

# **MASTER OF COMPUTER APPLICATIONS (MCA)**

**ASSIGNMENTS  
OF MCA\_NEW (2Yrs) PROGRAMME  
SEMESTER-IV**

**(July - 2022 & January - 2023)**

**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/2022-23**  
**Maximum Marks** : **100**  
**Weightage** : **30%**  
**Last Dates for Submission** : **31<sup>st</sup> October, 2022 (for July session)**  
**15<sup>th</sup> April, 2023 (for January session)**

**This assignment has 10 questions of 80 marks (All Questions carries equal marks). Answer all the questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

- Q1.** How Digital image relates to signals? Give definition of 1-D and 2-D signals and explain how a 2-D image is expressed in terms of 2-D signals.
- Q2.** Explain DCT with suitable example. Give advantages of DCT over DFT. Compute DCT matrix order 2.
- Q3.** Compare unsupervised learning techniques with supervised learning techniques. Explain the different categories of supervised machine learning algorithms. Also, draw block diagram for classical taxonomy of clustering methods.
- Q4.** Compare sampling and quantization in context of image digitization. Also, state Shannon-Nyquist theorem and discuss its role in sampling process of any image.
- Q5.** How wavelets differ from waves? Give properties of wavelets. Also, compare wavelet transform with Fourier transform.
- Q6.** Explain Agglomerative Hierarchical Clustering. Write steps of general agglomerative clustering algorithm. Also, compare single link and complete link type of Agglomerative clustering.
- Q7.** Explain How image enhancement is better in frequency domain as compared to spatial domain. Also, differentiate between image smoothing filters and image sharpening filters.
- Q8.** Explain image degradation with suitable block diagram. How Noise relates to image degradation. Explain the various noise models.
- Q9.** What do you understand by shifting the center of the spectrum? Why is it required? Write steps to carry out filtering in frequency domain.
- Q10.** Write short notes on following.
- a) DFT and its limitations
  - b) RGB colour method
  - c) Linear Discriminant Analysis
  - d) Contrast stretching & its need
  - e) Euclidean distance classifiers
  - f) Low pass and high pass filters
  - g) Spatial resolution
  - h) Pixelization error

**Course Code** : **MCS-231**  
**Course Title** : **Mobile Computing**  
**Assignment Number** : **MCA\_NEW(IV)/231/Assign/2022-23**  
**Maximum Marks** : **100**  
**Weightage** : **30%**  
**Last Dates for Submission** : **31<sup>st</sup> October, 2022(for July session)**  
**15<sup>th</sup> April, 2023 (for January session)**

**There are four questions in this assignment, which carry 80 marks. Each question carries 20 marks. Rest 20 marks are for viva voce. All algorithms should be written nearer to C programming language. You may use illustrations and diagrams to enhance the explanations, if necessary. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

- Q1.** Briefly explain the terms “Guided Transmission” and “Unguided Transmission”.
- Q2.** What is meant by Modulation? Explain any one type of Modulation.
- Q3.** What is meant by Multiplexing? How does TDMA differ from FDMA?
- Q4.** What are the advantages and disadvantages of 4G networks in comparison to 3G networks.