



ALLAMA IQBAL OPEN UNIVERSITY
Semester Terminal Exam Autumn 2020

Program /level:	B.Ed	Maximum Marks	100
Title /Course Code	Physics IV (6444)	Pass marks	50

Instructions for Exams:

1. Attempt All Questions.
2. Write answers in your own words and avoid copying from an internet source or any book.
3. Be precise, avoid unnecessary details, answer to each question must be between 600-800 words.
4. Students are advised to upload their answer sheets/solutions on LMS portal as soon as they complete their answers and not to wait for 8:30 PM.
5. Submissions after due date & time will not be entertained. Attach undertaking with each course code which were allowed to attempt in Urdu.
6. If plagiarism found, Student may be declared fail.

Q. No.	Questions	Marks
Q.No.1	<p>a) Discuss the types and characteristic of transistors and their applications?</p> <p>b) The electron in a hydrogen atom makes a transition from the $n = 2$ energy level to the ground level ($n = 1$). (i) Find the wavelength and frequency of the emitted photon. (ii) In interstellar space, highly excited hydrogen atoms called Rydberg atoms have been observed. (iii) Find the wavelength to which radio astronomers must tune to detect signals from electrons dropping from the $n = 273$ level to the $n = 272$ level. (iii) What is the radius of the electron orbit for a Rydberg atom for which $n = 273$? (iv) How fast is the electron moving in a Rydberg atom for which $n = 273$?</p> <p>c) Consider the hydrogen atom in the, $l=3$ state. Calculate the magnitude of L, the allowed values of L_z.</p>	10+13+10
Q.No.2	<p>a) Write a note on Frank hertz experiment. Also discuss its applications in modern physics.</p> <p>b) The most common kind of iron nucleus has mass number $A = 56$. Find the approximate radius, mass, and density of the nucleus.</p> <p>c) Consider a nucleus of mass number A. (i) Find an approximate expression for the mass of the nucleus. (ii) Find an expression for the volume of this nucleus in terms of A. (iii) Find a numerical value for the density of this nucleus.</p>	13+10+10

Q.No.3	<p>a) Calculate the energy released when 1.00 kg of ^{235}U fissions, taking the disintegration energy per event to be $Q = 208 \text{ MeV}$.</p> <p>b) For the nuclear force to overcome the repulsive Coulomb force, the separation distance between two deuterons must be approximately $1.0 \times 10^{-14} \text{ m}$. (i) Calculate the height of the potential barrier due to the repulsive force. (ii) Estimate the temperature required for a deuteron to overcome the potential barrier, assuming an energy of $3/2 k_{\text{B}}T$ per deuteron (where k_{B} is Boltzmann's constant). (iii) Find the energy released in the deuterium–deuterium reaction.</p> <p>c) Write a note on magnetic confinement. Also explain uses with examples.</p>	10+10+14
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