National Qualifications 2016

2016 Graphic Communication

Advanced Higher

Finalised Marking Instructions

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General Marking Principles for Advanced Higher Graphic Communication

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this paper. These principles must be read in conjunction with the detailed marking instructions, which identify the key features required in candidate responses.

(a) Marks for each candidate response must always be assigned in line with these General Marking Principles and the Detailed Marking Instructions for this assessment.

(b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

(c) If a specific 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.

(d) For each candidate response, the following provides an overview of the marking principles. Refer to the Detailed Marking Instructions for further guidance on how these principles should be applied.

(i) Questions that ask candidates to **describe**
Candidates must provide a statement or structure of characteristics and/or features. This should be more than an outline or a list. Candidates may refer to, for instance, a concept, experiment, situation, or facts in the context of and appropriate to the question. Candidates will normally be required to make the same number of factual/appropriate points as there are marks available.

(ii) Questions that ask candidates to **explain**
Candidates must generally relate cause and effect and/or make relationships between things clear. These will be related to the context of the question or a specific area within a question.

(iii) Questions that ask candidates to **compare**
Candidates must generally demonstrate knowledge and understanding of the similarities and/or differences between, for instance, things, methods, or choices. These will be related to the context of the question or a specific area within a question.

(e) Candidates can respond to any question using text, sketching, annotations or combinations where they prefer. No marks shall be awarded for the quality of sketching. Marking will relate only to the information being conveyed.

Detailed Marking Instructions for each question

SECTION 1

Question			Expected Response	Max Mark	Additional Guidance
1.	(a)	(i)	Housing developer • Existing buildings • Topography • To show to planning office for planning permission • To show potential clients plots prior to buying • Use in promotional information	**2**	Any two points An explanation of a topographical consideration can be awarded one mark
		(ii)	House Buyer • To view boundaries • Direction of plots in relation to north arrow • Lay of the land • Land Features (trees) • Road access	**2**	Any two points
	(b)		• Energy efficiency • Use of new green technologies • Shows communal land and green space • Open areas – trees • How the new development will look with current environment • Visualisation, how new development will suit the current buildings/local area/environment • Fly-through of houses and development, positive imagery of local area • Show materials of buildings, in-keeping with local area • High quality graphic communications	**2**	

Question			Expected Response	Max Mark	Additional Guidance
	(c)		If the purpose of the survey is to serve as a base map for the architect • Know boundary lines • Allow for accurate zoning/scale • Can design around existing structures etc • Can design to suit land contours and features • To avoid costly mistakes during construction • Digital surveys are available in DWG and DXF format so can be used to plan a development on software	**2**	1 mark for each valid answer showing an understanding of the graphics **value** to the architect Can reference to CAS (planning drawing – knowledge of): • drainage surveys, underground surveys— storm water, foul water, services, gas, electric and telecommunications • feature surveys; paving, seating, lighting
	(d)	(i)	Construction trade – production and manufacture • Materials to be used in construction of roof • How the roof trusses are constructed and supported • How the exterior render and materials should be applied and look when complete	**2**	Answers can include; dimensioning/measurements
		(ii)	Sales Team - promotion • To sell the energy efficiency of the home and how this is achieved • 3D floor plan gives an idea of the upper level layout to sell to the client • Cross section of the house shows how the 3 levels integrate and showcase the double height ceiling • Promoting different house styles • How the exterior render and materials should be applied and look when complete	**2**	

Question			Expected Response	Max Mark	Additional Guidance
	(e)		Accessed by a wider audience Allow information for the site to be shared/sent to other potential buyers Allow potential buyers to see the development without visiting the site/or prior to building starting Promote all house styles Allow 2D/3D/animations to be shown	**2**	Allows for Instant editing – lead time for changes Cost saving measures due to future editing. Company is seen as more "green" because of the use of digital interface
	(f)		• It is easier to get smoother animation with motion tweening which suits a fly/walk-through • You can choose the key frames you want the fly/walk-through to take and motion tweening will calculate the frames of animation in between • You can choose/edit the path the animation is to take	**2**	Comparisons to another animation types is <u>not accepted</u>
	(g)		• Assigned internal lighting to the house • Considered/adjusted the brightness of the lights inside the building • Amount of lights required for the interior to be illuminated effectively • Use of external light coming into building • Suitable explanation of image based lighting	**1**	Spot light is NOT a valid answer

Question			Expected Response	Max Mark	Additional Guidance
	(h)	(i)	**Graphic 1** **Bump map** Bump maps are grayscale textures you map to objects, to create the illusion of surface relief on an otherwise flat object. **Applied lighting** A lighting style that consists of: • one or more discrete light objects positioned within the graphics window • different lighting styles applied to an object or assembly • different lighting types, directional	**2**	Texture Map With explanation Enlarged/zoomed in detailed view Spot light and point lights are NOT valid answers
		(ii)	**Graphic 2** **Final render/environment** The image has been placed in a **suitable environment** to compliment the product or item/inform the viewer of context **Image Based Lighting/High Dynamic Range Imagery** have been used (IBL/HDRI) for a more realistic graphic	**2**	

Question			Expected Response	Max Mark	Additional Guidance
2.	(a)	(i)	File type used on 3D software Convert to STL file 3D printing used Stereolithography	**3**	Answer example (for 3 marks): A 3D model is created in CAD and needs to be converted to an STL file format (1). A stereolithography file format converts a 3D model to a triangulated representation (1) which allows the 3D printing software to interpret the surface of the model ready for printing(1)
	(b)	(i)	Scale and proportion Modification of shape	**2**	Appropriate testing method Addition of Fixtures and Fittings For consideration: production, cost, speed, proportion, look, scale Prototyping Duplication of answers is <u>NOT</u> allowed
		(ii)	Construction methods Testing of construction; can be done prior to final manufacture Exterior materials and finishes	**2**	
	(c)		Finite Element Analysis or FEA, Computational Fluid Dynamics or CFD	**2**	
	(d)		Allows customer to make informed decisions about different models. It will give information about towing performance and aerodynamics Add impact upon fuel consumption	**2**	

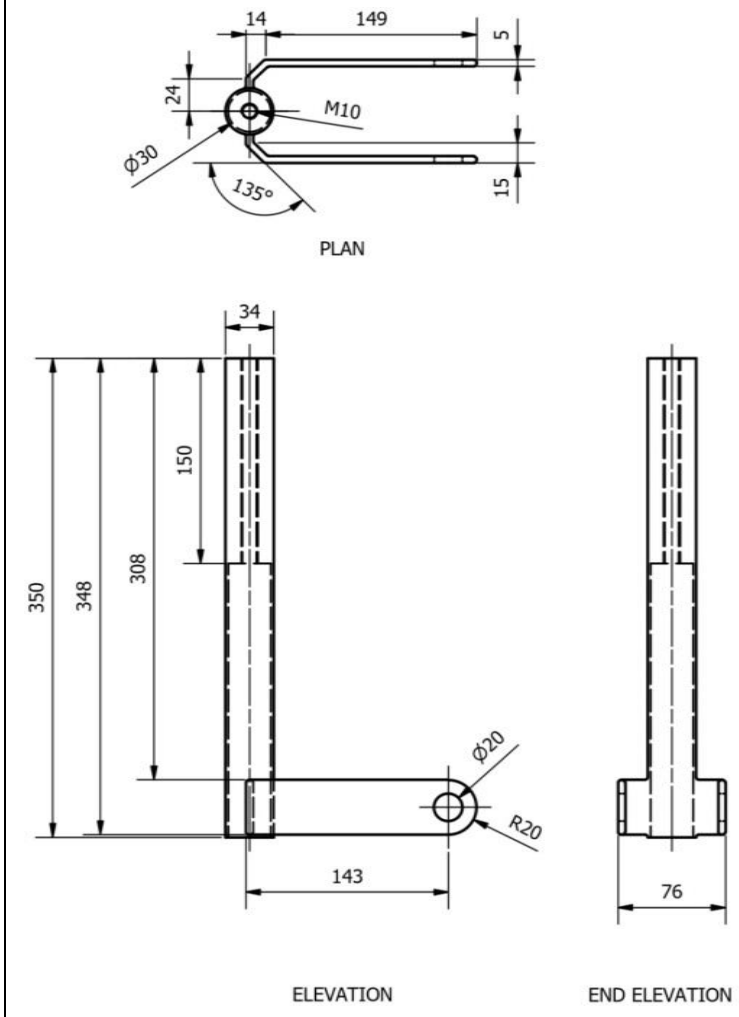
Question			Expected Response	Max Mark	Additional Guidance
	(e)		Colour schemes Internal rendered views could be shown (lighting styles) Exterior materials could be shown Patterns Materials used Maintenance of parts Decals and design Personalisation Shown in different environments Any four for 4 marks – related to the target markets	**4**	
	(f)		• Allow user to interact with the website • It is a more visual graphic than a static 2D graphic ie JPEG • Allow the user to view inside and outside of the caravan model as a virtual experience • Let the user navigate the 3D model/environment using the keyboard and/or mouse	**2**	Can be embedded into a website

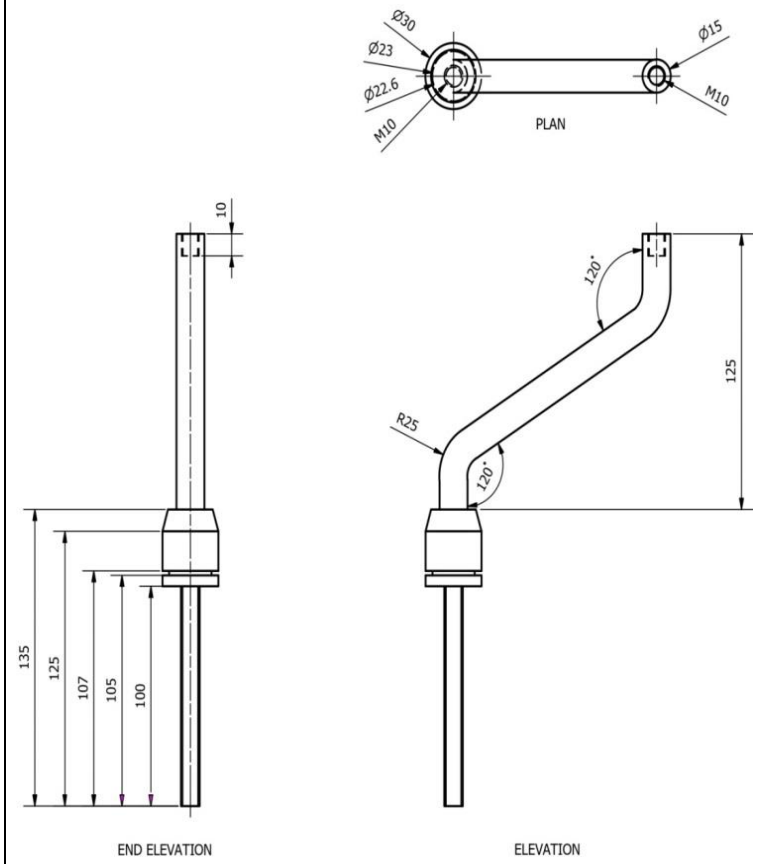
Question			Expected Response	Max Mark	Additional Guidance
	(g)		Using VRML; Potential buyers can interact by viewing, moving, rotating and within the interior caravan 3D scene, allowing 360 degree viewing capabilities Potential buyers can view specific room/sections of the caravan and use controls to move the room as you would experience it if you were walking through in real time Potential buyers get a more realistic experience of the product than from a 2D graphic Any of these reasons would increase interest in the product and potentially lead to sales for the company. Any for 1 mark	**1**	DO NOT award marks for an answer which has been awarded marks in 2(f)

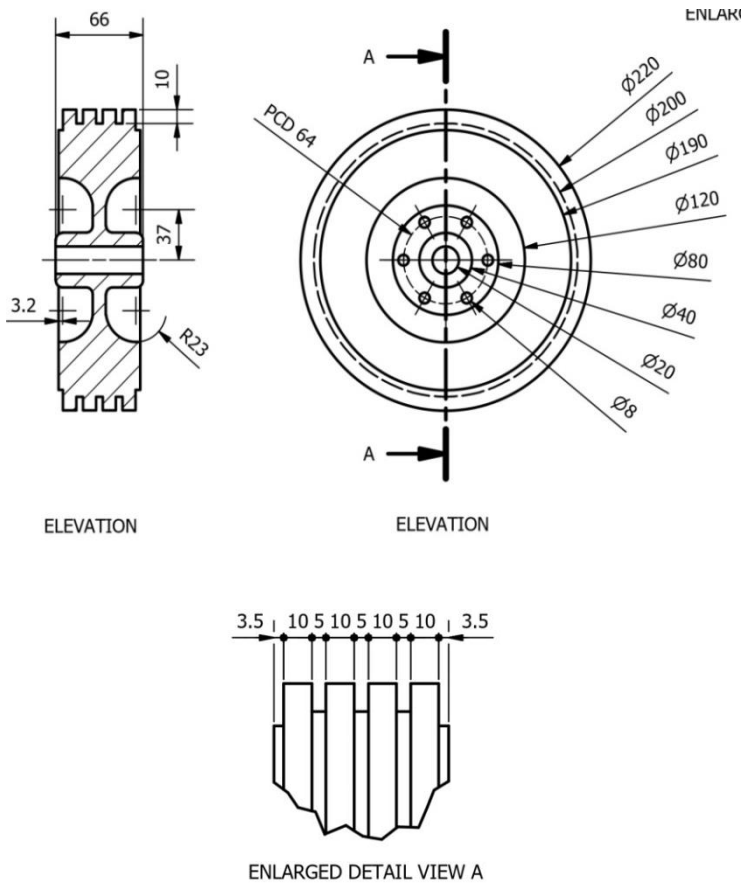
Question			Expected Response	Max Mark	Additional Guidance
3.	(a)		• Much smaller file size compared to large raster images • Can infinitely zoom in on arcs/curves/circles/splines and they remain smooth • Zooming, lines and curves will not get wider proportionally • The parameters of objects are saved and can be later modified — this means that modifications will not reduce the quality of a drawing • Pixilation can occur in raster images	**3**	Comparison must be made between the two formats to gain marks
	(b)		Pantone Colour Matching System CMYK number match HTML safe colour RGB value	**2**	Name a colour system and explain that this system is universally understood on a global level to ensure that the same colour will always achieved (for 2 marks)
	(c)		Paper thickness gsm (weight/density) Opacity Calendaring – smooth/glossy finish An alternative substrate/material could be used for the flyer Additional plates	**2**	

Question			Expected Response	Max Mark	Additional Guidance
	(d)		Offset lithography process description of the process using correct function of keywords; • Crop Marks • Registration • CMYK • Printing plates (rollers) • The process involves 4 printing plates (rollers) each with one of the CMYK colours • Registration marks are used on the flyer to ensure the alignment of the page runs through the four different colour plates correctly. The printing plate has the image to be printed, in relief, on its surface (the image stands out slightly from the printing plate (roller) surface) • The printing plate is kept dampened. Ink is applied to the plate but it is repelled from the dampened surfaces which are the non-image areas • After the printing process is complete the flyer is cut to the crop marks	**4**	The explanation should correctly explain the process using the 4 keywords; • Crop Marks • Registration Marks • CMYK • Printing plates (rollers)
4.	(a)		• Continuity of elements helps **connect** each of the different varieties to the same company • Recognisable and trusted brand/product	**2**	
	(b)		• Ensure the company have exclusive use of the brand/product • Legal protection from others using the logo • Protect the company from being connected to sub-standard product • Protect the reputation of the product/company	**3**	

Question			Expected Response	Max Mark	Additional Guidance
	(c)		**Target Market** • Young playful market • Market with a thirst for adrenaline and energy • Market which considers the effects on the environment and natural resources **Colour** • Using the red, black and white creates a dramatic eye catching visual to attract market. Tradition use of red for the coca-cola branding • Primary use of the colour black links to the product coca-cola zero, which is to attract a male target market. Images used within the visual are also masculine • The green and white scheme suggests a more natural product which may be better for the environment. The images used within the visual also suggest this **Social responsibilities** • Visual 1 suggests a more active lifestyle with the graphics suggesting sports and the word PLAY dominating the visual. This counteracts the full sugar content of the product - Obesity • Visual 2 suggests that an adrenaline fuelled lifestyle can still be pursued, even with a zero sugar product – positive replacement for the original coca-cola product • Visual 3 – the market can still experience coca-cola and have less environmental impact on the environment. More sustainable lifestyle – positive environmental image of the company and product	**6**	Cross over within response enabling up to 6 marks. One response <u>at least</u> for each area to enable full 6 marks to be achieved If answer only references 1 graphic in either category a maximum of 1 mark can only be awarded Colour – Professional judgement required for outlining appropriate use of colour choice in the Graphic Social Responsibilities – A justified response relating to the Graphics in relation to healthy, active lifestyles and sustainable living etc

Question			Expected Response	Max Mark	Additional Guidance
5.	(a)		Can be achieved by drawing half and mirror Can be achieved using Sweep or Extrude Could be achieved in part by revolve Expected answer: **Cylindrical element;** Correct dimensioning (1 mark) Correct 3D command (revolve) (1 mark) • If using Extrude: Extrusion of three cylindrical parts Ø34mm to 350mm, Ø30mm subtract 200mm, Ø10mm subtract 150mm Correct thread M10 (1 mark) **Then;** Position of new plane 2mm from top/bottom (1 mark) • If using Sweep: Profile must be 2mm from base of cylinder A sketch or path to the correct dimensions and correct use of Modelling command, Extrude or Sweep (1 mark) Fillet 20mm or extrude subtract on end (1 mark) Position of, Ø20mm and extrude subtract (1 mark)	**7**	

Question			Expected Response	Max Mark	Additional Guidance
	(b)		Profile = Ø15 Path = illustration (with sizes) Sweep/extrude along a path (1 mark) Creation of M10 thread (1 mark) **Then;** A sketch, axis and dimensions, then correct use of Revolve command (1 mark) • *If using extrude **ALL** dimensions and terminology must be precise*	**3**	

Question			Expected Response	Max Mark	Additional Guidance
	(c)		Can be achieved most efficiently by using Revolve Correct wheel dimensions (1 mark) Fillets on the inside axle (1 mark) Axle hole dimensioned correctly (1 mark) • This could be completed within the first sketch or extrude subtract later Correct tread dimensions (1 mark) Correct use of Revolve command (1 mark) • A full sketch may be shown or a half sketch and Mirror command used • *If the response has been created using extrude, **ALL** sizes must be correct* Position and size of circle. Extrude subtract circle (1 mark) Radial array (1 mark)	**7**	
	(d)		**Centre-axis** of hex bolt and handle. **Mate** wider inner flat face of the hex bolt, with the inner flat face of the handle.	**2**	

[END OF MARKING INSTRUCTIONS]