Reg. No																

B.Tech DEGREE EXAMINATION, NOVEMBER 2023

Seventh Semester

18CSE465T - COMPUTATIONAL MEDIA

(For the candidates admitted during the academic year 2020 - 2021 & 2021 - 2022)

Note:

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

PART - A (20 × 1 = 20 Marks)

Answer **all** Questions

		Marks	BL	CO
1.	Which of the following represents range of frequency measured by ADC? (A) a) Bandwidth (B) b) Threshold frequency (C) c) Peak frequency (D) d) None of the mentioned	1	1	1
2.	Dynamic range of ADC is depended on _____ (A) a) Resolution (B) b) Linearity (C) c) Accuracy (D) d) All of the mentioned	1	1	1
3.	A 4-bit R/2R digital-to-analog (DAC) converter has a reference of 5 volts. What is the analog output for the input code 0101? (A) 0.3125 V (B) 3.125 V (C) 0.78125 V (D) –3.125 V	1	1	1
4.	Which of the following represents over sampling DAC? (A) a) PWM DAC (B) b) Delta-sigma DAC (C) c) Binary weighted DAC (D) d) Switched resistor DAC	1	1	1
5.	Which of the following is an indication by settling time? (A) a) Accuracy of conversion (B) b) Speed of conversion (C) c) Precision in conversion (D) d) All of the mentioned	1	1	1
6.	The distance between pixels p and q, the pixels have a distance less than or equal to some value of radius r, form a square centred at (x,y) is called : (A) a) Euclidean distance (B) b) Chessboard distance (C) c) City-Block distance (D) d) None of the Mentioned	1	1	2
7.	If r be the gray-level of image before processing and s after processing then which expression defines the negative transformation, for the gray-level in the range [0, L-1]? (A) a) $s = L - 1 - r$ (B) b) $s = cr^{\gamma}$, c and γ are positive constants (C) c) $s = c \log (1 + r)$, c is a constant and $r \geq 0$ (D) d) none of the mentioned	1	1	2
8.	A pixel p at coordinates (x, y) has neighbors whose coordinates are given by:(x+1, y), (x-1, y), (x, y+1), (x, y-1)This set of pixels is called _____ (A) a) 4-neighbors of p (B) b) Diagonal neighbors (C) c) 8-neighbors (D) d) None of the mentioned	1	1	2
9.	For Image Enhancement a general-approach is to use a function of values of f(input image) in a predefined neighborhood of (x, y) to determine the value of g(output image) at (x, y). The techniques that uses such approaches are called_____ (A) a) Contouring (B) b) Contrast stretching (C) c) Mask processing (D) d) None of the mentioned	1	1	2

10.	What is gamma correction? (A) a) A process to remove power-law transformation response phenomena (B) b) A process to remove log transformation response phenomena (C) c) A process to correct log transformation response phenomena (D) d) A process to correct power-law transformation response phenomena	1	1	2
11.	Which of the following is the effect of using an inadequate amount of intensity levels in a digital image's smooth areas? (A) Contouring (B) Interpolation (C) Gaussian smooth (D) False Contouring	1	1	3
12.	What is meant by Region of Interest (ROI) operations? (A) Dilation (B) Masking (C) Shading correction (D) None of the above	1	1	3
13.	What is the output of a smoothing, linear spatial filter? (A) Median of pixels (B) Maximum of pixels (C) Minimum of pixels (D) Average of pixels	1	1	3
14.	Smoothing filter is used to remove _____ from an image. (A) Smooth transitions of brightness levels (B) Smooth transitions of grey levels (C) Sharp transitions of brightness levels (D) Sharp transitions of grey levels.	1	1	3
15.	Median filters belong to which category of filter? (A) Frequency Domain Filter (B) Order Static Filter (C) Linear Spatial Filter (D) Sharpening Filter	1	1	3
16.	DPCM encodes the PCM values based on (A) a) Quantization level (B) b) Difference between the current and predicted value (C) c) Interval between levels (D) d) None of the mentioned	1	1	4
17.	The most common compression technique that is used to create CD-quality audio is based on the perceptual encoding technique is called (A) A) predictive encoding (B) B) perceptual encoding (C) C) MPEG (D) D) JPEG	1	1	4
18.	If the frames are displayed on the screen fast enough, we get an impression of (A) A) signals (B) B) motions (C) C) packets (D) D) bits	1	1	4
19.	In which type of applications can hard disk based drives are useful? (A) a) Electronic news gathering (B) b) Timing errors (C) c) Low cost (D) d) High data stream	1	1	5
20.	In Streaming stored audio/video, the files are compressed and stored on a (A) A) IP (B) B) server (C) C) domain (D) D) internet	1	1	5

PART - B (5 × 4 = 20 Marks)

Answer **any 5** Questions

		Marks	BL	CO
21.	Explain how to apply lossy compression to an image while preserving the essential details.	4	3	1
22.	Illustrate how the number of colors that can be assigned to a pixel represented by a given number of bits in a Palette-indexed Bitmap.	4	2	2
23.	Summarize about the histogram equalization.	4	2	3

24.	Explain the relationship between MIDI note durations and the perceived rhythm in music.	4	2	4
25.	Explain the difference between noise reduction and audio enhancement in the context of audio restoration?	4	2	5
26.	How does the sampling rate affect digital audio filter design?	4	2	5
27.	How does the amplitude of an audio wave affect its volume or loudness?	4	2	4

PART - C (5 × 12 = 60 Marks)

Answer **all** Questions

		Marks	BL	CO
28.	(a) Analyze the trade-offs between lossless and lossy compression in various real-world applications.	12	4	1
	(OR)			
	(b) Compare and contrast different multimedia tools in terms of features, capabilities, and suitability for various projects.			
29.	(a) Summarize the human visual perception system in detail with necessary diagrams.	12	4	2
	(OR)			
	(b) Illustrate how the image is digitized by sampling and quantization process and also demonstrate the effect of Aliasing.			
30.	(a) Show the various techniques in frequency domain to enhance an image with necessary examples.	12	5	3
	(OR)			
	(b) Tabulate the various filters available under frequency domain for image enhancement.			
31.	(a) Develop a method for automatically segmenting an audio file into its structural sections using statistical features.	12	6	4
	(OR)			
	(b) Evaluate the implications of changing time signatures in MIDI data on the overall musical structure and interpretation.			
32.	(a) Assess the impact of video compression on video quality and file size. How can one strike a balance between the two?	12	5	5
	(OR)			
	(b) Assess the trade-offs between lossy and lossless audio compression techniques.			

* * * * *