

June 2003

A AND AS LEVEL

MARKING SCHEME

MAXIMUM MARK: 90

SYLLABUS/COMPONENT: 9691/01, 5216/01

COMPUTING
Written Paper 1



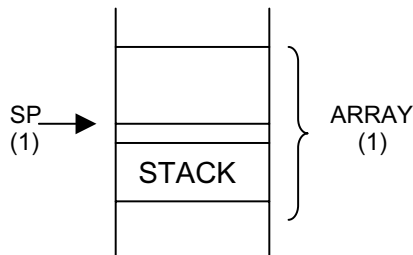
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- 1 (a)** - OS controls operation of system/hardware
- Applications software allows the system to do something useful (2)
- (b)** - File handling
- Copy/move/delete
- Anti virus software
- To protect files from attack by virus
- Defragmentation
- To keep files sensibly arranged on the hard drive
- Format
- To divide surface of drive into smaller areas to aid storage
(1 per -, max 6) (6)
- 2 (a)** (i) Jobs collected together for processing at a later time
(ii) Output produced quickly enough to affect the next input
(iii) User has direct contact with processor
(iv) User cannot communicate directly with processor (4)
- (b)** - Real time
- E.g. turning the wheel must turn the car immediately
- On line
- Otherwise system cannot be real time (4)
- (c)** - Sharing of software and data files
- Sharing of hardware, e.g. printers
- Communication
- Security of files more of a problem
(1 per -, max 3) (3)
- 3 (a)** (i) Incorrect use of language, e.g. PLINT instead of PRINT
(ii) A mistake in the structure of the solution, e.g. a jump goes to the wrong line
(iii) Inappropriate arithmetic is used, e.g. division by 0 is attempted (6)
- (b)** - Translator diagnostics
- Produced when wrong programming used
- Gives position and explanation of error
- Cross-referencing
- Used when program modularised
- To check use of variables
- Trace routines
- Follow value of variable
- To give clue as to where error occurs
- Variable dump
- Prints values of all variables
- At given point in program
(1 per -, max 2 per type, max 4) (4)

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- 4 (a)** - Data enters at one end (of a stack)
 - Leaves at the same end
 - Hence 'last in, first out'
 (1 per -, max 2) (2)

(b)



(2)

- 5 (a)** - Uses all 7 digits
 - Creates >2000 results
 - Highlight the danger of multiplying by zero (2)

(b) Any two 7 digit numbers that cause a clash (1)

- (c)** - Search serially from hash value
 - Until vacant location found
 - Mention of circular reference
 - If the memory locations become full, use a bucket
 - Use bucket to place duplicates in
 - In serial form
 - Pointer to bucket from hashed location
 - Use hashed location as start of linked list
 - Ensure end of list with null value of pointer
 (1 per -, max 2 methods, max 4) (4)

- 6 (a)** (i) To manage the execution of instructions
 By running a clock
 To decode instructions
 (ii) To store OS
 To store those parts of applications programs currently running
 To store data currently in use
 (iii) Part of processor where data is processed/manipulated
 All I/O must pass through here
 (1 per -, max 2, 2, 2, max 6) (6)

- (b)** - Main memory transitory, secondary storage is (semi-)permanent
 - Processor can only use data/instructions that are in main memory
 - Main memory in processor, secondary storage not
 (1 per - max 2) (2)

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- 7 (a)**
- Serial is the transmission of data one bit at a time/through one wire
 - Parallel is the transmission of data more than one bit at a time/many wires
 - Simplex is the transmission of data in one direction only
 - Duplex is the transmission of data in both directions simultaneously (4)
- (b)**
- Extra bit on each data-byte that
 - Does not transmit data
 - Makes number of ones in a byte be always even or always odd
 - Error in the transmission of a bit will make the even/odd wrong
 - Problem of two errors in one byte not being found
 - Parity block
 - (1 per -, max 4) (4)
- 8**
- College authorities are the experts in the problem
 - SA is the expert with computers
 - The two need to pool resources to come up with a clear definition
 - Agree the outcomes so that when the system is implemented there are a set of criteria to judge it by
 - (1 per -, max 4) (4)
- 9 (a)**
- Corporate colour scheme
 - Languages to be used
 - What information should be on
 - Should the site be two way/students allowed to enroll
 - Size of the site
 - What links should there be?
 - (1 per -, max 4) (4)
- (b)**
- Presentation software
 - Talks to large groups
 - DTP
 - Produce newsletter/advertising material
 - Word processor
 - Mail merged personal letters/junk mail
 - Database
 - To store lists of the recipients of the junk mail
 - (1 per -, max 4) (4)
- 10**
- A description of:
- Passwords
 - Hierarchy
 - Only allow some staff to access student files
 - Only some machines able to access
 - Physical location of these machines
 - Physical lock on machines
 - Encrypted data in files
 - Firewall if connected to the Internet
 - (1 per -, max 5) (5)

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- 11** (i) Dual input of data
Two inputs are compared by the system
And any discrepancies reported (and not stored.)
Data input once, either printed out or checked on screen
Errors corrected
- (ii) Rules given to processor
Only accept A,B,C,D,E,F,G
Any other input rejected.
Drop-down list/radio buttons
Provides only valid inputs
So no other validation required
- (1 per -, max 6) (6)
- 12** Enrolment:
- Data input on line
- Individual records validated
- Speed mismatch implications
- Indexes updated immediately
- Exam grades:
- Data input twice
- Off line
- Run as a batch
- At otherwise downtime
- (1 per -, max 6) (6)
- 13** - Day to day information supplied to teachers
- About abilities of students
- Class lists
- Middle managers
- E.g. departmental exam results
- Strategic information
- Supplied to Principal
- E.g. overall exam results to compare performance of departments
- Comparison of grades year on year
- (1 per -, max 5) (5)
- TOTAL 90**