

# Candidate 1

The candidate was awarded a total of **61 marks**.

## Section 1

### Question 1(a)

The candidate was awarded **5 marks** for the following responses:

- ◆ 'Mildsteel...durable this means it can survive the wears and tears'
- ◆ 'Polypropylene...tough this means it can survive impacts'
- ◆ 'Polystyrene...chemically resistant. This makes the product easier to clean'
- ◆ 'galvanised mild steel...does not rust'
- ◆ 'Polypropylene...scratch resistant...keep its aesthetic quality'

### Question 1(b)

The candidate was awarded **6 marks** for the following responses:

- ◆ 'Rotational moulding...ABS wheels'
- ◆ 'repeatable'
- ◆ 'Dip coating...mildsteel frame'
- ◆ 'protects ferrous metal from rusting'
- ◆ 'adds aesthetic value'
- ◆ 'Injection moulding...polypropylene seat'

Other valid responses made by the candidate include:

- ◆ 'Injection moulding...highly accurate'
- ◆ 'Injection moulding...high quality finish'

### Question 1(c)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'suspension, this makes the product easier to use over multiple and difficult terrain'
- ◆ 'mudguards...protects the user from getting dirty while using'
- ◆ 'reflectors...lets people know where the product is in the dark, reducing the chance of an accident'
- ◆ 'steering wheel away from any moving parts...limits the chance of an injury'

### Question 1(d)

The candidate was awarded **1 mark** for the following response:

- ◆ 'racing stripes...intended for a younger market'

**Question 1(e)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'deal with a third party which could have unforeseen issues with delivery'

**Section 2****Question 2(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Aluminium'
- ◆ 'light, meaning carrying multiple won't affect the climbers performance'
- ◆ 'high strength to weight ratio, which means it can support the weight of the user'

**Question 2(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'suitable process...repeatable'
- ◆ 'mass manufactured reducing the cost per product to produce'

**Question 2(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'works very well with CAM'
- ◆ 'can run simulations to test the performance of a product'

Other valid responses made by the candidate include:

- ◆ 'what could be used to show clients progress or for advertising'

**Question 3(a)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'diameter of adult's grip...diameter of the steering wheel'
- ◆ 'length of a adult's thumb...button placement on the steering wheel'
- ◆ 'adding resistant to the steering wheel, this tells your brain it is moving'
- ◆ 'push/pull levers...makes the product easier to use'

**Question 3(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'product manager ensures everyone is on task, doing their job'
- ◆ 'accountant sets and gives everyone a certain amount of money'

**Question 3(c)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'cost less than a full time employee...they are only there for a certain amount of time'

**Question 4(a)(i)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'Technology push is when new inventions and creations take over...example of this is touch screens'

**Question 4(a)(ii)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'cameras...ability to take better quality photos and have larger file size to store them'

**Question 4(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'user trip...tests an existing product'
- ◆ 'user trip...information can also be gathered with notes or photos after'
- ◆ 'questionnaire...ask specific questions but from a larger amount of people'
- ◆ 'questionnaire...better idea on market needs...wants'

**Question 4(c)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'iphones...over time become slow and laggy'

**Question 5(a)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'flexible, which makes wearing the product more comfortable as it fits to the persons face'

**Question 5(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'gant charts...know their time schedule and if they are behind or not'
- ◆ 'CAD and CAM...the machines can work all night without mistakes'
- ◆ 'subcontractors...handle other parts of manufacturing'
- ◆ 'standard components...imported, leaving more time for other parts'

**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'celebrity endorsement...have a big sway with the public'
- ◆ 'billboards...people are constantly driving by them...very noticeable'

**Question 6(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'flame test...different metals burn with a different flame'
- ◆ 'float test...some plastics are less dense than water which means they float'
- ◆ 'magnetic test...metals are either ferrous or non-ferrous'

**Question 6(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'materials used, as you would not be able to weld wood'
- ◆ 'target market...unsafe to use small standard components for baby toys'

**Question 6(c)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'locally sourcing materials...reduce the amount of carbon emissions'
- ◆ 'using renewable energy to power manufacturing machines'
- ◆ 'limiting the amount of manufacturing process used'

**Question 7**

The candidate was awarded **8 marks** because they displayed extensive knowledge and understanding of the types of graphics used at certain stages of the design process and the information that can be gained.

The candidate has made clear reference to several different graphic types. Several points are made clear with examples used to support them.

## Candidate 2

The candidate was awarded a total of **46 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'polystyrene mud guards...chemical resistant making it easy to wipe down and clean'
- ◆ 'mild steel frame...painted finish making it corrosion resistant'

#### Question 1(b)

The candidate was awarded **5 marks** for the following responses:

- ◆ 'ABS wheels could have been injection moulded'
- ◆ 'great accuracy'
- ◆ 'mild steel wheels have been galvanised...made it chemical resistant, allowing for easy cleaning'
- ◆ 'tubular mild steel frame could have been extruded'
- ◆ 'is a long continuous shape'

#### Question 1(c)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'steering wheel...connection to the wheels in order for the go-karts to turn'
- ◆ 'hand operated brakes...in order to avoid accidents'
- ◆ 'reflective lights making it visible at nights'

#### Question 1(d)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Contrasting colours have been used, red & yellow in the commercial go-kart'
- ◆ 'symmetry...pattern on the front guard is mirrored'
- ◆ 'red is also eye catching on both, appealing to the target market of children'

#### Question 1(e)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'involve a third party...trust everything gets delivered on time' (drawback)
- ◆ 'trust...everything is of a high quality' (drawback)

## Section 2

### Question 2(a)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'Mild Steel'
- ◆ 'With a finish...making it corrosion resistant'

### Question 2(b)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'Makes it finished product hard and with good strength'
- ◆ 'very accurate'

Other valid responses made by the candidate include:

- ◆ 'repeatability'

### Question 2(c)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'stress tests...letting you know about any weak points'
- ◆ 'can also be 3D printed, perfect for something small like this'

### Question 3(a)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'seat to the pedals must be close enough...leg length taken into consideration'
- ◆ 'seat must also be wide enough...considering hip width'
- ◆ 'seat must sit high enough as to where everyone can see out the car, considering the height from your lower back to eyes'
- ◆ 'medals must be stiff enough...without applying much force'

### Question 3(b)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'market researcher will go out and ask potential customers what it is they want'
- ◆ 'lawyer will ensure no one has a patent on the technology'
- ◆ 'lawyer...protecting anything the business is developing themselves'

### Question 3(c)

The candidate was awarded **1 mark** for the following response:

- ◆ 'Sub-contractors will bring new and fresh ideas'

**Question 4(a)(i)**

The candidate was awarded **0 marks** because their response does not describe how technology push has influenced products (vacuum).

**Question 4(a)(ii)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'market asked for new technology to be developed...the launch of Airpods'

**Question 4(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'focus groups or interviews will let you to ask the public questions face to face on a product'

**Question 4(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'the business who launches the product make it deteriorate over time'
- ◆ 'mobile phone creator may slow down...limit the battery'

**Question 5(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'stretchy, allowing the to be able to fit around multiple sizes of head'
- ◆ 'water tight, making sure no water gets into your eyes'

Other valid responses made by the candidate include:

- ◆ 'soft, meaning it won't hurt when pressing against your face'

**Question 5(b)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Gantt charts...keep you on schedule'
- ◆ 'Gantt charts...tell you when parts need to be ordered'
- ◆ 'JIT...stock to come in as you need it'

**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'launch adverts...making the company more well known'
- ◆ 'Packaging could be changed...spark interest in the business'

Other valid responses made by the candidate include:

- ◆ 'launch a rewards promotion'

#### **Question 6(a)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'magnet could be put next to metal...ferrous or non-ferrous'

#### **Question 6(b)**

The candidate was awarded **0 marks** because their response Their response did not relate to factors influencing the assembly method of a product.

#### **Question 6(c)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'reduce amount of packaging...less waste'
- ◆ 'transport products with electric vehicles'
- ◆ 'buy from sustainable sources...supplies won't run out'

#### **Question 7**

The candidate was awarded **2 marks** because their response displays limited knowledge and understanding of the use of graphic techniques throughout the design process. Although the candidate has listed several graphic types, they do not demonstrate enough knowledge on their use in the design process to gain marks about the 'limited' marks range.



## Candidate 3

The candidate was awarded a total of **74 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **5 marks** for the following responses:

- ◆ 'mild steel...strong - can hold weight of user'
- ◆ 'Plastic coated mild steel frame...corrosion resistant'
- ◆ 'tubular mild steel frame – lightweight – easier to move around'
- ◆ 'polypropylene seat – durable – resistant to wear + tear'
- ◆ 'Polystyrene...chemical resistant – easily cleaned'

#### Question 1(b)

The candidate was awarded **6 marks** for the following responses:

- ◆ 'Extrusion...mild steel frame'
- ◆ 'continuous cross section'
- ◆ 'Bending...tubular mild steel frame'
- ◆ 'create correct shape'
- ◆ 'Injection moulding...polypropylene seat'
- ◆ 'intricate detail'

#### Question 1(c)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'adjustable seat so it can be operated by people of different heights'
- ◆ 'lockable break which allows the product to stay stationary'
- ◆ 'textured seat...helps to prevent the user from slipping'
- ◆ 'pedals to allow the kart to move easily'

#### Question 1(d)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'symmetrical, which makes it look balanced'
- ◆ 'gender neutral colours so they appeal to a wider market'
- ◆ 'chequered pattern...matches that of a racing finishing line'
- ◆ 'red frame...harmonises with the yellow lines'

**Question 1(e)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'no need to make them, simply ordering therefore saving time'
- ◆ 'any leftover they can be used in other products'
- ◆ 'If delivery is late...set back/delay production'
- ◆ 'wrong size component could be delivered...delay production'

**Section 2****Question 2(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'stainless steel'
- ◆ 'strong to hold the weight of the user'
- ◆ 'corrosion resistant for use outdoors'

Other valid responses made by the candidate include:

- ◆ 'Durable to sustain rubbing against rope + rock'

**Question 2(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'process is highly repeatable'

The candidate's second response required reference to the surface to attract a mark.

**Question 2(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'put through stress testing...before it is manufactured'
- ◆ 'variety of colours/materials could be applied'

**Question 3(a)**

The candidate was awarded **6 marks** for the following responses:

- ◆ 'diameter of the steering wheel...width between shoulders'
- ◆ 'steering wheel should be easy for the user to turn without strain/much strength required'
- ◆ 'hazard light button is red as red indicates danger'
- ◆ 'buttons should be suited to a persons finger tip diameter'
- ◆ 'buttons should be easily pressed without much force required'
- ◆ 'indicators will make a clicking noise so the user knows they are on'

**Question 3(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'project manager is in charge of the overall development...communicate with all members of the team'
- ◆ 'ensure everything is on track + on schedule + to resolve any issues'
- ◆ 'Manufacturers make + assemble the final product...ensure everything is made correctly + to plan'
- ◆ 'The communicate with materials specialise + ergonomists to ensure...communicate to the project manager'

**Question 3(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'cannot guarantee their work is of high standards'
- ◆ 'may introduce new ideas for the company'

**Question 4(a)(i)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'facial identification technology which was used in mobile phones'
- ◆ 'better photo quality in devices such as I pads'

**Question 4(a)(ii)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'fit their device in their pocket to make it more portable...making smaller sized phones'
- ◆ 'bluetooth for wireless earphones/headphones'

**Question 4(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'existing products – you can find out which products are already commonly bought'
- ◆ 'price...need + want + incorporate this into your product'
- ◆ 'Survey/questionnaire – ask the target market questions about what they would want/need'
- ◆ 'include things such things as aesthetic factors...Record the results'

**Question 4(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'companies will design there product to fail/need replacing after a certain amount of time'
- ◆ 'mobile phone companies will design the phones to degrade in quality'

**Question 5(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'stretchy + flexible...fit to various head sizes'
- ◆ 'seal will fit to the user's face to prevent water getting in'

**Question 5(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'Flow charts are tasks arranged in sequential order...what jobs need done in which order'
- ◆ 'Gantt charts show the task, its duration + deadlines'
- ◆ 'shows task dependency so workers know what task needs to be done before another'
- ◆ 'Mass production systems allow large amounts of products to be produced quicker'

**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'television advertisements will show the products to a large numbers of people'
- ◆ 'Celebrity endorsement...makes the market have more trust in a product as a familiar face is supporting it'

**Question 6(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Wood types can be identified by the colour + grain'
- ◆ 'ferrous or non-ferrous using a magnet'
- ◆ 'identify plastics through the coding system found on the material'

Other valid responses made by the candidate include:

- ◆ 'flame test can identify types of plastics through colour of flame,smell'

**Question 6(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'The amount of the product required'

**Question 6(c)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'Flat packing...less trips with lorry – less emissions'
- ◆ 'Less packaging...less waste'

- ◆ 'Instructions on how to dispose + recycle product'
- ◆ 'Using less different materials'

### **Question 7**

The candidate was awarded **7 marks** because they displayed extensive knowledge and understanding of the types of graphics used at certain stages of the design process and the information that can be gained.

The candidate has referred to several different graphic types. Several points are made clear with examples used to support them.

## Candidate 4

The candidate was awarded a total of **45 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Mild Steel has a good strength to weight ratio...hold the weight of a person'
- ◆ 'also will be easy to lift'
- ◆ 'ABS wheels...scratch resistant, so the wheels will keep aesthetic qualities'

#### Question 1(b)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'mild steel frame...extruded'
- ◆ 'continuous cross section'
- ◆ 'Seats...injection moulded'
- ◆ 'highly accurate'

#### Question 1(c)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'braking system...need to stop for any reason they can do so safely'
- ◆ 'front panel...prevents stones flicking up off the ground'

#### Question 1(d)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'bright and appealing colours...draw attention from the younger audience'
- ◆ 'narrower look...implies that it is aerodynamic'

#### Question 1(e)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'easily accessible...when manufacturer needs them'
- ◆ 'components might be faulty or poor quality'

### Section 2

#### Question 2(a)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'mild steel'
- ◆ 'durable so after repeated use...still be sturdy and secure'

**Question 2(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'highly repeatable'
- ◆ 'adds strength'

**Question 2(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'make any changes...easily'
- ◆ 'no materials get wasted'

**Question 3(a)**

The candidate was awarded **5 marks** for the following responses:

- ◆ 'adjustable seat...reach the wheel'
- ◆ 'steering wheel should not require too much force to turn'
- ◆ 'pedals should be easy enough to operate without causing strain'
- ◆ 'buttons...contrasting colour on them...it is a useable button'
- ◆ 'handbrake should not require alot of force to lift up'

**Question 3(b)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Materials technologists give information to the manufacturer on materials are most suitable'
- ◆ 'Market researchers will research similar products on the market to help establish a reasonable price'
- ◆ 'look into what people are demanding and feed that back to the rest of the team'

**Question 3(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'you can focus on other jobs'
- ◆ 'no guarantee of quality'

**Question 4(a)(i)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'computers now come with wireless keyboards and mouses'

**Question 4(a)(ii)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'headphones have added noise-cancellation as people wanted to eliminate background noise'
- ◆ 'TV remotes come with Netflix buttons on them as Netflix becomes more popular'

**Question 4(b)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'survey where potential clients are given questions related to the product'
- ◆ 'user trial where potential users get to try a product before it is released'
- ◆ 'feedback on what they would like added to the design'

**Question 4(c)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'where a product is designed to only last a specific amount of time'

**Question 5(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'very stretchy, so they will be easy to take on and off'
- ◆ 'suctioned...stay on your eyes'

**Question 5(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'Jigs/templates could be used to ensure parts are highly accurate'

**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'advertising boards...draw the attention of anyone passing by'
- ◆ 'discount to make them more affordable for people which might lead to more sales'

**Question 6(a)**

The candidate was awarded **0 marks** because their response was too vague. No specifics were given to differentiate the materials being tested.

**Question 6(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'assembly methods could be selected based on cost'



**Question 6(c)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'reduce packaging'
- ◆ 'made from sustainable materials'
- ◆ 'Make products durable so that they will last alot longer'

**Question 7**

The candidate was awarded **0 marks** because their response does not answer the question. Much of their response is based on modelling techniques, rather than graphic techniques.

## Candidate 5

The candidate was awarded a total of **61 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'Galvanised mild steel...corrosion resistant'
- ◆ 'Plastic coated tubular mild steel...strength to weight ratio, allowing it to support the user'
- ◆ 'Polypropylene...chemical resistant, allowing it to be cleaned easily'
- ◆ 'ABS...impact resistant, allowing it to withstand bumps'

#### Question 1(b)

The candidate was awarded **6 marks** for the following responses:

- ◆ 'tubular mild steel frame...extruded'
- ◆ 'continuous cross section'
- ◆ 'Bending'
- ◆ 'allows it to be shaped into a frame'
- ◆ 'Rotational moulding...ABS wheels'
- ◆ 'they are hollow'

#### Question 1(c)

The candidate was awarded **5 marks** for the following responses:

- ◆ 'seat provides grip...preventing them from falling off'
- ◆ 'seat is adjustable...to allow differently sized kids to use it'
- ◆ 'Mud guards prevent the user and go-karts from becoming as dirty'
- ◆ 'lockable break to allow the user to safely stop on a hill'
- ◆ 'hand operated brake to allow the user to control their speed'

#### Question 1(d)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'red body contrasts with the black seat'
- ◆ 'textured wheels contrast with smooth seat'
- ◆ 'square cross section frame contrasts with the cylindrical frame'

#### Question 1(e)

The candidate was awarded **1 mark** for the following response:

- ◆ 'bought in bulk...discounts, reducing costs'

## Section 2

### Question 2(a)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Mild steel'
- ◆ 'strong which allows it to support a lot of weight'
- ◆ 'painted to enable it to be corrosion resistant'

### Question 2(b)

The candidate was awarded **0 marks** because their response does not answer the question.

### Question 2(c)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'Designers can collaborate'
- ◆ 'no waste as no physical models are created'

### Question 3(a)

The candidate was awarded **6 marks** for the following responses:

- ◆ 'thickness of the steering wheel...grip size'
- ◆ 'diameter of the steering wheel...shoulder width'
- ◆ 'width of park button...thumb width'
- ◆ 'height of the flappy paddles...width of all four fingers'
- ◆ 'force required to pull the handbrake up...strength of the user'
- ◆ 'hazard warning lights is red...symbol of danger'

Other valid responses made by the candidate include:

- ◆ 'width of the seats...users hip width'

### Question 3(b)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'lawyers are responsible for filing patents for new products'
- ◆ 'settling any legal disputes'
- ◆ 'Accountants are responsible for ensuring employees are paid the correct amount'
- ◆ 'producing cash budgets/income statements'

### Question 3(c)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'work will be done to a good standard as they are professionals in that field'
- ◆ 'more expensive than carrying out the work yourself'

**Question 4(a)(i)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Question 4(a)(ii)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'People wanted mobile phones to be smaller...more portable'
- ◆ 'people are now using mobile phones for much more...larger screen'

**Question 4(b)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Focus groups...meets with a group of people from the target market and asks them questions'
- ◆ 'User trials...product or prototype is given to a member of the market to be used for a short while'
- ◆ 'give advice on how to improve it'

**Question 4(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'products are designed to fail after a period of time'
- ◆ 'Apple when they stopped updating their software on older devices'

**Question 5(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'stretchy, allowing the goggles to fit snugly'
- ◆ 'malleable, allowing a good seal to be created around the eyes'

**Question 5(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'Gant charts...show workers what tasks need to be completed when, ensuring deadlines are met'

**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'sale to attract more customers'
- ◆ 'increase advertisement...on tv for example'

**Question 6(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Flame tests can be carried out on plastics...melt/char/continue burning and any smells are recorded'
- ◆ 'Magnets can be used to test metals to determine if they are ferrous or non-ferrous'
- ◆ 'symbols can be looked for on plastic products'

Other valid responses made by the candidate include:

- ◆ 'Colour and grain...determine the type of wood'

**Question 6(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'Materials in product'

**Question 6(c)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'reduce the amount of packaging'
- ◆ 'use electric delivery vehicles'
- ◆ 'use renewable energy to power their factory'

**Question 7**

The candidate was awarded **6 marks** because they displayed secure knowledge and understanding of the types of graphics used at certain stages of the design process and the information that can be gained.

The candidate has made clear reference to several different graphic types. Several points are made clear with examples used to support them.

## Candidate 6

The candidate was awarded a total of **56 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'ABS...impact resistance, this is good as it can limit the damage...bumping & hitting'
- ◆ 'Mild Steel...very strong, this will allow it to easily support the weight of the user'
- ◆ 'Zinc...galvanised mild steel wheels as it stops metal underneath from corroding & rusting'

#### Question 1(b)

The candidate was awarded **6 marks** for the following responses:

- ◆ 'Rotational moulding...ABS wheels'
- ◆ 'creates a hollow product'
- ◆ 'Extrusion...tubular mild steel frame'
- ◆ 'uniform cross section'
- ◆ 'Injection moulding...polypropylene seat'
- ◆ 'adds a textured finish'

#### Question 1(c)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'textured polypropylene seat, this allows the user to have more grip...prevents them from falling off'
- ◆ 'lockable break...doesn't need to worry about it rolling away'
- ◆ 'adjustable seat position...make it more comfortable'
- ◆ 'bumper...allow the cart to become much less damaged'

#### Question 1(d)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'range of different colours which could increase the aesthetic appeal'
- ◆ 'contrast with the colours red & yellow...stand out'
- ◆ 'contrast with the textured seat & smooth frame'

**Question 1(e)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'do not have to make them themselves which would cost a lot of time'
- ◆ 'reduce costs...they do not need to set up machinery'
- ◆ 'made by a specialist...higher quality'
- ◆ 'issues with the standard components the company...has to take the blame'

**Section 2****Question 2(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'stainless steel'
- ◆ 'strong so it could hold up the weight of the user'
- ◆ 'doesn't corrode'

**Question 2(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'creates a product with one piece construction'
- ◆ 'strengthens the product'

**Question 2(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'changes & edits can be made quickly'
- ◆ 'easily be shared...via things like email'

**Question 3(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'steering wheel...light enough that it can be operated easily without any problems by the user'
- ◆ 'diameter of the steering wheel grip...get their hand around it'

**Question 3(b)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'accountant...handle everything to do with money such as costs & budgets'
- ◆ 'give advice to other team members about what would be expensive & what would be cost effective'
- ◆ 'materials specialist...about materials and their properties & which would work best for the project.'

**Question 3(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'specialise in the task...high quality work'
- ◆ 'business has to take the blame for any faults...even if the sub-contractor is at fault'

**Question 4(a)(i)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'mobile phone...touch screen'
- ◆ 'earphones...bluetooth connection'

**Question 4(a)(ii)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Question 4(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'user trials...sends out the product for customers to try before release & give feedback'
- ◆ 'survey is sent out to customers in the target market...needs and wants'

**Question 4(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'business intentionally makes their product unusable after a certain time'
- ◆ 'holding back technology for later products'

**Question 5(a)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'very stretchy...fit around lots of different sized heads'

**Question 5(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'standard components. This is when a business buys parts...don't have to make them themselves'
- ◆ 'just in time production...orders the exact amount of parts they need for exactly when they need them'
- ◆ 'Gantt charts...tasks are plotted on a timeline showing when they have to start and finish'
- ◆ 'Jigs/templates...product doesn't have to be made from scratch'



**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'rebranding...get rid of bad publicity about the business causing an increase in sales'
- ◆ 'releasing a new variant...create excitement'

**Question 6(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'telling if a metal is ferrous or non ferrous...putting a magnet on it'
- ◆ 'scratching it – if nothing shows then it could be something like polypropylene or ABS'

**Question 6(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'budget of the company...type of process they can afford'

**Question 6(c)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'using as little amount of materials as possible'
- ◆ 'make it easily dismantlable'
- ◆ 'signs on the product on how to properly dispose of it'
- ◆ 'reduce packaging sizing'

**Question 7**

The candidate was awarded **2 marks** because their response displays limited knowledge and understanding of the use of graphic techniques throughout the design process.

## Candidate 7

The candidate was awarded a total of **45 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'tubular mild steel...strong material...can hold the weight of the user'
- ◆ 'galvanised mild steel...corrosion resistant'
- ◆ 'ABS...scratch resistant, meaning that the wheels will maintain its aesthetic'

#### Question 1(b)

The candidate was awarded **5 marks** for the following responses:

- ◆ 'extrusion...mild steel frame'
- ◆ 'uniform shape'
- ◆ 'mild steel wheels...accurate'
- ◆ 'injection moulding...ABS wheels'
- ◆ 'intricate detailing'

#### Question 1(c)

The candidate was awarded **1 mark** for the following response:

- ◆ 'length between the two front & back wheels...wide base'

#### Question 1(d)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'contrast of colours in both go-karts between the red and black'
- ◆ 'contrast of shapes...frame is rectangular whereas the seat is rounded'
- ◆ 'rounded body and a rounded seat...creating a sense of harmony'

#### Question 1(e)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'reduced the lead time as the components are bought in'
- ◆ 'special training is not required'
- ◆ 'problem with delivery...can delay production'

## Section 2

### Question 2(a)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'Mild steel'
- ◆ 'very strong material as it has to support the weight of the user'

### Question 2(b)

The candidate was awarded **1 mark** for the following response:

- ◆ 'each product needs to be exactly the same' (repeatability)

### Question 2(c)

The candidate was awarded **2 marks** for the following responses:

- ◆ 'no material will be wasted'
- ◆ 'changes can be made quickly'

### Question 3(a)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'physiology...steering wheel as it has to have some resistance but it also cannot be too hard to move'
- ◆ 'physiology...pressure needed to press the buttons'
- ◆ 'psychology...bright red colouring of a button showing that it has an important meaning'

### Question 3(b)

The candidate was awarded **3 marks** for the following responses:

- ◆ 'accountant...financial advice for designers'
- ◆ 'production specialist...best production process to use will be depending on the materials'
- ◆ 'production specialist...volume they are being produced at'

### Question 3(c)

The candidate was awarded **1 mark** for the following response:

- ◆ 'new knowledge and advice during the development of the product'

### Question 4(a)(i)

The candidate was awarded **1 mark** for the following response:

- ◆ 'earphones...pushing newer versions of wireless earbuds into the market'

**Question 4(a)(ii)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'laptops...wishing that it was capable of holding more storage'

**Question 4(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'surveys...target market gets asked a series of questions that will allow them to express their opinion'
- ◆ 'existing products...potential competitors in order to understand what is successful within the target market'

**Question 4(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'company will give their own product a limited lifespan'
- ◆ 'business slowing down products, so that they aren't as effective'

**Question 5(a)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'not affected by elements...will not corrode or lose their pigment'
- ◆ 'user stretches them then it will be hard to snap or break'

**Question 5(b)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Question 5(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'if customers see their favourite celebrity endorsing a product they are more likely to buy the product'
- ◆ 'social media to advertise...can help them reach a wider audience'

**Question 6(a)**

The candidate was awarded **0 marks** because their response does not answer the question. No specifics were given to differentiate the materials being tested.

**Question 6(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'volume of products being made'
- ◆ 'materials being used as some assembly methods won't work for some materials'

**Question 6(c)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'using solar energy or energy from wind farms during the production process'
- ◆ 'utilise every part of the material so that no unnecessary waste occurs'
- ◆ 'reducing the amount of packaging'

**Question 7**

The candidate was awarded **3 marks** because they displayed adequate knowledge and understanding of the types of graphics used at certain stages of the design process and the information that can be gained.

## Candidate 8

The candidate was awarded a total of **38 marks**.

### Section 1

#### Question 1(a)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'polypropylene seat...durable so it won't break easily if being bashed around'
- ◆ 'tubular mild steel is very lightweight...can be lifted when needed without strain'
- ◆ 'ABS wheels...scratch resistant so they aren't ruined after use'
- ◆ 'PVC steering wheel...chemical resistant so can be easily cleaned'

#### Question 1(b)

The candidate was awarded **4 marks** for the following responses:

- ◆ 'Extrusion...metal frame'
- ◆ 'cross section of hollow poles'
- ◆ 'Injection moulding...textured seat'
- ◆ 'complex detail'

#### Question 1(c)

The candidate was awarded **5 marks** for the following responses:

- ◆ 'Pedals...pedal the kart yourself without help'
- ◆ 'Steering wheel...reaching distance so children can navigate the kart easily'
- ◆ 'brake...operated easily by their hand if they need to stop'
- ◆ 'Textured seat so grip is given when using so children don't slip out'
- ◆ 'Mudguards to stop mud flying up onto the child'

Additional marks could also have been awarded for:

- ◆ 'Handle is part of the seat so it can be easily lifted'
- ◆ 'metal bars...if they bump into anything they don't get injured'

#### Question 1(d)

The candidate was awarded **1 mark** for the following response:

- ◆ 'contrast of red and black has been used'

**Question 1(e)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Section 2****Question 2(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'Stainless steel'
- ◆ 'corrosion resistant'
- ◆ 'scratch resistant...won't get ruined when being harshly rubbed'

**Question 2(b)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'is very accurate'

**Question 2(c)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Question 3(a)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'gear stick...easy reaching distance so you don't have to stretch'
- ◆ 'steering wheel isn't too thick so it's easy to get a good grip'
- ◆ 'gear stick...easily changed without strain'

**Question 3(b)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'Accountant...ensure they stay in the budget'
- ◆ 'Lawyer...ensures it doesn't break legislation'

**Question 3(c)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'specialised in that task'
- ◆ 'can be very expensive for the company'

**Question 4(a)(i)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Question 4(a)(ii)**

The candidate was awarded **2 marks** for the following responses:

- ◆ 'Digital cameras were made because people wanted a camera they could take more than one photo...access them almost instantly'
- ◆ 'Contactless and mobile payments...people wanted to be able to pay from there mobile phone'

**Question 4(b)**

The candidate was awarded **0 marks** because their response does not answer the question.

**Question 4(c)**

The candidate was awarded **1 mark** or the following response:

- ◆ 'buy it because there's is old and slow' (slowing down technology)

**Question 5(a)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'elastomers provide a seal'

**Question 5(b)**

The candidate was awarded **4 marks** for the following responses:

- ◆ 'Jit...delivered straight away as needed'
- ◆ 'Standard components are good because they are widely available...don't have to wait on specialist parts'
- ◆ 'Subcontractors...specialised in the specific area so they can get the job done faster'
- ◆ 'Gantt charts...visual picture of what has already been done and whats still to be done'

**Question 5(c)**

The candidate was awarded **1 mark** for the following response:

- ◆ 'Loyalty cards...used to try to bring people back'

**Question 6(a)**

The candidate was awarded **0 marks** because their response does not answer the question. No reference made to type of material being tested.

**Question 6(b)**

The candidate was awarded **0 marks** because their response does not answer the question.



**Question 6(c)**

The candidate was awarded **3 marks** for the following responses:

- ◆ 'use products that can be locally sourced'
- ◆ 'order what you need...aren't lots of spare material that will go to waste'
- ◆ 'order everything at once...one trip and not lots of small ones'

**Question 7**

The candidate was awarded **1 mark** because they displayed limited knowledge and understanding of the types of graphics used at certain stages of the design process and the information that can be gained.