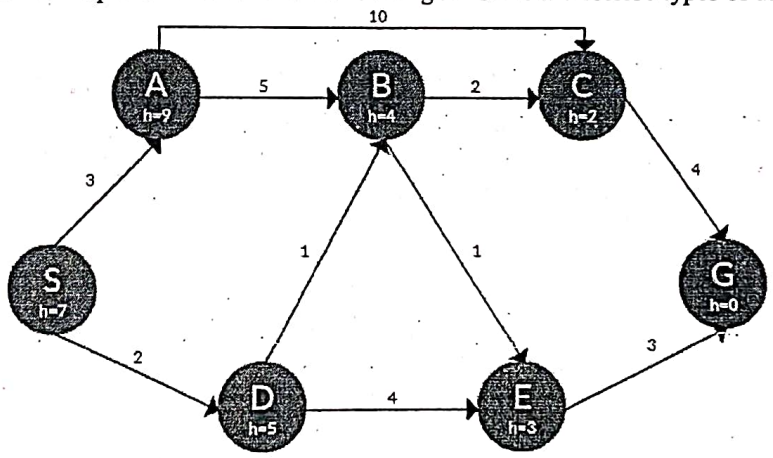
End Semester Examination 2023

Name of the Course: B.Tech
Name of the Paper: Fundamentals of Statistics and AI
Time: 3 Hours

Semester: 1st
Paper Code: TCS421
Maximum Marks: 100

Note:

(i) All Questions are compulsory.
(ii) Answer any two sub questions among a, b and c in each main question.
(iii) Total marks in each main question are twenty.
(iv) Each question carries 10 marks.

Q1	(10*2=20 marks)	
(a)	How is A.I., Machine Learning (ML) and Deep Learning (DL) differ from each other. Give brief introduction to the Turing Test.	CO1
(b)	Explain • How is Model-Based Reflex Agents • Goal-Based Agent	
(c)	Find the path to reach from S to G using A* search. Describe types of data? 	
Q2	(10*2=20 marks)	CO2
(a)	Difference Between Greedy Best First Search and Hill Climbing Algorithm.	
(b)	What is Space Space representation? Illustrate the various components of A.I. Program.?	
(c)	What are the various types of Environments in AI	
Q3	(10*2=20 marks)	

(a)	Decide which part of the study given below represents the descriptive branch of statistics. What conclusions might be drawn from the study using inferential statistics? a) A large sample of men, aged 48, was studied of 18 years. For unmarried men, approximately 70% were alive at the age of 65. For married men, 90% were alive at age 65. Still alive at 65 Married men-→ 90% Unmarried men-→ 70%	CO3
(b)	The following sample dataset lists the prices (in dollars) of 30 portable global positioning system (GPS) navigators. Construct a frequency distribution that has seven classes. 90, 130, 400, 200, 350, 70, 325, 250,150, 250, 275, 270, 150, 130, 59, 200, 160, 450, 300, 130, 220, 100, 200, 400, 200, 250, 95, 180, 170, 150.	
(c)	State the life cycle of a Data Science project. How is it different from Business Intelligence?	
Q4	(10*2=20 marks)	CO4
(a)	What is data preprocessing? State various techniques to detect the outliers.	
(b)	What are Pandas in Python? Mention the different types of Data Structures and significant features of Pandas Library.	
(c)	What are the various Objects in R. Explain data frames in detail?	
Q5	(10*2=20 marks)	CO5
(a)	Calculate the correlation coefficient for the gross domestic products and carbon dioxide emissions data given below in Table1. What can you conclude?	
(b)	Find the equation of the regression line for the gross domestic products and carbon dioxide emissions data used in Table 1.	
(c)	A person has undertaken a job. The probabilities of completion of the job on time with and without rain are 0.44 and 0.95 respectively. If the probability that it will rain is 0.45, then determine the probability that the job will be completed on time.	

Table 1

GDP	1.6	3.6	4.9	1.1	0.9	2.9	2.7	2.3	1.6	1.5
CO2	423.2	828.8	1214.2	444.6	264.0	413.5	571.8	454.9	358.7	573