Wydział Informatyki i Telekomunikacji

Faculty of Computing and Telecommunications

Kierunek studiów:

Field of study:

ELEKTRONIKA I TELEKOMUNIKACJA

Electronics & Telecommunications

Studia stacjonarne pierwszego stopnia prowadzone w języku angielskim

Undergraduate studies in English

ZAGADNIENIA NA EGZAMIN DYPLOMOWY INŻYNIERSKI

ISSUES AND PROBLEMS ON GRADUATION EXAM

Lp. Item	Zagadnienie Issues and problems
1.	Basic metrological definitions and terminology
2.	Methods of measuring the parameters of periodic signals
3.	Electrical circuits analysis
4.	Impulse response and transmittance of LTI system
5.	Mobile radio communication channel
6.	Cellular networks
7.	Distribution of frequency signal in the network physical layer
8.	Network synchronization in the packet layer
9.	Digital phase loop realizations
10.	Parameters of synchronization signals
11.	Digital Filters
12.	Filter design algorithms
13.	A/D and D/A signal conversion
14.	Spectral analysis
15.	The transmission properties of optical fiber
16.	Active and passive elements of optical link
17.	Assessment of the range of the fiber optic link limited by power and band
18.	Multiplexing technologies in fiber optic links
19.	Fiber optic links measurement methods
20.	Design a fiber optic link
21.	Interfaces in measuring systems
22.	Sensors and measuring circuits
23.	Analog and digital modulations of harmonic carrier
24.	Analog and digital pulse modulations
25.	Digital transmission over baseband and bandpass channels
26.	Sequential and combinational logic circuits
27.	Boolean algebra
28.	Design of finite state machines
29.	Complement arithmetic

Lp. Item	Zagadnienie Issues and problems
30.	Internet services
31.	Searching in the Internet
32.	Local Area Networks
33.	Conversion of integer or real numbers from decimal to binary and from binary to decimal system
34.	Methods of solving nonlinear equations: bisection, falsi, Newton's
35.	Numerical solving of sets of linear equations: accurate methods – Gauss-Jordan; approximate solutions – Jacobi, Gauss-Seidl and gradient methods
36.	Numerical calculation of integrals – rectangles, trapezoids and Simpson's methods
37.	Methods of discrete-event simulation
38.	Data structures that can be used to construct the simulation agenda
39.	Generation of pseudo-random numbers: uniform and other distributions
40.	Transient phase length estimation in simulations
41.	Discuss the concept of Activity and its lifecycle
42.	Way of defining user interface for Android application
43.	Discuss the concept of Intent and its use cases
44.	Discuss the concept of fragments and the navigation component
45.	Codd's postulates
46.	Entity relationship diagrams (ERD)
47.	DDL, DQL, DML, DCL and TCL commands
48.	SQL extensions – PL/SQL, T-SQL
49.	Database normalization
50.	Database models
51.	Major pillars of object oriented programing in C#
52.	C# - Interfaces and abstract classes
53.	C# - Exception handling
54.	C# - Control statements
55.	Memory management and Garbage Collection in C#
56.	Major pillars of object oriented programing in Java.
57.	Java - Interfaces and collections
58.	Java - Exception handling
59.	Java - Control statements
60.	Types of JDBC drivers
61.	Object programming in C++
62.	IPv4 and IPv6 addressing
63.	ISO/OSI and TCP/IP layer models
64.	Protocols and data transmission in networks
65.	Switching in LAN networks
66.	Signaling systems in telecommunication networks
67.	Integrated services in telecommunication networks
68.	Structural aspects of the Internet of things (traffic, scalability, interoperability)
69.	Key technologies for the Internet of things
70.	Addressing and routing for the Internet of things

Lp. Item	Zagadnienie Issues and problems
71.	Big Data Analytics
72.	Access networks' technologies
73.	Design of logical topology of local area networks (VLAN)
74.	Planning networks with OSPF, ISIS and BGP protocols
75.	Metro(Carrier) Ethernet, MPLS and GMPLS
76.	Design of virtual private networks
77.	Network testing
78.	Model for computer networks based on layers
79.	Logical addresses in computer networks (IPv4/IPv6)
80.	Basic routing algorithms used in computer networks
81.	Hardware Oriented Network Operating Systems
82.	Application Oriented Network Operating Systems
83.	Mechanisms in IP addressing
84.	Rules in protocols, mechanisms and devices from link layer in computer networks
85.	Rules in protocols, mechanisms and devices from network layer in computer networks
86.	Features and functions of operating systems (tools and commands)
87.	Services and their realization in Data Center
88.	Programmability in computer networks
89.	Topologies of telecommunication networks
90.	Information transfer modes in telecommunication networks
91.	Layered network models, network architectures
92.	Telecommunication services
93.	Numbering and addressing in telecommunication networks
94.	Switching nodes' functions and architectures
95.	Routing in switching nodes and telecommunication networks
96.	Functions, properties and operation of switching networks (switching fabrics)
97.	Signalling in telecommunication networks
98.	Connection setup process in a mobile network
99.	Buffering in packet switching nodes
100.	Systemy ze stratami i z oczekiwaniem
104.	Rodzaje pierścieni w sieciach optycznych
105.	Circuits with Zener diodes, rectifiers and switching diodes
106.	Bipolar transistors - circuits and applications
107.	Operational amplifier - principles of operation and typical circuits
108.	Antenna parameters
109.	Antennas for radiocommunication systems
110.	EM wave propagation
111.	Resonance in electrical circuits
112.	Power in DC and AC circuits
113.	Transient states in electrical circuits
114.	Vision systems optics
115.	Image segmentation methods
116.	Image features

Lp. Item	Zagadnienie Issues and problems
117.	Signal representation with harmonic components
118.	Processing of signals by linear and time invariant (LTI) systems
119.	Frequency characteristics of LTI systems
120.	Analog filter requirements
121.	Stability of systems
122.	Automatic Control Systems
123.	Representation of systems in the state space
124.	General structure of programmable devices
125.	Basic functional primitives in FPGA devices
126.	Verilog hardware description language
127.	Acquisition, perception by humans, representation and display of multimedia data in digital systems
128.	Compression of multimedia data
129.	Video and audio processing
130.	Standardization in multimedia communications
131.	Impulse response and transmittance of LTI system
132	Timers in microcontrollers
133	Architecture of microcontrollers (e.g. 8051, ARM Cortex M4)
134	Interruptions in microcontrollers
135	Serial communications (e.g. RS232, RS 485, USB)
136	Logic operations on bites and bytes
137	Multiple Access techniques
138	Selected mechanisms used in programming of applications for mobile terminals
139	The concept of coroutines n Kotlin
140	Way of defining user interface for Android application
141	Data structures (list, tree, heap)
142	Sorting algorithms
143	Markup languages (HTML, XML)
144	Wireless channel path loss models
145	Wireless channel coherence time and bandwidth: source, calculation and influence on wireless systems design