1^{st} Sessional Examination

Maths (BSc IT)

Total Marks : 25

Time : 1 hr

(1) Answer any five. $1 \times 5 = 5$

(a) What do you mean by a Pendent Vertex?

(b) Define Connected Graph.

(c) Draw a Regular Graph having '4' vertices and having degree of each vertex as '3'.

(d) What is Eccentricity of a vertex in a Graph?

(e) Define Basis of a Vector Space.

(f) Write dimensions of the Vector Spaces $\mathbb{C}(\mathbb{R})$ and $\mathbb{R}(\mathbb{R})$.

(2) Answer any two : $2 \times 2 = 4$

(a) How many vertices are there in a graph G with 15 edges, if its each vertex is of degree 3?

(b) Show that the subset $S = \{(1,0,0), (0,1,0), (0,0,1)\}$ of $V_3(F)$ generates ~~or~~ spans the entire Vector Space $V_3(F)$ i.e. $L(S) = V_3(F)$

(c) If two vectors are Linearly dependent, then Prove that one of them is scalar multiple of the other.

(3) Answer any four : $4 \times 4 = 16$

(a) If W_1 and W_2 are subspaces of the V.S. $V(F)$ then show that (i) $W_1 + W_2$ is a subspace of $V(F)$

(ii) $W_1 + W_2 = L(W_1 \cup W_2)$

(b) State and Prove Rank-Nullity Theorem.

(c) Prove that the set of all Solutions (a, b, c) of the equation $a+b+2c=0$ is a sub-space of the V.S. $V_3(\mathbb{R}$

(d) (i) Show that maximum number of edges in a simple graph with 'n' vertices is $\frac{n(n-1)}{2}$

(ii) Draw the Complete bipartite Graph $G_{4,3}$

(e) The size of every connected graph of order 'n' is atleast $(n-1)$.