2016

MCA

5th Semester Examination

NATURAL LANGUAGE PROCESSING

PAPER—MCA-504

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(*Natural Language Processing*)

Answer any *five* questions.

1. Describe text segmentation with proper example. Briefly describe about different sources of Noisy Text.   7+7

2. Define Minimum Edit Distance. Show the different stage of computing Minimum Edit Distance between following two strings :

    'INTENTION' and 'EXECUTION'   4+10

(Turn Over)

3. Briefly describe Sentiment Analysis. Write down various application of Sentiment Analysis. 7+7

4. Define Lemmatization with proper example. What is Distractors ? Give example. Write down the importance of Distractors in MCQ generation task. 4+2+1+7

5. Write short note on following topics :

   (a) Semisupervised Learning ;

   (b) Stemming. 7+7

6. Draw the pages structure of following sentences :

   (a) Mohandas Karamchand Gandhi, the preeminent leader of the Indian independence movement in British-ruled India was born on Second October 1869.

   (b) Mohinder Amarnath of India was the first player in the history of Cricket World Cup to win Man of the Match awards in both semi-finals and finals in 1983 World Cup.

7. Write short note of Affix feature. Write down the impact of human generated text in social media on NLP task. 6+8

[Internal Assessment : 30]

3

(Image Processing)

Answer any *five* questions.

1. (a) With neat sketch, explain the components of image processing system. 10

   (b) Explain the neighbours of a pixel. 4

2. (a) Explain the basic concept of sampling and quantization with neat sketch. 4

   (b) Explain false countering and checkerboard effect. 4

   (c) Explain any four basic relationships between pixels. 6

3. (a) Consider the image segment given below. Let V = {2, 3, 4}, compute the length of the shortest 4, 8 and m path between P and Q. If the path does not exists, explain why.

3	4	1	2	0
0	1	0	4	2 (q)
2	2	3	1	4
(P) 3	0	4	.2	1
1	2	0	3	4

4

(b) Describe histogram equalization. Obtain Histogram equalization for the following image segment of size 5×5 ? Write the inference on image segment before and after equalization.

$$\begin{bmatrix} 20 & 20 & 20 & 18 & 16 \\ 15 & 15 & 16 & 18 & 15 \\ 15 & 15 & 19 & 15 & 17 \\ 16 & 17 & 19 & 18 & 16 \\ 20 & 18 & 17 & 20 & 15 \end{bmatrix}$$

10

4. (a) How mean filters are used for image enhancement.   6

(b) Explain image smoothing using Butterworth low pass filter and image sharpening using Gaussion high pass filter.   8

5. (a) Explain the following morphological operations :

(i) Thinning ;

(ii) Thickening ;

(Continued)

(iii) Opening ;

(iv) Closing. $2\frac{1}{2} \times 4$

(b) Prove that Erosion and dialation are equals of each other with respect ot set complementation and reflection.

4

6. (a) What is global thresholding ? 2

(b) What do you mean by image segmentation ? Explain point detection, edge detection and line detection using derivatives. Write Prewitt, Sobel and Roberts edge detection. 2+6+4

7. (a) Explain three basic gray level transformation for image enhunt. 8

(b) Explain :

(i) Contrast streately ;

(ii) Gray level slicing ;

(iii) Bit plane slicing. 3×2

C/17/MCA/5th Seme./MCA-504 *(Turn Over)*

8. Write short notes (any *two*) :   7×2

   (a) Fourier tranform ;

   (b) Erosion and Dialation ;

   (c) Image subtraction or arithmetic / logic operation ;

   (d) Chain codes.

[Internal Assessment : 30]

———