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National Institute of Technology Hamirpur (H.P.)

(Under Ministry of Education, Govt. of India, New Delhi)

Branch/ Semester	**: Dual Degree (4th Year)**	**Subject Code**	**: CS-734**
Subject Name	**: Computer Vision**	**Duration**	**: 3 Hrs**
Date	**: 04/05/2023**	**Max. Marks**	**: 50**

Q. 1 What is image enhancement Differentiate spatial domain and frequency domain methods. If I is input intensity and O is output intensity then write the equation for image negation and log transformation. Let the intensity range for the image is [0, L-1]. **(8)**

Q. 2 Find the equalized histogram for the given histogram and plot both the histograms: **(8)**

Gray level	0	1	2	3	4	5	6	7
No. of pixel	190	250	210	160	80	60	30	20

Q. 3 How many coordinate systems are needed in determining the relationship between 3D points and their 2D projections? Describe the purpose of each coordinate system as well as the transformations involved from one to another **(5)**

Q. 4 Consider elongated region whose external points are given by $(r_1,c_1)=(24,137)$, $(r_2,c_2) = (24,163)$, $(r_3,c_3) = (30,181)$, $(r_4,c_4) = (32,181)$, $(r_5,c_5) = (39,155)$, $(r_6,c_6) = (39,145)$, $(r_7,c_7) = (32,119)$, $(r_8,c_8) = (30,119)$ Determine M_1, M_2, M_3, M_4, ϕ_1, ϕ_2, ϕ_3 ϕ_4. if this region is considered to be a rectangle , what would be computed orientation, length and width of rectangle ? **(8)**

Q. 5 Discuss the problem of median filter with even number of points in the window. **(5)**

Q. 6 In image processing, the term Gaussian is discussed many times for various applications. What do you mean by Gaussian Function? Can we use it to suppress Noise? **(6)**

Q. 7 Define the following terms: **(10)**

a) Vanishing point
b) Weak perspective projection
c) Rectification
d) Epipolar
e) Dilation