

## AI ASSIGNMENT 1 RUBRICS

Date of Submission : 11/2023

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**Total Marks : 25 Marks**

Theory section : 10 Marks

Computational section : 15 marks

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Theory

**Marks are reduced for Unclear or Unsound Answers**

1. Logic (5 marks): The universe either will simply exist as it is or end in a heat death. If there was no big bang then the universe simply existed. If and only if the universe is expanding then there was a big bang. If the universe is expanding and accelerated then it will end in a heat death.

- (a) Write the sentences using logical connectives.(1)

Ans) Let  $U$  = Universe,  $H$  = Heat death,  $S$  = Simply existed  $B$  = Big bang,  $E$  = Expanding and  $A$  = Accelerated.

$$H \vee S \iff U$$

$$\neg B \Rightarrow S$$

$$E \iff B$$

$$E \wedge A \Rightarrow H$$

- (b) Write the contra-positive of the sentence using logical connectives.(1)

$$\neg U \iff \neg H \wedge \neg S$$

$$\neg S \Rightarrow B$$

$$\neg B \iff \neg E$$

$$\neg H \Rightarrow \neg E \vee \neg A$$

Not having the 'U' will not reduce marks.

- (c) What can be inferred and not inferred from the statement. (1)

Ans) Example :

- Inferred : We infer that that the universe will end in a heat death if and only if there was a big bang otherwise it simply existed.
- Not Inferred : We don't know if the universe simply existed or there was a big bang. We also don't know if the universe will end in heat death if there was a big bang.

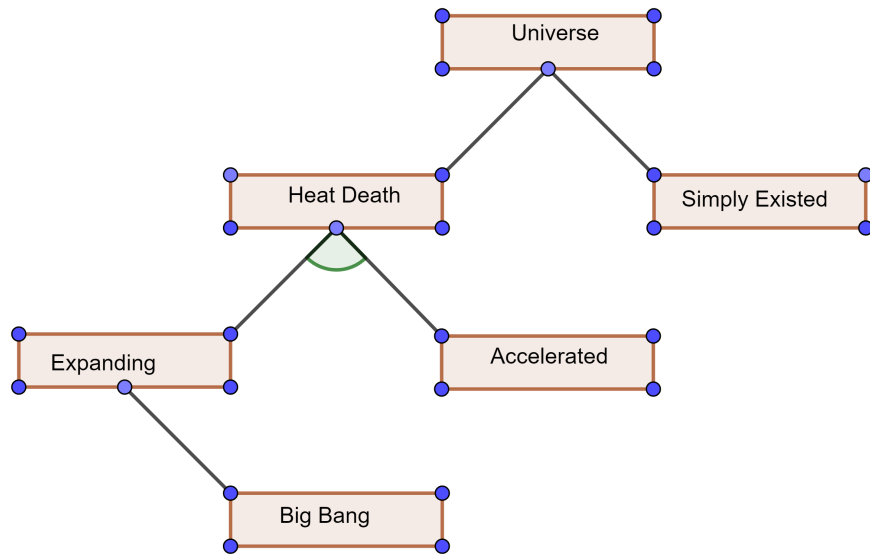


Figure 1: AND-OR graph

(d) Draw the And-OR graph (2)

Ans) Refer to figure 1. Similar figures will be considered. Missing "U" will not lead to reduced marks. Marks will be cut for mainly missing "and" "or" notations.

Computational question: