International Institute of Information Technology, Hyderabad

(Deemed to be University)

Digital Image Processing: Quiz-1 [28th Aug 2023] **SET A.** **[45min]**

Roll No: _____ *Programme:* _____ *Name:* _____

Fill in the blanks or select ALL correct answers (there may be multiple). $15 \times 4 = 60$ *marks.*
Write your choices (e.g.: a,c) on the left of each question (do not underline/circle the choices)

1. The colour that is most numerous in a Bayer pattern is: Green
   a. Red b. Green c. Blue d. White e. NOTA
2. The property of a light sensor that converts incident light to electric charge is called:
   photo Electric Effect
3. Quantization refers to discretization of: Intensity level
   a. Sample Location b. Frequency of light c. Intensity level d. Polarization
4. Which of the following factors of an image is affected by the aperture of a camera?
   (a.) Brightness b. Colour (c.) Depth-of-field d. Motion Blur
5. The generic expression of Linear Intensity Transform of an image, I, is: $y = mx + c$
6. The histogram of a 10 × 10 binary image has 40 pixels in the bin at 0. The number of distinct images that could result in this particular histogram is: $^{100}C_{40}$
7. The 3 × 3 neighbourhood of a pixel is referred to as: 8-neighbors
   (a.) 8-neighbors b. 9-neighbors c. 4-neighbors d. None of the above
8. Applying a 5 × 5 mean filter once to an image is not identical to repeatedly applying a 3 × 3 mean filter twice: (a.) True b. False — TRUE
9. The Laplacian of Gaussian filter is most useful to: find edges in noisy images
   (a.) Find edges in noisy images b. Find noise in images c. Sharpen an image d. NOTA
10. The Unsharp Mask: increases sharpness
    a. Increases contrast b. decreases sharpness (c.) increases sharpness d.NOTA
11. The padding required to fully apply a 7x7 filter is 3 pixels on each side.
12. For a system with input ($f(x)$) and output ($g(x)$) to be Linear Shift Invariant, the output of $\alpha f_1(x) + \beta f_2(x)$ should be: $\alpha g_1(x) + \beta g_2(x)$

Intensity difference AND distance

13. Which of these factors affect the coefficient of a Bilateral filter centered at (i,j)?
a. Gradient at (i,j) b. Intensity difference with I(i,j) c. Distance from (i,j) d. NOTA

14. The number of terms required to perfectly represent a square wave in Fourier series is: ∞

15. The Inverse Fourier Transform of a 1D Gaussian will be a: 1D Gaussian

SET B

1. NOTA
2. cones
3. Photo Electric Effect
4. Intensity level
5. Brightness ; Depth-of-field
6. $100C_{50}$
7. Contrast stretching
8. False
9. Second derivative
10. Increases Sharpness.
11. 2
12. $g_1(x) + g_2(x+d)$
13. Intensity difference & Distance from I(i,j)
14. Sum of sine & cosine harmonics of the same period
15. Sinc function $\left(= \frac{\sin x}{x}\right)$