

Total No. of Questions : [03]

Total No. of Printed Pages: [02]

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PAPER CODE	U321-231B(ESA)
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**May 2022 (ENDSEM) EXAM**  
**T.Y.B.TECH.(COMPUTER ENGINEERING) (SEMESTER - II)**  
**COURSE NAME: PROFESSIONAL ELECTIVE-II**  
**[ARTIFICIAL INTELLIGENCE]**  
**COURSE CODE: CSUA32181B**  
**(PATTERN 2018)**

Time: [1 Hr]

[Max. Marks: 30]

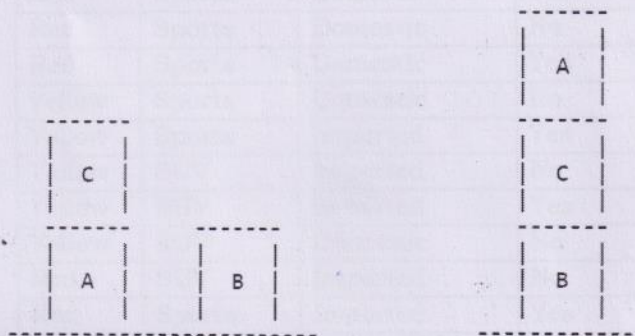
**(I) Instructions to candidates:**

- 1) Figures to the right indicate full marks.
- 2) Use of scientific calculator is allowed
- 3) Use suitable data where ever required

- Q.1      a) Justify that "Hierarchical Task Network is most widely used AI planning approach [4]  
b) Solve following Goal Stack Planning problem . Explain the operators and operations required to achieve the goal. [6]

Initial State

Goal



**OR**

- b) Enlist different classical planning algorithm. Explain with suitable example that Backward search for planning reduces branching factor. [6]
- Q2      a) Justify that "Bias and variance is important to build machine learning model" [4]

- b) Build a decision tree using CART algorithm for following data. Use the model to classify future loan applications into one of these classes: [6]

No (not approved)      Yes (approved)

Identify with appropriate explanation the root of the tree only.

Data: Loan Approval prediction

Age	Job_status	Owns_House	Credit_Rating	Loan_Approved
Young	False	False	Fair	No
Young	False	False	Good	No
Young	True	False	Good	Yes
Young	True	True	Fair	Yes
Young	False	False	Fair	No
Middle	False	False	Fair	No
Middle	False	False	Good	No
Middle	True	True	Good	Yes
Middle	False	True	Excellent	Yes
Middle	False	True	Excellent	Yes
Middle	False	True	Excellent	Yes
Old	False	True	Excellent	Yes
Old	False	True	Good	Yes
Old	True	False	Good	Yes
Old	True	False	Excellent	Yes
Old	False	False	Fair	No

OR

- b) Apply Naive Baye's classifier for the following "Car Theft" data to classify whether Red Domestic SUV is stolen or not stolen. [6]

Color	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

Q.3

- a) Explain use of Artificial Intelligence in Robotics [4]

- b) Illustrate role of Artificial Intelligence in Speech Recognition [6]

OR

- b) Write algorithm for correcting the spelling of English Paragraph [6]