

Student Number:

2007
HIGHER SCHOOL CERTIFICATE
Sample Examination Paper

INFORMATION PROCESSES AND TECHNOLOGY

General Instructions

- Reading Time – 5 minutes
- Working Time – 3 hours
- Write using blue or black pen
- Write your student number at the top of this page

Total marks – 100

Section I

20 marks

- Attempt ALL of Questions 1–20
- Allow about 40 minutes for this section

Section II

40 marks

- Attempt ALL of Questions 21–24
- Allow about 1 hour and 10 minutes for this section

Section III

40 marks

- Attempt TWO questions only from Questions 25–28
- Allow about 1 hour and 10 minutes for this section

Directions to school or college

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Section I
20 marks

Allow about 40 minutes for this section

Select the alternative A, B, C, or D that best answers the question. Fill in the response sheet clearly.

1	X			
---	---	--	--	--

If you think you have made a mistake, blank out the incorrect answer and fill in the new answer.

1	X			X
---	---	--	--	---

If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word *correct* and drawing an arrow.

1	X			X
---	---	--	--	---

Correct →

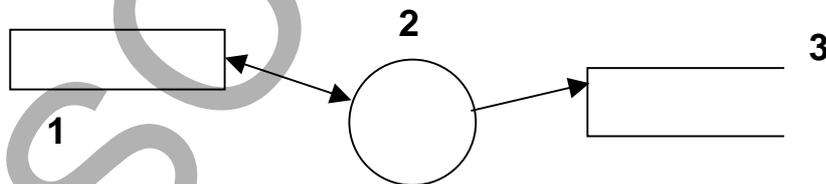
Section I

20 marks

Attempt ALL of Questions 1–20
Allow about 40 minutes for this section

Use the multiple-choice answer sheet
Select the alternative A, B, C or D that best answers each question

- 1 A company, which presently uses memos placed in named 'pigeon-holes' (shelf spaces) for daily communications, proposes a new system based upon email. Which of the following represents a likely social challenge?
- A Staff acquiring the necessary typing skills
B Staff acquiring the habit of checking for new mail
C Keeping permanent records
D Forwarding of replies to memos
- 2 Which of the following would NOT be expected when producing a prototype of a new system?
- A Clarification of participants' understanding of the system
B Generation of system screens
C Production of final output by the system
D Generation of reports to be printed by the system
- 3 Which of the following is a key potential advantage of a web-based tutorial over a CD-ROM based tutorial?
- A Cross-platform compatibility
B Opportunity for feedback from tutors
C Better quality graphics and animated segments
D Cost savings



- 4 Which items are labelled 1, 2 and 3 in the above context diagram?
- A External entity, process and data store
B Process, external entity and data store
C Data store, process and external entity
D External entity, data store and process

Use the following information to answer Questions 5–8.

The Sheriff's Office in NSW is responsible for organising citizens to participate as members of juries for court cases. Courthouses are located in Sydney and regionally throughout NSW. A relational database is used by the Office in Sydney to record names, contact details, previous jury service and the court in which that citizen is a juror. This central data can be accessed by each courthouse in the state via a network.

- 5 An entity forms part of the schema for any relational database. Which of the following are examples of possible entities for this database?
- A The first and second names of jurors
 - B The computer running the database and the file server hosting it
 - C The juror and the court
 - D The link between court case and juror and the link between juror and court number
- 6 Which of the following is an example of a suitable primary key field for the juror table?
- A Jury members' surnames
 - B Jury members' first names combined with their surnames
 - C Jury members' date of birth combined with surnames
 - D An invented numeric code uniquely assigned to each jury member
- 7 Urgent and accurate searches of this database are necessary, often by help desk operators at short notice. Which of the following is a suitable search method?
- A Trained database managers to perform the searches
 - B Query by example (QBE)
 - C Prepared reports
 - D Structured query language (SQL)
- 8 Network communication between the courts and the Sheriff's Office has been established. This network is known as which of the following?
- A An Ethernet network
 - B A WAN
 - C A LAN
 - D An ISDN network
- 9 A mobile phone company is conducting an online survey. As an internal check on data provided by those completing the survey, the date of birth stated on an application form is compared with an age in years stated on the survey. Which of the following describes this check?
- A Data redundancy
 - B Data verification
 - C Data accuracy
 - D Data validation

- 10** Which of the following is the most reliable error detection method?
- A Parity
 - B Cyclic redundancy checking
 - C Checksum
 - D Symbol substitution

Use the following information to answer Questions 11 and 12.

An SQL statement as follows generates a report from a flat file database used as part of a music store's CD catalogue system.

```
SELECT song_code, artist_firstname, artist_surname, release_year,  
FROM song_file  
WHERE release_year=2007 AND genre IS rock  
ORDER BY artist_surname DESC
```

- 11** Which of the following describes the final order of the artists in the report?
- A Artists alphabetically Z to A by surname
 - B Artists alphabetically A to Z by surname
 - C Songs alphabetically Z to A by title
 - D Songs alphabetically A to Z by title
- 12** Which of the following statements is true?
- A Output will be all songs released by each artist in the catalogue
 - B Output will be all rock songs released in 2007 by each artist in the catalogue
 - C Output will be all rock songs released by each artist in the catalogue
 - D Output will be all songs released in 2007 by each rock artist in the catalogue
- 13** Metalanguages are used to organise data as part of hypermedia functions in web pages. Which of the following is an example of a metalanguage?
- A The use of protocols for Internet communication
 - B The inclusion of images in web pages
 - C The use of a URL
 - D The use of HTML tags in web pages
- 14** Which of the following is a major disadvantage of free text Internet searching?
- A Incorrect matches in results returned
 - B Its slowness
 - C The return of irrelevant results
 - D The large numbers of results returned
- 15** Which of the following best describes a data warehouse?
- A The main collection of an organisation's computerised data
 - B A warehouse which stores an organisation's pre-computerised data
 - C A commercial supplier of useful data
 - D A collection of private data usually acquired illegally

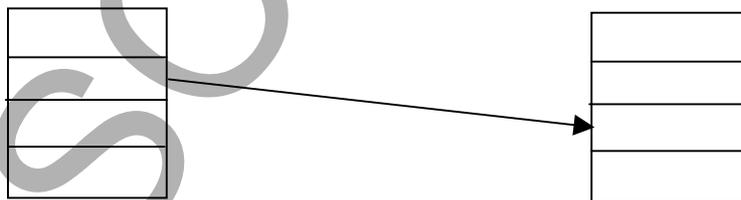
- 16 An arcade game called SNAKEZ has a gameplay design where players moving around a maze collect rewards to gain lives and lose lives when touched by poisonous snakes. The decision table shown below summarises the game's logic.

Conditions					
rewards collected > 5	✓	✗	✗	✗	✗
hit by > 3 snakes	✗	✗	✓	✗	✗
lives = 10	✗	✓	✗	✗	✗
lives = 0	✗	✗	✗	✓	✗
round wins = 3	✗	✗	✗	✗	✓
Actions					
announce win round add 1 to rounds	✗	✓	✗	✗	✗
announce end game	✗	✗	✗	✓	✓
win life	✓	✗	✗	✗	✗
lose life	✗	✗	✓	✗	✗
set rewards to zero	✓	✓	✗	✓	✗
set lives to zero	✗	✓	✗	✓	✗
add name to Hall of Fame	✗	✗	✗	✗	✓

How does a player win the game?

- A By collecting five rewards
- B By collecting 10 lives
- C By achieving 10 lives three times in the game
- D By collecting five rewards and winning 10 lives

- 17 The diagram shows the organisation of a database.



What organisation method is being used for this database?

- A Flat-file
- B Relational
- C Hypertext
- D Hypermedia

- 18** Which of the following lists methods of converting digital to analogue signals?
- A Parity, checksum and cyclic redundancy
 - B Modulation and demodulation
 - C Digitisation and demodulation
 - D Amplitude, frequency and phase modulation
- 19** Which of the following is true of email addressing?
- A BCC: field recipients can see all other email addresses specified in the BCC: fields
 - B All recipients can see all email addresses specified in the To: field, CC: field and BCC: field
 - C All recipients can see all email addresses specified in the To: and CC: fields. No recipients can see any other email address in the BCC: field
 - D No recipient listed in the BCC: field can see email addresses specified in the To: and CC: fields.
- 20** A student quotes material obtained from a website for an essay on the Iraq War. Which of the following should be taken into account by the student in the bibliography?
- A The source, date of composition and date of access of the site
 - B The site is likely to be inaccurate and out of date
 - C Quoting the site will involve plagiarism
 - D The content will need to be rewritten by the student in his/her own words

End of Section I

Section II

40 marks

Attempt Questions 21–24

Allow about 1 hour and 10 minutes for this section

Answer the questions in an answer booklet.

Begin each question on a new page.

Diagrams should be clearly labelled.

Marks

Question 21 (10 marks)

When a student heard that Australia’s Wonderland was to close, she conducted a personal survey of the theme parks she has visited in her life and recorded what she believed to be the major rides of each. She decided to arrange the details in two tables called PARKS and FEATURED_RIDE.

Part of the PARKS table is shown below.

Park	Theme	Address	Park Code	Featured_ride	return discount?
MovieWorld	Hollywood	Gold Coast Hwy	1	coaster	Y
Dreamworld	General	Gold Coast Hwy	2	tower	Y
Australia's Wonderland	General	Wallgrove Rd, Eastern Creek	3	coaster	N
Wet 'n Wild	Water	Gold Coast Hwy	4	slide	Y
Seaworld	Marine	Gold coast	5	coaster	Y

Part of the FEATURED_RIDE table is shown below.

Ride	Park code	Type_ride	Features
Lethal Weapon	1	coaster	outer loops, length
Tower of Terror	2	tower	acceleration, free fall
Demon	3	coaster	backwards loop, size & speed
Large slide	4	slide	dark tunnel, speed, water
Corkscrew	5	coaster	loop, triple corkscrew

Marks

- (a) Identify field(s) in the table(s) which would best be stored using a Boolean data type. **1**
- (b) Identify field(s) that could use data validation and describe the validation appropriate for each. **2**
- (c) Using the table, a search is made as follows for all parks located on the Gold Coast. This search yields no results for the section of the table displayed despite four parks existing on the Gold Coast. Give reasons for this and rewrite this SQL specification in order to achieve a correct result. **2**
- ```

SELECT Park
FROM PARKS
WHERE PARKS.Address = 'Gold Coast'

```
- (d) Data redundancy is evident in the two tables. Describe this redundancy and create a join of these tables by designing a suitable schema so the redundancy is eliminated. **3**
- (e) The student intends to leave the file on her home computer but wishes it to remain secure. Describe TWO methods of achieving data security. **2**

Question 22 (10 marks)

**Hi tech T-shirt really rocks**



It's called the WIS – the Wearable Instrument Shirt – and it is tipped to make the air guitar as obsolete as the horse and cart.

Scientists at the CSIRO's Textile and Fibre Technology division in Geelong have woven electronic sensors into a T-shirt so that it can be played liked a real guitar.

Movements by the wearer's arms are mapped and beamed by radio to a computer which interprets them and turns them into musical notes.

The wearer only has to act out playing the instrument to make sounds. "The left arm chooses a note and the right arm plays it," said Richard Helmer, a CSIRO chemical engineer who led the project. The arrangement can be reversed for left-handed musicians. "You can play with your hands above your head," said Dr Helmer. "You can turn around and jump. Whatever you like."

Exactly when the WIS could be on the market is not certain, but the CSIRO has already taken out patents and Dr Helmer has started work on a business plan for its commercialisation.

While Dr Helmer believed the market for the WIS could be enormous, the real objective was to let the public glimpse the future of intelligent clothing being developed by the CSIRO.

People wearing shirts with sensors could operate computers and play computer games without ever having to touch a mouse or a touch pad.

Richard Macey

(extract) *Sydney Morning Herald*, November 13, 2006

- (a) Identify the participants in this system and describe the purpose of the system. 3
- (b) Draw a diagram to show the hardware components in the WIS system, label them, and show how they are connected. 3
- (c) Examine the potential impact of the new system on guitarists. 2
- (d) The author has suggested another possible application of this technology apart from music. Describe TWO further possible applications. 2

Marks

**Question 23** (10 marks)

The term 'viral advertising' refers to a growing commercial concept where interesting, offbeat or 'fun' video clips, images and audio content are shared by people over the Internet but which contain carefully placed promotional content or brand names as part of their content.

The main strength of viral marketing is its ability to reach a large number of interested people at a very low cost.

- |     |                                                                                                                                               |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------|---|
| (a) | Identify and describe ways in which such viral content can be made widely available by advertisers at little cost.                            | 2 |
| (b) | Critically analyse the social impact of viral advertising.                                                                                    | 4 |
| (c) | The open nature of the Internet has both positive and negative consequences. Identify and discuss TWO positive and TWO negative consequences. | 4 |

**Question 24** (10 marks)

You are designing a new computer-based system for a friend's landscaping business which at present uses manual systems. The owner presently performs the following tasks manually and you will be recommending computer-based replacement approaches for each.

- manage finances
  - design and print landscape layouts
  - advertise
  - create promotional pamphlets
  - manage customers' details.
- |     |                                                                                                                                                                                                                                                                                        |   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| (a) | Compare and contrast each of the manual tasks named above with its computer-based equivalent approach.                                                                                                                                                                                 | 4 |
| (b) | Recommend and justify off-the-shelf software that will meet the needs of this business.                                                                                                                                                                                                | 3 |
| (c) | The owner does not wish to cutover to the new system instantly. He has asked that each stage be introduced separately.<br><br>Develop a strategy for the staged adoption of the new system and draw a Gantt chart to illustrate your strategy. Explain the reasons for your decisions. | 3 |

**End of Section II**

### Section III

40 marks

Attempt TWO questions ONLY from Questions 25–28

Allow about 1 hour and 10 minutes for this section

Answer each question in a SEPARATE answer booklet

Diagrams should be clearly labelled.

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Marks |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <b>Question 25 – Transaction Processing Systems (20 marks)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |
| (a) Transaction processing systems can use either batch or real-time processing. Explain which of these two approaches would be most suitable for each of the following systems and in each case justify your choice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |
| (i) An on-line system for a group booking a climb of the Sydney Harbour Bridge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2     |
| (ii) Annual summaries of school enrolment data sent to a state education office.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2     |
| (b) A multiple-choice computing skills exam is conducted by the Board of Studies for all students in Year 10. Schools are given a choice of two methods of delivery for this test: either pen and paper or on-line. Schools delivering the test on-line must set up and test a small utility application on the school server to assist in the delivery of the test. After each student logs in, test questions are delivered to candidates' computers from a dedicated Board of Studies server. As students confirm each response it is sent to and stored on this server.<br><br>Schools selecting the pen and paper delivery of the test have outside supervisors conduct a formal examination in a school hall or classrooms. |       |
| (i) Identify participants and users in the online system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2     |
| (ii) Draw a basic data flow diagram for this system, including both of the methods of test delivery in your diagram.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4     |
| (iii) A designer needs to consider carefully the definition of the boundary of this system. Define the boundary for the system outlined above and state why this is an important decision.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3     |
| (iv) Examine each method of test delivery in terms of its approach to processing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3     |
| (c) Discuss ONE technical, ONE social AND ONE ethical issue which would be relevant to such an online examination system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4     |

**Question 26 – Decision Support Systems (20 marks)**

The 20Q website was invented by Robin Burgener in 1996 based on work he began in 1988. A player thinks of an object and 20Q asks a series of questions to which the player usually answers ‘Yes’ or ‘No’. Other choices such as ‘Unknown’, ‘Irrelevant’ or ‘Probably’ are also possible.

A Help screen from the website and a typical game are reproduced below.

The 20Q website claims that 20Q guesses the secret object correctly about 80% of the time by asking only 20 questions. It also states that the game uses a neural network and every time one of the 30 000–50 000 daily users plays the game, it continues to ‘learn’.

A subset of data from the 20Q website has been captured in the form of a handheld toy, although this version does not ‘learn’ after each game.

When it guesses the player’s object incorrectly—something that happened frequently in the first months of the game’s use—the player types in the correct answer and that object becomes part of 20Q’s growing neural network. The Artificial Intelligence then looks back over all the questions it just asked and associates the player’s answers with the object it just learned. As more people play, 20Q gets better and better at understanding how each object is characterised.

Part of the 20Q website:

**20Q** the neural.net on the internet

**Play** **Game FAQ**

## Help

### Play

**To start...**  
Think of an object, it can be anything as long as it is general. A cat is a good object, but my cat, Pepper, would be a bad object.  
Once you think of an object, 20Q will ask you a series of questions that begin: "Is it Animal, Vegetable, Mineral, or Unknown?" When thinking of your object, keep in mind that Animal, Vegetable, and Mineral each have their own broader meaning. Take into consideration the primary substance of the object of which you're thinking. For example, if you're thinking of a jumper, and it's a wool jumper, you should answer "yes" to the "Is it Animal?" question (not to put too fine a point on it, but wool comes from sheep, and sheep are animals.) Answer "yes" to the Mineral question if you are thinking of a jumper made of polyester, because polyester is made mainly of petroleum products, and that's mineral based. If your jumper is made of cotton, you'd answer "yes" to the Vegetable question, because cotton is a plant.  
A tricky example might be an arrow: you'd answer "yes" to the Mineral question if you were thinking of an arrow made mainly of metal, but the choice is more difficult if you are thinking of an arrow with a wooden shaft, metal arrowhead and a vane made of feathers or plastic - a multiplicity of materials and a conundrum for the player. Make the choice you think is best.  
**Note** This game is "G" rated and is suitable for audiences of all ages.

### Answering a general question

You should be able to answer "Yes" or "No" to the rest of the questions. However, there are questions where the answer is not that simple. A horse is larger than a breadbox, but, water is not larger than a breadbox, neither is it smaller. Other questions seem silly: "Does a camel have four wheels?" No! And neither does a motorcycle.

**Yes** You are sure about your answer of Yes.  
**No** You are sure about your answer of No.  
**Unknown** You are unsure of how the question relates, or you don't know. The question will not be counted.  
**Irrelevant** The question does not apply to your object.  
**Probably** You are not sure but you think the answer might be Yes.  
**Doubtful** You are not sure but you think the answer might be No.

*"Intriguing, entertaining and downright spooky."  
The Tech. Museum of Innovation*

This is a printout of a typical 20Q game where the secret object was an egg:

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Is it Animal, Vegetable, Mineral, or Other? Animal.</li> <li>2. Does it have short fur? Irrelevant.</li> <li>3. Does it make a good pet? No.</li> <li>4. Can it scratch? No.</li> <li>5. Does it have ears? No.</li> <li>6. Does it have feelings? No.</li> <li>7. Does it dig holes? No.</li> <li>8. Does it breathe? No.</li> <li>9. Is it a specific color? Yes.</li> <li>10. Does it taste good fried? Yes.</li> <li>11. Do you use it in public? Sometimes.</li> <li>12. Does it roll? Yes.</li> <li>13. Can it be used in a pie? Rarely.</li> <li>14. Can it be dried? No.</li> <li>15. Does it reflect objects? No.</li> <li>16. Is it healthy? Sometimes.</li> <li>17. I am guessing that it is an egg? <b>Right!</b></li> </ol> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- |     |                                                                                                                                                                                                                                                                                                                                                                                                            |                                 |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| (a) | Compare structured, semi-structured and unstructured decisions support systems and give an example of each. Decide which type the 20Q site is.                                                                                                                                                                                                                                                             | <b>6</b>                        |
| (b) | <ol style="list-style-type: none"> <li>(i) Describe how the 20Q website could use the principles of a neural network to guess that the object in the example above was an egg.</li> <li>(ii) Describe how 20Q could acquire new facts about an egg.</li> </ol>                                                                                                                                             | <p><b>4</b></p> <p><b>4</b></p> |
| (c) | <p>A General Practitioner in a large medical centre proposes customising the 20Q application for the field of medical diagnosis. The doctor wishes to have patients complete a 20Q session consisting of 20 diagnostic questions about their symptoms while in the waiting room.</p> <p>Discuss the technical, social and ethical issues which should be considered before considering implementation.</p> | <b>6</b>                        |

**Question 27 – Automated Manufacturing Systems (20 marks)**

- (a) (i) Describe the differences between an actuator and a sensor and give an example of an actuator. **3**
- (ii) Identify THREE types of sensors used in Automated Manufacturing Systems and state how each could be used. **3**
- (b) A low voltage garden fountain pump uses three controls. It is solar powered and the low voltage mains supply exists only as backup when the batteries have not been sufficiently charged by solar energy through the day.
- The first control senses water level. This shuts off the pump if the water level drops too low.
- The second control shuts the pump off if the input filter gets too clogged with silt or leaves. This prevents the pump motor burning out.
- The third control turns the mains supply on if the solar batteries are not charged sufficiently.
- (i) Draw a block diagram for this system. **4**
- (ii) Describe with the aid of diagrams the effects of overdamping and underdamping on the system in terms of the first control and identify the most stable situation. **4**
- (c) A major botanic garden has a pond with a waterfall fed by a small creek. Issues of global warming, power consumption and an unreliable water supply have caused the management of the botanic garden to consider adapting the fountain pump described above and its technology for use in the botanic garden.
- Discuss the technical, social and ethical issues which should be considered before implementation of the system. **6**

**Question 28 – Multimedia Systems (20 marks)**

- (a) (i) Compare and contrast CRT and LCD as screens for multimedia displays. **3**
- (ii) Outline the major fields of expertise required in the development of a typical multimedia application. **3**
- (b) Adrian is a student who is a member of a group producing a multimedia project. The group has decided upon a theme of body image and has produced a storyboard upon which all members have agreed.
- The group's concept is to show that people with a wide range of body shapes can perform unique feats and possess unique abilities. The group has acquired film clips of the world's tallest man reaching into a dolphin's throat to retrieve swallowed plastic, a large woman throwing a winning Olympic shot put, a small man as a champion jockey winning a horse race and physically challenged men and women as champion Para-Olympians.
- Media acquired by the group include animations, digital movies, 2D and 3D graphics, music background clips.
- The class teacher has asked each group to present the final product to the class. The group has suggested that the final multimedia presentation should be authored using PowerPoint, a product with which other members of the group are familiar and feel comfortable. Adrian however feels this would limit the potential impact of the final project.
- (i) Critically analyse the strengths and weaknesses of the group's proposal to author the title using PowerPoint. **5**
- (ii) Identify and discuss TWO alternative approaches to authoring the project. **3**
- (c) Discuss the technical, social and ethical issues which should be considered before presentation of the multimedia project to the class. **6**

**End of paper**

**Section I – Multiple choice**

**Answer sheet**

|           | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----------|----------|----------|----------|----------|
| <b>1</b>  |          |          |          |          |
| <b>2</b>  |          |          |          |          |
| <b>3</b>  |          |          |          |          |
| <b>4</b>  |          |          |          |          |
| <b>5</b>  |          |          |          |          |
| <b>6</b>  |          |          |          |          |
| <b>7</b>  |          |          |          |          |
| <b>8</b>  |          |          |          |          |
| <b>9</b>  |          |          |          |          |
| <b>10</b> |          |          |          |          |
| <b>11</b> |          |          |          |          |
| <b>12</b> |          |          |          |          |
| <b>13</b> |          |          |          |          |
| <b>14</b> |          |          |          |          |
| <b>15</b> |          |          |          |          |
| <b>16</b> |          |          |          |          |
| <b>17</b> |          |          |          |          |
| <b>18</b> |          |          |          |          |
| <b>19</b> |          |          |          |          |
| <b>20</b> |          |          |          |          |

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