existing products as solutions to design. Candidates should be advised to solicit information from existing ideas and come up with improved ideas.
- Most candidates came up with very brief generic specifications giving limited indication of key aspects required. Specification points should focus on the design brief and to provide check points for evaluation.

Ideation

- A wide range of different and appropriate ideas that were a solution to the design problem were considered in this section. Some candidates lost marks by repeating similar concepts in the exploration of ideas.
- Most candidates presented creative design possibilities however some displayed a low level of creativity in the generation and exploration of own ideas. Some candidates would copy concepts of existing ideas and present them as their own ideas.
- Some ideas were not evaluated against specification. Candidates should be encouraged to evaluate all ideas to justify the best idea.
- A number of candidates displayed poor graphic skills hence ideas were not easy to visualize.

Development and planning for production

- This section was generally not well done. Most candidates made insignificant alterations on the selected idea which did not justify any further development. Candidates should be advised to justify any changes made as development in relation to the specification. The developed idea should be evaluated against all specifications to justify the development.
- Very few candidates did modeling and trialing at this stage in order to make reasoned decisions about form, materials and construction methods.
- Some candidates lost marks because they did not have working drawings. Working drawings should include detailed orthographic/ pictorial views of the product to be made and cutting lists.

- Most candidates did not produce a detailed, logical sequence of the stages of manufacture and marks were lost.

Product Realization

- This section carries more marks than any other section of the paper, so if not well done a large chunk of marks is lost.
- It is commendable that in most centres the candidates had something to show as a finished product however the standard of manufacture left a lot to be desired as some did extremely poor in this section. Candidates should be advised to demonstrate a high level of competence as this a skills based assessment.
- A number of candidates lost marks for failing to apply proper finish.
- Candidates should be advised to include pictures as evidence of manufacture during the making process.

Testing and Evaluation

This section was fairly done as most candidates carried out a test of their products and produced a brief evaluation. Candidates should be advised to produce an outline of evaluation against the original specification. After testing candidates should identify the strengths and weaknesses of the product and suggest proposals for further improvement/development.