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School of Engineering Science & Technology
New Delhi – 110062
Examination Even Semester Examination 2023

Paper Name: Data Mining and Prediction by Machines
Time: 3 Hours

Paper Code: BTCSEAI 410
Maximum Marks: 75

COURSE OUTCOMES:

The students will be able to:

CO-1: Understand the process of formulating business objectives, data selection/collection, preparation and process to successfully design, build, evaluate and implement predictive models for a various business application.

CO-2: Create a Model for Data mining.

CO-3: Evaluate predictive modeling to analyses time series

CO-4: Select appropriate predictive modeling approaches to identify cases to progress with.

CO-5: Apply predictive modeling approaches using a suitable package such as Python/Tableau

Follow proper numbering for answering the questions.

Section-A				
All questions are compulsory in this Section				
Ques.		Marks	CO	BL
1.	What is CRISP-DM Model? Explain with the help of block diagram.	5	2	1,2
2.	What is data cleaning? What are the different techniques for handling missing values?	5	1	1,2
3.	What is Predictive Modelling? What are the common applications of Data Mining and Prediction?	5	3	3,4
4.	What is meant by classification? What are the applications of classification model?	5		1,2
5.	Let there be 10 balls (6 white and 4 red balls) in a box and let it be required to pick up the red balls from them. Suppose we pick up 7 balls as the red balls of which only 2 are actually red balls. What are the values of precision and recall in picking red ball?	5	2	5,6
6.	What is Neural Network? Explain Multi level feed forward network?	5	4	2
7.	What is Web mining? What are the different purposes of web mining.	5	5	1,2
Section-B				
Attempt any FOUR Questions from this Section				
1	What is Association Rule Mining? What is the benefit of Rule Mining.	10	1	1,2
2	Describe the data classification process with a neat diagram. How does the Naive Bayesian classification work? Explain.	10	2	2,5,6
3	What measures are used to find best split in Decision Tree Induction algorithm? How Can we improve the scalability in Decision Tree Induction algorithm?	10	3	2

4	The marks for 15 students on mid-term and end-term examinations in Data Analytics course are: <table><tr><td>Mid-Term</td><td>82</td><td>73</td><td>95</td><td>66</td><td>84</td><td>89</td><td>51</td><td>82</td><td>75</td><td>90</td><td>60</td><td>81</td><td>34</td><td>59</td><td>97</td></tr><tr><td>End-Term</td><td>76</td><td>83</td><td>89</td><td>76</td><td>79</td><td>73</td><td>62</td><td>89</td><td>77</td><td>85</td><td>48</td><td>69</td><td>51</td><td>25</td><td>74</td></tr></table> a) Obtain the simple linear regression analysis to predict the score on the end-term examination from the mid-term examination score. b) It is suggested that if the regression is significant, then there is no need to have final examination. How you test the significance level of your regression analysis?	Mid-Term	82	73	95	66	84	89	51	82	75	90	60	81	34	59	97	End-Term	76	83	89	76	79	73	62	89	77	85	48	69	51	25	74	10	3,4	1,2
Mid-Term	82	73	95	66	84	89	51	82	75	90	60	81	34	59	97																					
End-Term	76	83	89	76	79	73	62	89	77	85	48	69	51	25	74																					
5	For the given confusion Matrix below for 3 classes. Find Sensitivity & Specificity metrics to estimate Predictive Accuracy of Classification Method? <table><tr><th rowspan="2">Predicted Class</th><th colspan="3">True Class</th></tr><tr><th>1</th><th>2</th><th>3</th></tr><tr><td>1</td><td>8</td><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td><td>9</td><td>2</td></tr><tr><td>3</td><td>0</td><td>0</td><td>7</td></tr></table>	Predicted Class	True Class			1	2	3	1	8	1	1	2	2	9	2	3	0	0	7	10	5	4,5													
Predicted Class	True Class																																			
	1	2	3																																	
1	8	1	1																																	
2	2	9	2																																	
3	0	0	7																																	
6	Write Short notes on any two: a) Evaluating the performance of a classifier? b) Explain Minimum Support and Confidence Threshold c) Support Vector Machine	5x2	2,4	1,2																																

BL- Bloom's Taxonomy Levels (1-Remembering, 2-Understanding, 3-Applying, 4-Analysing, 5-Evaluating, 6-Creating), CO- Course Outcomes