حان نـهائى- فصل ثانى ٢٠١١ / ٢٠١٢ م

الفرقة الرابعة أساسى- تربية (رياضيات)

المادة : توبولوجى الزمن : ساعتان

Answer the following questions :

(Q – 1) **(Degree: 25)**

Let (R,U) be the usual space, $A \subset R$;
$A = Q$ find:

A^o, A', $\bar{A}$, ex (A), A^b **and the smalles base of R and local base at $x \in R$.**

(Q – 2) : **(Degree : 25)**

Let X be a space and $A,B \subset X$. Prove that :

(i) $(A \cap B)^0 = A^0 \cap B^0$.

(ii) $\bar{A} = A \cup A'$.

(iii) $A^b \cap A = \phi$ iff A *is* open.

(Q – 3) **(Degree: 20)**

Prove that :

(i) $f : X \to Y$ is open iff $f(A^\circ) \subset (f(A))^\circ$ $\forall A \subset X$.

(ii) $f : X \to Y$ is homeomorphism iff $f(\bar{A}) = \overline{(f(A))}$ $\forall A \subset X$.

(iii) $f : X \to Y$ is continuis if $f^{-1}(A^0) \subset [f^{-1}(A)]^\circ$ $\forall A \subset Y$.

(Q – 4) **(Degree: 20)**

(i) Prove that the space X is T_1–space iff { x } is closed $\forall x \in X$.

(ii) Prove that every T_4- space is T_3- space .

(iii) Give an example of space T_1- space but not regular and example of space regular but not T_1- space .
