SRM Institute of Science and Technology
Thiruchirappalli
Department of Mathematics

Discrete Mathematics (21MAB302T)

Model Exam

Date: November 13, 2024 Duration: 180 min Max mark: 50

Answer All Questions
Part-C- $(5 \times 10 = 50)$

1. Using Warshall's algorithm find the transitive closure of the relation

$$R = \{(1,4),(2,1),(2,2),(2,3),(3,2),(4,3),(4,5),(5,1)\}$$

on the set A={1,2,3,4,5}.

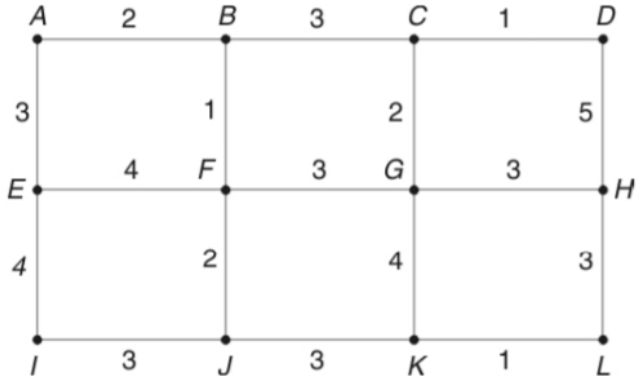
2. Express $GCD(1819, 3587)$ as a linear combination of the two numbers using Euclidean algorithm.

3. Use indirect method of proof to show that
$r \to \neg q$, $r \vee s$, $s \to \neg q$, $p \to q \implies \neg p$.

4. Find the code word generated by the parity check matrix

$$H = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$ when the encoding function is $e : B^3 \to B^6$.

5. Using Kurskal's algorithm to find a minimum spanning tree for the weighted graph shown in figure.



Best wishes

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