7 A digital video camera records students in a classroom. The data is transferred from the digital video camera over the internet to a server. Artificial Intelligence (AI) is used to analyse the video on the server to identify when students are interacting with the lesson and the teacher.

(a) Describe **one** ethical impact of this use of AI in the classroom.

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..... [2]

(b) A video is made of many bitmap images called frames. 30 frames are recorded every second.

Each frame is 4000 pixels wide by 3000 pixels high. The video records using 16-bit colour depth.

Calculate an estimate for the file size for **one** second of the video in gigabytes.

Show your working.

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File size ..... gigabytes

[2]

(c) Identify **and** describe **one** method of data verification that can be used when transferring data from the digital video camera to the server.

Method .....

Description .....

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[3]

(d) Describe **two** reasons why the server that stores the videos uses magnetic hard disks instead of solid state (flash) memory.

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[4]

(e) The table contains three algorithms that perform data validation. The third algorithm uses the functions `MID` and `LENGTH`.

The functions `MID` and `LENGTH` are defined as follows:

- `MID(ThisString : STRING, x : INTEGER, y : INTEGER) RETURNS STRING`
  returns a string of length `y` starting at position `x` from `ThisString`
- `LENGTH(ThisString : STRING) RETURNS INTEGER`
  returns the integer value representing the length of `ThisString`

Complete the table to identify the method of data validation for each algorithm. Each method of data validation must be different.

Algorithm	Method of data validation

`INPUT x`
`IF x < 1 or x > 26 THEN`
`  OUTPUT "Invalid"`
`ENDIF`	

`INPUT x`
`IF x <> 'R' AND x <> 'G' AND x <> 'B' THEN`
`  OUTPUT "Invalid"`
`ENDIF`	

`INPUT x`
`FLAG ← FALSE`
`FOR INDEX ← 1 TO LENGTH(x)`
`  IF MID(x, INDEX, 1) = "@" THEN`
`  FLAG ← TRUE`
`  ENDIF`
`NEXT INDEX`
`IF NOT FLAG THEN`
`  OUTPUT "Invalid"`
`ENDIF`	

[3]