Eötvös Loránd University (ELTE)
Faculty of Informatics
Savaria Institute of Technology
Szombathely

FINAL EXAMINATION
MEASUREMENT

Measurement 1

1. The concept of measurement, measurement units. Direct and indirect measurement, practical examples.
2. The concept of measurement error, types of errors, Abbé principle, accuracy class of measuring instruments, specification methods and their interpretation.
3. Measurement process, block diagram and component elements, perturbation types.
4. Measurement data, main statistical parameters, Gauss distribution, outlier data and their filtering.
5. Concept and content of measurement result, specifying the measurement result for individual measurements and series of measurements, concept of measurement uncertainty, types of uncertainty.
6. Verification and calibration, measurement standard (etalon), measuring gauges, construction of a given size using measuring gauge blocks.
7. Main metrological characteristics of measuring instruments.
8. Basic concepts related to manufacturing: nominal size, medium size, tolerance field, scrap, measurement and control.
9. Control, control tools, main types and use, Taylor principle.
10. Mechanical length measuring devices, measuring ranges, accuracy, adjustment, nonius principle.
11. Angle measurement methods and devices.
12. The concept of measuring force, contact and non-contact measurement methods, elements of optical measuring instruments: lenses, prisms, eyepieces and objectives.
13. Optical length and angle measurements, microscopes, projectors, optical fine touches.

Measurement 2

14. Pneumatic measurement methods, principle of operation, tactile types, measurement applications.
15. Surface roughness, definition, types, measurement methods.
16. Gears, main types, simplified representation, accuracy classes of gears, methods of checking for complex gear defects.
17. Gears, main types, simplified representation, accuracy classes of gears, methods of checking for individual gear defects.
18. Measuring sensors, principle of operation, main types and their operation.
19. Measuring bridge (Wheatstone Bridge), representation and operation, measuring bridge types, applications,
20. Industrial proximity switches, operating principles (mechanical, inductive, capacitive, optical).
21. Strain gauges, construction, operation, types, measurement applications.
22. Speed and rotation measurement methods.
23. Pressure measurement methods (mechanical, electrical).
24. Liquid level and flow measurement methods (mechanical, electrical).
25. Temperature scales, temperature measurement methods (mechanical, electrical, optical).
26. Force and torque measurement methods (mechanical, electrical).