**Western Australian Certificate of Education**

**Semester 1 Examination, 2022**

**Question/Answer Booklet**

Please place you student identification label in this box (if required)

**APPLIED**

**INFORMATION**

**TECHNOLOGY**

## Year 12 ATAR: Unit 3

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## Time allowed for this paper

Reading time before commencing work: ten minutes

Working time: three hours

## Materials required/recommended for this paper

***To be provided by the supervisor***

This Question/Answer Booklet

Multiple Choice Answer Sheet

***To be provided by the candidate***

Standard items: pens, pencils, eraser, correction fluid/tape, ruler, highlighters

Special items: non-programmable calculators approved for use in this examination, Mathomat and/or Mathaid and/or any system flowchart template

**Important note to candidates**

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

## Structure of this Paper

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Section | Number of questions available | Number of questions to be answered | Suggested working time (minutes) | Marks available | Percentage of examination |
| Section One:  Multiple Choice | 15 | 15 | 20 | 15 | 15 |
| Section Two:  Short answer | 7 | 7 | 40 | 54 | 25 |
| Section Three:  Extended answer | 1 | 1 | 50 | 25 | 20 |
| Section Four:  Scenario | 1 | 1 | 70 | 70 | 40 |
|  |  |  |  | **Total** | 100 |

## Instructions to candidates

1. The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2022: Part II*. Sitting this examination implies that you agree to abide by these rules.
2. Answer the questions according to the following instructions. Section One: Answer all questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. Do not use erasable or gel pens. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.
3. Write your answers to the questions in Sections Two, Three and Four in this Question/Answer booklet.
4. You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question.
5. Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

## Section One: Multiple-choice 15% (15 marks)

This section has **fifteen** questions. Answer **all** questions on the separate Multiple-choice Answer Sheet provided.

For each question shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square. Do not erase or use correction fluid. Shade your new answer.

Marks will not be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

Suggested working time: 20 minutes.

Which is true about Copyright in Australia?

1. Copyright protection ends when the author becomes deceased.
2. Copyright protection is automatic for works that qualify for it.
3. It is necessary to register for copyright protection as soon as possible.
4. Copyright protection is the most robust form of Intellectual Property protection available.

Which specifications would most suit a retired grandmother who uses her computer primarily for reading online news and keeping in touch with her grandchildren via email/video conferencing?

1. Large screen size, large secondary storage, powerful CPU
2. Medium powered workstation, large secondary storage via a home server.
3. GPU, powerful CPU, and high-speed RAM.
4. Tablet device with integrated screen, power efficient processor, fixed secondary storage.

Which is a **DISADVANTAGE** of a growing labour force working from home?

1. A non-localised workforce.
2. The focus of workers moves to producing results rather than hours spent in the office.
3. Productivity decreases during times of home Internet disruptions.
4. Less overhead costs for companies.

Which is an example of a **Display Option** that can be encoded into a website to enhance user experience?

1. The ability to print in different colours and fonts.
2. The ability to create special effects layers.
3. The ability to connect wirelessly to an external monitor or projector.
4. The ability to view the body of text without advertisements or images.

What will generally occur if a user experiences poor usability on a website?

1. The user will shut down their device.
2. The user will likely switch to another site.
3. The user will stop using the Internet and start making phone calls to the company.
4. The user will generally be patient and wait for the proper response from the webpage.

What hardware factor needs to be considered when choosing a mobile digital device to suit client usability requirements?

1. Colour and styling.
2. Weight vs portability.
3. The Graphical Interface.
4. Application software available.

Why is site structure very important for a website?

1. To maximise sales.
2. To ensure a company’s brand is clearly emphasised.
3. To enhance search engine optimisation on web browsers and to provide a good user experience.
4. To increase the chance of return visits from viewers.

What is a feature of using layers in graphics editing software?

1. Allows individual assets to be locked or frozen preventing accidental changes.
2. Delivers faster editing options.
3. Replaces the need for editing separate video and audio tracks.
4. Enables properties to be set for the whole project.

Which analogy best describes the relationship between elements and principles of design?

1. The principles are the building blocks on which the elements are built.
2. The elements are the building blocks on which the principles are built.
3. Elements and principles are mutually exclusive parts of design.
4. Elements and principles form the compositional rules of design.

Which is **NOT** a valid relationship between an element and principle of design in this image:

1. Red colour emphasising the petals.
2. Red colour creating unity.
3. Red colour creating negative space.
4. Red colour creating dominance.

Which is an example of why kerning forms an important part of digital publishing?

1. To make certain more important information is in larger font than less important information.
2. To prevent viewers misreading letters such as an ‘m’ instead of an ‘r’ and ‘n’ that have been placed too close together.
3. To ensure headings are centred across columns.
4. To provide a typeface that is suitable for the target audience.

Choose which statement best describes the purpose of the Freedom of Information Act 1982 in Australia.

1. To ensure national security interests are kept safe.
2. To stop indiscriminate spying of individuals within the community.
3. To allow citizens access to sensitive information the government is keeping.
4. To facilitate an informed community that can better participate in decision making processes.

Which of the following would be a **DEFENDANT** in an online defamation case?

1. Someone accused of posting defamatory remarks about another on a social media platform.
2. Someone who is accusing another of posting defamatory remarks on a digital publication.
3. Someone who has been defamed publicly on a digital forum.
4. Someone who receives defamatory information on a social media platform.

A best practice for designing an effective user interface is to \_\_\_\_\_\_\_\_\_\_

1. create consistency and use common elements.
2. put as much information into as small a screen real estate as possible.
3. have a hierarchy starting with least important information at the top.
4. maintain the same font size through the page.

Which of the following is an issue with students and teachers using more online software applications in education?

1. The shift of learning responsibility from teachers to students.
2. More data being stored on remote cloud servers.
3. Less need for face-to-face teaching in the classroom.
4. Creation of a digital divide with students who do not have fast Internet at home.

## END OF SECTION ONE

## Section Two: Short answer 25% (54 marks)

This section contains **seven** questions. You must answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 40 minutes.

Question 16 (6 marks)

Describe an example for each of the following graphical user interface (GUI) features.

Usability:

Inclusivity:

Accessibility:

Question 17 (7 marks)

1. Explain what is likely to happen when a user browses a website with a very deep organisational hierarchy. (2 marks)

1. Outline why this would be a problem for the owners of the website, especially if their business is in retail sales. (2 marks)

1. Explain what changes could be made to rectify a deep hierarchy. (3 marks)

Question 18 (6 marks)

The inclusion of high-resolution digital cameras in smartphones has been an emerging trend in mobile devices which has caused a decreased in standalone cameras sales.

Describe **two (2)** other emerging trends in mobile devices which have caused decreased demand and sales in other standalone electronic devices.

One:

Two:

Question 19 (8 marks)

1. Outline an example of how the following intellectual property types can be used to protect the rights of creators for their digital solutions and products. (6 marks)

Patents:

Registered Designs:

Copyright:

1. Outline the term ‘moral rights’ in relation to copyright. (2 marks)

Question 20 (8 marks)

1. Joel is a producer of digital advertisements for the Internet and television. Describe how the following three (3) video application features would be used in the production of his work. (6 marks)

Multi-layer track editing:

Transitions:

Effects:

1. Joel has chosen to use an online video editing tool for his work. State one (1) possible reason for his choice. (2 marks)

Question 21 (9 marks)

The table below outlines components for three different computing systems.

|  |  |  |
| --- | --- | --- |
| **SYSTEM 1** | **SYSTEM 2** | **SYSTEM 3** |
| * 11th Gen. 6 Core processor, 4.9 GHz | * 12th Gen. 6 Core processor, 4.7 GHz | * 11th Gen. Mobile processor, 4.2 GHz |
| * 8GB Primary Memory | * 32GB Primary Memory | * 16GB Primary Memory |
| * 500GB SSD, 2TB HDD Secondary Memory | * 4TB HDD Secondary Memory | * 512GB SSD Secondary Memory |
| * GPU with 12GB VRAM, capable of 4K resolution @ 60fps | * GPU with 24GB VRAM, capable of 8K resolution @ 60fps | * Onboard Graphics * 802.11ax and Bluetooth |
| * 32-inch 4K screen | * 32-inch 4K screen | * 16-inch screen |

\*fps = frames per second

1. SYSTEM 1 is to be used for playing fast paced first person shooter games at 4K resolutions. Identify which component from the list that would need to be upgraded most urgently. Provide reasoning for your answer. (3 marks)

Component:

Reasoning:

1. SYSTEM 2 is to be used for editing and rendering videos for social media platforms such as YouTube. Identify which component from the list that could be downgraded to save the most money, yet not lose much functionality. Provide reasoning for your answer. (3 marks)

Component:

Reasoning:

1. SYSTEM 3 is to be used on construction sites in the metropolitan area operating online application software and sending emails back to the office. Outline an additional requirement that would add functionality to the system. Provide reasoning for your answers. (3 marks)

Additional Requirement:

Reasoning:

Question 22 (10 marks)

1. Explain two (2) reasons why convergent trends in contemporary digital technologies make them more suited for remote education than a traditional Desktop PC.  
    (6 marks)

One:

Two:

1. Describe two (2) difficulties when using virtual collaboration in an education environment. (4 marks)

One:

Two:

## END OF SECTION TWO

## Section Three: Extended answer 20% (25 marks)

This section contains **one** question. You must answer **all** parts to the question. Write your answers in the spaces provided.

Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 50 minutes.

Omnicam Enterprises are currently in the feedback and enhance phase of creating an innovative multi-view streaming platform for watching sports events.

Called ‘Intelli-View”, the system allows viewers to watch a sporting event on their smart device from up to 5 simultaneous camera feeds, along with streaming other on-demand content such as live stats, social media, even instant and slow-motion replays of live action. Viewers are given the ability to watch all feeds at once or switch and zoom into specific feeds of interest using the exclusive Intelli-View mobile app.

Omnicam achieves this economically for event organisers through their patented ‘Intelli-cam’ and ‘Intelli-server’ devices. The Intelli-cams are small, high-definition cameras placed around the sporting venue or playing field to capture the viewing action from all angles. They are connected wirelessly to the Intelli-server through high bandwidth streaming channels. The ‘Intelli-server’ is a proprietary device which records and routes data from the cameras and streams it to viewers on demand through the mobile app, which uses an intuitive and easy to use graphical user interface.

The ability for users to seamlessly switch between different camera angles, live content and other real time data sources guarantees to hold the viewer’s attention even more than if they were actually at the event.

Omnicam believes that while capacity restrictions are being placed on numbers at live events, viewers and fans should still be able to enjoy their sports as if they were physically in the stands, even if in reality they are sitting at home on the couch.

1. (25 marks)
2. Given that Onmicam are in the ‘feedback and enhance’ phase of this project, identify which management approach they have chosen for this project. (1 marks)

Project Management Approach:

1. Outline two (2) possible reasons for their choice of project management approach.

(4 mark)

One:

Two:

1. Storyboards, sitemaps and flow charts are useful project planning tools. Describe specifically how each could be used effectively in the completion of this project.

(6 marks)

Storyboard:

Sitemap:

Flow chart:

1. Outline one (1) other tool found in popular project management software packages that could be beneficial in the completion of this project. (2 marks)

1. State the difference between a user interface (UI) and user experience (UX).

(2 marks)

1. Given the purpose of Omnicam’s mobile app, describe the features that would likely be incorporated into the graphical user interface (GUI). (3 marks)

1. Describe one (1) hardware limitation of mobile devices that MAY affect the usability of Omnicam’s mobile app. (3 mark)

1. With reference to the article, explain how Omnicam’s use of features found in modern convergent devices will impact (positively or negatively) the target viewer’s lifestyle. (4 mark)

**END OF SECTION THREE**

**Section Four: Scenario 40% (70 Marks)**

There is **one** question in this section. You must answer **all** parts of the question.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
* Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the part of the question that you are continuing to answer at the top of the page.

Suggested working time: 70 minutes.

1. (70 Marks)

EnerCell Pty Ltd started its business in 2021 as a delivery and pickup service for rechargeable batteries. After the success of its initial business idea, the directors decided to target schools in its next effort to change battery usage habits in the community.

Alkaline batteries thrown into household trash end up in landfill where they leach poisonous chemicals into the soil, which eventually make their way back into our water supply. For this reason, EnerCell felt it necessary to educate and promote safe disposal of batteries. The company noticed there were already schools in the WA community that collect used batteries for proper disposal but thought it could help these efforts with the use of their innovative Smart-Bins.

Their plan is to lease Smart-Bins and place them in the library of as many WA schools as possible. The bin has an inbuilt scanner which scans batteries placed in it. It counts the number and type of batteries deposited and sends this information wirelessly via the Internet to the EnerCell servers. Individual school totals are tallied and listed on a dedicated page on the EnerCell website. EnerCell hopes to create a friendly competition between and within schools, offering monthly prizes and incentives to the school who manages to collect the most batteries.

To foster this competitive spirit, the collection data of participating schools is made available on EnerCell’s website. The data includes schools participating and a scoreboard of collection data/tallies including a dedicated section for ‘School of the Month’, for the school that manages the most collection of batteries for that month. The plan is to also offer monthly prizes and incentives to the school of the month, including free rechargeable battery deliveries and rebates for solar power installations.

Along with the website, EnerCell is developing a mobile app which allows students and staff from schools to obtain live data on their school’s collection efforts. The app allows sub-groups within schools to be created such as year groups and student groups. These sub-groups can be used to foster intra-school competitions. Sub-groups are created using the mobile app to create unique QR codes for each group that are scanned at the Smart-Bin when batteries are deposited.

After the success EnerCell had with your designs for their initial website, they have decided to contract you again to create the design for their Smart-Bin webpage and Smart-Bin Mobile app, both of which are to incorporate **inclusive** and **accessible** design.

The home page for the Smart-Bin webpage must include:

* an appropriately sized EnerCell logo placed in a prime viewing location on the page
* A section focused on information regarding EnerCell’s vision with the Smart-Bin
* A large image gallery highlighting the problem of batteries in landfill.
* A large subscription button for school’s to sign up to lease a Smart-Bin.
* Live scoreboard with school collection totals, highlighting the TOP 3 schools.
* A section dedicated to ‘School of the Month’
* Link along with QR code to download the mobile app.
* Appropriately placed menus:
  + About us
  + Our Vision
  + School recycling news
  + Further information
    - FAQ
    - Battery basics
    - Other recycling incentives
* Login for subscribed schools and students
* Social media links

The **mobile app home screen** must include the following:

* EnerCell’s logo in a strategically placed area of the screen
* Image slideshow with information focusing on batteries in landfill
* Login section for any subscribed sub-groups
* Real-time data of sub-group battery collections
* Link to a live scoreboard for all other subscribed schools
* Link to unique sub-group QR code for scanning at a Smart-bin
* Counter indicating how many batteries that individual user has saved from landfill

1. Outline two (2) target audience characteristics for EnerCell that can be identified from the design brief. (2 marks)

One:

Two:

1. Explain how you intend to organise the following UI considerations to create enhanced webpage functionality. (6 marks)

Structure:

Usability:

1. To gather some recycling facts and statistics in relation to batteries and landfill, EnerCell required access to some unreleased data and reports from the Australian Bureau of Statistics as well as a few private waste management companies.

Describe how the Freedom of Information Act could be used to help EnerCell in their information seeking efforts. (2 marks)

**Question 24** (continued)

1. Design EnerCell’s ‘Smart-Bin’ webpage in the space provided on the following page.

You may use the space below to plan your response.

Your design must include annotations and show:

(i) layout and structure of your intended design (9 marks)

(ii) elements and principles of design used and the relationship between them   
 (3 marks)

(iii) organisation of content suitable for the given digital medium (3 marks)

(iv) **two (2)** navigation controls suitable for the given digital medium (2 marks)

(v) **one (1)** inclusivity feature and **one (1)** usability help feature (2 marks)

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| Planning: anything written on this page will **not** be marked. |

**Question 24** (continued)

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**Question 24** (continued) additional space for annotations

**Question 24** (continued)

1. Explain how the following two (2) publishing features could be used effectively in the construction of the website. (4 marks)

Colour Schemes:

Typography:

1. EnerCell wish to distribute a community action plan to highlight the importance of helping to stop batteries ending up in landfill. Instead of just providing information on the webpage, they have heard of the advantages of using a digital publication for this purpose.

Identify two (2) different digital publication types and outline an advantage of each.  
 (6 marks)

One:

Advantage:

Two:

Advantage:

1. Outline how features found in sound editing applications could be useful in creating the multimedia aspects of EnerCell’s new webpage. (2 marks)

1. Design the home page of the EnerCell mobile app in the space provided on the following page.

You may use the space below to plan your response.

Your design must include annotations and show:

(i) layout and structure of your intended design (7 marks)

(ii) elements and principles of design used and the relationship between them   
 (3 marks)

(iii) organisation of content suitable for the given digital medium (3 marks)

(iv) **two (2)** navigation controls suitable for the given digital medium (2 marks)

(v) **one (1)** inclusivity help feature and **one (1)** accessibility feature (2 marks)

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| Planning: anything written on this page will **not** be marked. |

**Question 24** (continued)

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**Question 24** (continued) additional space for annotations

1. A video on EnerCell’s website contains footage from a landfill site portraying the operators in a negative way. The owners of the landfill site, ‘WER TRASH Pty Ltd’ are not happy about the publicity and threatened to start an online defamation case against EnerCell if they did not take down the video from their website.

Outline the three (3) requirements to be proven by WER TRASH for an online defamation case to be considered by a court of law. (6 marks)

One:

Two:

Three:

1. Describe three (3) actions available to ‘WER TRASH Pty Ltd’ if they think they have been defamed. (6 marks)

One:

Two:

Three:

**END OF EXAMINATION**

**Supplementary page**

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**ACKNOWLEDGEMENTS**

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| **Question 10** | [Image] Image of red flowers.by Graphic\_King  https://pixabay.com/vectors/watercolor-flowers-art-floral-6475471/ Accessed January 2022 |