Unit 3 · Multimedia

ANSWER KEY · FOR TEACHERS

Full marks 31

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. pixels
2. resolution
3. frame rate
4. amplitude
5. lossy
6. vector
7. keyframes
8. 3D

Each carries 0.5 mark. **K · 4**

2 Label the diagram

1. Video filmed with a camera
2. Animation made, not filmed
3. Graphics a still chart
4. Audio the teacher's voice

Each carries 0.5 mark. **K · 2**

3 Multiple choice

i. **b.** vector graphics **K · 1**

Vector graphics are shapes described by formulas, so they are drawn again sharply at any size. Raster graphics (GIF among them) are pixels, which turn blocky when enlarged.

ii. **b.** the most important positions of a movement, drawn first, with the frames between them filled in later **K · 1**

Keyframes mark where a movement starts, ends or changes. The in-betweens, filled in by the computer or an assistant, carry the movement from one keyframe to the next.

iii. **b.** Its pitch went up: it vibrates twice as fast. **U · 1**

The height (loudness) is the same; twice as many waves in the same time means twice the frequency, a higher note. (Twice the frequency is one octave higher, from "sa" to the next "sa".)

iv. **c.** It looks blocky or blurred, because each pixel is simply made bigger. **A · 1**

A raster picture holds only the pixels it was taken with. Enlarged, each pixel covers more of the screen (or the program blurs between them); no new detail can appear.

v. **b.** WAV **A · 1**

WAV keeps the sound uncompressed, exactly as recorded, which is best while editing. SVG and GIF are pictures, MOV is video.

4 Match the columns

1. TXT → **c.** plain text only, with no fonts or styles
2. SVG → **e.** a logo that must stay sharp at any size
3. MP3 → **a.** sharing a song in a small file
4. MP4 → **b.** sharing a video on a phone

Each carries 0.5 mark. **K · 2**

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5 True or false

U · 3

i. ✓ **True**
ii. ✗ **False:** WAV is usually uncompressed, about ten times the size of an MP3 of the same song.
iii. ✓ **True**
iv. ✗ **False:** The higher the frame rate, the smoother the motion; 8 fps looks jerky.
v. ✓ **True**
vi. ✗ **False:** 2D animation is flat drawings; only a 3D model can be seen from any angle.

Each carries 0.5 mark.

6 Short answers

a. MARKING SCHEME — U · 2

✓ Raster graphics are made of pixels; vector graphics are made of shapes and curves described by mathematical formulas.
✓ Raster graphics become blocky when enlarged, while vector graphics stay sharp at any size (or another correct difference: raster for photos and vector for logos; PNG, JPG against SVG).

b. MARKING SCHEME — U · 2

✓ A TXT file stores only plain characters; a DOCX file stores the text with its formatting (fonts, sizes, colors), pictures, tables and layout.
✓ A TXT file opens in any editor, such as Notepad, and is small; a DOCX needs a word processor such as Word and is bigger (or another correct difference).

c. MARKING SCHEME — A · 2

✓ PNG (or SVG).
✓ A reason: PNG supports transparency, so the logo has no box round it, and is lossless, so its sharp edges stay clean (or SVG: transparent and sharp at any size, being vector).

7 Numerical problem

ANSWER — A · 3

i. Bytes each second: 44,100 × 2 × 1 = 88,200. In 2 minutes (120 s): 88,200 × 120 = **10,584,000 bytes** = 10,584,000 ÷ 1,024 ÷ 1,024 ≈ **10.1 MB.**
ii. Bits: 64,000 × 120 = 7,680,000. Bytes: 7,680,000 ÷ 8 = 960,000. In KB: 960,000 ÷ 1,024 ≈ **938 KB**, about 11 times smaller than the WAV.

MARKING SCHEME

✓ 44,100 × 2 × 120 = 10,584,000 bytes.
✓ In MB: ÷ 1,024 ÷ 1,024 ≈ 10.1 MB.
✓ 64,000 × 120 ÷ 8 = 960,000 bytes ≈ 938 KB.

8 Long answer

ANSWER

For a Dashain greeting card to send on a phone, I would use:

- **Text:** the greeting itself ("शुभ विजया दशमी"), the names of the person it is for and from. Text is clear and exact.
- **Graphics:** a picture of a kite, tika and jamara, or a family photo, with a colorful border. Pictures carry the festival's feeling at a glance.
- **Animation:** the kite flying across the card, or the words appearing one by one, to catch the eye and make it lively.
- **Audio:** a short piece of festive music, or my own voice saying the greeting, to make it personal.

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If it is a printed card, only text and graphics can be used, so I would pick one strong picture and a big, readable greeting. **A · 4**

MARKING SCHEME

- ✓ Text, with its use: the greeting and the names, clear and exact.
- ✓ Graphics, with its use: a picture or photo that carries the festival's feeling at a glance.
- ✓ Animation, with its use: something moving (a kite flying, words appearing) to catch the eye.
- ✓ Audio, with its use: music or one's own voice saying the greeting, to make it personal (or video, with a sensible use; for a printed card, a sensible note that only text and graphics can be used).

9 Think

ANSWER **HA · 2**

One second of uncompressed FHD: 1,920 × 1,080 × 3 × 30 = 186,624,000 bytes = 186,624,000 × 8 ≈ 1,493,000,000 bits ≈ **1,493 Mbps**, about 149 times what the 10 Mbps connection carries. So the video is compressed (as MP4): it stores mostly what changes from one frame to the next, and FHD then needs only a few Mbps.

MARKING SCHEME

- ✓ Uncompressed FHD at 30 fps is about 186.6 million bytes a second, about 1,493 Mbps.
- ✓ That is about 149 times more than 10 Mbps, so it must be compressed (MP4 keeps mostly the changes between frames).

10 Activity: SD, HD and FHD

(not marked)

WHAT STUDENTS SHOULD FIND

Pixels: SD 345,600; HD 921,600; FHD 2,073,600, six times as many as SD. Small writing and faces far away are blurred in SD, readable in HD, sharp in FHD; but FHD uses the most data, so on a slow connection the video site may drop to a lower quality by itself.

Marks by level	Knowledge	Understanding	Application	Higher ability	**Total**
Marks	10	8	11	2	**31**

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