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Paper Code :DCS-118
Roll No.

PGDCA-6, MCA-6, M.Sc.(CA)-6
1st Year Examination, Academic Batch 2017-18
Mathematics & Graph Theory

Time : 3 Hours]

[Max. Marks : 100

Note. Attempt any **five** questions. Each questions carry equal marks.

Q.1. State and prove Unique Factorization Theorem.

Q2: If $n(A)=20$, $n(B)=25$, $n(A \cap B)=10$ then find $n(A \cup B)$.

Q3: (a) What can you say about the relation R on a set A if R is partial order and an equivalence relation?

(b) Explain the Boolean algebra.

Q.4 Explain matrices and its type with example?

Q.5. (a) State and prove pigeonhole and extended pigeonhole principle.

(b) In the game of bridge find the probability that atleast one player gets the complete suit.

Q6 :(a) Explain the Binary and Spanning tree .

(b) Explain this Theorem A diagraph is strong if and only if it has spanning closed walk.

Q.7. Let U and V be vector spaces over the field F and let T be a linear transformation from u into V. suppose U is finite-dimensional. Then

$$\text{Rank } (T) + \text{Nullity } (T) = \text{Dim. } (U)$$

Q8: Explain this Theorem A simple graph with n vertices and k components can have at most $(n-k+1)/2$ edges.