GCE EXAMINERS' REPORTS

GCE
DIGITAL TECHNOLOGY
AS

SUMMER 2023

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Annual Statistical Report

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DIGITAL TECHNOLOGY

General Certificate of Education

Summer 2023

Advanced Subsidiary

UNIT 1: INNOVATION IN DIGITAL TECHNOLOGY

General Comments

It was clear that the advanced information benefited candidates, as those questions tended to be answered in more detail.
Many candidates struggled to include technical information in their answers and to structure their answers in a way that is expected at this level.

Comments on individual questions/sections

Q.1 (a) (i) This question was answered poorly. Only a minority of candidates were able to give a technical answer worthy of credit at AS-level.

(ii) As part one, this was answered poorly. Some candidates would mention that a switch “sends data” but a more technical response was required.

(iii) As above, stating that a wireless access point “allowed wireless access” is not enough to be awarded credit.

(b) About half of candidates were able to give the name of a category of ethernet cable that could be used and a few were able to justify their choice.

Q.2 (a) A few candidates were able to describe the first phase of the development of the internet in detail. Some candidates confused this with the implementation of a new system.

(b) The majority of candidates who attempted this question but were not awarded marks had answered “faster” or “more powerful”. The candidates who were awarded full marks tended to answer that IPV4 has a lack of capacity and IPV6 would solve this problem because it allows over 1,000 times more addresses.

Q.3 (a) Although many candidates were able to show some understanding of the Turing Test, the structuring of answers was generally poor. Candidates should consider the different elements of the test and attempt to structure their answers to show a full understanding, including how they test is considered a success.

(b) As in part (a), structure was again an issue with answering this question. Quite a few candidates confused Nilsson’s employment test with Wozniak’s Coffee Test.

Q.4 (a) This question was generally well answered. Where candidates tended to lose marks, was with a lack to technical terminology in their answers, or stating that a robot “is AI”.

(b) This question was very well answered.

Q.5 (a) This question was the best answered question in the paper.

(b) This was generally well answered. Candidates who were able to list changeover methods tended to be able to be able to attain the majority of the marks for this question too. Some candidates lost marks where they struggled to differentiate between the Pilot and Parallel methods.

Q.6 This question was generally answered well. About half of candidates were able to give a well-structured answer that covered both mobile and desktop devices.

Q.7 (a) Generally, well answered. Some candidates failed to identify the sites they were describing. A few candidates struggled to identify functions of the sites.

(b) (i) Using technical terminology was again an issue with this question. Candidates who did well were concise. They often listed the legal act and they said why it was an issue.

(ii) This question was poorly answered. The majority of candidates failed to be concise. Few candidates did list ethical issues and related them to a business using social media.

Q.8 Most candidates were able to describe the more obvious answers such as convenience and automation. Only a few candidates were able to give a fuller and technically sound answers.

Q.9 The response to this question was mixed. Some candidates did not understand DUX but did try and give a very basic response and would have been in mark band 1. Some candidates discussed DUX as if it was the end product. Few candidates wrote a very good answer showing thorough knowledge of DUX showing a confident discussion of the different stages of DUX.

Q.10 The response to this question was mixed. Most candidates were able to give a basic discussion and were able to discuss how AI could be used to help with a diagnosis. Very few were able to think further than this and discuss testing, safety and adherence checking.

Summary of key points

Where a question asks for candidates to discuss a topic, the answer should be a discussion, and not a list.

Candidates need to ensure they cover all areas of the specification.

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UNIT 2: CREATIVE DIGITAL PRACTICES

General Comments

Many projects of a good standard were submitted for moderation this summer. Moderators saw some work of an excellent standard. Many centres had assessed the work accurately and had clearly explained their assessment decisions which aided the moderation process.

Most candidate work was uploaded correctly as per the specification. Centres should ensure that candidates' solutions are presented in a format that allows moderators to run the candidates' games with ease. In several instances, moderators found that games did not include all resources / files that prevented the solutions from functioning correctly in the Game Maker Studio environment.

It would aid the moderation process if centres would ensure that candidates' work and documentation are saved with filenames that clearly identify the centre number, candidate number and candidate name. As detailed in the specification for this qualification, "For example Diane Smith (centre number 68999, candidate number 12345) would store their work in a folder named 68999_12345_SM_D. A folder structure as with the exemplar material would also aid in the moderation process. It is an essential requirement that all candidate work is authenticated, and the authentication sheets are uploaded with the candidates' work. There were some instances where this was not the case, which then required moderators to and WJEC officers to contact centres to request missing paperwork.

The Joint Council for Qualifications (JCQ) document "Instructions for conducting nonexamination assessments" states that: "All candidates must sign a declaration to confirm that the work they submit for final assessment is their own unaided work. Teachers must sign a declaration of authentication after the work has been completed confirming that:

- the work is solely that of the candidate concerned;
- the work was completed under the required conditions;
- signed candidate declarations are kept on file."

It should also be noted that any additional candidates' work and/or paperwork requested by moderators should be provided in a timely manner.

Candidates' work

The following information is provided to help centres guide candidates through the NEA in future. There was evidence of some confusion regarding the following sections of the project work. In general, many centres do not appear to have recognised the importance of the feedback in the software development life cycle and its importance whilst developing the alpha, beta, and final versions of the game. The 'Making informed design decisions' section should be used for the identification of suitably substantive games to be identified. This is a good opportunity for teachers to steer candidates away from unsuitable ideas that will lack the scope required to produce work to a standard and level appropriate for this qualification, as well as ensuring that projects are overly complicated and deliverable within the timeframe of the qualification.

During design work candidates should identify the objectives for their game solutions. These objectives should inform all sections of the candidates' work from this point onwards. For each objective, candidates should:

- Create / source in-game audio
- Create / source characters
- Identify the core components of their game
- Identify the gameplay, interactivity, narrative, objectives, structure, target audience and visual style of their game

Comments on individual questions/sections

Investigating games

Many candidates demonstrated a strong understanding of the specified topics in games development. They showcased their knowledge across various genres of games, identified similarities and differences between game genres and sub-genres, and grasped the significance of various game aspects that can impact individuals.

The candidates showed a clear comprehension of the following areas:

- Genres of Games: Most candidates displayed a good understanding of different game genres, such as action, adventure, puzzle, simulation, role-playing, and sports, among others. They were able to discuss the defining characteristics of each genre and identify popular examples.

- Aspects of Games: Most candidates effectively discussed the various aspects of games, including the use of sound, high score tables, competitions, educational value, and levelling. They recognised that these elements contribute to the overall gaming experience and can influence players differently.

- Impact on Individuals: Candidates demonstrated a solid awareness of how different aspects of games can impact individuals. They identified that games can elicit emotional responses, influence behaviour, and have effects on cognitive skills, depending on the design choices made by developers.

- Technical Platforms: Some candidates were able to distinguish between different technical platforms used for gaming, such as arcade, augmented reality, casual (browser-based/apps), cloud, console, desktop, handheld, server (Massively Multiplayer Online (MMO)), and virtual reality. They discussed the unique features and advantages of each platform in delivering gaming experiences.

- Positive and Adverse Effects of Games: Most candidates demonstrated a good understanding of the potential positive and adverse effects of gaming on individuals. They acknowledged that games can be both entertaining and educational, while also recognising the risks of excessive gaming or exposure to inappropriate content.

Planning games

Most candidates demonstrated a solid grasp of various key aspects related to project organization and time management.

The candidates showed a clear comprehension of the following areas:

- Project Management Procedures: Most candidates were able to demonstrate the significance of maintaining task lists and time management in game development projects. They showed an understanding of the procedures for storing and protecting project information, as well as tracking and monitoring progress throughout the development cycle.

- Game Development Cycle: Many candidates were able to define the stages of the game development cycle, including analysis, design, prototyping, testing, producing documentation, and releasing. They recognised the importance of following a systematic approach to game development.

- Activities in Each Stage: Some candidates demonstrated an ability to identify the activities that should be carried out in each stage of the game development cycle. They recognized the relationships between these activities and how they contribute to the overall success of the project.

- Detailed Action Plan: Some candidates utilised appropriate software to create a detailed action plan, showcasing the overall timescale, project stages, specific activities within each stage, and timings for each activity. This demonstrated their proficiency in project planning and organization.

- Asset Log and Development Log: Most candidates understood the significance of maintaining up-to-date asset logs and development logs to document the planning, development, and evaluation elements of the project. They recognised the importance of documentation throughout the development process. The overall design of the documentation was good but could be improved upon by making use of inbuilt functions within the word processing software.

- Backups and Version Control: Candidates demonstrated a good understanding of the importance of keeping backups and maintaining strict version control of project files. They recognized the value of preserving different iterations of the game project and associated documentation, as well as incorporating feedback from peers to make necessary alterations.

Making informed design decisions

Candidates demonstrated a strong understanding of audience consideration, making informed design decisions, and justifying their chosen game concepts. They effectively addressed the specified areas of this section of the specification, showcasing their ability to develop comprehensive game ideas while incorporating essential design tools and features.

The candidates showed a clear comprehension of the following areas:

- Audience Consideration and Game Development: Most candidates demonstrated an excellent grasp of taking target audience and user requirements into account during game development. They successfully developed game ideas that catered to specific stakeholder needs and presented them effectively through well-structured reports or presentations, combining audio and visual elements when relevant.

  Further work could be done in terms of a range of game visualizations that illustrate key aspects of their game ideas, providing essential insights into the planning process. Many reports and presentations were thorough, clearly outlining game audio, characters, core components, gameplay, interactivity, narrative, objectives, structure, target audience, and visual style with some making use of the GML code that could be utilised in their game.

- Informed Design Decisions and Gaming Features: Many candidates demonstrated proficiency in utilising various design tools to inform their design choices. They effectively employed action lists, diagrams, graphical tools, mock-ups, mood boards, narratives, pseudo code, storyboards, videos, and wireframes to demonstrate and communicate their ideas.

  Some candidates demonstrated an understanding of key game development features, such as audio, image, level, object, script, and tile editors. Few candidates demonstrated use of physics and shader engines, level inheritance, animation sequencing, layer-based image editing, tiling systems, and aspects of the GML programming paradigm. They effectively applied tools to create both standard and advanced gaming features, showcasing their technical competence.

- Justification of Chosen Game: The majority of candidates effectively described and justified their decisions for the chosen game genre, technical platform, and key features. They drew upon thorough research and stakeholder feedback to support their choices, providing arguments for each decision.

  Some Candidates demonstrated a clear understanding of the importance of aligning their game concepts with the target audience's preferences and needs.

Creating games

Candidates demonstrated a proficient understanding and application of various game development techniques, effectively supporting the development of their games. They employed a range of methodologies and practices to implement their designs, gather stakeholder feedback, and refine their games using the GameMaker platform tools and facilities.

The candidates showed a clear comprehension of the following areas:

- Implementation of Game Designs and GML Usage: Many candidates successfully implemented one of their game designs using the GameMaker Language (GML). They demonstrated competence in utilizing GML to create game mechanics, interactions, and logic necessary for their game concepts. The incorporation of standard and advanced techniques showcased their ability to apply concepts effectively. Centres are reminded to study the mark bands from the specification and take note that Drag and Drop game development will limit the candidates' marks in this section.

- Draft Game Development and Stakeholder Feedback: Most candidates developed their draft games based on informed design decisions, incorporating valuable feedback obtained from stakeholders on the initial game concept. This demonstrated their responsiveness to user requirements and a willingness to refine their games accordingly.

- Appropriate Use of GameMaker Platform Tools and Techniques: Many candidates utilised various tools and facilities available through the GameMaker platform to enhance their games. They demonstrated proficiency in leveraging built-in features, as well as creating bespoke functions and procedures to add depth and functionality to their projects.

- Good Coding Practices and Annotation: Some candidates demonstrated a good understanding of coding practices by maintaining well-structured, readable, and annotated code. The use of meaningful comments and documentation showcased the candidates' ability to make their code comprehensible to a competent third party, facilitating future development. Candidates should be mindful of using comments as well as docstrings in their code which will aid in the moderation process.

- Reviewing and Documented Changes: Most candidates displayed a proactive approach to reviewing their work and making appropriate documented changes. They justified alterations based on the required functionality of their games, demonstrating a thoughtful development process focused on meeting stakeholder needs.

Testing and developing games

Many candidates demonstrated a comprehensive understanding of game testing techniques and the importance of iterative development. They effectively employed various methodologies to test the functionality of their games during development, ensuring the quality and reliability of their projects.

The candidates showed a clear comprehension of the following areas:

- Test Plans and Test Data Creation: Some candidates produced well-structured test plans and test data for the summative unit testing of each module, section, or part of their games. These plans covered a wide range of aspects, including end-user interactions, input and output handling, object collisions, game physics, and mathematical calculations.

- Implementation and Recording of Test Results: Some candidates demonstrated proficiency in implementing the test plans using the provided test data and accurately recording the test results. They carefully monitored the behaviour of their games during testing and documented any issues or discrepancies encountered.

- Adaptation Based on Test Results: Some candidates showed a strong ability to analyse the test results and make appropriate adaptations to their games where necessary or desirable. They displayed a proactive approach to addressing identified issues and improving the overall functionality and user experience of their games.

- Iterative Testing and Perfective Re-testing: Few candidates embraced iterative development principles by adjusting test plans and test data to re-test specific game modules, sections, or parts. This iterative testing approach allowed them to identify and resolve any new issues introduced during the adaptation process.

Refining and reviewing games

Many candidates demonstrated a strong understanding of stakeholder feedback, the game development life cycle, and the importance of reviewing and refining their games against the original concept. They effectively applied this knowledge to create well-rounded and polished games, considering stakeholder needs and adhering to the game development life cycle.

The candidates showed a clear comprehension of the following areas:

- Stakeholder Feedback, Scope Change, and Refinement: Some candidates exhibited proficiency in gathering and recording stakeholder feedback using appropriate methods. They recognized the significance of stakeholder input in shaping their games and made informed decisions based on the received feedback. Candidates adeptly reviewed stakeholder feedback on the game concept and draft game, utilising it to inform scope changes to improve the final product.

  The refinement process was evident in the candidates' games, showing their commitment to continuous improvement during the game development life cycle. The refinement phase allowed them to address stakeholder concerns and enhance the overall user experience.

- Game Development Life Cycle: Most candidates successfully described the parameters, constraints, and influences that affected scope change during the game development life cycle. They displayed a clear understanding of the various stages of the life cycle, such as concept development, design, implementation, testing, and release.

  Some candidates documented and justified any changes in scope during development effectively. They demonstrated an ability to manage project constraints and adapt to changing requirements while maintaining a coherent and polished final product.

- Reviewing and Refining against Original Game Concept: Candidates competently commented on the fitness for purpose of their completed games. They were able to assess how well their games aligned with the original concept and whether they met stakeholder expectations and requirements.

  Most candidates demonstrated a thorough utilization of stakeholder feedback to review and refine their games. The incorporation of feedback led to substantial improvements and demonstrated the candidates' responsiveness to user needs and preferences.

Presenting outcomes

Many candidates displayed an understanding of how to demonstrate the appearance and functionality of a game through the production of a 5–10-minute movie or screen capture, please note that there are several methods to achieving this, the use of filming a monitor with a hand-held device is not adequate. Many effectively showcased their games, emphasizing both the visual aspects and the underlying functionalities.

The candidates showed a clear comprehension of the following areas:

- Appearance of a Game: Candidates demonstrated their ability to effectively present the appearance of their games. Many candidates showcased general gameplay, highlighting the various levels when appropriate. They effectively used sprites and animation to bring their game worlds to life, creating engaging and visually appealing experiences.

  Many candidates integrated sound into their games, enhancing the overall gaming atmosphere and providing an immersive experience for the audience. The incorporation of scoring, lives, and game progression elements contributed to a sense of challenge and accomplishment.

- Game Functionality: Some candidates effectively demonstrated the functionality of their games by providing comprehensive descriptions of both the coded and non-coded elements. They showcased their understanding of how objects, sprites, and coding worked together to create interactive and dynamic gameplay experiences.

  Candidates elaborated on the coded elements, explaining how the logic and programming behind various game mechanics contributed to the game's behaviour and interactions. They also recognized the significance of non-coded elements, such as game assets, level design, and user interface, in shaping the overall gaming experience.

Many candidates presented the outcomes of their games, showcasing the appearance and to a lesser extent the functionality. They demonstrated proficiency in producing 5-10 minute movies or screen captures that effectively communicated the key aspects of their game development projects. The candidates' ability to combine visual demonstrations with detailed explanations of the underlying functionalities highlighted their competence in game development.

Summary of key points

Overall, the candidates' performance in this NEA was commendable. They have produced engaging and functional games. I commend their efforts and wish them well in their future game development endeavours.

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