IVP Quiz1

Total points 160/200

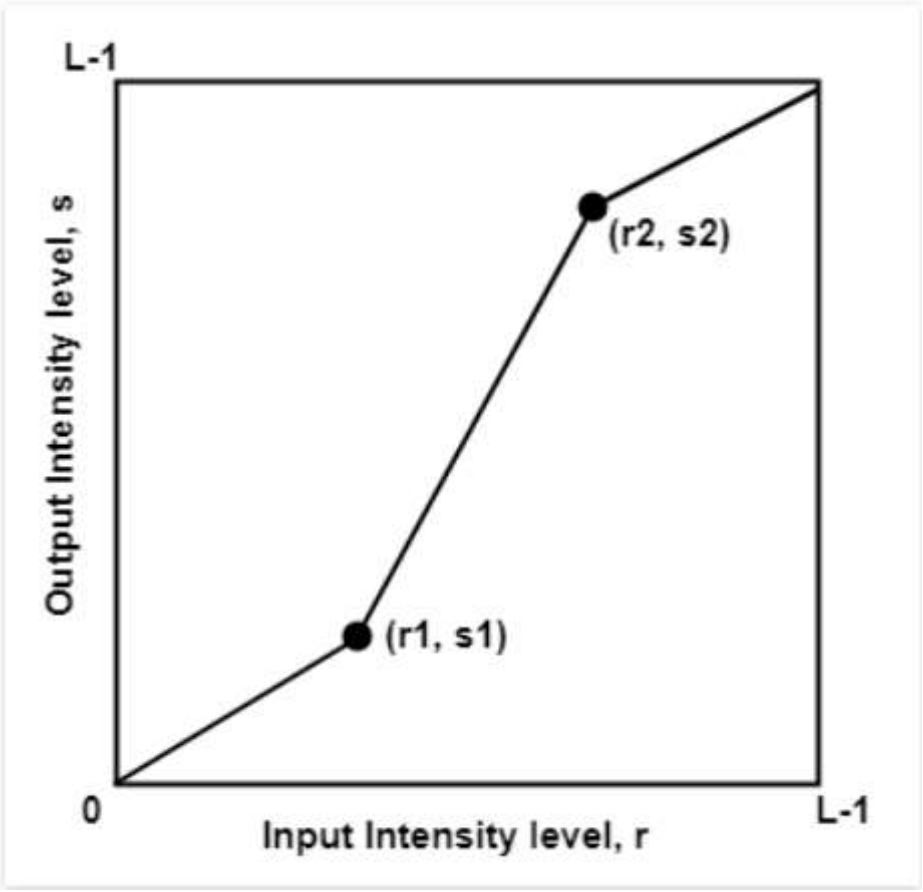
The respondent's email (**iit2020199@iiita.ac.in**) was recorded on submission of this form.

✓ Color information can be stored in - 2/2

- ○ Main memory
- ○ Graphics card
- ◉ Frame buffer ✓
- ○ Secondary memory

✗ Contrast - Stretching is an image processing technique that tries to improve the contrast by stretching the intensity values of an image to fill the entire dynamic range.Below figure shows a typical transformation function used for Contrast Stretching. 0/2

When (r1 , s1) = (rmin , 0) and (r2 , s2) = (rmax , L-1), transformation becomes



- ○ Percentile Stretching
- ○ Min-Max Stretching
- ◉ Thresholding function ✗
- ○ Linear function

Correct answer

- ◉ Min-Max Stretching

✗ A smoothing filter can also be called a median filter. 0/2

- (●) True ✗
- ( ) False

Correct answer

- (●) False

✓ How is image formation in the eye different from that in a photographic camera? 2/2

- ( ) No difference
- ( ) Fixed focal length
- (●) Variable focal length ✓
- ( ) Varying distance between lens and image plane

✓ If each element of set X is also an element of set Y, then X can be called _____ of set Y. 2/2

- (●) Subset ✓
- ( ) Complement Set
- ( ) Disjoint
- ( ) Union

✗ The transpose image B (M × N) of A (N × M) can be obtained as : 0/2

- both
- None of these
- B(j, i) = A(i, j) (i = 0, . . . , N − 1, j = 0, . . . , M − 1)
- B(i, M − 1 − j) = A(i, j) (i = 0, . . . , N − 1, j = 0, . . . , M − 1).

✗ Gray values of an image are- 0/2

i. proportional to scene radiance and foreshortening factor.

ii. inversely related to the distance between the object and the lens.

iii. inversely proportional to the distance between the lens and the image plane.

iv. proportional to total irradiance and unaffected by foreshortening factor.

- (iii) and (iv)
- (ii) and (iv) ✗
- Only (iv)
- (i) and (iii)

Correct answer

- (i) and (iii)

✗ In computer vision, the purpose of prepossessing is used for 0/2

- ○ Obtain a distinction between object and background.
- ○ Remove noise from the image
- ○ Convert analog information of light information into digital form.
- ◉ Store image as array of pixel ✗

Correct answer

- ◉ Remove noise from the image

✓ Name the procedure in which individual pixel values of the digital image get altered. 2/2

- ○ Image Registration
- ○ Geometric Spatial Transformation
- ○ Neighborhood Operations
- ◉ Single Pixel Operation ✓

✓ In perspective projection, at which of the following point the eyes of the observer are located? 2/2

- ◉ Station Point ✓
- ○ Observer Point
- ○ Perspective Point
- ○ Vanishing Point

✓ For an image with a large amount of detail, if the value of N (number of pixels) is fixed then what is the gray level dependency in the perceived quality of this type of image? 2/2

- ○ None of the mentioned
- ○ Totally independent of the number of gray levels used
- ◉ Nearly independent of the number of gray levels used ✓
- ○ Highly dependent of the number of gray levels used

✓ Which of the following is not a correct example of Image Multiplication? 2/2

- ○ Shading Correction
- ○ Region of Interest Operations
- ○ Masking
- ◉ Pixelation ✓

✓ In which type of projection, actual dimensions and angles of objects and therefore shapes cannot be preserved? 2/2

- ○ None of the above
- ○ Orthographic
- ◉ Perspective ✓
- ○ Isometric

✗ The quality of a digital image is well determined by _____ 0/2

- (●) The number of samples ✗
- ( ) None of the mentioned
- ( ) The discrete gray levels
- ( ) All of the mentioned

Correct answer

- (●) All of the mentioned

✓ Which of the following type of perspective projection is also called as "Angular Perspective"? 2/2

- ( ) Three-point
- ( ) One-point
- (●) Two-point ✓
- ( ) Four-Point

✓ The dynamic range of the imaging system is a quantitative relation where the upper limit can be determined by 2/2

- (●) Saturation ✓
- ( ) Contrast
- ( ) Noise
- ( ) Brightness

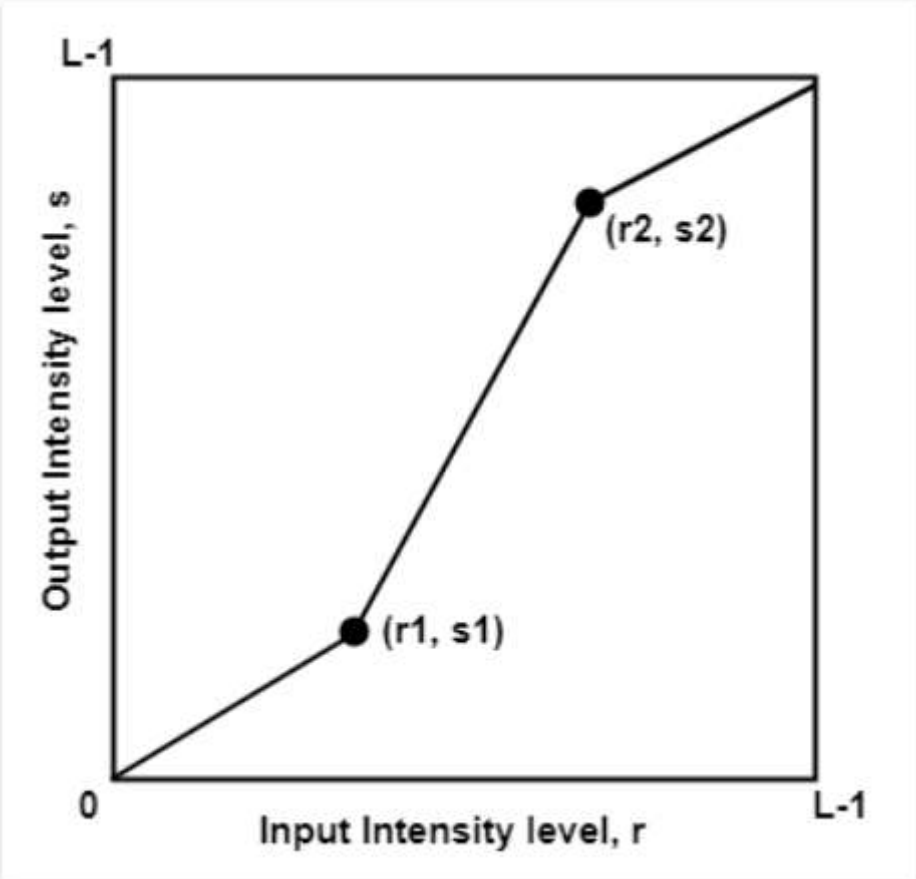
✓ Correct order of histogram equalization is: 2/2
1-Calculate the normalized sum of histogram
2-Transform the input image to an output image
3-Compute the histogram of the image

- ( ) 2 -> 3 -> 1
- ( ) 3 -> 2 -> 1
- (●) 3 -> 1 -> 2 ✓
- ( ) 1 -> 2 -> 3

✓ Contrast - Stretching is an image processing technique that tries to improve the contrast by stretching the intensity values of an image to fill the entire dynamic range. 2/2

Below figure shows a typical transformation function used for Contrast Stretching.

By changing the location of points (r1 , s1) and (r2 , s2), we control the shape of the transformation function. When r1 = s1 and r2 = s2, transformation becomes



- ○ Min-Max Stretching
- ○ Percentile Stretching
- ○ Thresholding function
- ◉ Linear function ✓

✓ What is the real-world application of image subtraction? 2/2

- ○ MRI scan
- ○ CT scan
- ◉ Mask mode radiography ✓
- ○ None of the above

✓ In perspective projection, which of the following is the point where all lines will appear to meet? 2/2

- ○ Projection Plane
- ○ Projectors
- ○ Point of Projection
- ◉ Vanishing Point ✓

✓ In perspective projection, what happens to the size of the image when the object moves far from the projection plane? 2/2

- ○ There is no image in perspective projection
- ○ There is no change in size of image
- ◉ Size of image gets smaller ✓
- ○ Size of image gets bigger

✓ The transition between continuous values of the image function and its digital equivalent is called _____ 2/2

- ○ Sampling
- ○ Rasterization
- ○ None of the Mentioned
- ◉ Quantisation ✓

✓ Power law transformation states that **s = cri** , where s is output pixels, r is input pixels, c & i are real numbers. Cathode ray tube (CRT) devices have an intensity-to-voltage response that is a power function, with i varying from 2/2

- ○ 1.81 to 2.51
- ◉ 1.80 to 2.50 ✓
- ○ 1.80 to 2.52
- ○ 1.80 to 2.51

✗ A continuous image is digitised at _____ points. 0/2

- ○ vertex
- ◉ random ✗
- ○ sampling
- ○ contour

Correct answer

- ◉ sampling

✓ Salt and pepper noise can interchangeably be used 2/2

- ○ black noise
- ◉ impulse ✓
- ○ gamma noise
- ○ Rayleigh noise

✓ What is the type of quantizer, if a Zero is assigned a quantization level? 2/2

- ○ Mistreat type
- ◉ Mid tread type ✓
- ○ None of the mentioned
- ○ Midrise type

✓ At what points, a continuous image is digitized? 2/2

- ○ Random
- ◉ Sampling ✓
- ○ Contour
- ○ Vertex

✗ Different cases of sampling include 0/2

- ◉ Ideal impulse sampling ✗
- ○ Flat-topped sampling
- ○ Sampling with rectangular pulses
- ○ All of the mentioned

Correct answer

- ◉ All of the mentioned

✓ The transition between continuous values of the image function and its digital equivalent is called _____. 2/2

- ○ Rasterisation
- ○ Sampling
- ○ None of the Mentioned
- ◉ Quantisation ✓

✗ For a continuous image f(x, y), Quantization is defined as. 0/2

- (●) Digitizing the coordinate values ✗
- ( ) Digitizing the amplitude values
- ( ) None of these
- ( ) All of the mentioned

Correct answer

- (●) Digitizing the amplitude values

✓ Images quantised with insufficient brightness levels will lead to the occurrence of _____ 2/2

- (●) False Contours ✓
- ( ) Pixillation
- ( ) Blurring
- ( ) None of the Mentioned

✓ Log transformation formula is given by 2/2

- ( ) s = c log(r)
- ( ) s = c log(2 + r)
- (●) s = c log(1 + r) ✓
- ( ) s = log(1 + r)

✗ In which of the following scenarios can you use a weak perspective camera model for the target object? 0/2

- (●) A squirrel passing quickly in front of you. ✗
- ( ) The Hoover tower when you are taking a photo of it right in front of it.
- ( ) A car beside you when you are driving.
- ( ) An airplane flying at a very high altitude.

Correct answer

- (●) An airplane flying at a very high altitude.

✓ The number of grey values are integer powers of: 2/2

- ( ) 4
- ( ) 8
- (●) 2 ✓
- ( ) 1

✗ Describe term pixel depth? 0/2

- (●) It is the number of units used to represent each pixel in RGB space ✗
- ( ) It is the number of mm used to represent each pixel in RGB space
- ( ) It is the number of bits used to represent each pixel in RGB space
- ( ) It is the number of bytes used to represent each pixel in RGB space

Correct answer

- (●) It is the number of bits used to represent each pixel in RGB space

✓ To convert a continuous image f(x, y) to digital form, we have to sample the function in 2/2

- ( ) Amplitude
- ( ) None of these
- ( ) Coordinates
- (●) All of the mentioned ✓

✗ Which is not a type of noise 0/2

- (●) Rayleigh noise ✗
- ( ) exponential noise
- ( ) black noise
- ( ) gamma noise

Correct answer

- (●) black noise

✓ What is the tool used in tasks such as zooming, shrinking, rotating, etc.? 2/2

- (●) Interpolation ✓
- ( ) None of the Mentioned
- ( ) Sampling
- ( ) Filters

✓ Which of the following is the basic unit of Image? 2/2

- ( ) Coordinate
- ( ) Value
- ( ) Dot
- (●) Pixel ✓

✓ The lower limit of the dynamic range ratio can be determined by 2/2

- ○ Saturation
- ○ Brightness
- ○ Contrast
- ◉ Noise ✓

✓ The process that highlights an image's intensity refers to 2/2

- ◉ Intensity Slicing ✓
- ○ Intensity Highlighting
- ○ Intensity Matching
- ○ None of the above

✓ Blurring an image with the help of a smoothing filter may lead to noise reduction 2/2

- ◉ True ✓
- ○ False

✓ The technique of enhancement that has specified Histogram processed image as result is called? 2/2

- (●) Histogram matching ✓
- ( ) Histogram linearization
- ( ) None of the above
- ( ) Histogram equalization

✓ Which of the following statements describes an affine camera but not a general perspective camera? 2/2

- ( ) Approximates the human visual system.
- ( ) Can be used to determine the distance from an object of a known height.
- ( ) An infinitely long plane can be viewed as a line from the right angle.
- (●) Relative sizes of visible objects in a scene can be determined without prior knowledge. ✓

✓ Images quantised with insufficient brightness levels will lead to the occurrence of _____ 2/2

- (●) False Contours ✓
- ( ) Pixilation
- ( ) Blurring
- ( ) None of the Mentioned

✓ What role does the segmentation play in image processing? 2/2

- ○ Deals with extracting attributes that result in some quantitative information of interest
- ○ Deals with property in which images are subdivided successively into smaller regions
- ◉ Deals with partitioning an image into its constituent parts or objects. ✓
- ○ Deals with techniques for reducing the storage required saving an image, or the bandwidth

✓ Reducing gamma makes image 2/2

- ○ slightly pale look
- ◉ slightly wash out look ✓
- ○ slightly reddish white look
- ○ slightly blue look

✓ For a continuous image f(x, y), how could be Sampling defined? 2/2

- ○ None of the mentioned
- ○ All of the mentioned
- ◉ Digitizing the coordinate values ✓
- ○ Digitizing the amplitude values

✓ Which of the following has the maximum frequency? 2/2

- ○ Radio Waves
- ○ Microwaves
- ◉ Gamma Rays ✓
- ○ UV rays

✓ What is the phenomenon one encounters when a lens fails to converge all the wavelengths of light on a single focal plane? 2/2

- ○ Vignetting effect
- ○ Distorted image
- ○ Non-collinear vanishing points
- ◉ Chromatic aberration ✓

✗ What is the distance of centre of projection from the projection plane in perspective projection? 0/2

- ○ There is a finite distance
- ○ Distance between centre of projection and projection plane cannot be told
- ◉ There is an infinite distance ✗
- ○ Point of projection lies on the projection plane itself

Correct answer

- ◉ There is a finite distance

✓ In orthographic projection an object is represented by two or three views on different planes which _____. 2/2

- ○ are parallel along one direction but a different cross section.
- ◉ are mutually perpendicular projection planes. ✓
- ○ Gives views from different angles from different directions
- ○ are obtained by taking prints from 2 or 3 sides of an object.

✓ Scaling can be 2/2

- ○ non-uniform
- ○ none of the above
- ○ uniform
- ◉ both uniform and non-uniform ✓

✓ Digital function requires both sampling and quantization of the one-dimensional image function. 2/2

- ○ FALSE
- ◉ TRUE ✓
- ○ can not say
- ○ Can be true or false

✓ What is the name of the effect caused by the use of an insufficient number of gray levels in smooth areas of a digital image? 2/2

- ○ Dynamic range
- ○ Ridging
- ○ Graininess
- ◉ False contouring ✓

✗ Gaussian noise is referred to as 0/2

- ○ Black noise
- ◉ white noise ✗
- ○ normal noise
- ○ Red noise

Correct answer

- ◉ Red noise

✓ The smallest discernible change in intensity level is called _____ 2/2

- ○ Contour
- ○ Contrast
- ◉ Intensity Resolution ✓
- ○ Saturation

✓ What is the name of the process in which the known data is utilized to evaluate the value at an unknown location? 2/2

- ○ None of the above
- ○ Pixelation
- ○ Acquisition
- ◉ Interpolation ✓

✓ When every entity of a geometric model remains parallel to its initial position, the transformation is called as ___ ? 2/2

- ○ Scaling
- ◉ Translation ✓
- ○ Mirror
- ○ Rotation

✓ Which of the following colors possess the longest wavelength in the visible spectrum? 2/2

- ○ Blue
- ○ Violet
- ○ Yellow
- ◉ Red ✓

✓ Median filters belong to which category of filter? 2/2

- ○ Frequency Domain Filter
- ○ Linear Spatial Filter
- ○ Sharpening Filter
- ◉ Order Static Filter ✓

✗ Digital function derivatives are defined as 0/2

- ○ addition
- ○ differences
- ○ multiplication
- ○ division

✓ The number of color options in a color raster system relies on - 2/2

- ○ Neither a nor b
- ○ colors in frame buffer
- ○ RGB color
- ◉ Amount of storage provided per pixel in frame buffer ✓

✓ _____ refers to the transition between the image function's continuous values and its digital equivalent. 2/2

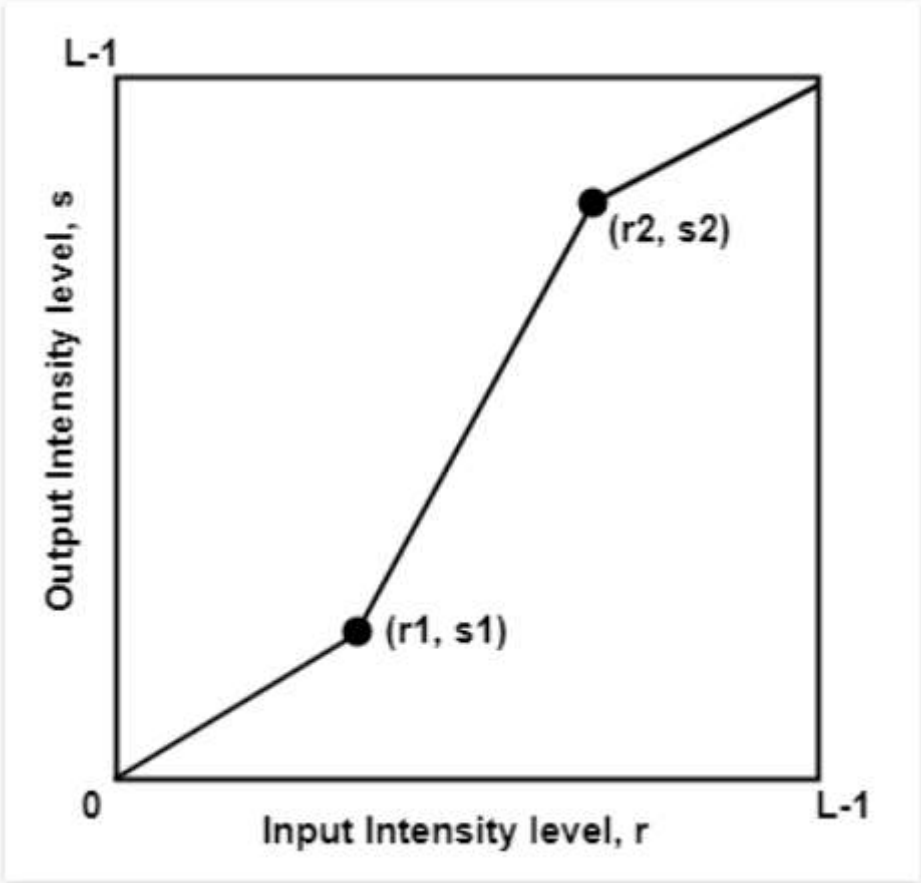
- ○ Sampling
- ○ Rasterization
- ◉ Quantisation ✓
- ○ Both A and B

✓ A to D conversion process uses 2/2

- ○ Quantizer
- ◉ Sampler & Quantizer ✓
- ○ None of the mentioned
- ○ Sampler

✓ Contrast - Stretching is an image processing technique that tries to improve the contrast by stretching the intensity values of an image to fill the entire dynamic range.Below figure shows a typical transformation function used for Contrast Stretching. 2/2

When r1 = r2, s1 = 0 and s2 = L-1, transformation becomes



- ○ Min-Max Stretching
- ○ Percentile Stretching
- ○ Linear function
- ◉ Thresholding function ✓

✓ What causes the effect, imperceptible set of very fine ridge like structures in areas of smooth gray levels? 2/2

- ○ All of the mentioned
- ○ Caused by the use of huge number of gray levels in smooth areas of a digital image
- ◉ Caused by the use of an insufficient number of gray levels in smooth areas of a digital image ✓
- ○ None of the mentioned

✓ Averaging filters is also known as 2/2

- ○ None of the above
- ○ High pass
- ○ Band pass
- ◉ Low pass ✓

✓ How many axis intersects with the projection plane in the three-point perspective projection? 2/2

- ○ Two
- ◉ Three ✓
- ○ One
- ○ No axis intersects the projection plane

✓ The quantization will be finer when 2/2

- ○ Does not depend on amplitudes
- ○ None of the mentioned
- ○ Smaller the number of discrete amplitudes
- ◉ Larger the number of discrete amplitudes ✓

✗ How many dimensions of an object are represented by each orthographic projection view? 0/2

- ◉ 3 ✗
- ○ 2
- ○ 4
- ○ 1

Correct answer

- ◉ 2

✓ In contrast stretching, if r1=s1 and r2=s2 then which of the following is true? 2/2

- ○ The transformation is not a linear function that produces changes in gray levels
- ◉ The transformation is a linear function that produces no changes in gray levels ✓
- ○ The transformation is not a linear function that produces no changes in gray levels
- ○ The transformation is a linear function that produces changes in gray levels

✓ What is the full form of CAT in image processing? 2/2

- ○ Computerized Axial Telegraphy
- ○ Computer-Aided Tomography
- ○ Computer-Aided Telegraphy
- ◉ Computerized Axial Tomography ✓

✓ Which of the following possess maximum frequency? 2/2

- ○ Radio waves
- ○ Microwaves
- ○ UV Rays
- ◉ Gamma Rays ✓

✓ In which of the following projection, the object size differs when look from different distances? 2/2

- ○ Parallel Projection
- ◉ Perspective projection ✓
- ○ Cabinet Projection
- ○ Cavalier Projection

✓ How many bit plane does a gray scale image has: 2/2

- ○ 4
- ○ 2
- ○ 6
- ◉ 8 ✓

✓ A 15 cm object is placed 30 cm from a convex lens, which has a focal length of 15 cm. The distance of the image form the center of the lens is? 2/2

- ◉ 30 cm ✓
- ○ 20cm
- ○ 25 cm
- ○ 15 cm

✓ How to carry out an array function together with one or more images? 2/2

- ◉ Pixel by Pixel ✓
- ○ Row by Row
- ○ Array by Array
- ○ Column by Column

✗ Negative of an image is obtained by 0/2

- ○ Adding the intensity levels
- ◉ Reducing the intensity levels ✗
- ○ Enhancing the intensity levels
- ○ Reversing the intensity levels

Correct answer

- ◉ Reversing the intensity levels

✓ The projection is known as _____ when the projectors are perpendicular to the plane and parallel to one another. 2/2

- ○ Perspective projection
- ○ Oblique projection
- ○ Isometric projection
- ◉ Orthographic Projection ✓

✗ A continuous image is digitized at _____ points. 0/2

- ○ random
- ◉ sampling ✗
- ○ vertex
- ○ contour

Correct answer

- ◉ random

✓ Blurring an image with the help of a smoothing filter may lead to noise reduction. 2/2

- ◉ True ✓
- ○ False

✓ Which of the following is not a correct example of Image Multiplication? 2/2

- ◉ Pixelation ✓
- ○ Region of Interest Operations
- ○ Shading Correction
- ○ Masking

✓ Which of the following is the correct application of image blurring? 2/2

- (●) Gross representation ✓
- ( ) Object motion
- ( ) Image segmentation
- ( ) Object detection

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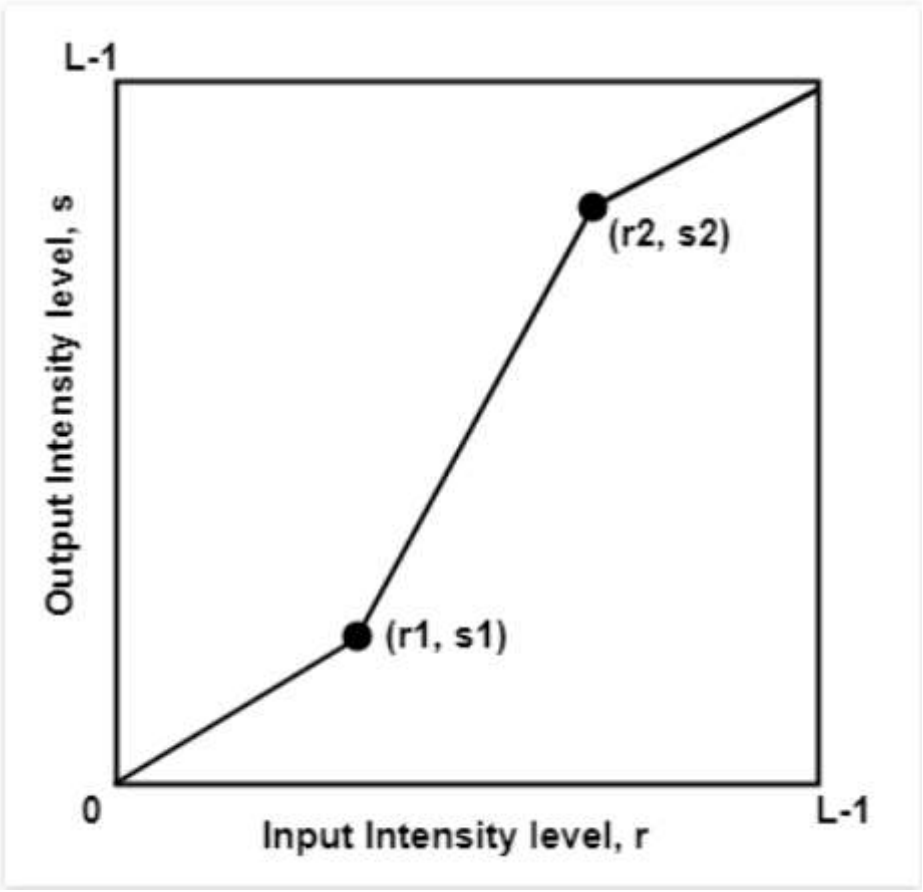

- ○ Min-Max Stretching
- ○ Thresholding function
- ○ Linear function
- ◉ Percentile Stretching ✓

✓ Given 1 D representation as : [2, 5, 8, 5, 2] 2/2

Now we apply average filter on this image of size 3. What would be the value of the last second pixel?

- (●) The value would remain the same ✓
- ( ) The value would decrease by 2
- ( ) The value would increase by 2
- ( ) None of the above

✓ Which of the following is an example of Digital Image Processing? 2/2

- (●) All of the mentioned ✓
- ( ) Camera Mechanism
- ( ) Pixels
- ( ) Computer Graphics

✓ Which of the following statements about human eye are true? i) In a poorly focused eye, the image is formed at retina. ii) Lens is made up of concentric layers of fibrous cells. iii) Cornea covers the anterior surface of the eye. 2/2

Select one:

- i, ii and iii
- Only ii
- i and ii
- ii and iii ✓

✓ The quality of a digital image is well determined by _____. 2/2

- None of the above
- Both A and B ✓
- The discrete gray levels
- The number of samples

✓ What is the sum of all components of normalized histogram? 2/2

- 1 ✓
- None of the above
- 0
- -1

✓ Which of the following factor does not affect the intrinsic parameters of a camera model? 2/2

- (●) Exposure ✓
- ( ) Image resolution
- ( ) Focal length
- ( ) Offset of optical center

✓ Non uniform quantization includes 2/2

- ( ) Expansion
- ( ) Compression
- (●) Compression & Expansion ✓
- ( ) None of the mentioned

✗ Which of the following is not a characteristic of perspective projection? 0/2

- ( ) Projectors are converging
- (●) Distance between Centre of projection (CP) and projection plane (PP) is finite ✗
- ( ) Projected image size is smaller than actual object
- ( ) Distance between Centre of projection (CP) and projection plane (PP) is infinite

Correct answer

- (●) Distance between Centre of projection (CP) and projection plane (PP) is infinite

✗ Projection plane is parallel to one of the principal axis. This is the characteristic of _____ 0/2

- ○ Axonometric projection
- ○ Orthographic projection
- ◉ None of the above ✗
- ○ Orthographic Perspective

Correct answer

- ◉ Orthographic projection

✓ Perspective projection can be divided into how many categories? 2/2

- ○ 6
- ○ 5
- ○ 4
- ◉ 3 ✓

✓ How many gray levels with 8 bits per pixel can we accommodate? 2/2

- ○ No color
- ○ 128 gray levels
- ○ 18 gray levels
- ◉ 256 gray levels ✓

✓ Dynamic range of imaging system is a ratio where the upper limit is determined by 2/2

- ○ Noise
- ○ Brightness
- ○ Contrast
- ◉ Saturation ✓

✓ which of the following is not the Relationship between pixel 2/2

- ○ connectivity
- ○ adjacency
- ○ neighborhood
- ◉ none of the above ✓

✓ A triangle is to be reflected about an arbitrary line. From the following, which transformation will be performed first? 2/2

- ◉ Translation ✓
- ○ Mirror
- ○ Scaling
- ○ Rotation

✓ Which of the following fact is true for an image? 2/2

- (●) An image is the multiplication of the illumination and reflectance component. ✓
- ( ) An image is the addition of illumination and reflectance component
- ( ) An image is the subtraction of the reflectance component from the illumination component
- ( ) An image is the subtraction of the illumination component from the reflectance component.