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Question 1
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Question 5

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Qtext:-

[2+5+2= 9 Marks]

Suppose the assumptions of markov model is applicable in the sequence prediction, to detect the unfair practices by the tax payers by the income tax department in below example, answer the following questions.

"Observation of the tax payer's payments & proofs in consecutive financial year depicted that those who pay correctly tax without fail submit their fund payment proof with 0.6 probability and show the loan proof with 0.4 probability. Alarmingly 70% of time the proof of investment submitted include medical claims among those who evade tax. 20% of the correct tax payers seem to evade tax in the following financial year and 35% of such evaders continue to evade tax again in next financial year. Among those who evade tax by any unfair means, 15% of time proof of investments prominently include fund payment and other 15% of such scenarios include loan proof."

a. Construct the Markov Model by extracting the transition and emission probability matrices from above pattern. Depict them with neat diagrams in addition to tabular representation. Assume equal likelihood for initial state.

b. For the below observations in the three consecutive financial year, predict if the tax payer correctly paid tax or not in the second financial year. Strictly follow the approach as discussed in class only.

(fund, Medical, fund)

c. Explain with appropriate situations in reference to the given problem only, where Viterbi algorithm is applicable. Frame suitable problem statement for the same. No need to solve the problem.