

University of Mumbai
Examination June 2021

Examinations Commencing from 1st June 2021

Program: **Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev2016

Examination: BE Semester VI

Course Code: ECC604 and Course Name: Image Processing and Machine Vision

Time: 2 hours

Max. Marks: 80

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Q1.	
1.	What is the third step in digital image processing?
Option A:	Image Restoration
Option B:	Segmentation
Option C:	Image Enhancement
Option D:	Colour Image Processing
2.	_____ is the total amount of energy that flows from light source.
Option A:	Radiance
Option B:	Darkness
Option C:	Brightness
Option D:	Luminance
3.	_____ represents the transition between image function's continuous values and its digital equivalent.
Option A:	Rasterization
Option B:	Quantization
Option C:	Sampling
Option D:	None of these
4.	The dynamic range of the imaging system is a quantitative relation where the upper limit can be determined by
Option A:	Brightness
Option B:	Contrast
Option C:	Saturation
Option D:	Noise
5.	What is the relationship between wavelength and frequency?
Option A:	$\text{frequency} = \text{wavelength} / c$
Option B:	$c = \text{wavelength} / \text{frequency}$
Option C:	$c = \text{wavelength} * \text{frequency}$
Option D:	$\text{wavelength} = c * \text{frequency}$

6.	What is the name of the property that indicates the output of linear operation (i.e., the sum of two inputs) similar to that of operation first being performed on individual inputs and then summing up the respective outcomes?
Option A:	Heterogeneity
Option B:	Homogeneity
Option C:	Additivity
Option D:	None of the above
7.	What is meant by Region of Interest (ROI) operations?
Option A:	Dilation
Option B:	Masking
Option C:	Shading correction
Option D:	None of the above
8.	What is the output of a smoothing, linear spatial filter?
Option A:	Median of pixels
Option B:	Maximum of pixels
Option C:	Minimum of pixels
Option D:	Average of pixels
9.	Which of the following is the disadvantage of a smoothing filter?
Option A:	Blur inner pixels
Option B:	Blur edges
Option C:	Sharp edges
Option D:	Remove sharp transitions
10.	Which of the following requires to specify the information at the time of input?
Option A:	Power transformation
Option B:	Log transformation
Option C:	Linear transformation
Option D:	Piece-wise transformation
11.	Which of the following fact is true for an image?
Option A:	An image is the subtraction of the illumination component from the reflectance component.
Option B:	An image is the multiplication of the illumination and reflectance component.
Option C:	An image is the addition of illumination and reflectance component
Option D:	An image is the subtraction of the reflectance component from the illumination component

12.	Given an intensity level $[0, L-1]$ with "r" and "s" positive values, how will the negative of an image obtain?
Option A:	$s = L - 1 - r$
Option B:	$s = L - 1 + r$
Option C:	$s = L + 1 - r$
Option D:	$s = L + 1 + r$
13.	In which of the following areas can we use the low pass filters?
Option A:	Machine perception, along with some application of character recognition
Option B:	Printing and publishing industry
Option C:	Satellite processing and aerial images
Option D:	All of the above
14.	What is the name of the innermost membrane present in the human eye?
Option A:	Sclera
Option B:	Choroid
Option C:	Retina
Option D:	Blindspot
15.	_____ is the principal factor, which helps in determining an image's spatial resolution.
Option A:	Dynamic range
Option B:	Quantization
Option C:	Sampling
Option D:	Contrast
16.	The technique of Enhancement that has a specified Histogram processed image, as a result, is called?
Option A:	Histogram Linearization
Option B:	Histogram Equalization
Option C:	Histogram Matching
Option D:	None of the above
17.	Which of the following possess maximum frequency?
Option A:	Gamma Rays
Option B:	UV Rays
Option C:	Microwaves
Option D:	Radio waves
18.	How to carry out an array function together with one or more images?
Option A:	Pixel by Pixel

Option B:	Column by Column
Option C:	Array by Array
Option D:	Row by Row
19.	What is the smallest possible value of the gradient image?
Option A:	1
Option B:	0
Option C:	e
Option D:	-e
20.	Which of the following technique is used to obtain a certain range of bits required to quantize each pixel?
Option A:	Contouring
Option B:	Bit-plane slicing
Option C:	Grey-level slicing
Option D:	Contrast stretching

Q2	
A	Solve any Two 5 marks each
i.	Explain morphological operations with mathematical expression a. Dilation b. Erosion c. Opening d. Closing
ii.	Explain the principle of Homomorphic filtering.
iii.	What is Gaussian and Rayleigh noise?
B	Solve any One 10 marks each
i.	Explain motion estimation.
ii.	Explain B-spline algorithm.

Q3	
A	Solve any Two 5 marks each
i.	Explain chain code and shape number of image using 8-connectivity.
ii.	Explain Statistical texture description methods.
iii.	Explain Geometric border representation.
B	Solve any One 10 marks each

i.	What is image segmentation? Draw hierarchy of image segmentation.
ii.	What is texture analysis?