S1 ICT Practice Paper 1 | storage units, network bandwidth, binary, spreadsheets, image resolution, cloud backup

Junior Secondary Information Technology

S1 ICT practice paper with worked solutions: storage units, bandwidth, download time, binary encoding, spreadsheets, image resolution, cloud backup.

1. Storage units and file sizes (16 marks)

A student backs up photos on a 32 GB USB flash drive; each photo is 4.5 MB on average. He also has a 12 MB report that becomes 7.5 MB after compression.

#	Question
1	(a) What is the maximum number of photos the drive can hold in theory? (whole number)
2	(b) Find the compression ratio of the report as a percentage.
3	(c) Convert 8000 MB into GB.
4	(d) He also has 5 video files of 240 MB each. Find the total size in GB.

2. Network bandwidth and download time (16 marks)

A home broadband line runs at 24 Mbps (megabits per second). Note that 1 byte equals 8 bits.

#	Question
5	(a) How many seconds are needed to download a 720 MB game update?
6	(b) How many minutes are needed to upload a 150 MB video at 5 Mbps?
7	(c) Backing up two 1.2 GB files over a 100 Mbps link takes how many seconds?
8	(d) A monthly data plan allows 500 GB. What is the average allowance per day?

3. Binary numbers and character encoding (18 marks)

Computers store data in binary: each bit has only two states, 0 or 1, and characters are represented by codes of a fixed number of bits.

#	Question
9	(a) Convert the binary number 1011 1010 into denary.
10	(b) Convert the binary number 1101 0011 into denary.
11	(c) How many distinct characters can 8-bit and 7-bit codes represent?
12	(d) A 2-minute recording is encoded at 128 kbps. Find its size in MB.

4. Spreadsheet formulas and percentages (18 marks)

Test scores of one class are stored in cells B2 to B9: 45, 62, 58, 71, 90, 38, 55 and 80. The pass mark is 40.

#	Question
13	(a) Write the formula for the mean and compute it.
14	(b) Use COUNTIF to find the pass rate as a percentage.
15	(c) Find the range, that is the highest score minus the lowest.
16	(d) An item priced at 380 dollars is sold at 25% off. Find the price and the formula.

5. Image resolution and pixels (16 marks)

A full high definition photo has a resolution of 1920 x 1080 and uses 24-bit true colour, so each pixel takes 3 bytes (one each for red, green and blue).

#	Question
17	(a) Find the total number of pixels in megapixels.
18	(b) What is the uncompressed file size in MB?
19	(c) What is the size of an 800 x 600 image at 24-bit colour in MB?
20	(d) If the photo in (b) compresses to 1.4 MB, find the percentage of space saved.

6. Cloud backup capacity and cost (16 marks)

A student has 100 GB of free cloud space and has used 68 GB. He follows the rule of keeping three copies of his data, whose total size is 45 GB.

#	Question
21	(a) How many 3.2 MB photos can the remaining space hold?
22	(b) Following the three-copy rule, how much storage is needed in total?
23	(c) How many hours does it take to upload 125 GB at 50 Mbps? (2 d.p.)
24	(d) Storage costs 0.02 dollars per GB per month. Find the monthly cost for (b).