

Grade 11 Markscheme

Question 1

(a)

Temperature

- central heating / air con system
- greenhouse environment
- a chemical reaction / process

[1]

(b)

Magnetic field

- anti-lock brakes on a car
- detection of motor vehicles (e.g. at traffic lights)
- reading magnetic ink characters on cheques
- geophysical surveys

[1]

(c)

Motion

- automatic doors
- burglar alarm

[1]

Question 2

1 mark for task and 1 mark for description

Memory management

- Controls the use of memory space in the primary memory
- Keeps tracks of which part of memory are currently being used and by which process
- Allocates and de-allocates memory space as needed etc

Processor management

- ensures that each process receives enough processor's time
- arranges jobs that need to be processed to maximise use of processor and throughput
- create, delete, cancel and resume process

File management

- Load/save
- Search
- Delete
- Copy
- Merge
- Calculate file size
- Maintain file allocation table etc

Accept any other valid task

(b)
RAM
Buffer [1]

Question 3

- (a)
- direct access because of concentric tracks
 - can read and write at the same time because it has a read/write head [2]
- (b)
- (i) solid state media, magnetic media [2]
- (ii) USB flash disk, SSD, etc [2]
Magnetic tape, hard –disk etc [2]

Question 4

- (a) 7D [1]
- (b) 5F [1]
- (c) (000)1 0000 1101
1 mark 1 mark 1 mark
- (d) - easier to spot errors
- Easier to identify values [2]
- Accept other valid answers**

Question 5

(a)
Either of the three options, **resistive**, **capacitive** or **infra-red** must be chosen
maximum of **two** marks from chosen technology:

resistive

- uses multiple layers of material ...
- ... that transmit electric currents
- when the top layer/screen is pushed/touched into the lower/bottom layer ...
- ... the electric current changes and location of “touch” is found

capacitive

- current sent/flows out from all 4 corners of the screen
- when finger/stylus touches screen, the current changes
- the location of “touch” is calculated

infra-red

- an “invisible” grid on the screen (pattern of infra-red LED beams)
- sensors detect where the screen has been touched through a break in an infrared beam(s)
- the position where the screen touched is calculated [2]

(b)

1 mark for **benefit**, 1 mark for **drawback**

Resistive

benefits:

- inexpensive/cheap to manufacture
- can use stylus/finger/gloved finger/pen

drawbacks:

- poor visibility in sunlight
- vulnerable to scratching
- wears through time
- does not allow multi-touch facility

capacitive

benefits:

- good visibility in sunlight
- (very) durable surface
- allows multi-touch facility

drawbacks:

- screen (glass) will shatter/break/crack (on impact)
- cannot use when wearing (standard) gloves

infra-red

benefits:

- good durability
- allows multi-touch facility
- can use stylus/finger/gloved finger/pen

drawbacks:

- expensive to manufacture
- screen (glass) will shatter/break/crack (on impact)
- sensitive to dust/dirt

[2]

Question 6

(a) hours: 18

minutes: 53

[2]

(b)

hours ("C")

minutes ("D")

0	0	0	0	0	1	1	1	:	0	0	0	1	1	1	1	0
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[2]

(c) Any **three** from:

- reads values in registers "C" and "D"
- and checks the values against those stored in registers "A" and "B"
(NOTE: the first two statements can be interchanged, i.e. "A" and "B" read first)
- If values in corresponding registers are the same
- the microprocessor sends a signal to sound alarm/ring

[3]

(d) Any **three** from:

- uses a light sensor
- sends signal/data back to microprocessor
- signal/data converted to digital (using ADC)
- value compared by microprocessor with pre-set/stored value
- if value < stored value, signal sent by microprocessor ...
- ... to the voltage supply (unit)
- ... "value" of signal determines voltage supplied/brightness of LED

[3]

(e) **RAM**

- stores the current time
- stores the settings (e.g. alarm time)

ROM

- stores start up procedure in case power lost to the clock
- stores instructions to operate clock

[2]