

GX 1483

Exam Code(s)	1SD1, 1EM1, 1OA1, 3BA1, 4BA4
Exam(s)	3 rd and 4 th B.A. (IT) H. Dip., Erasmus students and visiting students
Module Code(s)	CT336
Module(s)	Graphics and Image Processing
Paper No.	1
Repeat Paper	
External Examiner(s)	Professor D. Bell
Internal Examiner(s)	Professor G. Lyons Dr. A. Brennan

Answer 4 questions.
All questions will be marked equally.

No. of Pages	4
Department(s)	IT

OLLSCOIL NA hÉIREANN
The National University of Ireland

THE NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER 1 EXAMINATIONS 2003

3rd/4th B. A. (IT) & H. Dip. in Software Design and Development

CT336

GRAPHICS AND IMAGE PROCESSING

Professor D. Bell
Professor G. Lyons
Dr. A. Brennan

Candidates are required to answer **Four** questions.

All questions carry equal marks.

Time allowed: **TWO hours**

- Q. 1**
- Discuss the history and importance of steganography and its uses today. (10)
 - Describe the 4 steps in digitization (use examples). (8)
 - Using the ROT 4 scheme, encrypt the following message "The red rose lay diagonally on the steps of number 10 Downing street". (7)
- Q. 2**
- What is meant by indexed colour (use a diagram)? Why would indexed colour be used? What are the advantages and disadvantages of indexed colour? (12)
 - Why is colour harmony important and what colour schemes support colour harmony? (9)
 - Explain four of the following terms;
Colour depth, Emissive displays, Dichromatic, Gamma correction, Dithering, Anti-aliasing, Cipher text (4)
- Q. 3**
- Outline how the Cathode Ray Tube (CRT) works? Use diagrams. (11)
 - Discuss the differences amongst the following; (8)
Trojan horse, Covert channels, Easter eggs, Hardware/software keys
 - If the colour depth is 18bits, how many colours can be specified and what is the colour range for red, green and blue? (6)
- Q. 4**
- Discuss the differences between vector and bitmap formats outlining advantages and disadvantages (include examples of file type). (11)
 - Discuss the 6 guidelines for optimizing web graphics? (9)

- Draw the half tone cells that result when the printer resolution is 200dpi and the lines per inch are 50. (5)
- Q. 5 • Using the method for scaling relative to a fixed point, scale the following diagram (figure 1) relative to the fixed points where $F_x = 17$ and $F_y = 17$ and $S_x = 4$, $S_y = 3$. (draw the resultant scaled diagram) (11)

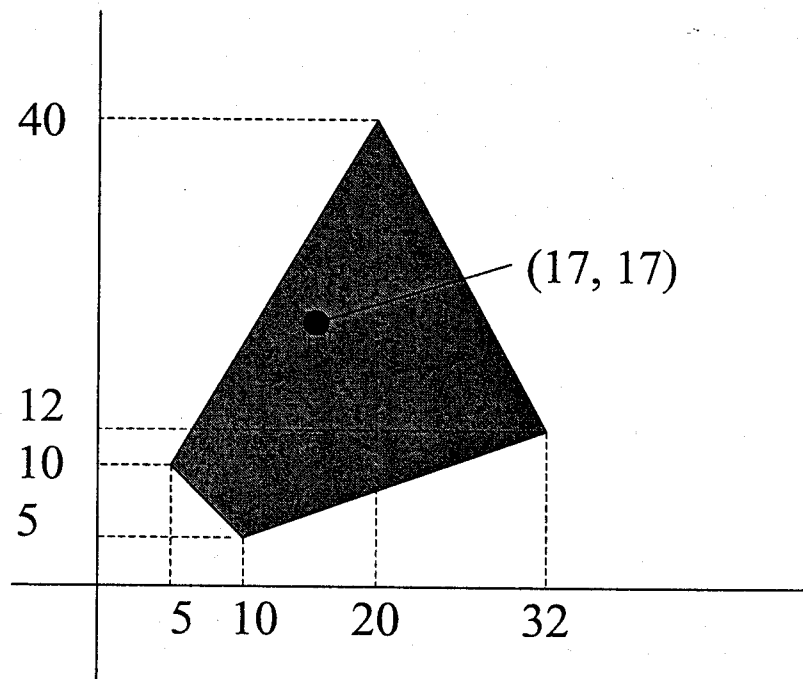


Figure 1

- Scale the same diagram (figure 1) using $S_x = 3$, $S_y = 5$. (draw the resultant scaled diagram) (8)
- Given the diagram in figure 2, what lights are absorbed by the layers of magenta and yellow inks and what is the resultant emergent light? (6)

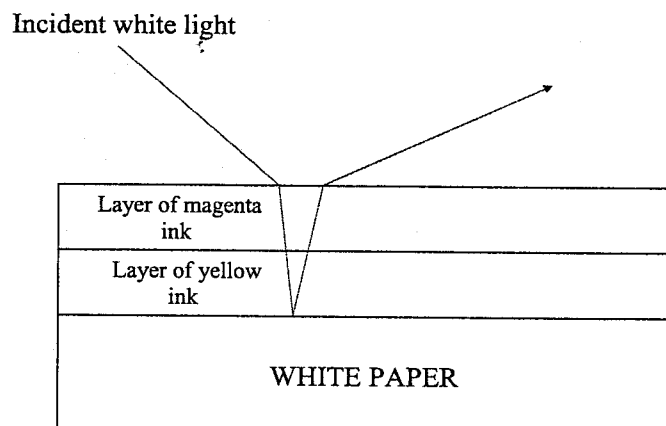


Figure 2

Q. 6

- Using the Huffman approach, compress the following (8)
t(15), a(2), s(5), h(8), u(3), x(1)
- Using the dictionary based scheme, compress the following strings (7)
 - a) ABBCABBDCAEFBCAD
 - b) BACBBAACCDECBA
- Using the dictionary based scheme, decompress the following ; (7)

00a	00d
00b	00a
00c	00b
11b	00c
31d	42e
00d	00e
64a	52c
41d	11a
61-	92d
	00d

- Do an RLE compression on the following (3)
AAAAAAAAAAAAAABBBBBCCCCCDEEFAAAABBB