Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2011

Marking Scheme

Technology

Ordinary Level

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2011 S.68

Junior Certificate Examination 2011

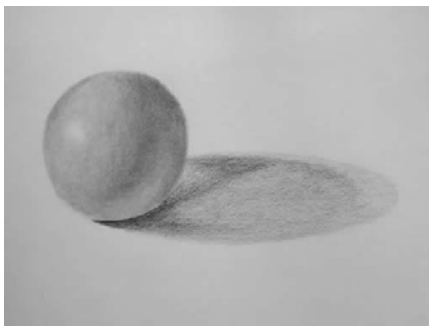
Technology

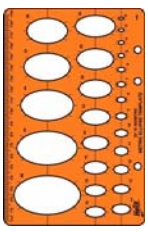
Ordinary Level

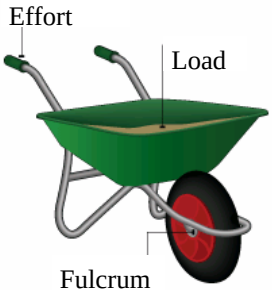
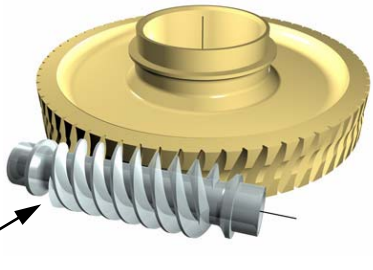
Marking Scheme

Section A, 20 short questions, candidates to answer any 16.	80 marks
Section B, 4 long questions, candidates to answer any 2.	80 marks

Section A – 80 marks. Answer **any sixteen** questions in this section.

1. 	The type of rendering shown is:	Shadow	
		Shade	
		Shadow and shade	⑤
2. 	Shown is a plasma HD television screen. HD stands for:	Half Definition	
		Huge Definition	
		High Definition	⑤
3. 	The computer shown is a:	Desktop	⑤
		Laptop	
		Notebook	
4. 	Shown is a capacitor. Capacitors store:	Sound energy	
		Electric charge	⑤
		Chemical energy	
5. 	The electronics tool shown is a:	Side cutter	⑤
		Pliers	
		Wire stripper	

6. 	A moving swing is an example of:	Reciprocating motion	
		Linear motion	
		Oscillating motion	⑤
7. 	A method of reading for blind people was developed by:	Louis Pasteur	
		Louis Braille	⑤
		Louis Vuitton	
8. 	The first 'D' in **D**VD stands for:	Durable	
		Digital	⑤
		Double	
9. 	This is a:	Countersink bit	⑤
		Auger bit	
		Flat bit	
10.  **A**  **B**  **C**	Which of the items shown is a set-square?	Item **A**	
		Item **B**	⑤
		Item **C**	

11. 	For the wheelbarrow shown the effort force is:	Greater than the load	
		Less than the load	5
		Equal to the load	
12. 	In the graphic shown, gear **A** is a:	Worm wheel	
		Ratchet	
		Worm	5
13. 	Formula 1 cars have:	A high centre of gravity	
		A low centre of gravity	5
		No centre of gravity	
14. 	The force on the bar shown is:	Torsion	
		Bending	5
		Compression	
15. 	This basin is an example of a:	Shell structure	5
		Frame structure	
		Shell and frame structure	

16.

Electric current is measured in:

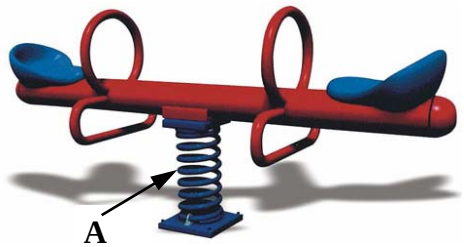
Ohms	
Volts	
Amps	⑤

17.

This structural framework model is a:

Prism	
Pyramid	⑤
Cone	

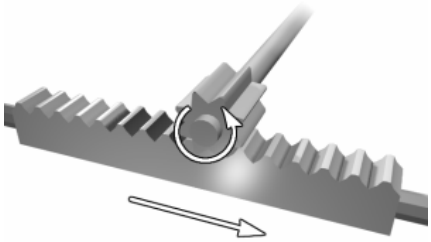
18.



A suitable material for the spring **A** would be:

Steel	⑤
Acrylic	
Polystyrene	

19.



The mechanism shown is a:

Crank and slider	
Rack and pinion	⑤
Worm and wormwheel	

20.

SatNav devices use a technology referred to as:

SPS	
GPS	⑤
GGS	

Question 1

Section B – 80 marks.
Answer **any two** questions from this section.

40 Marks

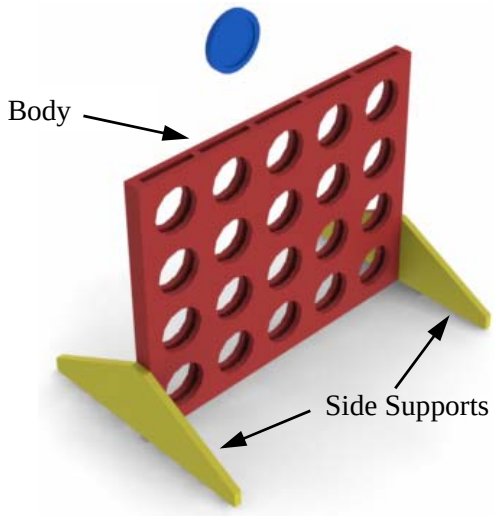
12 marks

(a) A 3D graphic of a popular game is shown.

(i) List **two** possible materials from which to make the body of the game.

1. *Acrylic* (2)

2. *MDF* (2)



(ii) Select **one** of the above materials and give a reason for its suitability.

Material: *Acrylic*

Reason: *Easy to produce a high quality finish* (2)

(iii) Describe **three** processes used in the manufacture of the acrylic side supports.

1. *Marking out* (2)

2. *Cutting tom shape* (2)

3. *Polishing edges* (2)

8 marks

(b) (i) Twenty holes had to be made on each side of the body of the game. Suggest a method of accurately drilling these holes.

After marking out hold work firmly, (4)

drill pilot holes then use larger drill sizes.

(ii) In the space below make a sketch of one of the side supports and draw a suitable logo on it to represent the product.

Side-support logo

Weak 1
Fair 2
Good 3
Complete 4

Question 1

12 marks

(c) (i) The following tools are useful when making Technology projects.
Name these tools and give a use for each.

Tool: *Centre Punch* (2)

Use: *Marking points on metal.* (1)

Tool: *Battery-powered drill* (2)

Use: *Drill holes in wood.* (1)

Tool: *Try-Square* (2)

Use: *Marking out lines* (1)

(ii) Glues are important in the assembly of products.
In each of the following situations name a suitable glue:

Wood to wood: *PVA* (2)

Acrylic to wood: *Super Glue* (1)

(d) (i) A graphic of a wooden toy is shown. *8 marks*
Identify **two** features of good design in this toy:

1: *Good aesthetics* (2)

2: *High quality finish* (1)

(ii) The choice of surface finish for children's toys is very important. Why is this so?

Needs to be smooth - no sharp edges, non-toxic finish (2)

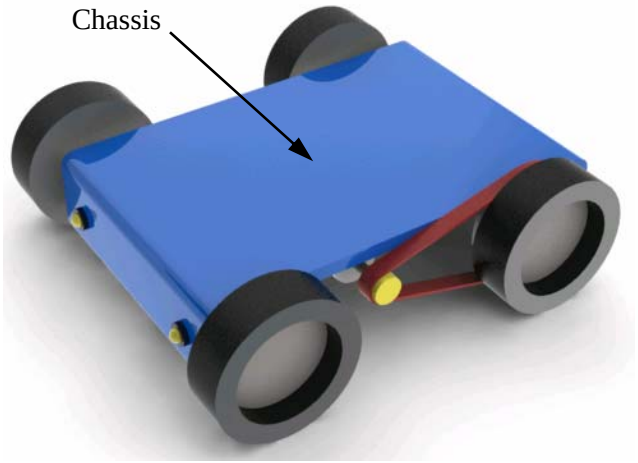
(iii) List **three** possible objectives identified by the designer of this toy.

1. *Portability* (1)
2. *Durability* (1)
3. *Lightweight* (1)

Question 2 — 40 Marks

12 marks

(a) The chassis of a motorised toy buggy is shown.

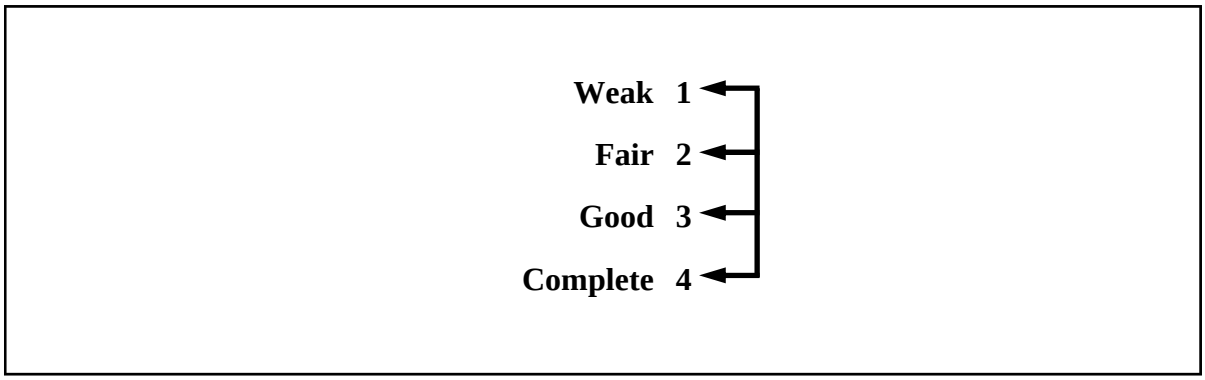


(i) Suggest **two** reasons why rubber is a suitable material for the wheels.

1. *Will grip surface* (2)

2. *Lightweight* (2)

(ii) Using sketches show how the wheels could be attached to the chassis.



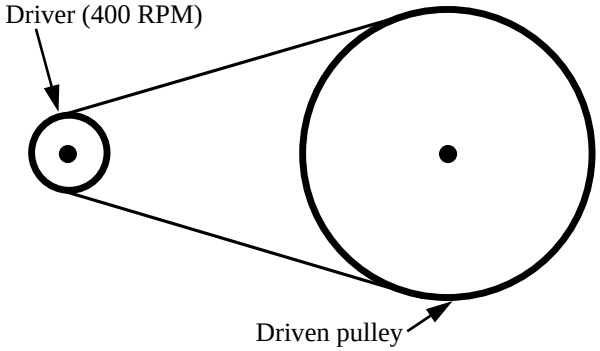
(iii) The edges of the chassis are smooth. List **two** processes used to obtain a smooth edge finish.

1: *Sand with sandpaper* (2)

2: *Polish with acrylic polish* (2)

8 marks

(b) (i) The buggy is propelled using a motor and a pulley drive. The motor is rotating at 400 RPM. If the driver pulley has a diameter of 2 cm and the driven pulley has a diameter of 8 cm, calculate the speed of the driven pulley.



Calculation

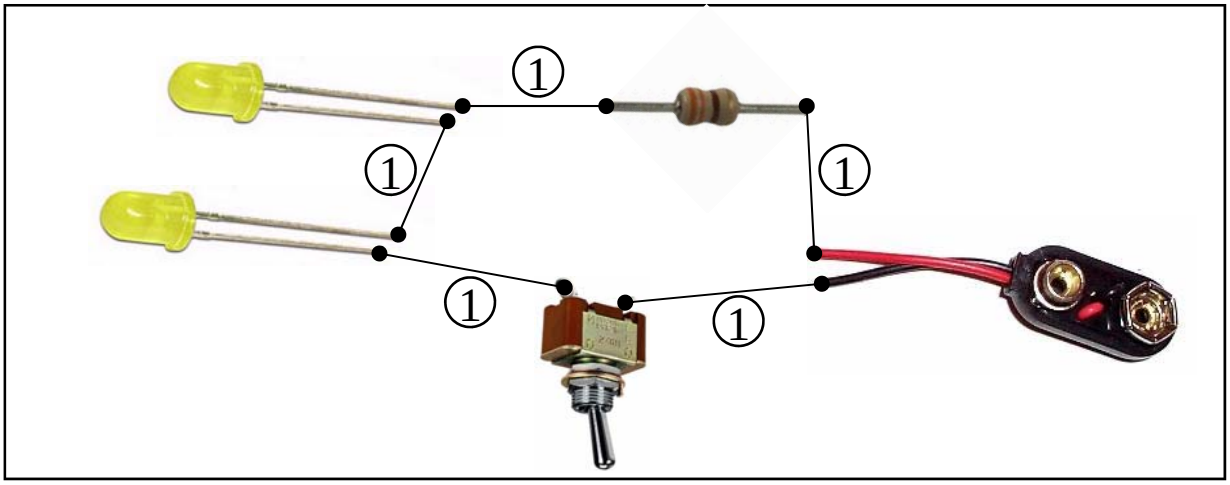
2/8 = 1/4 x 400 = 100

(ii) What do the letters RPM stand for? *Revolutions Per Minute* (2)

Question 2

(c) Two LEDs are used as lights for the buggy. The LEDs are wired in series. *8 marks*

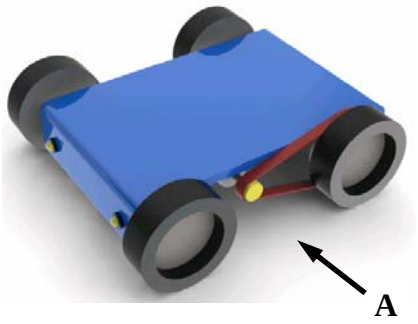
(i) Connect the components below to show how the LEDs and resistor would be connected in series to the battery snap and the switch.



(ii) The switch shown is a SPST toggle switch. What does SPST stand for?

Single Pole Single Throw ③

(d) Sketch an elevation of the buggy when viewed in the direction indicated by arrow **A**. *6 marks*



Elevation

Weak 1
Fair 2
Good 3
Complete 4

Quality of sketch = 2

6 marks

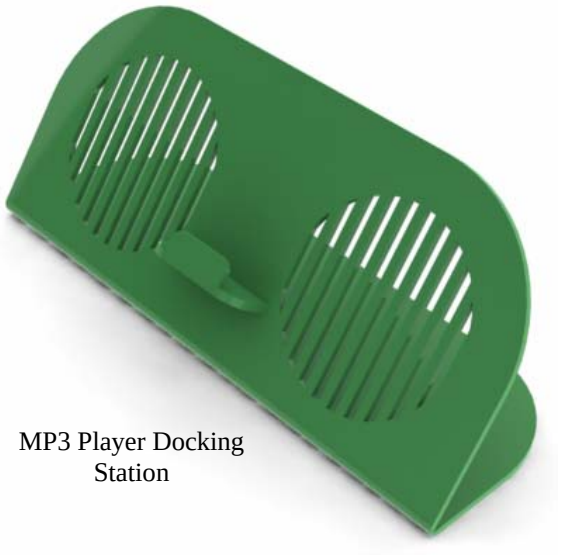
(e) When in use the belt on the pulley drive was found to slip.
Suggest **two** methods of overcoming this problem.

1. *Tighten the belt* ③

2. *Use a shorter belt* ③

Question 3 — 40 Marks

(a) The body of an MP3 player docking-station is shown. The unit is to be made from Acrylic. *12 marks*



MP3 Player Docking Station

(i) Suggest **two** advantages of using acrylic for this unit.

1. *Easily formed to shape* ③

2. *Has good surface finish & colour* ③

(ii) The final stage in making this unit is to bend the acrylic sheet.
Explain in detail the steps required to bend the acrylic to the angle shown.

Use a strip heater to bend on marked line on the sheet and use a wood former to achieve required angle. ⑥

(b) The slots on the docking station have been cut out using a laser cutter. *8 marks*

Laser Cutter

(i) Suggest **two** reasons why a laser cutter was used for this purpose.

1. *Increased accuracy* ②

2. *High quality finish* ②

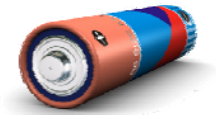
(ii) Laser cutters are a type of CAD/CAM machine. What does CAD\CAM stand for?

CAD: *Computer Aided Design* ②

CAM: *Computer Aided Manufacturing* ②

Question 3

(c) (i) Two speakers are to be fitted to the docking station. Speakers convert electrical energy into sound energy. For each component shown below, state the type of energy conversion which takes place. *12 marks*

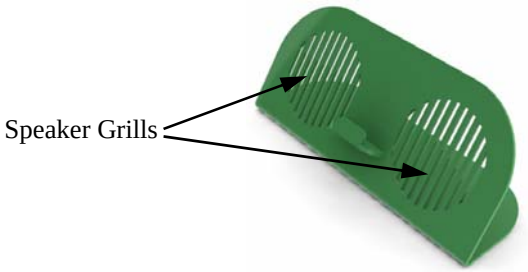
Component	Energy Input	Energy Output
	*Chemical* ①	*Electrical* ①
	*Electrical* ①	*Light* ①
	*Electrical* ①	*Mechanical* ①
	*Electrical* ①	*Sound* ①

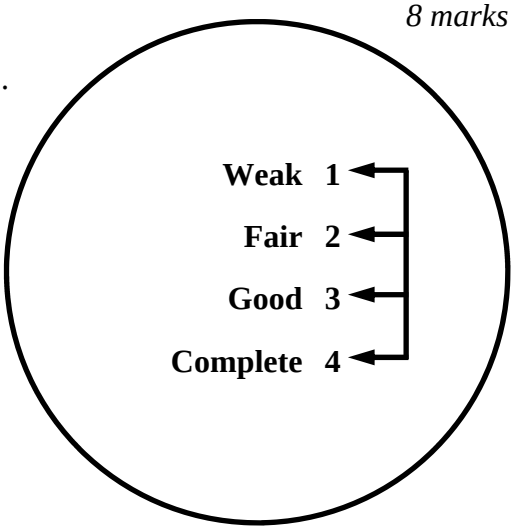
(ii) The circuit for the docking station is on a Printed Circuit Board (PCB). Name the two components shown below which are used in this circuit board.

1. *Capacitor* ② 2. *Transistor* ②

(d) The slots of the speaker grill on the MP3 docking station allow the sound to come through from the speakers. *8 marks*

(i) Make a drawing of your design for a speaker grill pattern in the circle given.





(ii) When researching this project suggest **two** pieces of information that the designer would need to know in order to design this product.

1. *Speaker size* ②

2. *Size of MP3 player* ②

Question 4 — 40 Marks

16 marks

(a) Data storage technology has changed in recent years.

(i) Name **two** portable data storage devices.

1. *USB Memory Key* ② 2. *CD* ②

(ii) Outline **two** uses of portable data storage devices.

1. *To store photos* ③

2. *To backup files* ③

(iii) What are the units of data storage capacity? *Byte* ③

(iv) Suggest **one** possible disadvantage of using a portable data storage device.

Can easily be lost ③

12 marks

(b) Give an example of **one** activity that can be carried out using each of the following:

1. Word Processor: *Writing a letter* ③

2. Desktop Publisher: *Publishing a newsletter* ③

3. CAD: *Drawing a technology project design* ③

4. Spreadsheet: *Calculating cost of a technology project* ③

12 marks

(c) Many changes have taken place in the music industry as a result of developments in technology.

(i) Describe **two** changes in the music industry that have occurred in recent years.

1. *Most music is now available via download from the Internet* ③

2. *People listen to music using portable MP3 devices* ③

(ii) Suggest **two** ways in which developments in technology have helped older people.

1. *Wireless panic buttons* ③

2. *Advances in hearing aid technology* ③