DIGITAL ELECTRONICS 1.

(exam topics: Electrical Engineering BSc speciality, full-time department)

1. Nature of digital signal. Encoding, decoding. Representation and transmission forms of coded signal in electric systems.
2. Possibilities of number representation, numerical codes (binary system, BCD codes, hexadecimal code, “one-step” codes).
3. Alfanumerical codes (international telegraphic, ASCII and other codes). Error detection and error correction.
4. The model of logic circuits. Combinational and sequential circuits.
5. Basic logic functions. Features of logic functions. Basic Bool-algebra laws. Duality principles.
6. Implementation of basic logic functions by universal gates.
7. Representation of logic functions.
8. Composition of logic functions on given problem.
9. Standard forms of logic functions: Sum of Products (SOP), Product of Sums (POS). Minterms, maxterms, simplification methods (enumerate them).
10. Algebraic simplification.
11. Graphical (Karnaugh-Veitch) simplification.
12. „don’t care” terms.
13. Design and implementation of combinational circuits by universal gates I.: design of NAND circuit.
14. Design and implementation of combinational circuits by universal gates II.: design of NOR circuit.
15. Design and implementation of combinational circuits by universal gates III.: design of And-Or-Invert (AOI) circuit.
16. Encoding and decoding circuits.
17. Data selector circuits: data selector (multiplexer), demultiplexer.
18. Implementation of combinational circuits by multiplexer and decoder
19. Hazard concept, its classification.

COMPULSORY / RECOMMENDED READINGS

1. Floyd T.L. Digital fundamentals. New Jersey: Pearson Prentice Hall, 2006 (http://puma.unideb.hu/~misak/Files/Floyd_Digital_fundamentals.djvu).

   .djvu files viewer: (http://puma.unideb.hu/~misak/Files/djvucntl_61_en.exe).
2. Mano M.M., Ciletti M.D. Digital Design. Addison Wesley Longman (4th ed.), 2007.