Hall Ticket Number:

Code No. : 18421

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

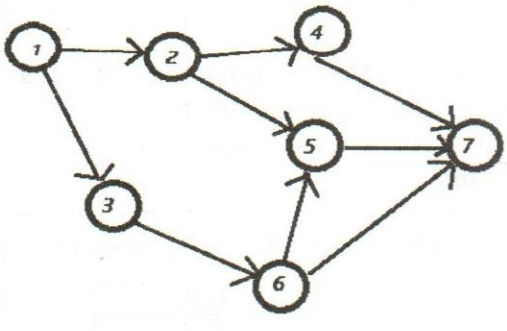
B.E. (E.C.E.) VIII-Semester Main & Backlog Examinations, June-2022

Image and Video Processing using Machine Learning (PE-V)

Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Differentiate Machine Learning and Computer programming?	2	2	1	1
2.	Discuss about Logistic regression.	2	1	1	1
3.	What are the advantages of Decision trees?	2	1	2	1
4.	Explain the concept of Bayes theorem.	2	1	1	1
5.	Write any four applications of SVM.	2	1	2	1
6.	What is Dendrogram.	2	1	3	1
7.	What is perceptron learning?	2	1	3	1
8.	Discuss about restricted Boltzmann Machines.	2	1	3	1
9.	What are the challenges in Face recognition?	2	1	5	1
10.	In CBIR, image size is 64X64. 200 images are used for training. If we take feature as the mean of the image, what is the size of the feature vector of the database?	2	2	5	2
	Part-B (5 × 8 = 40 Marks)				
11. a)	Explain Machine learning algorithms.	4	2	2	1
b)	Describe practical machine learning applications.	4	2	1	1
12. a)	Explain ID3 algorithm.	4	2	3	1
b)	What is Bayesian Network Check the validity of the Directed Acyclic graph  	4	3	3	2
13. a)	Discuss about hyper plane and derive the formulae for margin in decision boundary (SVM).	4	3	2	2
b)	Explain Agglomerative Clustering.	4	2	2	1

Contd... 2

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14. a)	Design the CNN architecture to classify the query image [output of CNN -only 2 classes (Car, Truck), use 2 convolution layers].	4	3	4	3, PSO3
b)	With a neat diagram explain RNN.	4	2	4	1
15. a)	Explain Video Classification with a neat diagram.	4	2	5	1
b)	Very small image is given below: $\begin{bmatrix} 10 & 12 & 256 \\ 34 & 45 & 180 \\ 23 & 43 & 150 \end{bmatrix}$ Segment the image into two clusters by using K-means clustering algorithm.	4	3	5	2, PSO3
16. a)	Illustrate cost function with an example.	4	3	3	2
b)	Design the decision tree for satellite image classification (Building, Road, Vegetation, Concrete) by considering any 2 features.	4	3	5	3, PSO3
17.	Answer any *two* of the following:				
a)	Assume, you want to cluster 7 observations into 3 clusters using K-Means clustering algorithm. After first iteration clusters, C1, C2, C3 has following observations: C1: {(2,2), (4,4), (6,6)};_C2: {(0,4), (4,0)};_C3: {(5,5), (9,9)} What will be the Manhattan distance for observation (9, 9) from cluster centroid C2 in second iteration?	4	3	3	2
b)	Consider a 4 X 4 matrix as shown below: 5 7 2 4 5 7 2 4 8 8 8 4 8 8 12 8 What is the result after applying max pooling of a filter 2X2 and stride of 2. What is the result after applying average pooling of a filter 2X2 and stride of 2.	4	3	4	2
c)	Consider a dataset with 100 minority examples and 10,000 majority class examples. A model makes predictions and predicts 120 examples as belonging to the minority class, 90 of which are correct, and 30 of which are incorrect. Calculate Precision?	4	3	4	2 PSO3

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	35%
iii)	Blooms Taxonomy Level – 3 & 4	45%

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