MASTER OF COMPUTER APPLICATIONS (MCA_NEW)

ASSIGNMENTS
OF MCA_NEW (2Yrs) PROGRAMME
SEMESTER-IV

(July - 2023 & January - 2024)

MCS-230, MCS-231

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068

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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to Programme Guide of MCA (2Yrs).
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the Programme Guide of MCA (2yrs).
4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	**:**	**MCS-230**
Course Title	**:**	**Digital Image Processing and Computer Vision**
Assignment Number	**:**	**MCA_NEW(IV)/230/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last Dates for Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

This assignment has sixteen questions of 5 Marks each, answer all questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1: Given an image is a gray scale image with aspect ratio of 6:2 and pixel resolution of 640000 pixels, calculate the following: **(5 Marks)**

a) Resolve pixel resolution to calculate the dimensions of image

b) Calculate the size of the image

Q2: Consider the following orthogonal matrix A and image matrix f. **(5 Marks)**

$$A = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \qquad f = \begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}$$

Apply the orthogonal transform and its inverse

Q3: What do you understand by Image enhancement? Explain the techniques of image enhancement with a suitable example. Also discuss the advantages of image enhancement. **(5 Marks)**

Q4: Compute various bit planes of the following 8-bit image. **(5 Marks)**

50	80	100	150
20	75	200	250
90	125	155	255
175	210	230	110

Q5: For the given 4x4 image having grey scales between [0, 9], carry out histogram equalization. Also, draw the histogram of image before and after equalization. **(5 Marks)**

2	4	5	3
3	3	8	4
3	4	6	2
2	2	7	2

Q6: Explain image degradation and its types. **(5 Marks)**

Q7: Discuss Mean and Median filters with suitable examples **(5 Marks)**

Q8: Consider the coordinates of warm white (0.55, 0.3) and the coordinates of deep blue (0.25, 0.15). Find the percentage of the three colours red (X), green (Y) and blue (Z). **(5 Marks)**

Q9: Perform a 60^0 rotation of a triangle ABC with coordinates A: (0, 0),B: (1,1),C: (5,2) about the origin. **(5 Marks)**

Q10: What do you mean by Camera Calibration? Explain how intrinsic and extrinsic parameters of a camera are estimated?

Q11: Explain Image segmentation. Also discuss about its applications. **(5 Marks)**

Q12: What do you understand by feature extraction? What are its applications? Also discuss few traditional methods of feature extraction. **(5 Marks)**

Q13: Explain how Deep Learning Techniques are used for feature extraction? **(5 Marks)**

Q14: Explain Bayesian Classification with the help of a suitable example. **(5 Marks)**

Q15: Explain Supervised, Unsupervised and Reinforcement learning. **(5 Marks)**

Q16: Explain Agglomerative Hierarchical Clustering with the help of a suitable example. **(5 Marks)**

Course Code	**:**	**MCS-231**
Course Title	**:**	**Mobile Computing**
Assignment Number	**:**	**MCA_NEW(IV)/231/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last Dates for Submission	**:**	**31st October, 2023(For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

There are four questions in this assignment, which carry 80 marks. Each question carries 20 marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance theexplanations, if necessary. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1: What are the latest versions of Windows and iOS operating systems? What are the differences between the latest and earlier versions? **(20 Marks)**

Q2: Explain .NET framework. Compare it with any other framework. **(20 Marks)**

Q3: Explain the working of Mobile IP. **(20 Marks)**

Q4: What are the advantages and disadvantages of 5G networks in comparison to 4G networks. **(20 Marks)**