ST. XAVIER'S COLLEGE
KOLKATA
(AUTONOMOUS)

2nd SEMESTER EXAMINATION
JUNE - JULY 2021
M. Sc. COMPUTER SCIENCE

CMSM4224

Wednesday, June 30, 2021
1:00 PM to 4:00 PM
3 hours
Full Marks : **80**

COMPUTER GRAPHICS AND MULTIMEDIA

PLEASE READ THESE INSTRUCTIONS BEFORE YOU START WRITING:

1. Of the questions attempted, the answers to only the first required number of questions (as stipulated in the question paper) will be evaluated. **So please do not attempt extra questions**.

2. Use fountain pen or ball-point pen of **blue** or **black ink**.

3. Write **(not type)** the answers legibly, in your own words as far as practicable, on A4 size sheets.

4. Save the pages of your answer sheets (hand-written document) to a single PDF file and name the document accurately i.e. **Roll No_Paper Code.PDF** (example: 147_PH36141T).

5. Send the PDF file to the following email address **(in REPLY mode) within 30 minutes of the completion of the examination**: **cmsm42242021@sxccal.edu**

6. In the subject field of your email, please write "**Answer Script – Roll No, Paper Code**" (example: "Answer Script – 147, PH36141T").

7. The scanned answer scripts should have **enough clarity** to enable evaluation.

8. On top of each page **handwrite** the following information: **Name, Roll Number, Paper Code , Date,** and **Page Number**

9. No multiple submissions would be allowed.

The marks are given in **brackets [ ]** at the end of each question or part question.

The question paper consists of **2** pages.

(FOR 2 GROUPS, 2 SEPARATE PDF FILES SHOULD BE SENT)

GROUP A
Marks: 40

Answer <u>ANY 2</u> questions: [5×2=10]
1. What is Polygon Clipping Algorithm? Illustrate with an example. **[5]**
2. How do you define Illumination? What are the different Illumination Models? **[1+4]**
3. Define Resolution. Give an example. **[2+3]**

Answer <u>ANY 2</u> questions: [15×2=30]
4. a) What is meant by Shading?
   b) What are the different Shading models?
   c) Explain any one Shading Model with the help of proper illustrations. **[1+4+10=15]**
5. a) Differentiate between Multi-Core CPU and Many-Core GPU. Depict a diagram in support to your answer.
   b) Draw the architecture of a CUDA capable GPU and discuss in brief. **[7+8=15]**
6. a) Differentiate between Additive Color Model and Subtrative Color Model.
   b) Differentiate between HSB Color Model and HSL Color Model in details. Give examples in support to your answer. **[5+10=15]**

GROUP B
Marks: 40

Answer <u>ANY 2</u> questions: [5×2=10]
7. What are the different components of a Multimedia system? Differentiate between the images stored in the PC in the form of vector art and bitmapped. **[2+3]**
8. Write down some essential applications of Multimedia. **[5]**
9. What is MIDI? Explain the advantages and disadvantages of MIDI over digital audio. **[2+3]**

Answer <u>ANY 2</u> questions: [15×2=30]
10. a) Define frequency spectrum graph. Write down briefly all the steps of JPEG compression scheme.
    b) What is lossy and lossless compression? Explain Run-Length coding scheme by taking an example. **[(2+6)+(2+5)=15]**
11. a) Explain digital half-toning method. Explain Dithering technique by taking a suitable Dither Matrix.
    b) Define sampling resolution? An image scan centre needs to store medical images whose resolution is 1024 X 1024 X 32 bits. A total of 1000 images are present. How much storage and transmission time is required at 64 kbps? If the image is scanned at 500 dpi, then, what is the physical size of the image? **[(4+3)+(2+6)=15]**
12. a) What do you mean by I-frame, B-frame and P-frame in the context of video compression scheme. Estimate the storage requirement for a video of frame size 640 X 320 for a period of one (1) minute. Assume any suitable necessary data.
    b) Define computer animation. What are the basic components of computer animation? What is Virtual reality? **[(5+2)+(4+4)=15]**

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