

اجابة مادة الجوامد – رابعة فيزياء – علوم-1/2 مادة

د/ محمود حسنى موسى مقلد - تاريخ الاحد ٢٧/١/٢٠١٤ بعد الظهر

المادة : فيزياء جوامد و ليزر
الزمن : ٣ ساعات

قسم : الفيزياء
الفرقة : الرابعة نظام قديم

اجب عن خمسة اسئلة فقط :
السؤال الأول : (٣٢ درجة)

A) Complete the table for a conductor materials.

(٢٠ درجة)

Brillouin Zone dimensions'	$-\pi/a$	$-\pi/2a$	0	$\pi/2a$	π/a
Effective mass of electron	M^*	Maximum	M^*	Maximum	M^*
Electron Energy	Maximum	middle	zero	middle	Maximum
Effective number of electron	Empty	Top	---	Top	Empty
Electron velocity	zero	Maximum	zero	Maximum	Zero

B) If N is the number of atom in the crystal , the number of electrons in one band is equal to :

A) A) 2N

b) N

c) 1/2 N

(١٠ درجات)

Ans: a) 2N

السؤال الثانى : (32 درجة)

1- Why K.P Model succeeded to differentiate between metals and insulators , whereas Bloch model failed

Ans: *K.P model classified the solid to three bands with different properties and established a relation between effective mass of conduction electron and the energy of conduction band , which is the main factor in differentiate between the metals and insulator , on the other hand Bloch's model is a propagation and modulation for the electron energy related to lattice constant not else, and did not talked about energy band .*