

НАУ
ННАКІ
Кафедра **Машинознавства**

ЗАТВЕРДЖУЮ

Зав.кафедри _____ (Кіндрачук М.В.)
(підпис) (ПІБ)

«_____» _____ 2016

МЕТОДИЧНІ РЕКОМЕНДАЦІЇ
З ВИКОНАННЯ ДОМАШНІХ ЗАВДАНЬ
з дисципліни «**Метрологія та стандартизація**»

Розробник **к.т.н., доцент, Башта О.В.**
(наук.ступінь, вч.звання, П.І.Б. викладача)

1. Objectives of Control work

Tests carried out in the sixth semester in order to consolidate and deepen the theoretical knowledge and skills of students and is an important step in learning given to an independent study students.

Tests carried out on the basis of educational material given to an independent study students, and is a component of the module №1 "Fundamentals of measurement, measurement and their results."

The specific objective of control contained in the study and assimilation of the order of measurement and control their execution by metrological requirements, followed by a competent execution of measurement results in the production of documentation.

Execution, execution and protection of student homework done on an individual basis according to the guidelines.

The time required to perform inspection work - up to 8 hours of independent work.

Tests in the course includes a task that includes practical and theoretical part. The practical part is provided in 10 variants. Student performs the version number, which corresponds to the last digit cipher academic record book. Number represents the number of theoretical part, which is the sum of the last two digits of academic records.

The decision of each task must be carried forth, with all intermediate calculations, and the text should be links to the literature stating the page numbers of tables and formulas. References should result in the end of work.

Tests should be prepared on a computer font - Times New Roman, 14 pt, spacing - 1,5. Printed reference work on one side of the sheet of A4 (210 x 297 mm) with continuous numbering and binding standards into account (ЄСКД, ЄСТД etc.). On the sheets remain retreat: the left side (for filing) - 25 mm, and on the right, top and bottom 15 mm.

The volume control works - 25-30 pages.

The mandatory components of the control work should be: title page, table of contents, introduction, main body, conclusions, references, appendices (if necessary).

Variants of practical tasks.

Make multiple static processing of results of direct measurements.

| Варіант | № досвіду | | | | | | | | | |
|---------|-----------|------|------|------|------|------|------|------|------|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | 26,6 | 28,9 | 29,1 | 29,1 | 29,2 | 29,3 | 29,3 | 29,4 | 28,9 | 29,6 |
| 2 | 28,3 | 28,5 | 28,6 | 28,9 | 28,9 | 28,9 | 29,1 | 29,3 | 29,4 | 29,6 |
| 3 | 26,3 | 26,4 | 26,6 | 26,8 | 26,8 | 26,9 | 26,8 | 27,1 | 26,9 | 26,7 |
| 4 | 26,2 | 26,4 | 26,5 | 26,6 | 26,6 | 26,7 | 26,7 | 26,8 | 26,5 | 27,1 |
| 5 | 30,3 | 31,3 | 31,4 | 30,8 | 31,5 | 31,5 | 31,7 | 31,6 | 31,4 | 31,7 |
| 6 | 31,2 | 31,1 | 31,3 | 31,4 | 31,5 | 31,5 | 31,6 | 31,7 | 31,8 | 31,9 |
| 7 | 30,5 | 30,7 | 30,8 | 30,8 | 30,9 | 31,0 | 30,9 | 30,8 | 30,9 | 31,1 |
| 8 | 27,3 | 27,5 | 27,6 | 27,4 | 27,6 | 27,7 | 27,8 | 27,9 | 28,0 | 27,8 |
| 9 | 28,8 | 28,9 | 28,8 | 29,0 | 29,0 | 29,1 | 29,2 | 29,3 | 29,4 | 29,4 |
| 10 | 25,2 | 25,3 | 25,4 | 25,4 | 25,2 | 25,3 | 25,4 | 25,5 | 25,6 | 25,7 |

2. Options for the theoretical part of the problem.

The theoretical part involves two theoretical questions.

| | | | | | | | | | | |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| № варіанту | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| № питання | 1,20 | 2,21 | 3,22 | 4, 23 | 5, 24 | 6, 25 | 7,26 | 8, 27 | 9, 26 | 10, 27 |
| № варіанту | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
| № питання | 11, 28 | 12, 29 | 13, 30 | 14, 31 | 15, 32 | 16, 33 | 17, 34 | 18, 35 | 19, 36 | |

3. The list of questions for the theoretical part

1. Metrology and its mission.
2. Scope of the Law on metrology and metrology.
3. The national reference system.
4. Regulations on metrology.
5. Metrological Service of Ukraine and its main task.
6. Metrological Service of central executive bodies, enterprises and organizations.
7. Structure of metrological service of Ukraine.
8. The international metrological organizations.
9. Physical quantities and their units.
10. Classification measurements.
11. Principles and methods of measurement.
12. The errors of measurement of physical quantities.
13. Static treatment results of direct measurements.
14. Assessment of the true value of the measured value.
15. Measuring instruments and basic definitions.
16. Metrological characteristics of measuring instruments.
17. Errors of measuring instruments.
18. Classification of measuring instruments.
19. State standards.

20. Exemplary measuring equipment, the basic concept, purpose and requirements.
21. Methods for calibration of measuring instruments.
22. The basic error of measurement tools.
23. Methods of reducing random errors.
24. Testing, inspection and examination of measuring instruments.
25. State metrological control and supervision.
26. State testing of measuring instruments.
27. Legal basis and legislation of Ukraine in the field of standardization.
28. standardization bodies and services.
29. Types of existing standards in Ukraine. Distinctive features.
30. The system of basic standards.
31. Control of norms of technical documentation.
32. The essence of parametric standardization.
33. Order of the development of national standards.
34. Regulations refer to regulations.
35. The rules of construction, presentation, design and requirements for content standards.
36. International standardization and its role.

3. The list of tasks to prepare for the differentiated credit

1. History of metrology.
2. What is metrology system measures and what are its foundation.
3. What studies metrology as science and what its objectives.
4. What does the metrology for industrial development.
5. The international metrological organizations and their functions.
6. State Metrology Service of Ukraine.
7. What is the natural unit and which are types of physical units.
8. The system of physical units quantities.
9. International System of Units and its basic values. 10.Osnovni and derivatives systems C.
- 11.What is value measurement of physical quantities.
- 12.Osnovne equation metrology.
- 13.Typy measurement of physical quantities.
14. Principles and methods of measurement.
15. measurement errors, their types.
- 16.Chynnyky occurrence of errors of measurement of physical quantities.
- 17.Chynnyky occurrence of random measurement errors. 1
- 8.Chynnyky emergence of systematic measurement errors.
- 19.Otsinka true value of the measured value.

20. The sequence of mathematical processing as a result of the measurement.
21. Metrological characteristics of measuring instruments.
22. The errors of measuring instruments and factors of their occurrence.
23. How is the unity of measurements.
24. What is the standard physical quantity.
25. The order of state metrological control and supervision. 26. Orhanizatsiya departmental metrological services.
27. Testing, inspection and examination of measuring instruments.
28. Metrological traceability software.
29. Structure of metrological service of Ukraine.
30. State testing of measuring instruments.
31. The role and importance of standardization for the development of industry and trade between nations.
32. The history of standardization in Ukraine.
33. Items of standardization.
34. Basic terms and definitions in the field of standardization. 35. Informatsiyne support work on standardization.
36. Basic principles of standardization.
37. The method of standardization and the relationship between them.
38. Categories and types of standards and regulations.
39. The order of development, approval, publication and implementation of standards.
40. The ranks of preferred numbers and their use in the standardization.
41. Intersectoral and standardization of basic system.
42. The system of design documentation.
43. Responsibility for violation of the requirements of the standard.
44. Integrated and advancing standardization and its role in enhancing product quality.
45. State supervision over compliance with standards.
46. Activities of the International Organization for Standardization.
47. International Electrotechnical Commission.
48. The International Organization of Legal Metrology.
49. Ethan development of international standards.
50. Technical and economic efficiency of standardization.