Cambridge Assessment International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/01**

Paper 1 Theory **For examination from 2022**

MARK SCHEME

Maximum Mark: 70

Specimen

This document has **10** pages. Blank pages are indicated.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

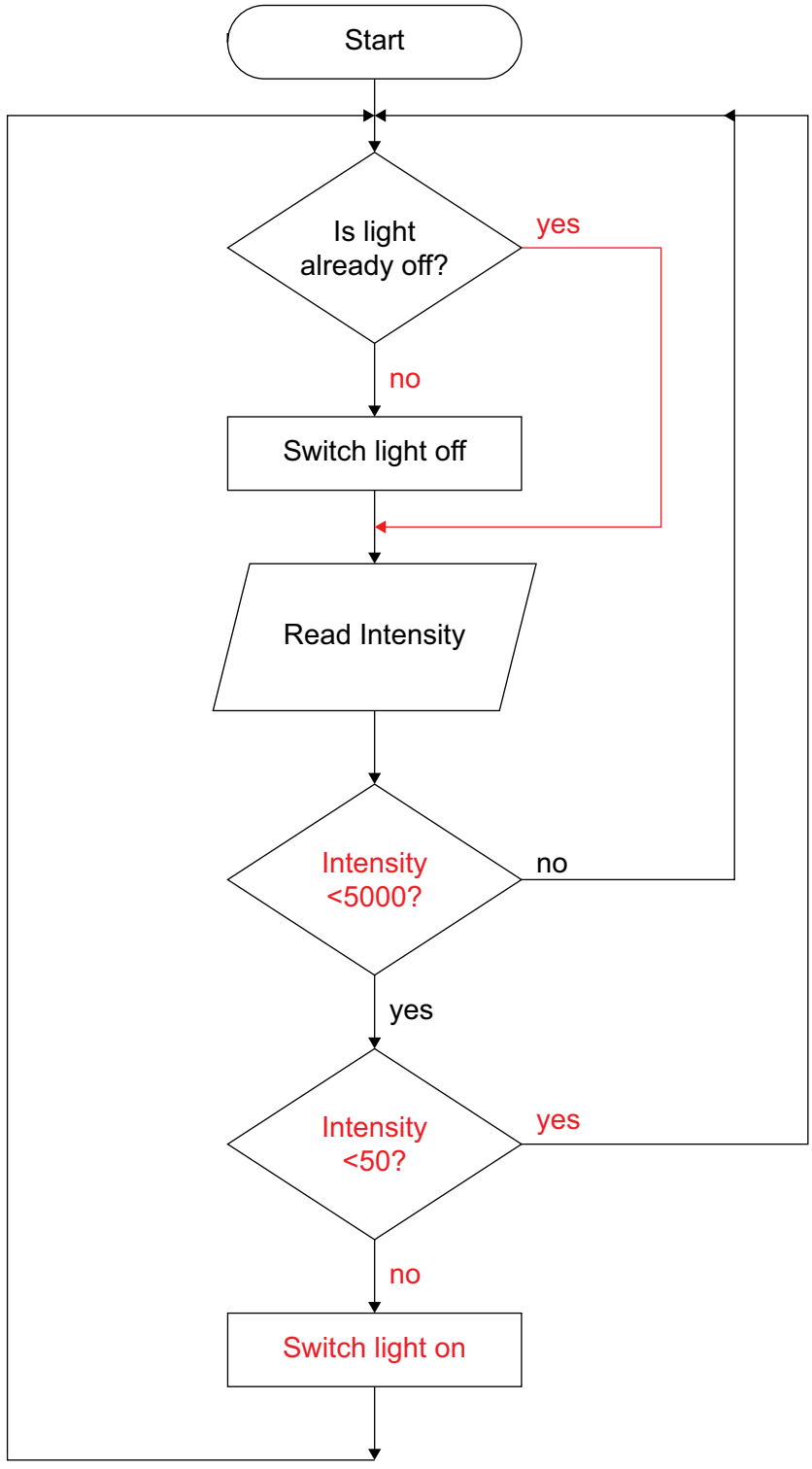
GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)	**Two** from: Millions of instructions per second It measures the performance speed of a mainframe computer's CPU Does not take into account input/output speeds so can be unreliable Is often used in terms of MIPS per unit cost Is more often used when measuring performance of computers involved in running database queries, word processing or spreadsheet software	**2**
1(b)	**Two** from: Floating point operations per second Useful in measuring performance of computers where scientific/complex calculations need to be carried out Modern supercomputers, performance is measured in petaflops/quadrillion of flops Does not take into account CPU's clock speed, bus speed, and the amount of RAM available so can be unreliable	**2**
1(c)	**Two** from: Used to describe the ability of a computer system to continue to operate when there is a failure in one part of the system This ability may be provided by software, hardware or a combination of both The greater the fault tolerance the lower the degree of reduction of throughput The lower the fault tolerance the greater the increase in response time	**2**

Question	Answer	Marks
2(a)	**Three** from: Both involve the use of telephones to trick the customer Both attempt to gain personal information Both are methods used to attempt to defraud a bank customer of money Both are used in identity fraud to open up new lines of credit Both can involve the use of good news such as a lottery win	**3**
2(b)	**Three** from: Vishing involves calling the customer whereas smishing is the use of text messages Vishing involves the customer having to respond immediately to the caller Smishing involves the sending of a website link or telephone number Smishing allows the user more time to check the veracity of the message	**3**

Question	Answer	Marks
3(a)	**Two** from: Motors to open/close windows in glasshouse Actuator to operate a water solenoid valve to activate air spray to increase humidity Actuator to operate a water solenoid valve to activate water hose to water plants Actuator to operate a fan Actuator to switch on/off heaters	**2**

Question	Answer	Marks
3(b)		**6**

Is light already off? Yes/no in correct place – 1 mark
Line joins to correct place in flowchart – 1 mark
Intensity <5000? – 1 mark
Intensity <50? – 1 mark
yes/no in correct place – 1 mark
Switch light on – 1 mark

Question	Answer	Marks
4	**Eight** from: **Advantages of direct data sources** Only as much or as little data is gathered as needed Where the data came from is known exactly and therefore how reliable it is There may be an opportunity to sell the data for other purposes **Disadvantages of direct data sources** It may be more expensive as companies may have to be hired to collect the data It may be more expensive as data loggers and computers may need to be purchased Travelling expenses and time taken to collect data may be greater By the time the project is complete the data may be out of date **Advantages of indirect data sources** Indirect data sources may allow a larger set of data to be examined A larger sample size can be used Information may be of a higher quality as it has already been collated and grouped into meaningful categories Poorly written responses to questionnaires or interview transcripts do not have to be read through to create the data source **Disadvantages of indirect data sources** The various purposes for which data was collected originally may be quite different to the building of a road in this area and unnecessary data may need to be filtered out There may be no data available since this may be the first road to be built in the area There may be sampling bias as data from only one section of the community may have been collected There may be coding difficulties as the purpose for which the data was collected may not be the same as building a road in this area If it has already been coded the coding may be difficult to understand Indirect data sources may also vary in reliability, depending on who collected the data and how old the data are Must have advantages and disadvantages of both to gain full marks	**8**

Question	Answer	Marks
5(a)	**Three** from: People in rural areas tend to have lower incomes and are less able to afford technology devices Broadband speeds are lower than in urban areas Telecommunication facilities are less readily available in rural areas Lower incomes in rural areas make it less appealing for investments by technology providers Rural areas lack the infrastructure for technology companies to build on without heavy investment Fibre connection costs are much higher for companies to provide in rural areas	**3**

Question	Answer	Marks
5(b)	**Three** from: The government could subsidise internet access for low-income households The government could provide schools, libraries and rural health care providers with network wiring and access to both telecommunications and internet services Greater provision of internet cafes Schools could allow adults access to technology facilities in the evenings and during school holidays Schools could provide teaching and training to adults to improve their skills	**3**

Question	Answer	Marks
6	**Six** from: Both are methods of reasoning used by an inference engine Both use a rules base to attempt to solve problems Both involve the output of one rule activating another rule Forward chaining is bottom-up reasoning/backward chaining is top-down reasoning Forward chaining starts with a set of known facts and applies rules to generate new facts Forward chaining continues until it reaches a predetermined goal Forward chaining checks the facts against the predetermined goal Forward chaining is data driven rather than goal driven With forward chaining data determines which rules are used in a rules base With backward chaining goals determine which rules are used in a rules base Backward chaining starts with a goal or hypothesis and looks for rules to support the hypothesis Backward chaining can either support or reject an hypothesesis	**6**

Question	Answer	Marks
7(a)	**Two** from: To remove unwanted footage from a video To reduce the length of a video To reduce the storage space required to store the video	**2**
7(b)	**Two** from: The video may have a start and end that may feel very abrupt Fading can make it look smoother by adding a fade-in effect for the beginning and fade-out effect for the end It gives your video a more professional look and feel	**2**

Question	Answer	Marks
8(a)	**Two** from: Special relational database table column (or combination of columns) used to uniquely identify all table records It must contain a unique value for each row of data It cannot contain null values	**2**

Question	Answer	Marks
8(b)	**Two** from: A column or group of columns in a relational database table Provides a link between data in two tables Acts as a cross-reference between tables because it references the primary key of another table and establishes a link between them Can contain duplicate values	**2**

Question	Answer	Marks
9(a)	**Six** from: *Read first record in transaction file* *Read first record in old master file* *WHILE not end of transaction file DO* *IF transaction file ID number = master file ID number THEN* IF Transaction = “I” OR Transaction = ”A” THEN Write transaction file record to new master file ELSE read next master file record ELSE write master file record to new master file Read next transaction file record ENDWHILE Write remaining master file records to new master file Alternative solutions are possible	**6**
9(b)	**Four** from: For large systems the hardware required can be cheaper to buy than that in an online system Batch processing can be carried out at a time when the computer would not normally be used ... ... so a company can get more work out of the computer hardware it owns Batch processing moves the time of processing to when the computing resources are less busy Batch processing requires less human supervision and input ... ... reduces the staff costs for the data operators The transaction file can be set up when it is more convenient to the person entering the data Online processing is designed for continual input, processing and output whereas there are fewer occasions for input with payroll	**4**

Question	Answer	Marks
10	**Four** from: Custom written software has code specifically written for the task/off-the-shelf software has to be adapted to suit the task Custom written software has limited testing according to what the programmers think may be required/off-the-shelf has been rigorously tested by the developers so it is less likely to have any bugs With custom written software support is limited to the team of programmers only/off-the-shelf software will have many sources of support including helplines with operators who will already have had to deal with a wide range of problems Can take a long time to develop custom written software/off-the-shelf software will be available straight away Custom written software will have no unnecessary features/off-the-shelf software may have several distracting extra features unsuitable for the use it is to be put to Custom written software, unlike off-the-shelf software will have programmers available to make any changes required Off-the-shelf software is relatively cheap to buy as it is mass produced/custom written software can be expensive as a team of programmers have to be paid You own the custom written software but with off the shelf you have to buy a licence	**4**

Question	Answer	Marks
11	**Eight** from: **Advantages** The running costs of fuel and tyres are greater than the running and maintenance costs of a car driving simulator The environment benefits from driver training in a simulator, as there is less pollution created by a driving simulator Situations can be created in a driving simulator without putting the trainee and the training instructor in danger If there is an accident there is no cost to repair car bodies as there would be in a real car Emergency procedures such as adverse weather conditions can be more easily/quickly produced or recreated in a driving simulator Overuse of parts such as the clutch and brakes can cause damage to real car parts but not in the simulator **Disadvantages** The simulator response will not always be exactly the same as an car, as there are too many variables Not every car driving situation can be replicated Sometimes drivers become bolder/more overconfident after training on the simulator and can go on to make mistakes in real driving situations leading to car damage/driver injury Amount of stress a car driver would be under in heavy traffic is very difficult to be created Initial cost is very expensive Simulator sickness affects many people learning to drive more so than motion sickness in a real car 1 mark is available for a reasoned conclusion/opinion Must have advantages and disadvantages to gain full marks	**8**

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