

EXAMINERS' REPORT

DESIGN AND TECHNOLOGY

MAIN SESSION 2018



**L-Università
ta' Malta**

**MATSEC
Examinations Board**

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Statistical Information

This year a total of 249 candidates applied for Design and Technology examination. 149 candidates applied for Paper A and 100 candidates applied for Paper B. 10 candidates did not present their coursework.

The following table shows the distribution of marks

GRADE	1	2	3	4	5	6	7	U	ABS	TOTAL
PAPER A	12	22	24	22	9	-	-	58	2	149
PAPER B	-	-	-	25	18	19	18	15	5	100
TOTAL	12	22	24	47	27	19	18	73	7	249
% OF TOTAL	4.82	8.84	9.64	18.88	10.84	7.63	7.23	29.32	2.81	100

Paper 1 is the Extended Project which is common for both Paper A and Paper B. The average mark obtained by those who presented their project was 76% in Paper A and 68% in Paper B.

The table below shows the choice by areas of study of the Extended Project.

	Resistant Materials	Electronics	Food	Textiles	Not presented
No. of projects	82	40	112	5	10
% of Total	33%	16%	45%	2%	4%

In the Extended Projects for Paper 1 the candidates' choice was mainly the same as in the previous year.

3 candidates who registered for Paper A and 7 candidates who registered for Paper B examination did not present their coursework.

The following table shows the performance in Paper 1 of the Extended Project of candidates opting for Paper 2A and Paper 2B. The total marks allotted to this project is 50.

Extended Project of marks (Max. 50)	0 - 10	11 - 20	21 - 30	31 - 40	41 - 50	Projects Not presented	Total
No of candidates Paper A	0	7	14	62	63	3	149
No of candidates Paper B	0	7	20	45	21	7	100
Total	0	14	34	107	84	10	249
% of total	0	5.6	13.7	43.0	33.7	4.0	100

CANDIDATES' PERFORMANCE

General Comments

The aim of the coursework is to develop the candidates' thinking skills in a world where technology is rapidly changing. They evaluate existing products and carry out modifications to make them suitable for a given target group. Candidates learn to create designs and research different materials to understand their suitability for their product and the impact such resources have on the environment. They also use tools, acquire new skills and processes which they find useful later on in life.

Comments on Coursework

Moderation for course work was conducted in 3 schools. Most of the projects presented were of good quality, candidates showed creativity in their designs, used appropriate tools in producing their artefact and communicated and recorded adequate details of all their work. However, in some of the folios, evidence for testing against specifications was missing.

Paper 2A

Question 1

- a. A small number of candidates were awarded full marks as the answer included the shop logo, potential customers, advertising, etc. 46% of the candidates were awarded 2 marks as the design brief started with the 'design and make' but then shifted towards the production method instead, copying parts of the situation in the process. 1 mark was awarded for answers starting with design and make, and mentioning an eye catching organiser holding three remote controls and a smart phone.
- b. Typical answers included aesthetic, size, price and safety. Most reasons given for choosing the above were: the artefact should be eye catching, not too big and bulky, not expensive since it is going to be given for free, and safe for young children. 66% of the candidates were awarded full marks.
- c. Only 29% of the candidates were awarded full marks. 1 mark was awarded when size and dimensions were given as answers in the same question.
- d. Only 15% of the candidates got full marks in this question. Candidates had to write two reasons why it is important to plan before making the artefact.

Question 2

- a. 47% of the candidates were awarded 5 or more marks in this question. Candidates who did not include the shop logo in their design were awarded half the marks for the design concept. Most candidates included overall dimensions. Marks were only awarded for one idea, where candidates drew the same idea twice. Irrelevant answers were not awarded marks.
- b. 64% of the candidates were awarded full marks in this question. Acceptable answers may include: relevance to brief, cost to manufacture, production time, and sustainability. Other acceptable answers: aesthetically, eye catching, attractive were all accepted, lighter, functionality/ practical, safety, smaller etc.

Question 3

- a. This question sought the difference between the three types of properties: aesthetic, physical and mechanical. Few candidates showed an understanding of this difference. In fact, one third obtained no mark. The majority of correct entries referred to aesthetic properties. Some candidates also made the mistake of repeating the same property under different headings.
- b. The majority of candidates obtained marks in this question. Amongst the most common answers for Part A were glass and acrylic, while for Part B were aluminium. Many lost marks when identifying the material for Part B of the cable car.
- c.
 - i. Only sixteen candidates answered correctly and some did not attempt this question.
 - ii. A good number of candidates obtained marks in this question. However, it was noted that the use of proper technical terminology was lacking. Some answers did not distinguish between metal wire and metal bar as the processes described were related to the latter instead. Others confused wire-bending with the use of the plastic line-bending machine.

Question 4

- a. Two thirds of the answers were correct. Few candidates drew the arrows on the belt rather than the pulleys, as requested in the question, for which no marks were awarded.
- b. Two thirds of the answers for this question were also correct. Candidates reasoned out that the pulleys need to remain fixed and equidistant from each other for the belt to stay on tension. Nonetheless, some answers showed difficulty in expressing this.
- c. Many of the given answers did not refer to the driven pulley as the question requested suggesting that the instructions were not read properly. Half of the candidates failed to give a correct answer for the first part of the question. More candidates correctly answered the second part of the question.
- d. There was a mixed response to the first part of this question which asked for a calculation of the number of teeth on a gear, with some candidates not attempting it at all and others achieving full marks. Half of the candidates seem to have understood the question but confused the mathematical calculation, gaining only some marks. Only one third of the candidates recalled that the introduction of an idler gear changes the direction of rotation of the output gear.
- e. Candidates had to redesign the system by adding at least one other pulley attached to the cabin of the cable car. Almost all candidates attempted this question, with two thirds achieving some or full marks. Some sketches were unlabelled while others did not include the cabin, leading to a reduction in marks for lack of clarity.

Question 5

- a. A large number of candidates named the component (ne555) but failed to name the system.
- b. Few candidates explained properly how the system chosen will help to save battery power.
- c. Most candidates explained the components correctly but a good number of them labelled the capacitor as a battery.
- d. The majority of candidates answered this question correctly naming the two leads shown in the given IC.
- e. Most candidates knew one advantage of building a circuit on a breadboard therefore they answered this question correctly.
- f. Candidates had to include the IC to complete the given circuit. A good number of candidates did not attempt the question, other failed to notice that the IC was missing.
- g. Some candidates failed to correctly interpret the given information and drew a sign wave as the output instead of the signal showing the output.

Question 6

- a. A number of candidates used the value of 3.5v from the LED, rather than calculating the voltage drop across R4. They also failed to convert mA to A.
- b. A good number of candidates drew the right symbol for the latching switch but failed to position it in the right position.
- c. Most candidates answered correctly although some of them described a latching switch as an "automatic switch".
- d. The question required the design of a way to increase the brightness by adding a second LED. Few candidates attempted this question.

Question 7

- a. The majority of candidates did not name the correct method which is commonly used when preserving jams.
- b. Most candidates listed three valid reasons why packaging is important in the food industry.
- c. The majority of candidates successfully gave two advantages and two disadvantages of using glass as a material for jam packaging.
- d. Only few candidates suggested the requested four quality control procedures that should be followed when producing jam.

Question 8

- a.
 - i. The majority of candidates suggested a healthy cooking method for vegetables and gave a good reason for their choice.
 - ii. Most candidates correctly stated the main function of protein.
 - iii. Some candidates did not suggest the right ingredient that can be added to thicken sauce.
- b. The majority of candidates correctly named two special dietary conditions that one should consider when planning the meal.
- c. Only few candidates answered correctly what HACCP stands for.
- d. The majority of the candidates did not list the four steps of HACCP that should be followed when producing the given dish.

Question 9

- a. The majority of candidates answered cotton or linen and gave a valid reason for their answer, such as that the material is breathable, strong, washable, durable, etc. Wool was not accepted as a correct answer given that the question asked for the best natural fibre to produce a laundry bag.
- b. Candidates who answered question 9a wrongly but gave the correct corresponding origin of the fibre were awarded full marks for this question. Candidates who stated that the origin of the fibre was plant or animal were given half the mark. Full marks were awarded to candidates who mentioned the type of plant or animal of the natural fibre mentioned in question 9a.
- c. More than half of the candidates did not mention or explain the terms 'spinning' or 'weaving' in their answer. Full marks were awarded to candidates who mentioned or explained both terms.
- d. The majority of candidates sketched and named two fasteners without any relation to the laundry bag. Full marks were awarded to candidates who produced clearly labelled sketches of the bag and the named fasteners.
- e. Only a few candidates mentioned the proper term 'interfacing'. However, most candidates mentioned metal, wood or plastic rods placed at the edges of the bag. These answers were awarded full marks. Some candidates mentioned placing a piece of cardboard at the bottom of the bag, and were awarded half the marks since this component would not fully keep the bag upright.

Question 10

- a. More than 50% of the candidates answered this question incorrectly.
- b. About 50% of the candidates were awarded full marks for giving the correct meaning of the given symbols. 'Cold wash' was accepted as a correct answer for the first symbol in this question.
- c. Most candidates mentioned cutting and sewing the handles to the laundry bag without mentioning folding the handles before sewing to make them stronger.
- d. Answers not related to the production stage of the laundry bag were not accepted. Using natural fibres does not necessarily mean that the bag is eco-friendly since a lot of energy and water may still be wasted. Typical correct answers included: using recycled material to produce the bag, producing the bag from biodegradable material, avoiding material wastage when producing the bag.

Paper 2B*Question 1*

- a. None of the candidates provided a full answer, which had to include the shop logo and batch production. More than half of the candidates achieved 2 marks in this question. 1 mark was awarded for answers starting with design and make, and mentioning an eye catching organiser holding three remote controls and a smart phone.
- b. Almost half of the candidates achieved full marks in this question.
- c. Almost 40% of the candidates got full marks in this question by writing details they can communicate in the working drawing.
- d. Only 17% of the candidates achieved full marks in this question. Candidates had to provide two reasons on the importance of planning before making the artefact.

Question 2

- a. Only 30% of the candidates were awarded 5 or more marks in this question. Candidates who did not include the shop logo to their design, were awarded half the marks for the design concept. Some candidates didn't show the dimension arrows appropriately and the design was not proportionate. Most candidates did overall dimensions. Some candidates did not specify the material used to construct the artefact and did not add colour to their designs. Marks were given for one idea only when the ideas were very similar; irrelevant answers were not awarded marks.
- b. 32% of the candidates got this question correct.

Question 3

- a. Only five candidates obtained full marks in this question. Answers showed a difficulty in relating the correct property to the different parts of the cable car. Material properties were confused with material names by some candidates.
- b. 75% of the candidates correctly stated that 'Part A' of the cable car could be made out of glass. However, only nine of them also deduced a correct material for 'Part B'. Some answers were swapped and thus marked as incorrect.
- c.
 - i. The answers provided showed a lack of proper understanding of the question with some candidates suggesting that the single-stranded wire was made from other materials. 13 candidates scored some marks in this question.
 - ii. One third of the candidates knew what standard forms are. Some answers included names and sketches which did not match.
 - iii. Many candidates were awarded marks for this question, but none obtained full marks. Most marks were lost when choosing tools for marking out. In fact, tools such as the scribe were rarely cited. As a tool for cutting out, many suggested using a saw without specifying the type of saw. The same happened for drilling tools, with candidates mentioning the drill without specifying its type or the relevant cutting bits.

Question 4

- a. One third of answers were correct. Many candidates did not follow the instructions, drawing the arrow in other places rather than on the driver pulley.
- b. 50% of candidates obtained marks in this question, but only four achieved full marks. Most marks were lost because the speed of the driven pulleys was not related to that of the driver pulley, even though some candidates realised that the cable car would go faster.
- c. 75% of candidates showed proper knowledge in working out the gear ratio. However, marks were deducted for adding units to the ratio. Many answers were incorrect in the second part of this question, whereby candidates had to sketch the gear system according to the calculated ratio. In fact, only nineteen attempts were awarded some marks. Many confused gears with toothed pulleys. Performance was poorer in the last part of this question with only nine candidates properly explaining what an idler gear is.
- d. There was a variety of answers for this question, with half of the attempts being awarded some marks. Once again it was noted that some sketches lacked annotations. Some candidates drew unrealisable solutions since proposed mechanisms made turning impossible. Twelve candidates obtained full marks.

Question 5

- a. Most candidates correctly recognised that the timing system was 'monostable'.
- b. Candidates found it hard to explain how the use of an LED instead of a bulb would save battery power.
- c. A good number of candidates gave the correct answer for the R2 and the TRI components.
- d. Most candidates numbered the given lead of the NE555 correctly.
- e. Most candidates correctly provided one advantage of building a circuit on a breadboard.
- f. A good number of candidates labelled the components correctly. However the variable resistor was wrongly labelled by some of them.
- g. The signal showing the output of the circuit on the graph was correctly drawn by most candidates.

Question 6

- a. Most candidates correctly provided the purpose of resistor R1 in the given circuit.
- b. Candidates had to calculate the value of R1. Most failed to convert mA to A and did not correctly change the subject of the formula.
- c. Most candidates did not join the second terminal of S2 in the given circuit to turn on L1 indefinitely.
- d. The majority of candidates did not add a second LED in parallel to L1 in the given circuit to increase the brightness of the system, as requested.

Question 7

- a. Some of the candidates listed the three different types of micro-organisms that can spoil jam.
- b. The majority of candidates successfully listed two conditions for the micro-organisms to grow.
- c. Only few candidates named a correct method which is commonly used to preserve jams.
- d. Most of the candidates successfully provided one disadvantage of using glass as a material for packaging. However, only a few candidates provided a valid advantage.
- e. The majority of candidates properly listed two compulsory pieces of information that should be included on the labelling on the jam jar, according to EU legislation.

Question 8

- a. Many candidates successfully mentioned one healthy cooking method to cook the vegetables.
- b. Most of the candidates briefly described the healthy cooking method mentioned in question 8a.
- c. Most of the candidates did not fill in the blanks correctly. Few candidates correctly identified flour/cornflour as a thickening agent for the sauce, and named a substitute of chicken for vegetarians. Most candidates correctly listed protein as the source provided by chicken in the dish, and named rice as a source of carbohydrates. Some candidates correctly stated that protein is very important for the growth and repair of the body.
- d. Most of the candidates successfully suggested an important safe and hygienic practice whilst producing the dish.
- e. Only a few candidates suggested batch production as the production method for the airline dish.

Question 9

- a. The majority of candidates were awarded full marks. However, some candidates opted not to answer this question.
- b. Only a small number of candidates fully answered this question correctly. Most candidates did not provide the correct terminology for the labelled parts.
- c. The majority of candidates sketched and named the fastener without any relation to the laundry bag. Full marks were awarded to candidates who produced a clear labelled sketch of the bag and the named fastener. Some candidates opted not to answer this question or the sketch was unclear and unlabelled.
- d. Almost all the candidates answered this question incorrectly with answers being out of point.

Question 10

- a. About 75% of the candidates answered this question incorrectly.
- b. The majority of candidates answered this question correctly.
- c. Most of the candidates achieved full marks in this question.
- d. The majority of candidates answered this question correctly by using the word bank provided.
- e. None of the candidates were awarded the full marks in this question as most of them only listed the first 3 steps in correct order.

Chairperson
Examination Panel 2018