

Grade 12 Main MARK SCHEME

Subject: Computer Science

Question Number	Scheme	Marks
1 (a)	<p>ONE mark for each difference from the bullet points below.</p> <ul style="list-style-type: none"> • RAM loses content when power turned off /volatile memory/temporary memory ROM does not lose content when power turned off/non-volatile memory/permanent memory • Data in RAM can be altered /deleted /read from and written to ROM is read only/cannot be changed / altered / deleted • RAM stores files /data/operating system currently in use ROM is used to store BIOS/bootstrap/pre-set instructions 	2
(b)	<ul style="list-style-type: none"> • DRAM has to be refreshed / charged // SRAM does not request a refresh • DRAM uses a single transistor and capacitor // SRAM uses more than one transistor to form a memory cell // SRAM has more complex circuitry • DRAM stores each bit as a charge // SRAM each bit is stored using a flip-flop/latch • DRAM uses higher power (because it requires more circuitry for refreshing) //SRAM uses less power (no need to refresh) • DRAM less expensive (to purchase/requires fewer transistors) // SRAM is more expensive (to buy as it requires more transistors) • DRAM has slower access time/ speed (because it needs to be refreshed) // SRAM has faster access times • DRAM can have higher <u>storage/bit/data</u> density // SRAM has lower <u>storage/bit/data</u> density • DRAM used in main memory // SRAM used in cache memory 	3
2 (a)		2

	<p>Any two from</p> <ul style="list-style-type: none"> • The hardware is unusable without an OS // hides complexity of hardware from user • Acts as an interface / controls communications between user and hardware / hardware and software • Provides software platform / environment on which other programs can be run 	
(b)	<p>Any two from:</p> <ul style="list-style-type: none"> • Process / task / resource management • Main memory management • Peripheral / hardware / device management • File / secondary storage management • Security management • Provision of a software platform / environment on which other programs can be run – only if not given in part (b)(i) • Interrupt handling • Provision of a user interface run – only if not given in part (b)(i) 	2
© (i)	<ul style="list-style-type: none"> • A DLL file is a shared library file • Code is saved separately from the main .EXE files • Code is only loaded into main memory when required at run-time 	2
(ii)	<ul style="list-style-type: none"> • The DDL file can be made available to several applications (at the same time) <p>ONE mark for each benefit, and ONE mark for a further expansion.</p> <ul style="list-style-type: none"> • The executable file is smaller / the executable does not contain all the library routines ... • ... DLL files are only loaded into memory when required. • Changes / improvements / error correction to the DLL file code are done independently of the main program... • ... So there is no need to recompile the main program • ... All programs using it will benefit 	2
(iii)	<ul style="list-style-type: none"> • A single DLL file can be made available to several application programs... • ... Saving space in memory / easing the pressure on memory 	2

	<p>ONE mark for each bullet point from MAX ONE group.</p> <ul style="list-style-type: none"> • The executable code is not self-contained ... • ... the DLL file(s) needed to be included at run time. • Appropriate (linking) software must be available at run-time ... • ... to link/include/import the DLL files. • The DLL file must be present ... • ... otherwise (unable to find X.dll) errors • Unexpected changes to the DLL file/corrupted DLL file ... • ... could mean the program stops working as expected • Malicious changes to the DLL file ... • ... could install a virus on the user's computer/related files could be corrupted 	
3 (a)	<p>(i) 127</p> <p>(ii) 123</p> <p>(iii)- Easier to understand/read - Easier to find errors</p>	1 1 1
(b)	<p>(i) 1 0 0 1 1 0 1 0</p> <p>(ii) 1000 0010</p> <p>(iii)- 53</p>	
©	2 bytes	
4	<p>1 mark for each device + 1 mark for corresponding reason</p> <p>input</p> <p>touch screen</p> <ul style="list-style-type: none"> - to choose where to sit in cinema - select payment options - select number of seats <p>keypad</p> <ul style="list-style-type: none"> - to input PIN - to input number of seats <p>magnetic stripe reader/card reader</p> <ul style="list-style-type: none"> - to read data from credit card/debit card when making payment <p>sensors</p> <ul style="list-style-type: none"> - to count/recognise money if paying by cash for tickets 	8

5

output

printer

- to print the tickets/receipt

screen

- instructions to the customer
- show prices of tickets
- show available seats on seating plan
- show which films are showing that week

speakers

- to indicate an error or that purchase procedure is OK

	A	B	C	D
	primary memory storage	magnetic secondary storage	optical secondary storage	solid state secondary storage
DVD – RAM			✓	
ROM	✓			
hard disk		✓		
flash memory				✓

1 mark for each correct tick

(b)

(i) A

(ii) B

(iii) C / D (If both ringed here then still award a mark)

©

1 mark for a benefit and 1 mark for a drawback

benefit

- faster start up speed (no “spin-up” required)
- no moving parts (so more robust)
- very fast read write seek (latency) times
- doesn’t require additional read/write hardware devices (just plugs into USB)
- can store data indefinitely provided that it is periodically refreshed

drawback

- vulnerable to magnetic fields and electrostatic charges
- limited write cycles
- more vulnerable to corruption if used as primary source of saving files
- because it is small, very easy to lose

4

[8]

6

1 mark for each correct box ticked.

Program	True	False
Database		✓
Virus checker	✓	
Web browser		✓
Backup software	✓	

1 mark for each valid utility program to max 2

e.g.

- System clean up
- Automatic update
- Disk contents analysis / Disk checking / Disk repair
- File compression
- Disk formatter
- Firewall
- Disk Defragmenter