CO1: Understand mathematical formulation of an image, its processing steps and relationship between image pixels.
CO2: Apply Image enhancement using intensity transformations and spatial filtering.
CO3: Analyze image enhancement for frequency domain using Fourier transform.
CO4: Formulate region of interest through morphological operations.
CO5: Evaluate strongly co-related regions obtained through Segmentation using discontinuity and homogeneity based segmentation techniques
CO6: Describe an object of an image using Shape Number and Boundary descriptors.

Printed Pages: 04 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (CSE/AIML/CCV/DA/CSF/IoT), III Year, VI Semester
BCSE 0101: Digital Image Processing

Time: 2 Hours **Maximum Marks: 30**

Instructions for students:
1. Use of calculator is allowed.
2. Clearly mention if any assumptions are being made.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Consider the following 1-bit image. P: 1 1 1 1 1 1 0 1 0 0 0 1 0 0 1 0 0 0 1 Q: 1 a. Draw the m-adjacency path from pixel P to pixel Q where V={1}. b. Calculate City Block Distance between P and Q. c. Find the size of the given image.	[1 + 1 + 1 = 3]	1	A	C
2	i. Suppose there is a multispectral image of size 100 x 100. This image has 4 bands and each band uses 256 gray levels. This image needs to be transmitted at the rate of 10K bits per second. Calculate the time required to transmit the image in seconds. ii. How many different 100 x 100 binary images can exist?	[1.5 + 1.5]	1	A	C
3	**Attempt any one** i. An 8-bit digital image has a histogram where the				

	gray levels are equally distributed in the range from 160 to 220. For each operation of the following transformation functions, describe the gray level range in which the pixels will lie. Also draw the transformation function for each. In each case a gray level image will be generated where the gray level cannot be less than 0 or more than 255. **a.** Image negative **b.** Addition of 50 to all pixel gray levels **c.** Application of a thresholding function where the threshold is selected as gray level 128. **ii.** A certain image has 11 gray level intensities in the range of 10 to 20. If we generate a linear contrast stretched image with minimum gray level 0 and maximum gray level 7, then how will the new intensities get mapped? Write the formula and show the mapping in a tabular format as shown below. Note: Intensity values are always integers. So apply rounding off when required. r | s | After rounding | | | | ⋮ | ⋮ | ⋮	[1 + 1 + 1=3]	2	An	P
4	**Attempt any one** **i.** Consider the following image. 0 1 0 2 7 2 1 6 1 0 5 6 7 6 3 1 1 6 1 5 5 4 2 2 5 What will be the new value of the pixel (2, 2) if smoothing is done using a 3 x 3: a) Mean filter [½] b) Weighted average filter (Assign weights as 3, 2 and 1) [1] c) Median filter [½] d) Min filter [½] e) Max filter [½]	3	2	A	C

	ii. Consider the following 4 bit, 4 x 4 image. 4 9 1 0 1 2 5 7 5 1 2 15 2 4 6 7 a. Extract the 0th Bit Plane. [1.5] b. How will the image look if thresholding is set at 3? [1.5]				
5	i. Give the transfer function of Gaussian Low pass and High pass filter. ii. Compute the convolution of the Laplacian Kernel L_4 with the image given below. Use border values to extend the image. 50 50 50 50 50 50 50 50 50 50 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	[1 + 2 = 3]	3	A	C

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Perform histogram equalization on the following 8 x 8 image. The gray level distribution of the image is given below. Gray levels (r_k): 0 1 2 3 4 5 6 7 Number of pixels (p_k): 8 10 10 2 12 16 4 2 Give your answer in tabular form as shown. i/p Gray Level (r_k) | No. of pixels (n_k) | $p(r_k) = n_k / MN$ | Σ | $(L-1)\Sigma$ | o/p Gray Level (S_k) | No. of pixels in o/p image ⋮ ⋮ ⋮ ⋮ ⋮ ⋮ ⋮	5	2	A	P
2	**Attempt any one** i. Consider the following image strip of 19 pixels. 6 6 6 6 5 4 3 2 1 1 1 1 1 1 6 6 6 6 6 Compute its First order and second order derivatives. Your answer should be in a tabular format having 3	5	2	E	P

CS - 3rd/year

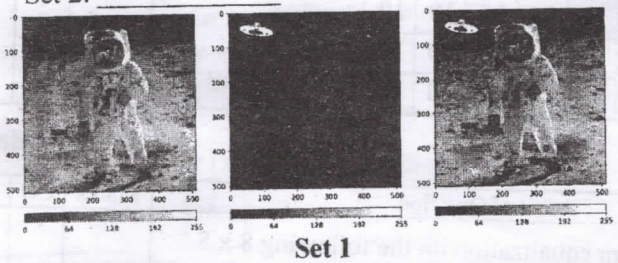
rows as shown below.

	6	6	6	6	5	4	3	2	1	1	1	1	1	6	6	6	6	6
1st order																		
2nd order																		

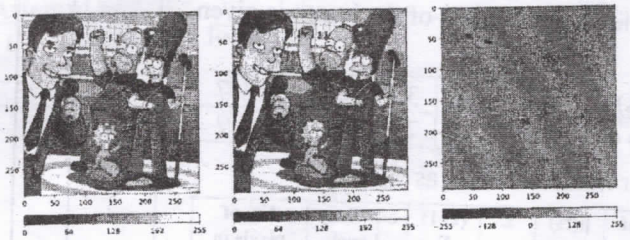
ii. Consider the following two set of images. The images on the right are the result of applying arithmetic operations between the two images on the left and in the middle. Specify which arithmetic operation has been used on Set1 and which on Set 2. Hint: Division operation has not been used on any Set. Give your answer by filling up the following blanks.

Set 1: _____

Set 2: _____



Set 1



Set 2

3 Compute the row wise Fourier transform of the following image, i.e. compute F(0, v), F(1, v), F(2, v) and F(3, v)

1	0	0	0
0	0	2	0
0	0	1	0
0	0	0	0

5 | 3 | A | P

Course Name: Machine Learning

Course Outcome

CO1- Understand the basic concepts of machine learning.
CO2- Apply the concepts of regression, classification, and re-sampling methods.
CO3- Design supervised and re-enforcement learning based solution.
CO4- Apply the ensemble methods for improving classification.
CO5- Identify the ways of feature extraction, reduction, and selection.

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Mid Term Examination, Even Semester 2021-22
B. Tech (CSE), III, VI
BCSE0105: Machine Learning

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:

- *This paper is divided into two sections: **A** and **B**. All the sections are **compulsory**.*
- *Write down the Serial Number of the question before attempting it and do all questions of a section at one place.*

Section – A 3 X 5 = 15 Marks

<table>
<tr><th>No.</th><th>Detail of Question</th><th>Marks</th><th>CO</th><th>BL</th><th>KL</th></tr>
<tr><td>1</td><td>What is Bayes' theorem? Write its two applications in Machine Learning?</td><td>3</td><td>3</td><td>R</td><td>F</td></tr>
<tr><td>2</td><td>Given the confusion matrix, find the Classification Accuracy, Recall, Precision, F-measure.
<table>
<tr><th colspan="2" rowspan="2">Actual</th><th colspan="2">Predicated</th></tr>
<tr><th>Positive</th><th>Negative</th></tr>
<tr><td colspan="2">Positive</td><td>6</td><td>4</td></tr>
<tr><td colspan="2">Negative</td><td>2</td><td>8</td></tr>
</table></td><td>3</td><td>3</td><td>A</td><td>P</td></tr>
<tr><td>3</td><td>Consider the following data where fruits and their corresponding value and price are given.
<table>
<tr><th>Fruit</th><th>Value of Fruit</th><th>Price</th></tr>
<tr><td>Avocado</td><td>1</td><td>50</td></tr>
<tr><td>Pineapple</td><td>2</td><td>110</td></tr>
<tr><td>Apple</td><td>1</td><td>25</td></tr>
<tr><td>Mango</td><td>3</td><td>90</td></tr>
<tr><td>Avocado</td><td>3</td><td>120</td></tr>
</table>
Apply the one hot encoding on the dataset.</td><td>3</td><td>1</td><td>A</td><td>P</td></tr>
</table>

4	What are the differences between Classification and Regression?	3	2	U	C
5	What is Curse of Dimensionality? Discuss the steps of the PCA algorithm.	3	5	U	C

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	We have data from the questionnaires survey (to ask people opinion) and objective testing with two attributes (acid durability and strength) to classify whether a special paper tissue is good or not. Here are six training samples	5	2	A	P

X1 = Acid Durability (seconds)	X2 = Strength (kg/square meter)	Y = Classification
1	4	Good
7	7	Bad
7	4	Bad
3	4	Good
2	5	Good
1	3	Bad

Now the factory produces a new paper tissue that pass laboratory test with **X1 = 3** and **X2 = 7**. Without another expensive survey, can we guess what the classification of this new tissue with the help of KNN algorithm. Solve it for both **K=3** and **K=5**.

<table>
<tr>
<td>2</td>
<td>Consider the following results obtained on correlation of number of hours spent in driving (X) with the risk of developing acute backache (Y). Compute parameters of a linear regression model.
<table>
<tr><td>Number of hours (X)</td><td>10</td><td>9</td><td>2</td><td>15</td><td>10</td><td>16</td><td>11</td><td>16</td></tr>
<tr><td>Risk Score on a scale of 0-100 (Y)</td><td>95</td><td>80</td><td>10</td><td>50</td><td>45</td><td>98</td><td>38</td><td>93</td></tr>
</table>
a) Find the regression line Y = A.X + B.
b) Use the regression line as a model to estimate the Risk Score on 12 hours of driving.</td>
<td>5</td><td>2</td><td>A</td><td>P</td>
</tr>
<tr>
<td>3</td>
<td>How does a machine learning system work? Explain each phase in detail.</td>
<td>5</td><td>1</td><td>U</td><td>C</td>
</tr>
</table>

Course Outcome (CO)

CO1: Understand the concept and challenges of big data.
CO2: Work with existing technology to collect, manage, store, query, and analyze the various form of big data.
CO3: Perform job scheduling of various applications and resource management in the cluster using Hadoop and Yarn.
CO4: Do the data summarization, query, and analysis over the big data with the help of pig and hive.
CO5: Prepare the regression model, cluster and decision tree over the real big data.
CO6: Gain hands-on experience in large-scale analytics tools to solve some open big data problems.

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Mid Term Examination, Even Semester 2021-22
B. Tech. (CSE), III Year, VI Semester
BCSE0157: INTRODUCTION TO BIG DATA ANALYTICS

Time: 2 Hours **Maximum Marks: 30**

Instructions for students:

1. All questions should be answered into given sequenced order for both sections.
2. Answer should be brief and to-the-point with neat sketch/diagram.
3. Any missing or wrong data may be assumed suitably with giving proper justification.
4. Mentioned on the right-hand side margin, indicates the full marks for respective questions.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Given Statement: "*Neither memory, nor disk have been shared among multiple processors*". Justify the statement with suitable example in term of Distributed Computing Architecture.	3	2	R	F
2	Brief the importance of ***Block Size*** in Hadoop HDFS ? Consider a file "example.txt" with size 524MB and determine, how many blocks will be created using default configuration of block size for this given file. Sketch the layout for such representation of block size.	3	3	U	P
3	How to Calculate the Jaccard Index for dataset similarity ? Consider below given datasets, • A = ['Rose', 'Lotus', 'Jasmine', 'Tulip'] • B = ['Lotus', 'Lavender', 'Marigold', 'Daisy'] Determine the following: (a) Number of observations in both datasets (b) Number of observations in either dataset (c) Jaccard Distance	3	1	A	C

4	Will Big Data be able to replace traditional database, data warehouse and data mart ? Justify your answer with suitable example.	3	2	U	M
5	Discuss the different types of NoSQL Databases with suitable examples ?	3	1	An	C

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Consider a situation, where ***NameNode*** does not receive a heartbeat message from a particular ***DataNode*** in Hadoop Cluster. Then, Point-out the actions need to be taken by ***NameNode*** for such problem. Also, draw the diagram to depict scenario for the revival of new ***DataNode*** in given Cluster.	5	3	E	M
2	In current time, 80% of digital data worldwide are "***unstructured***" and that need to be handled with more efficient techniques. Discuss all such possible techniques in detailed with diagram, which ultimately helps in handling the unstructured data ?	5	2	C	P
3	Sketch the High-Level Architecture of Hadoop with HDFS & MapReduce Layers. Also, discuss its Daemons associated to Master Node & Slave Node.	5	3	U	C

Course Name. CLOUD COMPUTING

Course Outcome

CO1- Describe importance of virtualization along with their technologies like system, network, and storage virtualizations.

CO2- Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, XaaS, Public Cloud, Private Cloud, Hybrid Cloud and the core issues of cloud computing such as security, privacy, and interoperability.

CO3- Justify the need of new technology of Virtualization & Cloud Computing and its ecological impact.

CO4- Identify the known threats, risks, vulnerabilities and privacy issues associated with Cloud based IT services.

CO5- Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost.

CO6- Identify the Challenges in managing heterogeneous clouds.

CO7- Analyze various cloud programming models and apply them to solve problems on the cloud.

CO8- Describe the key components of Amazon web Service.

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Mid Term Examination, Even Semester 2021-22
B.Tech CSE, III Year, VI Semester
BCSE 0207 CLOUD COMPUTING

Time: 2 Hours **Maximum Marks: 30**

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Explain XaaS. Also, explain at least five different types of services that falls in the category of XaaS.	3	2	U	C
2	Compare desktop virtualization with the application virtualization.	3	3	An	C
3	Explain different types of Cloud deployment models with the help of examples.	3	2	U	C
4	Identify the different challenges that the organization must consider before going to cloud if it wants to replace its legacy system with cloud solution.	3	4	Ap	P
5	Explain the differences between cloud & virtualization. Also, explain the fields where cloud and virtualization overlap.	3	3	U	C

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Determine the types of virtualization an organization must use to set up its offices in different part of the world.	5	1	E	D

	Justify your answer with proper reasoning. Also, estimate the cost impacts of proposed virtualization.				
2	An enterprise needs highly controlled storage and access to their databases as well as managing the infrastructure for web front ends and other applications. They have a large existing IT infrastructure and they are continually expanding the capabilities. Which cloud computing model will satisfy all their current needs and enable them to reduce cost? Justify your answer.	5	2	E	M
3	Discover the relationship between cloud computing, client server model, cluster computing, grid computing and utility computing?	5	3	An	F

Printed Pages: 13 **University Roll No.....**

Mid-Term Examination, Even Semester 2021-22

B.Tech. CSE, III: Year, VI: Semester

BCSE 0905: Artificial Intelligence for IIoT

Time: 1-hour **Maximum Marks: 30**

Note: Attempt all questions. 60 x 0.5 = 30 Marks

1. Perimeter and area measurements are meaningful only for _____ images.
   A. Secondary
   B. Binary
   C. Primary
   D. None of the above

2. Pixels that are in error Often appear visually to be markedly different from their neighbours
   A. True
   B. False

3. The dynamic range of the imaging system is a quantitative relation where the upper limit can be determined by
   A. Brightness
   B. Contrast
   C. Saturation
   D. Noise

4. The lower limit of the dynamic range ratio can be determined by
   A. Brightness
   B. Contrast
   C. Saturation
   D. Noise

5. ..... is the smallest possible value of the gradient image.

A. 0
B. 1
C. e
D. -e

6. ..... is being used for object segmentation, security enhancement, pedestrian tracking, counting the number of visitors, number of vehicles in traffic etc. It can learn and identify the foreground mask.

A. Background addition
B. Background subtraction
C. Background extraction
D. Background registration

7. The process of converting an image from other color spaces. It varies between complete black and complete white.

A. Eroding an image
B. Blurring an image
C. Gray scaling of image
D. Erosion and Dilation of images

8. What is the smallest unit of an image?

A. 1 sq. mm
B. DPI
C. Pixel
D. None of the above

9. Match the following image formats to their correct number of channels

- GrayScale
- RGB

I. channel
II. channels

III. channels
IV. channels

A. RGB -> I, GrayScale-> III
B. RGB -> IV, GrayScale-> II
C. RGB -> III, GrayScale -> I
D. RGB -> II, GrayScale -> I

10. To blur an image, you can use a linear filter:

A. TRUE
B. FALSE

11. Which gives a measure of the degree to which a pure colour is diluted by white light?

A. Saturation
B. Hue
C. Intensity
D. Brightness

12. Which of the following step deals with tools for extracting image components those are useful in the representation and description of shape?

A. Segmentation
B. Representation & description
C. Compression
D. Morphological processing

13. Which of the following is not a Machine Learning strategy in ANNs?

A. Unsupervised Learning
B. Reinforcement Learning
C. Supreme Learning
D. Supervised Learning

14. Which of the following statement describe the term pixel depth?

A. It is the number of units used to represent each pixel in RGB space
B. It is the number of mm used to represent each pixel in RGB space
C. It is the number of bytes used to represent each pixel in RGB space
D. It is the number of bits used to represent each pixel in RGB space

15. Finite difference filters in image processing are very susceptible to noise. To cope up with this, which of the following methods can you use so that there would be minimal distortions by noise?

A. Down sample the image
B. Convert the image to grayscale from RGB
C. Smooth the image
D. None of the above

16. Suppose we have an image which is noisy. This type of noise in the image is called salt-and-pepper noise

Median filter technique is the best way to denoise this image

A. TRUE
B. FALSE

17. Who is known as the -Father of AI"?

A. Fisher Ada
B. Alan Turing

C. John McCarthy
D. Allen Newell

18. Which of the following are the approaches to Artificial Intelligence?

A. Applied approach
B. Strong approach
C. Weak approach
D. All of the mentioned

19. An image is a two-dimensional function of ——— coordinates.

A. Spatial
B. Network
C. Dimension
D. All of the above

20. _____ is a method for Contrast Manipulation.

A. Amplitude scaling
B. Multispectral Image
C. Scaling
D. none of the above

21. What is the correct function to display the image in a window?

A. cv2.imshow("red", R)
B. cv2.imgshow(R)
C. cv2.display("Red",R)
D. None of the above

22. What is the correct function to read an image in python using openCV?

A. cv2.imread()
B. cv2.imget()
C. cv2.scan()

D. None of the above

23. A perceptron adds up all the weighted inputs it receives, and if it exceeds a certain value, it outputs a 1, otherwise it just outputs a O.

A. True
B. False

24. What is full form of ANNs?

A. Artificial Neural Node
B. AI Neural Networks
C. Artificial Neural Networks
D. Artificial Neural numbers

25. What are the characteristics that are used to distinguish one color from the other?

A. Brightness, Hue and Saturation
B. Hue, Brightness and Intensity
C. Saturation, Hue
D. Brightness, Saturation and Intensity

26. Given the following NumPy array shape, how would we interpret the width, height, and number of channels in the image: (400, 600, 3):

A. Width=600, height=400, channels=3
B. Width=600, height=3, channels=400
C. Width=400, height=600, channels=3
D. width=3, width=600, channels=400

27. Which of the following is a challenge when dealing with computer vision problems?

A. Variations due to geometric changes (like pose, scale etc.)
B. Variations due to photometric factors (like illumination, appearance etc.)
C. Image occlusion
D. All of the above

28. Which of the following is the primary objective of sharpening of an image?

A. Decrease the brightness of the image
B. Increase the brightness of the image
C. Highlight fine details in the image
D. Blurring the image

29. Which of the following environment is strategic?

A. Rational
B. Deterministic
C. Partial
D. Stochastic

30. What is perceptron?

A. A single layer feed-forward neural network with pre-processing
B. An auto-associative neural network
C. A double layer auto-associative neural network
D. A neural network that contains feedback

31. What is the name of the tool that helps in zooming, shrinking, rotating, etc.?

A. Filters
B. Interpolation
C. Sampling
D. None of the above

32. How to carry out an array function together with one or more images?

A. Pixel by Pixel
B. Column by Column
C. Array by Array
D. Row by Row

33. A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. What will be the output?

A. 238
B. 76
C. 119
D. 123

34. Which is true for neural networks?

A. It has set of nodes and connections
B. Each node computes it's weighted input
C. Node could be in excited state or non-excited state
D. All of the mentioned

35. Computer vision is concerned with modeling and replicating human vision using computer software and hardware.

A. TRUE
B. FALSE

36. Which of the following correctly describes the slightest visible change in the level of intensity?

A. Contour
B. Saturation
C. Contrast
D. Intensity Resolution

37. What is back propagation?

A. It is another name given to the curvy function in the perceptron
B. It is the transmission of error back through the network to adjust the inputs
C. It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
D. None of the mentioned

38. The RGB tuple (0, 255, 0) codes for red. But OpenCV would interpret this colour as:

A. Orange
B. Blue
C. Green
D. Yellow

39. What does the cv2.inRange function do?

A. Erodes and dilates an image
B. Finds pixel in the image that fall between a lower and upper boundary
C. Constructs a morphological kernel
D. Masks the image

40. What is the correct function to write an image to a window?

A. cv2.imdisplay("red", R)
B. cv2.imwrite()
C. cv2.output("Red",R)
D. None of the above

41. We have an image that is 393 pixels wide and 312 tall. How many total pixels are in the image?

A. 367,848
B. 122,616
C. 280,800
D. 93,600

42. OpenCV stores RGB pixels in what order?

A. GBR
B. RGB
C. BRG
D. BGR

43. The range of values spanned by the gray scale is called:

A. Dynamic range

B. Band range
C. Peak range
D. Resolution range

44. Which is a colour attribute that describes a pure colour?
A. Saturation
B. Hue
C. Brightness
D. Intensity

45. How can we change the resolution of an image from 1280 x 720 pixel to 720 x 480 pixel?

A. Image Cropping
B. Image Resizing
C. Image Skewing
D. None of the above

46. To understand image quality, you need to understand _____
A. Resolution
B. Compression
C. Both resolution & compression
D. npn of them

47. The RGB tuple (255, 0, 0) codes for red. But OpenCV would interpret this color as:
A. Orange
B. Blue
C. Green
D. Yellow

48. It refers to making the image less clear or distinct. It is done with the help of various low pass filter kernels.
A. Eroding an image

B. Blurring an image
C. Gray scaling of image
D. Erosion and Dilation of images

49. When we talk about image resolution, we're talking about _____
A. Pixel resolution
B. Pixel transformation
C. Light depth
D. None of Them

50. Pixel resolution is straightforward: a single pixel represents a: _____
A. Light
B. Color
C. Darkness
D. None of Them

51. Which of the following filter is used to find the brightest point in the image?
A. Max filter
B. Mean filter
C. Median filter
D. None of the above

52. What is the full form of JPEG?
A. Joint Photographs Expansion Group
B. Joint Photographic Expansion Group
C. Joint Photographic Experts Group
D. Joint Photographic Expanded Group

53. What role does the segmentation play in image processing?
A. Deals with extracting attributes that result in some quantitative information of interest
B. Deals with techniques for reducing the storage required saving an image, or the bandwidth required transmitting it

C. Deals with partitioning an image into its constituent parts or objects d) Deals with property in which images are subdivided successively into smaller regions

54. How many bit RGB colour image is represented by full-colour image?

A. 32-bit RGB colour image
B. 24-bit RGB colour image
C. 16-bit RGB colour image
D. 8-bit RGB colour image

55. An image is considered to be a function of a(x,y), where a represents:

A. Height of image
B. Width of image
C. Amplitude of image
D. Resolution of image

56. What is pixel?

A. Pixel is the elements of a digital image
B. Pixel is the elements of an analog image
C. Pixel is the cluster of a digital image
D. Pixel is the cluster of an analog image

57. With dilation process images get

A. Thinner
B. Shrinked
C. Thickened
D. Sharpened

58. Points exceeding the threshold in output image are marked as

A. 0
B. 1
C. 11
D. X

59. An _____ consist of erosion followed by dilation.

A. Close operation
B. Open operation
C. none of the above
D. both 1 and 2

60. Sobel operator is superior for an _____ edge.

A. Diagonal
B. Color
C. Centre
D. Vertical edge

Course Name: AGILE SOFTWARE DEVELOPMENT

Course Outcome

CO1-Understand the significance of Agile Methodologies in software development.

CO2-Compare and contrast the different agile methods.

CO3-Determine the suitability of agile methods for a particular Project.

CO4-Evaluate how well a project is following agile principles, and assist the project to become more agile (where appropriate).

CO5-Understand the relationship between the customer and the development team in agile projects and the responsibilities of both communities.

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Mid Term Examination, Even Semester 2021-22
B. Tech. (CSE), Year: III, Semester: VI
BCSE 0053 Agile Software Development

Time: 2 Hours **Maximum Marks: 30**

Instruction for students: Attempt all questions from section A&B

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Assume that you are appointed as one of the cross-functional team members for a Scrum-based project in your dream company. Identify the roles of user stories in your project. Also, mention the syntax of the user story along with a suitable example.	3	CO:2, CO:3	A	C
2	Define refactoring? How refactoring helps in Agile development?	3	CO1	U	F
3	Compare and analyze the roles and responsibilities of Product Owner and Scrum Master.	3	CO2	An	P
4	What are the compulsory and optional principles related to Crystal framework	3	CO:3, CO:4	R	F
5	Name any five most popular agile frameworks. In which framework, the concept of Eliminate Waste and Amplify Learning are applied? Can we apply Selenium tool with Agile for testing purposes?	3	CO1	R	F

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Being a Product Owner to develop a project in a Scrum framework environment, you need to lead and fulfill your roles and responsibilities. What values and principles as per the Agile Manifesto you will ensure throughout the development of that project?	5	CO3	A	D
2	Mr. Jatin Gambhir is working as Solution Architect at Stratacent Data Driven Solutions, New Delhi. For a SAS environment based project, he need to use Extreme Programming. Design the framework diagram that can assist him to deploy this project. Also mention the cases in which XP framework can be applied.	5	CO4	C	PC
3	Define the FDD framework in detail along with its strengths and weaknesses.	5	CO1	U	F

Course Name: Information Retrieval Systems

Course Outcome

CO1: Apply different information retrieval techniques in real-life applications.
CO2: Analyze indexing and pre-processing of textual documents for the IR system.
CO3: Apply IR principles into Spelling Correction, Phonetic Correction.
CO4: Analyze the performance of retrieval systems.
CO5: Apply IR techniques to XML Retrieval.
CO6: Develop retrieval systems for web search tasks.
CO7: Demonstrate similarity computation for the document.

Printed Pages: 03 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (CSE), III, VI
Subject Code & Subject Name- BCSE0154 Information Retrieval Systems

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:

1. Attempt all questions
2. Do not switch between section A and Section B; first, solve one section, then move to second
3. No B sheet will be given

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Draw the inverted index that would be built for the following document collection and design the term-document incidence matrix for this document collection. ***Doc 1*** breakthrough drug for schizophrenia ***Doc 2*** new schizophrenia drug ***Doc 3*** new approach for treatment of schizophrenia ***Doc 4*** new hopes for schizophrenia patients For the document collection shown above, what are the returned results for this query? ***schizophrenia AND drug***	3	CO2	C	C
2	Explain why IR techniques are essentially heuristics? Differentiate between Boolean retrieval model and Vector space model? Discuss the drawbacks of Boolean model?	3	CO1	R	F
3	Explain the key goal of an IR system?Differentiate between IR and data Retrieval?	3	CO1	U	F
4	When two vectors have the same orientation what is the angle between them and what is the angle of opposite vectors in regard to computing cosine similarity? **OR** Differentiate between exact match and best match?	3	CO2	U	C

	Explain with diagram the architecture of IR system with process of indexing and ranking?				
5	What is Cosine Similarity ? Explain the metric to compute Cosine similarity? Calculate the Cosine Similarity of the below given two documents: Document 1 = 'the best data science course' Document 2 = 'data science is popular'	3	CO7	E	P

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Consider a case insensitive query and document collection with a query Q and a document collection consisting of the following three documents **Q :** " silver gold truck" **D1:** " shipment of gold damaged in a fire" **D2**: " delivery of silver arrived in a silver truck" **D3:** "shipment of gold arrived in a truck" How similarity coefficient is measured? Calculate the similarity coefficient between query **Q** and Document **D1,D2&D3**	5	CO7	E	C
2	Discuss any five data centric challenges posed by web in context to IR. **OR** Here are two short texts to compare: *T1:* Julie loves me more than Linda loves me *T2:* Jane likes me more than Julie loves me Explain how one can know how similar these texts are, purely in terms of word counts (and ignoring word order)	5	CO2	A	C
3	Consider the (k = 2)-shingles for each D1, D2, D3, and D4: D1 : I am Sam. D2 : Sam I am. D3 : I do not like green eggs and ham. D4 : I do not like them, Sam I am. Write the number of terms generated by (k = 3)-character shingles for D1 ∪ D2 ? How jaccard similarity is computed?Compute the Jaccard similarity between a) (D1,D2) b) (D1,D4) c) (D3,D4)	5	CO7	U	C

Course Name: B.Tech (CSE)

Course Outcome

CO1: Understand basic elements and concepts related to distributed system technologies; and core architectural aspects of distributed systems.

CO2: Identify the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion, deadlock detection, and agreement.

CO3: Understand principle behind IPC and use various interposes communication techniques, such as remote method invocation, remote events for building distributed systems.

CO4: Introduce the concepts of distributed file system with its architecture and components along with case studies.

CO5: Distinguish the main failure types in a Distributed System and specify algorithms for achieving fault tolerance and error recovery within such a system.

CO6: Understand how balancing of resources is done; issues, components and algorithms for load balancing in distributed environment.

Printed Pages:02 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22

B.Tech. (CSE), Year III, Semester VI

BCSE0205: DISTRIBUTED SYSTEMS

Time: 2 Hours **Maximum Marks: 30**

Attempt all the questions.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Enlist various characteristics of Distributed Systems, Also define Software Architecture Model.	3	1	U	Factual
2	Define the Global State, provide the solution using Chandy Lamport Algorithm?	3	1	U	Procedural

3	Define Inherent Limitations of Distributed Systems. Explain the Implementation Rules of Logical Clock?	3	1	U	Factual
4	Explain the Middleware using a suitable example.	3	1	E	Conceptual
5	Write a short note on the Interaction Model, Failure Model and Security Model.	3	2	U	Conceptual

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Describe the Centralized approach to handle deadlock in distributed systems, explain any one algorithms that is based on Centralized approach?	5	2	U	Conceptual
2	Execute the Lamport's Algorithm for Mutual Exclusion using a suitable example. Also define its performance.	5	2	A U	Procedural Factual
3	Show that the situation where, Agreement cannot be reached. Also explain the Classification of Agreement protocols.	5	2	A U	Procedural Factual

Course Outcome

CO1- Apply programming concepts using NodeJs.
CO2- Develop web application using MongoDB and AngularJs.
CO3- Develop web application based on MongoDB.
CO4- Understand project management and code
CO5- Develop REST full and MVC based web application.

Printed Pages: 2

University Roll No. .....

Mid Term Examination, Even Semester 2021-22
B.Tech (CSE), III Year, VI Semester
BCSE 0252 : Full Stack Using Node JS

Time: 2 Hours

Maximum Marks: 30

Instruction for students:

1) Write the complete code in one place neatly.
2) Mention the correct question number.

Section – A

3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	a) Explain the use of _id key in mongodb. b) What is the default port number of mongodb? c) Which type of DBMS is MongoDB? Explain.	1+1+1	CO3	R	C
2	MongoDB is called a schema-less database. Is it true? How to create the schema in MongoDB?	3	CO3	U	F
3	Explain mongodump and mongorestore utility in detail with the help of examples.	3	CO2	U	F
4	a) What is the maximum size of mongodb document? b) Which command is used to backing up a database? c) The mongoimport utility can load data in which file formats? Explain.	1+1+1	CO4	R, An	C
5	a) Explain insert() and remove() with example b) Explain various insertion method available in mongodb.	1.5+1.5	CO2	C, A	C

Section – B

5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Write the queries for the below question. 1)Create Inventory collection based on the below description and insert 3 documents in it.	5	CO4	C, An	C

	2)Store Inventory details for 3 items- laptop, keyboard, mousepad, qty, size attributes like height, width and unit measurement. **3)**Each item has multiple colors **i)** Write query to display black color items name only. **ii)** Write query to display the items that has white and black color. **iii)** Include new item "mobile" in the inventory **iv)** Set qty: 10, colors are black, white and gray for the mobile item.				
2	What do you understand by MongoDB's data models? Explain in detail.	5	CO4	U	F
3	a) What are the advantages and disadvantages of nosql? Explain in detail. b) Explain database, collection and document in mongodb.	2.5+2.5	CO2	R	C

Course Name: PHP Scripting Language

Course Outcome

CO1: Do programming using PHP.
CO2: Develop web application using PHP
CO3: Understand project management and code.
CO4: Getting familiar with XML and My-Sql.

Printed Pages:3 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (CSE), 3rd Year, 6th Semester
BCSE 0254 / PHP Scripting Language

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:
You have to attempt all the questions.
Write the complete answer/code in one place neatly.

Section – A **3 X 5 = 15**

Marks

No.	Detail of Question	Marks	CO	BL	KL
1	a) Write a PHP Script to get ASCII value of each character along with number of occurrences for the following string : **"What a beautiful day is it !!!"** Sample input:"Our teacher is brilliant" Sample Output: Array ([32] => 3 [79] => 1 [97] => 2 [98] => 1 [99] => 1 [101] => 2 [104] => 1 [105] => 3 [108] => 2 [110] => 1 [114] => 3 [115] => 1 [116] => 2 [117] => 1) b) Explain the role of chunk_split() with an example.	2+1	CO 1	U	C

2	a) What will be the output of the following code? Explain with justification. <?php $res=print(15>8)? printf("%d",printf("great learning")): "no" ; echo $res; ?> b) Differentiate between print_r() and var_dump() for an array.	2+1	CO 1 CO 3	A	F
3	Explain the working of all array operators in PHP. Applied all operation on the given set of arrays. $array_one = [10,20,30,40,50]; $array_two = [10,20,'30',40]	3	CO 2	E	C
4	Explain the working of break and continue statements supported by PHP.	3	CO 1	R	C
5	Explain the working of following function to round off a number up to certain decimal points: Number_format( ) Round( ) Sprintf( )	3	CO 3	An	F

Section – B **5 X 3 = 15 Marks**

No.	Detail of Question	Marks	CO	BL	KL

1	a) Explain the implementation of foreach loop. Why we required it. Give example.
	b) What will be the output of the following code. Explain with justification.
	<?php
	declare(strict_types=1);
	function Teacher(string $name)
	{
	$index = 0;
	for (; $index <= 4; $index++) {
		3+2	CO 2	C,E	C

<table>
<tr><td></td><td>
echo strrev($name)."
";
$index++;
}
$index++;
}
Teacher("PHP class");
?>
</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>a) Illustrate the difference between asort( ) and arsort( ). Give an example
b) Write a user defined function which accepts three integer values as argument and finds the greatest number among them using nested switch statement</td><td>2+3</td><td>CO 1</td><td>U</td></tr>
<tr><td>3</td><td>Write a PHP script that prints the following numbers table from 1 – 10 using any loop within the HTML table tag formation. Add cellpadding="3px" and cellspacing="0px" to the table tag.
<table>
<tr><td>1 * 1= 1</td><td>1 * 2= 2</td><td>1 * 3= 3</td><td>1 * 4= 4</td><td>1 * 5= 5</td><td>1 * 6= 6</td><td>1 * 7= 7</td><td>1 * 8= 8</td><td>1 * 9= 9</td><td>1 * 10= 10</td></tr>
<tr><td>2 * 1= 2</td><td>2 * 2= 4</td><td>2 * 3= 6</td><td>2 * 4= 8</td><td>2 * 5= 10</td><td>2 * 6= 12</td><td>2 * 7= 14</td><td>2 * 8= 16</td><td>2 * 9= 18</td><td>2 * 10= 20</td></tr>
<tr><td>3 * 1= 3</td><td>3 * 2= 6</td><td>3 * 3= 9</td><td>3 * 4= 12</td><td>3 * 5= 15</td><td>3 * 6= 18</td><td>3 * 7= 21</td><td>3 * 8= 24</td><td>3 * 9= 27</td><td>3 * 10= 30</td></tr>
<tr><td>4 * 1= 4</td><td>4 * 2= 8</td><td>4 * 3= 12</td><td>4 * 4= 16</td><td>4 * 5= 20</td><td>4 * 6= 24</td><td>4 * 7= 28</td><td>4 * 8= 32</td><td>4 * 9= 36</td><td>4 * 10= 40</td></tr>
<tr><td>5 * 1= 5</td><td>5 * 2= 10</td><td>5 * 3= 15</td><td>5 * 4= 20</td><td>5 * 5= 25</td><td>5 * 6= 30</td><td>5 * 7= 35</td><td>5 * 8= 40</td><td>5 * 9= 45</td><td>5 * 10= 50</td></tr>
<tr><td>6 * 1= 6</td><td>6 * 2= 12</td><td>6 * 3= 18</td><td>6 * 4= 24</td><td>6 * 5= 30</td><td>6 * 6= 36</td><td>6 * 7= 42</td><td>6 * 8= 48</td><td>6 * 9= 54</td><td>6 * 10= 60</td></tr>
<tr><td>7 * 1= 7</td><td>7 * 2= 14</td><td>7 * 3= 21</td><td>7 * 4= 28</td><td>7 * 5= 35</td><td>7 * 6= 42</td><td>7 * 7= 49</td><td>7 * 8= 56</td><td>7 * 9= 63</td><td>7 * 10= 70</td></tr>
<tr><td>8 * 1= 8</td><td>8 * 2= 16</td><td>8 * 3= 24</td><td>8 * 4= 32</td><td>8 * 5= 40</td><td>8 * 6= 48</td><td>8 * 7= 56</td><td>8 * 8= 64</td><td>8 * 9= 72</td><td>8 * 10= 80</td></tr>
<tr><td>9 * 1= 9</td><td>9 * 2= 18</td><td>9 * 3= 27</td><td>9 * 4= 36</td><td>9 * 5= 45</td><td>9 * 6= 54</td><td>9 * 7= 63</td><td>9 * 8= 72</td><td>9 * 9= 81</td><td>9 * 10= 90</td></tr>
<tr><td>10 * 1= 10</td><td>10 * 2= 20</td><td>10 * 3= 30</td><td>10 * 4= 40</td><td>10 * 5= 50</td><td>10 * 6= 60</td><td>10 * 7= 70</td><td>10 * 8= 80</td><td>10 * 9= 90</td><td>10 * 10= 100</td></tr>
</table>
</td><td>5</td><td>CO 3</td><td>R</td></tr>
</table>

CS, CCV/DA/CSF/AIML

Course Name: Cloud & Business Process Management

Course Outcome

CO1: Understand basics of cloud Storage systems.
CO2: Explain the technologies and approaches for the business-related issues.
CO3: Understand the operation view and service catalog of cloud management.
CO4: Understand the concepts of VPM cloud computing.
CO5 Design process interactions interface for business users.

Printed Pages: 02 University Roll No. .....

Mid Term Examination, Even Semester 2021-22
B.TECH. (CSE-CCV), III Year, VI Semester
Cloud & Business Process Management (BCSE0508)

Time: 2 Hours **Maximum Marks: 30**

Note: Attempt all questions.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	What are BPM services with Appropriate Application	3	1	R	F
2	What is cloud service Management with suitable Diagram Architecture?	3	2	An	C
3	Which three services are available in the Middleware container of ANEKA cloud architecture? Explain in detail.	3	4	R	F
4	Why BPM is important? Explain Business Agility in detail.	3	3	U	P
5	What is Aneka workflow Architecture?	3	1	R	F

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	What is Aneka container and its use?	5	1	U	C
2	What is Cloud Architecture Diagram and its services?	5	4	A	P
3	What is Cloud Provisioning, and how does it work? Explore several types of provisioning models. Write short notes on orchestration and automate.	5	1	R	M

Course Name: IT Business Continuity & Disaster Recovery

Course Outcome

CO1: - Comprehend Information Technology, Business Continuity & Disaster Recovery Planning

CO2: -Appreciate the essence of different phases of Business Continuity & Disaster Recovery planning life cycle.

CO3: -Realize the probes of Risk Assessment and Mitigation.

CO4: -Interpret the management, auditing and maintenance of Business Continuity & Disaster Recovery planning.

CO5: -Deploy Catalyst software for Business Continuity & Disaster Recovery planning.

Printed Pages:02 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B. Tech. (CSE) Specialization in Cyber Security & Forensic,
III Year, VII Semester
IT Business Continuity & Disaster Recovery (BCSE0605)

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:

1. All parts of a question should be answered at one place.
2. Answer should be brief and to-the-point and be supplemented with neat sketches.
3. Any missing or wrong data may be assumed suitably giving proper justification.
4. Figures on the right-hand side margin indicate full marks.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	What is a business continuity and disaster recovery plan?	3	3	A	P
2	How frequently should Business Continuity Plans be reviewed? Why?	3	4	U	C
3	What is the Business Continuity Plan Life Cycle, Define the Components of a Business Continuity Plan and Program?	3	1	An	C
4	Discuss the structure of Disaster Recovery plan in Covid-19 Situation.	3	1	R	F
5	Explain the Challenges & Best Practices related to BCP& Disaster Recovery	3	2	U	M

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Why Are Business Continuity Planning and Disaster Recovery Planning So Important? How Do They Complement Each Other?	5	2	C	P
2	Define the actions necessary to create an effective Business Continuity Plan Audit and Review.	5	3	C	P
3	Explain the progressive strategy approach in exercising the Business Continuity Plan. How would this have applied in a university situation?	5	1	C, U	F

Course Name: Big Data Analytics

Course Outcome

CO1-Understand Architecture for Big Data.
CO2-Understand concept of Hadoop and its various versions.
CO3-Understands YARN, HDFS and Map Reduce Algorithm.
CO4-Understand Hadoop Eco system.
CO5-Understand data access through HIVE, PIG etc.
CO6-Understand MongoDB database and Cassandra file system

Printed Pages: 1 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (CSE(IoT), III[rd] Year, VI Semester
Subject Code & Subject Name- BCSE0655 & Big Data Analytics

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:
1. Write your Roll No. on the top immediately on receipt of this question paper
2. Attempt all the questions.

Section – A 3 X 5 = 15 Marks

No	Detail of Question	Marks	CO	BL	KL
1	Differentiate among NameNode, Backup Node and Checkpoint NameNode.	3	3	U	F
2	Describe various ways by which we can deal with the unstructured data.	3	1	U	C
3	Define daemon? And Explain their roles in a Hadoop cluster?	3	2	R	F
4	List down the steps involved in deploying a big data solution and describe the same.	3	1	U	C
5	Define rack awareness and on what basis is data stored in a rack?	3	3	U	C

Section – B 5 X 3 = 15 Marks

No	Detail of Question	Marks	CO	BL	KL
1	Differentiate between Hadoop 1.x and Hadoop 2.x on the basis of attribute in tabular format.	5	2	R	F
2	Describe the modules that constitute the Apache Hadoop 2.0 framework?	5	2	U	C
3	List down key components of YARN and describe YARN architecture with neat and clean diagram.	5	3	U	C

Course Name: B. Tech (Computer Science & Engineering- AIML)

Course Outcome

CO1- Understand the Usage of Machine Learning in Different Industries, Handling Data and Evaluation Matrices
CO2- Understand the Cyber Security and Analysis of Fraud Detection using ML in the banking sector
CO3- Understand the media analytics, customer reviews, Recommender Systems using sentiment analysis, ML and AI
CO4- Understand the sentimental analysis for student's feedback using the Machine Learning
CO5- Learn about machine learning approaches in drug discovery and disease prediction

Printed Pages: **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22

B. Tech (Computer Engineering-AIML), 6th Semester, 3rd Year

Subject Code - BCSE 0705

Subject Name- Applications of Machine Learning in Industries

Time: 2 Hours **Maximum Marks: 30**

Instruction for students: Attempt all questions in sequential order.

Section – A 3 X 5 = 15 Marks

No.	Detail of Questions	Marks	CO	BL	KL
1	Discuss the four differences between the Rule-Based and Machine Learning based fraud detection approaches.	3	2	U	C
2	Let's assume that we have 1000 Credit Card Fraud detection transactions, in which 947 data points represent the normal transaction and 53 data points for the fraud transaction. After applying certain Machine Learning model, the total outcome values are defined as TP = 30, TN = 930, FP = 30, FN = 10. Calculate the sensitivity, false-negative rate, and specificity of the model.	3	2	E	C
3	Explain and discuss the three techniques for handling imbalanced data with advantages and disadvantages.	3	1	U	F
4	Explain Type-1 Errors and Type-2 errors with an example.	3	1	R	C
5	Define any three types of Cyberattacks in banking and list down the name of at-least three deep learning algorithms for providing cyber security solutions.	3	2	R	P

Section – B 5 X 3 = 15 Marks

No.	Detail of Questions	Marks	CO	BL	KL
1	Explain and discuss all three types of Machine Learning Algorithms with the usage of each algorithm in industrial applications.	5	1	R	P
2	Last year, five randomly selected students (S1, S2, S3, S4, & S5) took a math aptitude test before they began their statistics course. Answer the questions asked by the Statistics Department. a. Based on math aptitude scores (X), what linear regression equation best predicts statistics performance (Y)? b. If a student made a 90 on the aptitude test, what grade would we expect her to make in statistics?	5	1	An	M
3	Explain the different types of recommender systems with advantages and limitations.	5	3	U	P

	S1	S2	S3	S4	S5
X	95	85	80	70	60
Y	85	95	70	65	70

Course Name: DevOps

Course Outcome

CO1- Explain the benefits of DevOps Methodology with respect to traditional Software Development Methodology.

CO2- Identify differences between DevOps and Agile Software Development methodology.

CO3- Explain the concepts of DevOps while being Agile.

CO4- Explain the Continuous Development, Continuous Integration, Continuous Testing and Continuous Delivery of Software.

CO5- Work with the tools for DevOps

CO6- Relate DevOps with the emerging technologies like BigData and IoT.

Printed Pages: 02 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22

B. Tech (Specialization in CCV), Year: III, Semester: VI

Subject Code & Subject Name- BCSE 0511/ DevOps

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:

Attempt all questions.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	An organization named "ABC IT Solutions" wants to opt for DevOps culture in their organization. Imagine you are an HR of the organization. What skills will you consider to create a cross-functional DevOps team? Why can't you consider the existing team for it?	3	1	U	C
2	Differentiate between Monolithic and Microservice development of an application. Also, draw the architecture of each.	3	3	R	F
3	Analyze the points of differences between Agile methodology and DevOps Culture.	3	2	An	F
4	Name the website and the installation filename that needs to be downloaded to install Jenkins in Windows Operating System. Write batch commands to create a directory named Developer in the workspace and a directory named Release inside it.	3	5	C	P
5	How has adoption of DevOps culture impacted the developers and operations team in an organization? Discuss.	3	1	R	F

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	What are the four paths of adoption of DevOps in an organization? Explain each in brief.	5	1	R	F
2	Explain the importance of the following tools in DevOps: a. Version Control System b. Continuous Integration/Continuous Delivery c. Configuration Management d. Continuous Monitoring How do they all work together in a DevOps Centric organization?	5	5	U	C
3	Explain the principles of DevOps each organization should be following before taking the decision of opting DevOps in their organization.	5	4	R	F

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	What are the four paths of adoption of DevOps in an organization? Explain each in brief.	5	1	R	F
2	Explain the importance of the following tools in DevOps: a. Version Control System b. Continuous Integration/Continuous Delivery c. Configuration Management d. Continuous Monitoring How do they all work together in a DevOps Centric organization?	5	5	U	C
3	Explain the principles of DevOps each organization should be following before taking the decision of opting DevOps in their organization.	5	4	R	F

Course Name: Hadoop & Big Data Analytics

Course Outcome

CO1- Understand the concept and challenges of big data
CO2- Apply the existing technology to collect, manage, store, query, and analyze the big data
CO3- Implement job scheduling and resource management of the cluster using Hadoop and Yarn
CO4- Apply data summarization, query, and analysis over the big data with the help of pig
CO5- Implement different real life applications by using large-scale analytics tools.

Printed Pages: **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (DA), III[rd] Year, VI[th] Semester
(BCSE0556) Hadoop & Big Data Analytics (DA)

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:
1. Write your Roll No. on the top immediately on receipt of this question paper
2. Attempt all the questions.

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Describe the need of Hadoop with some real-time examples and also explain various characteristics of Big data.	3	1	U	C
2	Design Hadoop Ecosystem with at least 3 components and justify its need	3	1	C	F
3	Differentiate between Hadoop 1.0 , Hadoop 2.0 and Hadoop 3.0 and also compare traditional BI with Big Data	3	2	A	F
4	Evaluate all type of daemons of Hadoop ecosystem with possible diagram.	3	3	A	C
5	Define processing Block Size in Hadoop and also explain role of Secondary Node Advantages	3	2	U	C

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Analyze the need of Yarn component with the context of Hadoop 1.x and also explain its various components with diagram .	5	3	An	M
2	Assume you are a Big Data Architect and you have to provide Big Data Solution for Banking Domain, Here Evaluate your solution with available resources to create Big Data Solution for any Banking Domain Area (Kindly mention your solution stepwise)	5	2	E	P
3	"Would Spark be a replacement of Hadoop Ever ?" Describe working of Spark Streaming and applications of Spark Streaming .	5	1	E	C

Course Name: BCSE0606: DIGITAL FORENSICS

Course Outcome

CO1: Understanding computer forensics investigative procedures.
CO2: Evaluate the systematic collection of evidence at incident scenes.
CO3: Discuss and analyze computer forensics findings.
CO4: Understanding of the trade-offs and differences between various forensic tools.
CO5: Implement and evaluate numbers of methodologies for validating and testing computer forensics tools and evidence.
CO6: Exhibit forensics ethical behavior and comply with professional conduct requirements

Printed Pages:2 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B. TECH-CSE (CSF), Year-III, Semester-VI
Subject Code:BCSE0606, Subject Name- DIGITAL FORENSICS

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:
ATTEMPT ALL QUESTIONS FROM SECTION A&B

Section – A **3 X 5 = 15 Marks**

No.	Detail of Question	Marks	CO	BL	KL
1	Write down the various steps Digital forensics entails.What are some initial assessments you should make for a computing investigation?	3	CO:1,CO:2	A	F
2	Define Computer security incident. Explain the various goals of incident response.	3	CO:2	R	F
3	Differentiate *Disk Cloning*and*Disk Imaging*. What types of data do you focus on in your investigations?	3	CO:3	A	C
4	As an Email forensics professionals what common techniques you will follow to examine emails and collect digital evidence. Explain Domain Squatters.	3	CO:5	A	P
5	Write down the Standard Procedures for Network Forensics. Differentiate Lossless and Lossy data compression.	3	CO:4,CO:5	A	U

Section – B **5 X 3 = 15 Marks**

No.	Detail of Question	Marks	CO	BL	KL
1	To assure accurate and meaningful results at the end of a network forensic, which rigid path you must follow as a forensic investigator. Write down the various sources of network evidence.	5	CO:4,CO:5	A	P
2	Write down the various steps to perform Live acquisitions. Differentiate cyber defamation and cyber stalking.	5	CO:3	A	C
3	Write down the various Issues relating to Electronic Evidence. Suppose you are working in a company and you think that a cellphone in your company may contain important evidence, being a forensic investigator how should you handle it?	5	CO:6	A	C

Course Name: IoT for Industries

Course Outcome

CO1- Describe IoT and IIoT
CO2: Understand the main characteristics of next generation industrial sensors.
CO3: Understand, design and develop the real life IIoT applications.
CO4- Applying the communication protocol in real life industrial application
CO5- Analyzing the practical aspect of industrial sensor

Printed Pages: 1 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (CS-IoT), III, VI
Subject Code & Subject Name- BCSE 0656 & IoT for Industries

Time: 2 Hours **Maximum Marks: 30**

Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	List all the device management capabilities of LwM2M protocol?	3	4	U, C	C
2	Outline and explain the different components of a Raspberry Pi 3 board?	3	3	An	F
3	Write the different model name of Raspberry Pi as per their generation.	3	3	R, U	C
4	Identify and discuss the immediate Benefits of Industrial IoT.	3	2	U	P
5	Differentiate IoT, IIoT and M2M with respect to nature, application and working.	3	1	U, R	C

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	How many Expansion Connectors, USB port, GPIO Port, internal communication support, ground pins are available with RPi 4 B+ model. Write the GPU specification of RPi 4 B+.	5	3	R, U	F
2	Briefly explain with real life example, how IoT has become a game changer in the new economy where the customers are looking for integrated values?	5	5	U, A	C
3	Define various IIoT Layers and their relative importance. Also differentiate between OMA LwM2M 1.2 and OMA LwM2M 1.1.	5	4	R, A	F

Course Name: Neural Networks

Course Outcome

CO1-Understand the differences between networks for supervised and unsupervised learning
CO2- Design single and multi-layer Perceptron neural networks
CO3-Understand Back Propagation Non-Linear Neural network architecture
CO4-Understand Convolutional Neural Network and Recurrent Neural Network

Printed Pages: 3 **University Roll No. .....**

Mid Term Examination, Even Semester 2021-22
B.Tech (AIML), 3rd Year, 6th Semester
(BCSE 0706) Neural Networks

Time: 2 Hours **Maximum Marks: 30**

Note-

-Attempt all questions.

-Use appropriate data if missing.

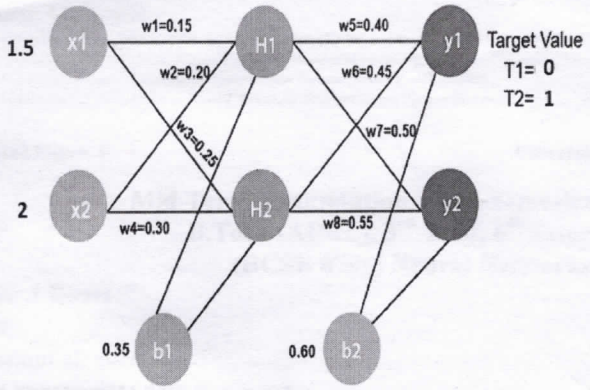
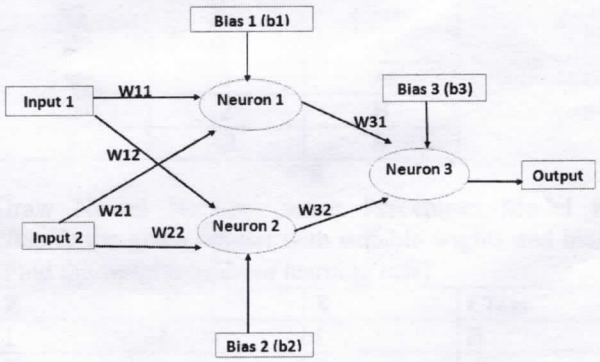
Section – A 3 X 5 = 15 Marks

<table>
<tr><th>No.</th><th>Detail of Question</th><th>Marks</th><th>CO</th><th>BL</th><th>KL</th></tr>
<tr><td>1</td><td>Explain Biological Neuron with proper diagram.</td><td>3</td><td>CO1</td><td>R</td><td>F</td></tr>
<tr><td>2</td><td>Explain Supervised Learning techniques vs unsupervised Learning techniques.</td><td>3</td><td>CO1</td><td>U</td><td>C</td></tr>
<tr><td>3</td><td>Design Neural Network using Perceptron Model to classify the given dataset with suitable wights and bias. (Find the weights without learning rule)
<table>
<tr><th>X1</th><th>X2</th><th>Class</th></tr>
<tr><td>-2</td><td>-4/3</td><td>A</td></tr>
<tr><td>12/7</td><td>3</td><td>A</td></tr>
<tr><td>-3/2</td><td>2</td><td>B</td></tr>
<tr><td>2</td><td>-2</td><td>B</td></tr>
</table>
OR
Draw Neural Network using Perceptron Model to classify the given dataset with suitable wights and bias. (Find the weights without learning rule)
<table>
<tr><th>Z</th><th>Y</th><th>X</th><th>Class</th></tr>
<tr><td>1</td><td>1</td><td>1</td><td>B</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>A</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>B</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>B</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>A</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>A</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>B</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>A</td></tr>
</table>
</td><td>3</td><td>CO2</td><td>A
N</td><td>D</td></tr>
</table>

4	Design a NAND and NOR Gates using McCulloch Pits Model of Neuron	3	CO2	R, A	D
5	Write a Python Program to train the model for basic gates using Perceptron Learning Rule	3	CO2	U, A	P

Section – B 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Explain Gradient Descent algorithm and its types. Also prove mathematically the direction of gradient is negative using Loss Function of Taylor Series.	5	CO 3	U, A	S
2	For the following dataset, design a neural network without any bias having two neurons in the hidden layer. ImageId | x1 | x2 | x3 | x4 | Class 1 | 252 | 4 | 155 | 175 | A 2 | 175 | 10 | 186 | 200 | B 3 | 82 | 131 | 230 | 100 | A 4 | 115 | 138 | 80 | 88 | C Also update the parameters of the model only for first datapoint from the dataset. Take Linear Transfer function in the input, hidden layer and output layer. Learning rate=0.5, Bias=0 for hidden and output layer. OR For the given neural network having two neurons in the hidden layer, two neurons at the output layer, update the parameters of the model using Backpropagation for the data point given below- x1 | x2 | Y1 | Y2 1.5 | 2 | 0 | 1	5	CO 3	AN, E	D

	 Take Sigmoid function in the hidden layer as well as output layer. Learning rate=0.2				
3	The figure shows a Neural Network for implementing XOR function. Derive the formula for updating all weights and biases using Gradient Descent Algorithm. Use Sigmoid Function at output layer and tanh function at hidden layer. 	5	CO 3	AN, E	D