

الفيزياء النووية

**Examination of Nuclear(Detectors & Accelerators) Physics**

**For ( 4 states ) Biophysics group  
( First term January )**

**Date:** *Wednesday 22 / 1 / 2014*

**نظام الساعات المعتره**

**Time:** Two hours only

**Regular Students**

**Total 100 mark**

**Course No.:** *PH 4163*

**1) Write in of sentence of the following :-**

- \* Compare between Alpha - and Beta – Spectra, Cite with example for each.
- \* Explain the cross section or linear absorption of detector medium, Cite with example for modifying.
- \* What is the versatility of a detector ? ( 20 mark )

**2) a) what are the quenching techniques when interact with a detector medium ?**

- b) Describe theory and discuss its recent development in the technology of the cyclotron, in short account. ( 20 mark )

**3) a) What is the principle of operation of the Sloan resonance linear accelerator ( lineac ) ?**

- b) Explain ( in brief ) each of the following :-
  - \* The drawback of the ionization chambers.
  - \* Working voltage of a Geiger Miiler counter. ( 20 mark )

**4) \* Motivate ( in brief ) of the following :-**

Neutron reaction with light helium  $^3\text{He}$  nucleus is not so widely used, in spite of it has best detection for thermal neutrons.

- \* What is the unit of biological effectiveness or equivalent to man ?
- \* Draw Schematic for nuclear electronic detection system. ( 20 mark )

**5) a) Draw sketch for energy levels of donner and acceptor of semiconductor bands, explain.**

- b) What is the operation theory of a magnetic spectrometer to measure an Alpha – or Beta – spectrum ? ( 20 mark )

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Best Wishes for Successful ,,

**Examiner: Prof. Dr. Mohsen El-Khosht**

