

For examiners' use only

EBU5305 A

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| Total | |

Joint Programme Examinations 2017/18

EBU5305 Interactive Media Design and Production

Paper A

Time allowed 2 hours

Answer ALL questions

Complete the information below about yourself very carefully.

QM student number

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BUPT student number

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Allowed: electronic calculators

INSTRUCTIONS

1. You must NOT take answer books, used or unused, from the examination room.
2. Write only with a black or blue pen and in English.
3. Do all rough work in the answer book – do not tear out any pages.
4. If you use Supplementary Answer Books, tie them to the end of this book.
5. Write clearly and legibly.
6. Read the instructions on the inside cover.

Examiners

Dr Marie-Luce Bourguet, Dr Yizhe Song

Instructions

Before the start of the examination

- 1) Place your BUPT and QM student cards on the corner of your desk so that your picture is visible.
- 2) Put all bags, coats and other belongings at the back/front of the room. All small items in your pockets, including wallets, mobile phones and other electronic devices must be **placed in your bag in advance. Possession of mobile phones, electronic devices and unauthorised materials is an offence.**
- 3) Please ensure your mobile phone is switched off and that no alarm will sound during the exam. **A mobile phone causing a disruption is also an assessment offence.**
- 4) Do not turn over your question paper or begin writing until told to do.

During the examination

- 1) You must not communicate with or copy from another student.
- 2) If you require any assistance or wish to leave the examination room for any reason, please raise your hand to attract the attention of the invigilator.
- 3) If you finish the examination early you may leave, but not in the first 30 minutes or the last 10 minutes.
- 4) For 2 hour examinations you may **not** leave temporarily.
- 5) For examinations longer than 2 hours you **may** leave temporarily but not in the first 2 hours or the last 30 minutes.

At the end of the examination

- 1) You must stop writing immediately – **if you continue writing after being told to stop, that is an assessment offence.**
- 2) Remain in your seat until you are told you may leave.

Question 3

a) This question is about sound encoding.

[9 marks]

i) Why is good quality sound usually encoded using a sampling rate of 44.1 kHz?

(4 marks)

ii) What is the typical sampling rate of a sound file encoded using MIDI?

(2 marks)

iii) What are speech formants? Refer to what you see in Figure 1 in your answer.

(3 marks)

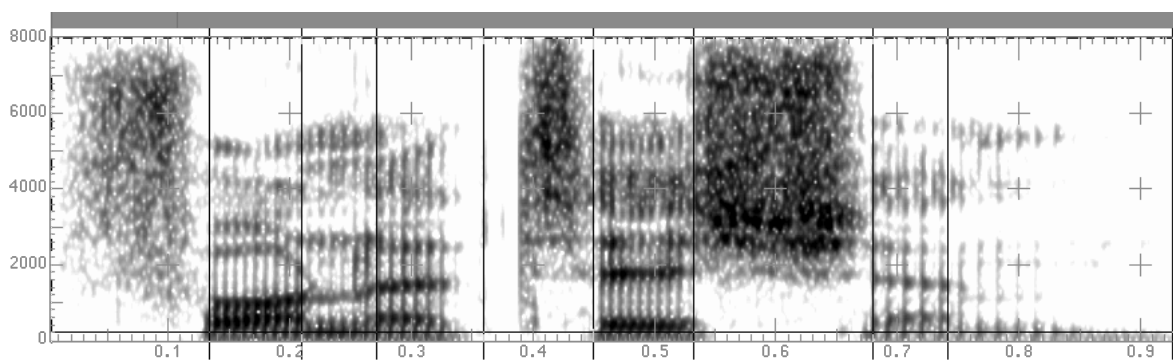


Figure 1: Speech spectrogram

[illegible]

[illegible]

b) This question is about JPEG image compression.

[8 marks]

i) How does chroma subsampling reduce the size of an image?

(4 marks)

ii) Does a quantization table, which contains very high values, achieve high or low compression? Justify your answer.

(4 marks)

[illegible]

c) This question is about MPEG1 video compression. Consider the three consecutive video frames shown in Figure 2. The middle frame is a B frame. It contains 4 macroblocks.

[8 marks]

i) What predictions can be made about the top left macroblock? How will it be encoded?

(3 marks)

ii) What predictions can be made about the bottom right macroblock? How will it be encoded?

(5 marks)

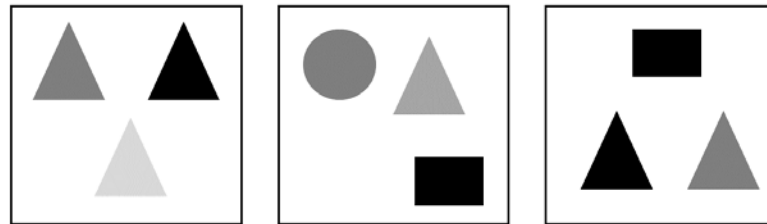


Figure 2: Three consecutive video frames

[illegible]

Question marking: $\frac{-}{9} + \frac{-}{8} + \frac{-}{8} = \frac{-}{25}$