COMPUTER STUDIES

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Paper 1276/1
Written
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General comments

Generally the question paper was well answered. Most candidates still have a problem with the algorithm and teachers are once again encouraged to allocate more time to do algorithms. Although it is not expected of candidates to actually write a program in any question paper, teachers need to do programming with HIGCSE candidates. It will help them in answering questions on algorithms as well as in projects.

1.   (a)   Most candidates knew the difference between RAM and ROM.

- Data stored in ROM is not volatile/that in RAM is volatile.

- ROM tends to be smaller in capacity/unless dealing with small devices using little data.

   (b)   The first part of no. (i) and (ii) was answered well by the majority of candidates, but only a few were able to explain why RAM and ROM are appropriate in their use.

      (i)   - Store OS/Data/Instructions/Program currently in use.

             - When no longer required it can be erased to allow space for other data.

      (ii)   - Boot program.

             - Will always be present when switched on.

   (c)   Some candidates did not know that virtual memory makes use of paging. It is not a separate type op memory.

- Software/data divided into pages....

- Each of same size.......

- Logically.

- Different pages loaded into memory when needed.....

- Starting with most commonly used pages.

- Locations of pages stored in table...

- Which is also used for addressing

- Some pages stored on fast access storage....

- Which allows pages to be input to memory very quickly.

- OS makes decision about likely page required next.

- Too much swapping leads to disk thrashing.

2.   (a)   This question was well answered.

- Imperative states a list of instructions and the order in which to carry them out.

- Declarative supplies rules and facts which are applied to produce a result.

   (b)   Most candidates were not able to explain what is meant by an object-oriented design.

- Data and operations to be performed on the data....

- Chronological output of data/to allow staff to study timeline.

- Emergency warning of some type/to provide immediate warning of serious weather.

- Historical data (comparative statistics) to allow analysis of accuracy of forecasting. (2 per -, max 3-, max 6).

4. The words "just in time" confused some candidates. The question was just about a normal stock control system.

    (a)   - System is set to initial values of stock on shelves.

            - When an item is bought its type is input to system...

            - Which decrements the number available

            - New value is compared to ....

            - Preset parameter (and decision made).

            - Which is set as low as is feasible.

            - If lower than parameter, preset volume reordered....

            - If not already ordered.

    (b)   - Loyalty cards....

            - Payment cards/Credit/Debit.

            - Store data about customer and....

            - Customer purchases/bank/payment details.

            - Read at checkout.

            - Supermarket can use data to find out relative popularity of items.

            - Know who has purchased items for marketing purposes.

            - Fliers/promotions/sales events.

5. Most candidates could explain the difference between a compiler and an interpreter, but were not able to state when both should be used.

    (a)   - Compiler translates entire code before allowing it to be run/interpreter runs each translated line of code before translating the next.

            - Compiler produces object code/interpreter must maintain source code.

            - Compiler will produce error diagnostics in one go/interpreter will run program until an error is found.

    (b)   (i)   - interpreter used during writing of software because ....

                    - Simpler debugging techniques/more accurate and informative diagnostics produced.

            (ii)   - Compiler used to produce final version of game for sale because...

                    - More difficult to change or copy/will run faster because no further translation necessary.

    (c)   This question was fairly well answered except that hardly any candidates used the A and = as part of the expressions.

- Are held in the same structure called an object.....

- Which are grouped together in classes....

- Which can be related to each other.

(c)   Candidates were able to state the errors, but not to suggest a correction.

- Count or condition wrong (allows 4 numbers)/Sensible solution e.g. COUNT<3.

- Condition X>9 wrong/should be X >=9.

- Output X will output the square/should be OUTPUT NUMBER.

(d)   This whole question was poorly answered by the majority of candidates.

    (i)   - A set of instructions/a subprogram.

          - Which can be called from another code.

          - Which carries out a defined task.

    (ii)   - It returns a single value.

    (iii)   - NUMBER.

          - Value/Reference.

          - Because NUMBER is needed again after the call to the function and must therefore not change within the function/NUMBER may, in final algorithm, be input to procedure by reference.

3.   This question was well answered, accept for no. (c) which was misinterpreted by most of the candidates.

(a)   - Data (collected by sensors) is stored....

- on a temporary storage device/hard drive/tape.

- At regular intervals.....

- e.g. (anything sensible) between 2 hrs and 12 hrs (factor of 24)

- Data sent to national centre by....

- Radio/landline...

- In response to signal from national centre

(b)   (i)   - More than one instruction/operation can be carried out at a time.

          - Need for a different type of OS/Need for specially written oftware.

    (ii)   - Large number of calculations to be done.

          - The more calculations possible, the more accurate the forecast.

          - Time sensitive calculations....

          - Because forecast only relevant for one day.

(c)   - Graphical display/for T.V. forecast/to make the forecast easy to understand.

- Tabular output/to arrange statistical data/to allow staff to interrogate data.

- Chronological output of data/to allow staff to study timeline.

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        (i)   ABAC +=

        (ii)   A2B*=

        (iii)   A2BC+*3D-=

6.   The candidates who did well in their projects, were able to answer Question 6 very well.

    (a)   (i)   - Data structures used/Relationships between tables/to explain relationships between data and how they are held.

            - Input and output screen designs/allow for adaptation by technicians

            - Data dictionary/contains details of structure of data/needed when necessary to alter way data is stored.

            - Data flow/diagrams or logic defining how data is used/negation paths through system.

            - Flow charts/to explain the logic of the system.

            - Specification of hardware/including full hardware requirements/to ensure hardware is able to run system.

        (ii)   - Copy of file.

            - Held on other medium.

            - In case of damage to original file.

            - Multiple copies.

            - Taken at regular intervals.

            - Kept away from original.

    (b)   - Perfective/maintenance designed to improve the performance of the software.

        - Adaptive/maintenance designed to alter the software in order to make it work if the original conditions are altered.

        - Corrective/maintenance necessary because faults have been found in the software during use.

7.   Question 7 was very well answered.

    (a)   - Loss of privacy of information.

        - May lose jobs.

        - May not be able to learn new methods.

        - Knowledge/experience of old system may be wasted.

        - Loss of seniority.

        - Time necessary to do training.

        - Use of new technology may be inappropriate if there is disability.

    (b)   - Do not have to pay for training.

        - Training can be staggered/done outside work time.

        - Therefore office does not need to close.

- Workers can work at own pace.
- Workers can revisit problem areas.

- Workers can train in any order.

- New system is computerised so sensible to train on a computer.

- Results of training can be downloaded by bosses at any time.

8   A few candidates managed to do (a), but hardly any candidate could do (b).

(a)   e.g. INPUT length, breadth, numbered, material
        AREA = (length + breadth)*4-numberdw
        IF material= E THEN COST = AREA *2
        ELSE   IF material = W THEN = AREA *5
                    ELSE OUTPUT "ERROR"
                    END IF
            END IF
    END IF
    OUTPUT COST

Mark points:

- Input of all four names
- using sensible variable names
- Correct formula for Area (or equivalent)
- Correct use of condition construct (may be CASE)
- All three possibilities covered
- Validation check on at least one input value
- Correct calculation of COST
- Output at end of routine

(b)   e.g. TOTAL = 0
        INPUT NUMBER_ROOMS
        FOR 1 = 1 TO NUMBER_ROOMS
                CALL FUNCTION ROOM
                TOTAL=TOTAL+COST
    NEXT
    IF NUMBER_ROOMS>3 THEN TOTAL=TOTAL*.9
    END IF
    OUTPUT TOTAL
    END

Mark points:

-       Initialise variables (e.g. TOTAL)
-       Input of number of rooms
-       Loop with working condition
-       Use of function room
-       Calculation of TOTAL
-       Correct formula
-       Output of TOTAL
-       Use of indentation for loop
-       Sensible structuring of code to help readability (across (a) and (b)