

UDC 53 / (076)
M 63

*Recommended for publication by the Scientific Council
of the Faculty of Physics and Technology
and RISO of Al-Farabi Kazakh National University
(Protocol №1 dated 02.11.2016)*

Reviewers:

doctor of Physics and Mathematics sciences, Professor **M.E. Abishev**
doctor of technical sciences, Professor **A.B. Ustimenko**

Authors:

A.S. Askarova, S.A. Bolegenova, S.S. Issatayev, V.V. Kashkarov,
I.N. Korzun, G. Toleuov, Sh.B. Gumarova, L.E. Strautman,
O.A. Lavryshev, M.S. Isatayev, Zh.K. Shortanbayeva

**M 63 Mechanics: laboratory practicum in physics / A.S. Askarova,
S.A. Bolegenova, S.S. Issatayev, V.V. Kashkarov, [et. al.].
– Almaty: Qazaq university, 2016. – 220 p.
ISBN 978-601-04-2109-7**

The manual drawn up in accordance with the university programs for the general physics course for students of physical and physical-technical specialties. The workshop contains descriptions of 17 laboratory works for the part «Mechanics». Each work includes a brief theoretical introduction, a description of the experimental setup, work assignment, as well as how to conduct experiments and processing the results.

The manual can be used in higher education institutions for the physical and physical-technical specialties.

Published in authorial release.

Учебное пособие составлено в соответствии с действующими университетскими программами по общему курсу физики для студентов физических и физико-технических специальностей. Практикум содержит описание 17 лабораторных работ по разделу «Механика». Каждая работа включает краткое теоретическое введение, описание экспериментальной установки, рабочее задание, а также методику проведения экспериментов и обработки их результатов.

Пособие может использоваться в высших учебных заведениях для физических и физико-технических специальностей.

Издается в авторской редакции.

UDC 53 / (076)

© Askarova A.S., Bolegenova S.A.,
Issatayev S.S., Kashkarov V.V., [et. al.], 2016
© Al-Farabi KazNU, 2016

ISBN 978-601-04-2109-7

CONTENTS

PREFACE.....	3
INTRODUCTION.....	4
Laboratory work № 1. Statistical regularity in measurements.....	20
Laboratory work № 2. Measurement of length, area and volume.....	31
Laboratory work № 3. Measurement of the moment of inertia of the disk.....	41
Laboratory work № 4. Study of the fundamental law of dynamics of rotational motion.....	56
Laboratory work № 5. Study of the law of oscillations of a physical pendulum.....	70
Laboratory work № 6. Study of the stationary flow of liquid in the tube of variable cross section. Verification of Bernoulli's theorem.....	82
Laboratory work № 7. Inclined pendulum.....	98
Laboratory work № 8. Measurement of the moments of inertia of bodies by torsion pendulum.....	110
Laboratory work № 9. Studying of elastic collisions of balls and determination of young's modulus.....	124
Laboratory work № 10. Measurement of the speed of flight of the body with a torsion-ballistic pendulum.....	133
Laboratory work № 11. Determination of the viscosity of liquids by the Stokes method.....	142