



National  
Qualifications  
2023

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# **2023 Graphic Communication**

## **Advanced Higher**

### **Finalised Marking Instructions**

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## General marking principles for Advanced Higher Graphic Communication

*Always apply these general principles. Use them in conjunction with the specific marking instructions, which identify the key features required in candidates' responses.*

- (a) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.
- (b) If a candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.
- (c) For 'Describe' questions  
Candidates must provide a statement or structure of characteristics and/or features, not just an outline or a list. For example they can refer to a concept, experiment, situation or facts in the context of and appropriate to the question. The number of marks available for a question indicates the number of factual/appropriate points required.
- (d) For 'Explain' questions  
Candidates must relate cause and effect and/or define relationships. This must be in the context of the question, or a specific area within the question.
- (e) For 'Compare' questions  
Candidates must demonstrate knowledge and understanding of the similarities and/or differences between things, methods, or choices. This must be in the context of the question, or a specific area within the question.
- (f) Candidates can respond to any question using text, sketching, annotations or combinations of these. Award marks for the information conveyed. Do not award marks for the quality of sketching.

## Marking instructions for each question

Question			Expected response	Max mark	Additional guidance
1.	(a)		<ul style="list-style-type: none"> <li>Creates brand identity.</li> <li>Ensures brand consistency.</li> <li>Brand/Company is instantly/easily recognisable.</li> <li>Ensures all graphics are associated with the company and not with competitor products.</li> <li>Creates unity between each graphic item.</li> </ul>	2	One mark for each correct answer
	(b)		<b>Negative Space</b> <ul style="list-style-type: none"> <li>Triangles on the logo introduce a new graphic in the form of a mountain range.</li> <li>The female climber makes the climbing context easily recognisable.</li> <li>The climbing rope enhances the climber graphic and/or underlines the 'climb on' title.</li> <li>The lines of negative space divide up the content of the entrance hall poster and/or the car window sticker.</li> <li>The rock/rough texture in the "climb on" text ties in with the climbing theme.</li> </ul>	3	One mark for each correct answer  Candidates must do more than identify examples of negative space.

Question			Expected response	Max mark	Additional guidance
1.	(c)		<p><b>Resolution</b></p> <ul style="list-style-type: none"> <li>If the logo is used as a raster graphics it must be a minimum of 300ppi for print and 72 dpi for digital to ensure optimum resolution/professional quality images in the different media.</li> </ul> <p><b>File Type</b></p> <ul style="list-style-type: none"> <li>The logo must be produced as a vector graphic to ensure it is scalable across a range of graphic and media to avoid diminished quality.</li> </ul> <p><b>Colour Space</b></p> <ul style="list-style-type: none"> <li>The logo must utilise CMYK to RGB colour conversion to ensure accuracy in reproducing colour across both digital and printed media.</li> <li>Use of the Pantone matching system (PMS) to ensure colour consistency.</li> </ul> <p><b>Software compatibility</b></p> <ul style="list-style-type: none"> <li>Software used to create items must be capable of exporting to both digital and printed media file formats.</li> </ul> <p><b>Printing Techniques</b></p> <ul style="list-style-type: none"> <li>Due to the range of items the logo is being printed/displayed on it must maintain the brand quality across a range of applications and substrates.</li> </ul> <p><b>Digital displays</b></p> <ul style="list-style-type: none"> <li>The logo should be clear when viewed on a full range of digital devices.</li> </ul>	6	<p>One mark (up to a maximum of 3 for) identifying: Resolution File Type Colour Space Software compatibility Printing techniques or Digital displays</p> <p>Good explanations, even without using the specific terms above, could attract a maximum of 2 marks.</p> <p>Repeat explanations will not be accepted.</p>
	(d)		<ul style="list-style-type: none"> <li>Ensure the photograph is 300 dpi.</li> <li>Fully crop the image/remove the background from around the figure (or use illustration software to trace/sketch around the outline).</li> <li>Apply a black colour fill.</li> <li>Convert jpeg to vector or png.</li> </ul>	2	<p>Any 2 of the 4 bullet points.</p> <p>Accept: photograph must be high/high enough resolution.</p>

Question			Expected response	Max mark	Additional guidance
2.	(a)		<ul style="list-style-type: none"> <li>• STL files are the standard in 3D printing which ensures the 3D printer can easily read the data specific to the model.</li> <li>• STL files splice the model into several printable layers for accurate printing.</li> <li>• STL files can enable identification of weak points in the print, so structural meshes can be added to strengthen the model.</li> <li>• STL files will provide all of the required details for volume, mass surface geometry etc. to ensure the model can be printed accurately.</li> <li>• Retains only the essential 3D geometric data required by the printer</li> </ul>	2	
	(b)		<p><b>Volume:</b></p> <ul style="list-style-type: none"> <li>• Volume data ensures the model being printed fits in volume inside the 3D printer.</li> <li>• Volume data can be used to check if there is sufficient print filament available.</li> </ul> <p><b>Centre of Mass:</b></p> <ul style="list-style-type: none"> <li>• Areas of greater mass can be supported to prevent collapse*</li> <li>• Can be used to determine centre of gravity/where the model is unstable so it can be supported during printing.</li> <li>• Determines the distribution of mass within a model indicating the areas of greater rigidity or strength, including supporting its own weight.</li> </ul> <p><b>Model Mass:</b></p> <ul style="list-style-type: none"> <li>• Can provide details on the quantity of material required for the build, which can help with costings and reducing material waste.</li> </ul>	3	<p>* Accept for 'centre of mass' or 'model mass'</p> <p>Data will determine where supports strengthening creating mesh supports are needed</p>

Question			Expected response	Max mark	Additional guidance
2.	(c)		<p><b>Volumetrics:</b></p> <ul style="list-style-type: none"> <li>• Create a realistic representation of the water within the swimming pool.</li> <li>• This shows the clarity in the water/depth of the pool/realistic distortion of the tile pattern</li> <li>• Shows the dissipation/distortion of light in the water</li> <li>• Gives the impression of mist/fog/haziness in the distance (before the last line of trees)</li> </ul> <p><b>Bump Mapping:</b></p> <ul style="list-style-type: none"> <li>• Used in the woodwork features to enhance the definition of the grain texture found within this material.</li> <li>• Used in the rocks to show the rough texture found within this material.</li> <li>• Used in the furniture fabric to show they are soft furnishings.</li> <li>• Used within the tiles features to enhance the definition of the texture found within this material.</li> <li>• Used in the black marble/highly reflective material around the pool to show it is smooth.</li> <li>• Used within the grass/leaves to add depth/definition to the texture of the foliage.</li> </ul> <p><b>IBL:</b></p> <ul style="list-style-type: none"> <li>• Realistic scene capturing the lighting of the environment or the effects of light on the environment.</li> <li>• Reflections captured in the water of the surrounding environment.</li> <li>• Reflections captured in the windows from the surrounding area/sited environment.</li> </ul>	6	2 marks for each area. Do not accept repeat answers.

Question			Expected response	Max mark	Additional guidance
3.	(a)		<p><b>File Type</b> DXF</p> <p><b>Suitability</b></p> <ul style="list-style-type: none"> <li>Allows for accurate data interoperability/transfer from the CAD drawing to the CAM process.</li> <li>DXF files are widely compatible across a range of graphics software.</li> <li>DXF files are easily editable/scalable allowing the graphics to be amended if the output is not as desired.</li> <li>It is a vector file, so line quality maintained when scaled.</li> <li>Lines can be selected, rather than individual pixels so editing/changing colours is easier.</li> </ul>	3	<p>1 mark for identifying DXF</p> <p>2 marks for explanation</p> <p>In addition to DXF accept other vector file types.</p>
	(b)		<ul style="list-style-type: none"> <li>Symbol A refers to the standard of surface finish required for the manufactured item.</li> <li>The circle feature on the surface finish indicates that all surfaces must be finished to the same standard.</li> <li>3.2 is the roughness factor and determines the relative smoothness/roughness of the surface.</li> </ul>	2	1 mark for identify 'surface finish'
	(c)		<ul style="list-style-type: none"> <li>Minimum Size = 47.84</li> <li>Maximum Size = 48.11</li> </ul>	2	1 mark for each

Question			Expected response	Max mark	Additional guidance
3.	(d)		<p><b>Centre Piece:</b></p> <ul style="list-style-type: none"> <li>Half profile with all dimensions included and revolved command 360 degrees (1 mark)</li> <li>subtracted hole created to 14mm depth (1 mark)</li> </ul> <p><b>Fan Blade:</b></p> <ul style="list-style-type: none"> <li>green profile/arc with radius dimension (1 mark).</li> <li>purple profile/arc with radius dimensions included, on a plane offset 16 from green profile (1 mark)</li> <li>'Loft' surface between green and purple profiles/arcs (1 mark)</li> <li>'offset thickness' of the blade surface to 1mm (1 mark)</li> <li>adding the irregular fillet 1mm to 3mm to the edge of the fan blade (1 mark).</li> <li>radial array of fan blade 12 times around the centre axis (of the centre piece) (1 mark)</li> </ul>	8	<p>Note: 2 marks for the centre piece can be achieved in one step if the 14mm hole is included within the revolved profile.</p> <p>Candidates must make reference to surface and solid modelling techniques to achieve full marks.</p>
	(e)		<ul style="list-style-type: none"> <li>position for the fan to ensure effective distribution cooling for components.</li> <li>position/size of air vents to allow for natural cooling/effective air flow.</li> <li>best positions for other components within the design to avoid overheating/effective cooling.</li> </ul>	2	<p>Accept:</p> <ul style="list-style-type: none"> <li>Change the speed of the fan.</li> <li>Change the material of a component to improve cooling/heat dissipation</li> </ul>
	(f)		<p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>Animations can be paused/rewound at key stages to support understanding.</li> <li>User can zoom into video to make instructions clearer.</li> <li>Subtitles/audio descriptions can be included to support understanding.</li> <li>Subtitles can be changed to support different languages.</li> <li>Mechanical animation demonstrates how the components fit together/move which may be easier to understand than static diagrams/drawings (eg rotation of screws etc..).</li> </ul>	4	<p>Do not accept repeat answers.</p> <p>Do not accept reference to post editing techniques (fades/transitions etc..) as this relates to user experience not essential function.</p>



Question			Expected response	Max mark	Additional guidance
3.	(g)		<p>Advantage of MOV. files</p> <ul style="list-style-type: none"> <li>• Can store both audio and video elements (of separate files).</li> <li>• Excellent for web based applications.</li> <li>• Can be embedded within other programs such as apps etc.</li> <li>• Is easily edited without having to rewrite code.</li> <li>• Provides high quality playback.</li> </ul> <p>Disadvantages of MOV. files</p> <ul style="list-style-type: none"> <li>• Often requires QuickTime player to run/is not compatible across all software platforms.</li> <li>• Compression can result in diminished quality in some cases.</li> <li>• Large file sizes (due to high quality playback).</li> </ul>	2	<p>Accept:</p> <p>For advantages: file can be compressed to aid data transfer (however note disadvantages).</p>

Question			Expected response	Max mark	Additional guidance
4.	(a)		<p><b>Colour space</b></p> <ul style="list-style-type: none"> <li>The graphic designer would be using an RGB monitor so the colour space would be different to the CMYK file that they would be working on. They would have to be careful to colour match them before printing</li> <li>A specific CMYK colour would be used to get the correct print colours</li> <li>The designer could use Pantone colours (PMS) to clarify colour choice/colour representation between digital and print.</li> </ul> <p><b>Bleed area</b></p> <ul style="list-style-type: none"> <li>A bleed area would be set for any run over (items designed to go beyond the cropped edge of the book sleeve)</li> <li>Bleed area must be large enough to ensure bleed but not so large as to waste ink</li> <li>Bleed will need to be carefully checked along with paper choice and crop mark positions to avoid print error</li> <li>The choice of the bleed area will not be clear during designing so print preview/test print/camera ready copy will all be used to confirm settings</li> </ul> <p><b>Dots per inch</b></p> <ul style="list-style-type: none"> <li>DPI will need to be a minimum of 300 dpi to ensure required print quality.</li> <li>There will need to be similarity between the PPI and the DPI so the screen design matches the print design if any quality assurance is to be done onscreen.</li> <li>PPI can be very high on a PC and in DTP software but DPI will dictate the final quality.</li> </ul>	3	<p>Accept:</p> <p>Bleed Area</p> <ul style="list-style-type: none"> <li>Ensures edge to edge print.</li> <li>No white border around finished item</li> </ul> <p>DPI</p> <ul style="list-style-type: none"> <li>The higher the DPI the larger the file size</li> <li>The higher the DPI the higher the cost and possibly the print time.</li> </ul> <p>Dots per Inch (DPI):</p> <p>Candidates do not need to mention 300dpi just that the higher the resolution the higher the image quality.</p>

Question			Expected response	Max mark	Additional guidance
4.	(b)		<ul style="list-style-type: none"> <li>• Offset Lithography suitable for large scale production: quantities greater than 10000</li> <li>• Can be printed on a variety of substrates such as textured paper</li> <li>• Consistently high quality images can be produced.</li> <li>• Can be setup for non-standard/custom sized paper</li> <li>• Offset lithography is set up the prints the separate CYMK colours.</li> </ul>	3	Do not accept a rewording of the question. Candidates must explain the choice of printing technique based on the specification.
	(c)		<ul style="list-style-type: none"> <li>• The image will not be the required resolution if printed from a screen-shot</li> <li>• The print will not look the same on the smooth calendared paper</li> <li>• The ink jet printer will not reproduce the colours the same as the offset lithography machine</li> </ul>	3	Do not accept a rewording of the question. Candidates must explain why this is of limited value

Question			Expected response	Max mark	Additional guidance
5.	(a)		<p><b>Motion capture</b></p> <ul style="list-style-type: none"> <li>• This is an accurate way to represent human movement as data can be capture from the real thing.</li> <li>• The animation will be more believable/better to watch/more realistic as it will match the walking and arm movements of the human body accurately.</li> <li>• The animator can request all required body movements and record this data.</li> <li>• There will no movements that are unnatural.</li> </ul> <p><b>Motion tweening</b></p> <ul style="list-style-type: none"> <li>• Simple form of animation to create an action sequence</li> <li>• Used to position of the character and limb positions at key points in the action sequence (software filling in in-between frames)</li> <li>• Allows for adjustment the frame rate/resolution to change the output</li> <li>• Can be edited to improve the realism/smoothness of the movements</li> <li>• Can be edited to add more actions into the sequence</li> <li>• Allows the designer/animator to control of the number of key frames required to create the required output.</li> </ul>	4	Maximum of 3 marks for each animation technique.

Question			Expected response	Max mark	Additional guidance
5.	(b)		<p><b>ai</b></p> <ul style="list-style-type: none"> <li>ai. files are vector so accurate shapes can be easily created and scaled</li> <li>easier to edit than equivalent raster files</li> <li>smaller files size than equivalent raster files</li> <li>ai. files are compatible with vector illustration software so can be edited and tweaked before being used in the game/app.</li> </ul> <p><b>png</b></p> <ul style="list-style-type: none"> <li>files are small and have transparency capabilities.</li> <li>raster files like png can be compressed without loss of quality.</li> <li>png files are compatible with a wide range of/all graphics software.</li> <li>a wider range of effects can be applied to raster (png) files like blurs/gradient fills.</li> </ul>	2	<p>Accept: for png file resolution can be tweaked so exported size can be as small as possible.</p> <p>candidates do not have to refer to the images in the question.</p>
	(c)		<p><b>dynamic effects</b></p> <ul style="list-style-type: none"> <li>the blurred effect behind the character in screenshot 3 give the impression of speed/movement.</li> </ul> <p><b>depth of field</b></p> <ul style="list-style-type: none"> <li>Created by the blurred foreground in screenshot 1 or 3 this helps to create a focus on the character.</li> </ul> <p><b>rule of thirds</b></p> <ul style="list-style-type: none"> <li>Screenshot 2 uses rule of thirds as the phone/facial expression is 1/3 in and 1/3 up from the bottom right corner</li> <li>Screenshot 1 uses rule of thirds : 1/3 foreground, 1/3 character, background in</li> </ul>	3	<p>Candidates do not need to mention 1/3 or 2/3's specifically, if the description of rule of thirds shows understanding of the character/focal points position.</p>

Question			Expected response	Max mark	Additional guidance
5.	(d)		<p><b>Transitions</b></p> <ul style="list-style-type: none"> <li>• Transitions would be used to add interest/breaks at different points in the animation eg to move between the close up of screen shot 2 and the more distant. screen shot 3, or when moving to different camera view points.</li> <li>• Allows changes between scenes to be seamless.</li> </ul> <p><b>Overlays</b></p> <ul style="list-style-type: none"> <li>• Overlays could be used to add more information to the animation eg speech bubbles of what the character is saying, indicators of how well the game is going eg numbers of task complete etc...</li> </ul> <p><b>Frame rates</b></p> <ul style="list-style-type: none"> <li>• By changing the frame rate the speed of the character could be altered or the quality of the game play could be increased/decreased.</li> </ul>	3	
6.	(a)		<p><b>Underground Survey</b></p> <ul style="list-style-type: none"> <li>• Identify type of substrate/depth of substrate to determine foundations required.</li> <li>• Identify wildlife habitats that could be affected by building work.</li> <li>• With existing trees to be removed there may root systems etc..to deal with</li> <li>• Identify any old drains/cabling/rail lines etc that may affect building work.</li> </ul>	2	Accept: Identify anything of historical significance.

Question			Expected response	Max mark	Additional guidance
6.	(b)	(i)	<p>Landscape Architect</p> <ul style="list-style-type: none"> <li>• Can use the location plan and scale provided to work out the space available for the surrounding landscape, park area and houses.</li> <li>• Can use the plan and developers requirements to determine types of materials, and work out labour costs based on available space/areas of coverage.</li> <li>• Can see where trees are being removed/proposed so that they can plan the landscape accordingly.</li> <li>• Can use the contours shown to establish the lay of the land and where land may need to be built up/removed etc.</li> </ul>	2	
		(ii)	<p>Quantity surveyor</p> <ul style="list-style-type: none"> <li>• Quantity surveyor could work out the amount of tarmac, asphalt and paving required for the roads/pavements using the scale and requirements provided.</li> <li>• Once the amount is worked out the quantity surveyor could provide costings.</li> <li>• For the play area the quantity surveyor could work out the amount of solid rubber required and how many children's play items/fixtures and fittings etc. would be required. Costing could also be provided for this.</li> </ul>	2	Accept: any suitable response for quantity surveyor that relates to quantities of materials (mentioned in the plan) or costing of materials (mentioned in the plan).
		(iii)	<ul style="list-style-type: none"> <li>• Available plot space for each house and surroundings garden/land to work out man ours for trades such as fencers, landscapers etc.</li> <li>• Roadworkers can use the location plan for the specification/location for the tarmac and asphalt/kerbs.</li> <li>• Plumbers can use the location plan to identify position of mains drainage for connecting to houses for foul/waste water.</li> </ul>	2	Candidates do not need to mention a specific building trade if the description relates to the content or images in the location plan.

Question			Expected response	Max mark	Additional guidance
6.	(c)		<p>Additional Layers</p> <ul style="list-style-type: none"> <li>• Layer showing eg the colour of the houses on the locational plan to clearly indicate the types of house</li> <li>• Layers showing additional features within the location plan eg street lighting, traffic calming measures, pedestrian crossings etc.that provides further information on safety/accessibility</li> <li>• Layer showing a simple linear scale to make it easier to calculate distances/plot sizes.</li> </ul>	4	<p>1 mark for identifying a possible layer. 1 mark for a suitable explanation.</p> <p>Accept: any layer in addition to existing content that is of clear relevance to a potential house buyer.</p>

[END OF MARKING INSTRUCTIONS]