Roll No. ☐☐☐☐☐☐☐☐☐☐

B.Sc.(PCM)-18, B.A.(Math)-6
3rd Year Examination, Academic Batch 2015-16
Mathematics-VI

Time : 3 Hours]   *[Max. Marks : 100*

Note. Attempt any five questions. All questions carry equal marks.

Q.1 (a) A field has no proper ideals.   **[20]**
  (b) Every field is an Euclidean ring.

Q.2 (a) Every field in on integral domain?   **[20]**
  (b) The intersection of two sub rings is again a sub ring

Q.3 (a) Prove that the vectors (2,-1,4), (1, -1,2), (3,1,-2) form a basis for R^3 **[10]**
  (b) Prove that the vectors (1,1,0), (3,1,3) and (5,3,3) are linearly dependent.

Q.4   Show that the mapping d.$R^2*R^2 \rightarrow R^2$ defined by d(x, y) = max. ={|x_1-y_2|, |x_2-y_2|}   **[20]**
     where x = (x_1, x_2), y = y_1, y_2 $\in$R is metric on R^2

Q.5   Let A and B be subset of a matrix space X. then   **[20]**
     (i) A⊂B ⟹ D(A)⊂D(B)
     (ii) D(A∩B)⊂D(A)∩D(B)
     (iii)D(AUB)=D(A)UD(B)

Q.6   Find the dual basis of the basis set B=={(1,-1,3), (0,1,-1),(0,3,-2)} for V_3 (R)   **[20]**

Q.7   If the matrix of a linear transformation T on a vector space V2 (c) w.r.t. the ordered   **[20]**
     basis B={(1,0), (0,-1)} is
     $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ what is the matrix of T w.r.t. the ordered basis B={(1,1), (1,-1)}?

Q.8 (a) The intersection of any two subspaces of a vector space is a subspace.   **[20]**
  (b) Is the sector (2,-5,3) in the subspace of R^3s panned by the vectors (1,-3,2), (2,-4,-1), (1,-5,7).