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 **PRESIDENCY UNIVERSITY**

  **Bengaluru**

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| **Ph.D. Course Work End Term Examinations – JAN-FEB 2025** |
| **Date:** 30 – 01-2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** Ph.D. |
| **Course Code :** MAT841 | **Course Name :** Machine learning with graphs |
| **Semester**: | **Max Marks**:100 | **Weightage**:50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **25** | **25** | **20** | **30** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 10 marks. 6Q x 10M=60Marks** |
| **1** | Explain about Supervised learning model. | **10 Marks** | **M** | **CO** |
| **2** | Describe Graph representation learning. | **10 Marks** | **M** | **CO2** |
| **3** | Explain Graph Laplacians. | **10 Marks** | **M** | **CO2** |
| **4** | Describe single layer of GNN with examples. | **10 Marks** | **M** | **CO3** |
| **5** | Explain Graph manipulations in GNN’s. | **10 Marks** | **M** | **CO3** |
| **6** | Describe Heterogenous graph transformer. | **10 Marks** | **M** | **CO4** |

**Part B**

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| **Answer the Questions. Each question carries 20 marks 2Q x 20 = 40 Marks** |
| **7.** | **a.** **b** | Write a detail note on Machine learning.Explain Stacking of GNN layers. | **15 Marks****5 Marks** | **H** | **CO1****CO 3** |
|  |
| **8.** | **a.** | Explain Knowledge graph embeddings and Briefly explain Neural subgraph representations. | **20 Marks** | **H** | **C04** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***