Examination questions from the subject "Electrical apparatuses and devices"

Operating level			
Electrical apparatuses and devices			
Questions B/D – means the character of the question (basic, difficult)			
Ref. no.	**B/D**	**Question**	**Correct answer**
1.	B	Voltage transformers are used for: A. the reduction of voltage for measurement purposes, B. the increase of voltage for measurement purposes, C. supplying the receiver, D. current measurement.	A
2.	B	A voltage transformer connects with the meter: A. in series, B. in parallel, C. by means of short conductors, D. by means of conductors with fixed resistance.	B
3.	B	Current transformers are used for: A. the reduction of voltage for measurement purposes, B. the reduction of current for measurement purposes, C. circuit balancing, D. supplying the receiver.	B
4.	B	AC current network present on a vessel with the voltage above 1,000 V is: A. a four-conductor network, B. a five-conductor network, C. a three-conductor network, D. a two-conductor network.	C
5.	B	A basic network of the IT type consists of: A. two conductors, B. three conductors, C. four conductors, D. five conductors.	B

6.	B	A network of the TN-C type consists of: A. 3 phase conductors, B. 3 phase conductors and a PEN conductor, C. 3 phase conductors, a PE conductor and a neutral conductor, D. 2 phase conductors and a PE conductor.	B
7.	B	A network of the TN-S type consists of: A. 3 phase conductors, B. 3 phase conductors and a neutral conductor, C. 3 phase conductors, a PE conductor and a neutral conductor, D. 3 phase conductors and a PE conductor.	C
8.	B	Portable electrical devices shall have at least: A. Protection class I, B. Protection class II, C. Protection class III, D. Protection class 0.	B
9.	B	An S1 symbol on the name plate means: A. continuous duty, B. short-time duty, C. intermittent periodic duty, D. intermittent periodic duty with a high number of shut-offs.	A
10.	B	An S2 symbol on the name plate means: A. continuous duty, B. short-time duty, C. intermittent periodic duty, D. intermittent periodic duty with a high number of shut-offs.	B
11.	B	An S3 symbol on the name plate means: A. continuous duty, B. short-time duty, C. intermittent periodic duty, D. intermittent periodic duty with a high number of shut-offs.	C

12.	B	An IP symbol informs of: A. voltage, B. power, C. efficiency, D. protection against contaminants and water.	D
13.	B	Light sources which do not require stabilization and ignition systems are called: A. metal halide lamps, B. light bulbs, C. fluorescent lamps, D. energy-saving lamps.	B
14.	B	A compact fluorescent lamp, when compared with the traditional light bulb: A. is less durable, B. presents no differences, C. is more durable, D. has a better light colour.	C
15.	B	Which lights source is characterised by the lowest durability: A. a fluorescent lamp, B. a sodium-vapour lamp, C. a halogen lamp, D. a light bulb.	D
16.	B	The parameter which characterises the luminous flux density is called: A. luminance, B. luminosity, C. lighting intensity, D. glare.	C
17.	B	Lighting intensity is measured in: A. candelas, B. lumens, C. lux, D. radians.	C

18.	B	A fluorescent lamp is composed of: A. a filament, electrodes, a glass bulb, B. electrodes, a glass bulb, a luminophore, C. an arc tube, electrodes, a glass bulb, D. electrodes, a diode, a glass bulb.	B
19.	B	The commutator in the motor serves for: A. supplying the stator, B. the change of current direction in the armature, C. the change of voltage direction in the stator, D. stator ventilation.	B
20.	B	The rings in an induction motor serve for: A. supplying the rotor, B. supplying the stator, C. slip reduction, D. the change of current direction in the rotor.	A
21.	B	Which of the following is used for the description of motor operation: A. the right-hand rule, B. the left-hand rule, C. Maxwell's law, D. Kirchhoff's law	B
22.	B	The operation of a generator can be described by: A. Maxwell's law, B. Ohm's law, C. the left-hand rule, D. the right-hand rule,	D

23.	B	A separately excited motor: A. is supplied with reduced voltage, B. has the excitation winding and the armature that are connected in series, C. has the excitation winding and the armature that are connected in parallel, D. does not have a commutator,	C
24.	B	A series-wound motor: A. is supplied with reduced voltage, B. has the excitation winding and the armature that are connected in series, C. has the excitation winding and the armature that are connected in parallel, D. does not have a commutator,	B
25.	B	The transformer is composed of: A. the armature, the stator, the commutator, B. primary and secondary winding, the core, C. primary winding, the condenser, the core, D. primary and secondary winding.	B
26.	B	The ratio of a transformer is: A. the relation between primary and secondary voltage, B. the relation between current and voltage, C. the change of resistance, D. loss on the core.	A
27.	B	The operation of a transformer is based on: A. Lenz's law, B. Coulomb's law, C. magnetic induction, D. the right-hand rule.	C
28.		Idle run of a transformer means: A. a duty at decreased voltage, B. a duty without load, C. a duty with load, D. a short-circuit.	B

29.	B	If U_P=100 V, U_W= 200, the ratio of a transformer totals: A. υ=2, B. υ=3, C. υ=0.5, D. υ=0.2.	C
30.	B	If the number of windings in the primary winding z_1=500, the number of windings of the secondary winding z_2=100, then the ratio totals: A. υ=5, B. υ=10, C. υ=0.5, D. υ=0.1.	A
31.	B	Symbol Yd on a transformer means: A. zigzag-delta connections, B. star-zigzag connections, C. star-delta connections, D. zigzag-star connections.	C
32.	B	A three-phase transformer operates on the basis of: A. Coulomb's law, B. magnetic induction, C. the right-hand rule, D. Lenz's law.	B
33.	B	The rotor of the squirrel cage motor is: A. supplied by the rings, B. supplied by the commutator, C. closed, D. composed of 3 windings.	C

34.	B	The rotor of a wound-rotor motor is: A. supplied by the commutator, B. supplied by the rings, C. closed, D. supplied with direct current.	B
35.	B	The rotor of the squirrel cage motor is: A. supplied by the rings, B. supplied with direct current. C. supplied by the rectifier, D. not supplied.	D
36.	B	The rotor of a wound-rotor motor: a. has 3 windings, b. is not supplied. c. has a commutator, d. is closed.	A
37.	B	Synchronous speed is: A. the idle run speed, B. the magnetic field speed, C. the speed under load, D. the speed in a short-circuit state.	B
38.	B	Synchronous speed can be calculated on the basis of the following formula: A. n_S=50*p/f, B. n_S=f/p, C. n_S=60*f/p, D. n_S=30*U/I.	C
39.	B	When p=4, f=60, synchronous speed totals: A. n_S=3,300, B. n_S=200, C. n_S=900,	C

		D. n_S=1,500.	
40.	B	The change of rotation direction of an asynchronous motor occurs through: A. the change of two phases, B. the change of supply voltage, C. the change of rotor resistance, D. one phase disconnection.	A
41.	B	The slip in an asynchronous motor is: A. the change of voltage under load, B. the difference between the supply voltage and the rotor voltage, C. The difference between rotor rotational speed and synchronous speed, D. the difference between idle run speed and synchronous speed.	C
42.	B	Asynchronous motors during start-up: A. draw high current, B. draw higher voltage, C. decrease resistance, D. increase inductivity.	A
43.	B	A contactor is a device used for: A. generator protection, B. motor protection, C. remote switching on and off, D. insulation control.	C
44.	B	A contactor contains the following main elements: A. a coil, a commutator, contacts. B. main contacts, auxiliary contacts, a drive, C. terminals, a drive, a coil, D. a commutator, a drive, contacts.	B
45.	B	Safety fuses provide: A. Cascade protection, B. multiple-use protection, C. multi-contact protection,	D

		D. single-use protection.	
46.	B	Compound-type voltage regulator: A. sums up the currents of the current and the voltage channel, B. regulates the fuel dose, C. sums up the voltage on generator terminals, D. enhances output current.	A
47.	B	The selection of the cross sections of feeder cables shall take into account: A. long-term current-carrying capacity, B. operating comfort, C. impact of weather conditions, D. vibration and motion of the vessel.	A
48.	B	Selectivity of protections means: A. the activation of the strongest protection, B. only the activation of overload protections, C. the activation of generator protections, D. the activation of the protection which is closest to the overload.	D
49.	B	A residual current device: A. is a delay-action breaker, B. is a fast breaker, C. is a one-off breaker, D. is an element of the Meyer's system.	B

50.	B	In a brushless generator, a rotating rectifier: A. provides the excitation current, B. supplies DC receivers, C. is the regulator of revolutions, D. is the frequency regulator.	A
51.	B	The Meyer's system ensures: A. the correct operation of the rudder, B. fast disconnection of a group of receivers, C. voltage stabilization, D. regulation of revolutions.	B
52.	B	Generator reactive power regulator is: A. the regulator of revolutions, B. excitation voltage regulator, C. frequency regulator, D. current regulator.	B
53.	B	The insulation condition control system: A. operates in a continuous manner, B. is used in 4-conductor networks, C. limits short-circuit current, D. stabilizes network voltage.	A
54.	B	The distribution of active power upon parallel operation of generators: A. depends on the equality of voltages of running generators, B. depends on rotational speed regulators, C. depends on the excitation regulator, D. depends on the current regulator.	B

55.	B	The distribution of reactive power upon parallel operation of generators: A. adapts to network load, B. depends on the current regulator, C. depends on the voltage regulator, D. depends on the quantity of motors.	C
56.	B	Generator directional protection prevents: A. the increase of generator revolutions, B. the change of generator frequency, C. the increase of generator current, D. current consumption by the generator.	D
57.	B	Generator undervoltage protection prevents: A. the change of generator frequency, B. generator connection to bus bars, C. the increase of generator revolutions, D. increase of windings temperature.	B
58.	B	Residual current devices can be used: A. in all systems, B. only in less important systems, C. in on-board devices, D. on the bridge.	B
59.	B	An isolation transformer: A. has the ratio equal to 1, B. reduces the voltage to the safe value, C. does not have insulation, D. is only used in the IT network.	A

60.	B	An isolation transformer: A. reduces the voltage to the value of 24v B. is only used in the TN-C networks, C. isolates the device from the network galvanically, D. decreases generator efficiency.	C

61.	B	Indirect climatic hazards to which electrical apparatuses are exposed on a vessel include: A. temperature, humidity, B. temperature, corrosion, C. corrosion, rodents, D. corrosion, sun rays.	c
62.	B	The value of alternating or constant voltage, applied from time to time to metallic elements of the tested device (cable) with the view to verifying the correctness of execution of insulation layers corresponds to: A. operating voltage, B. rated voltage, C. test voltage, D. peak voltage.	C
63.	B	Electric strength of apparatus insulation depends primarily on: A. temperature, material thickness, voltage type, B. humidity, insulation shape, C. temperature, apparatus size, D. humidity, voltage type, insulation colour.	A

64.	B	Allowable long-term temperature of class B insulation is [in ^{o}C]: A. 90, B. 120, C. 130, D. 150.	C
65.	B	Complete the sentence: "Electric strength of electrical devices insulation has to be checked during […….] minutes by means of RMS alternating, sinusoidal test voltage with the frequency of 50Hz." A. 0.5 B. 1, C. 1.5, D. 2.	B
66.	B	Earth-leakage relay must be used in the following networks: A. TN-C, B. IT, C. TN-S, D. TT.	B
67.	B	A short-circuit occurs when: A. foreseen starting current flows in normal circuit operating conditions, B. foreseen rated current flows in normal circuit operating conditions, C. unforeseen current flows in normal circuit operating conditions (most often exceeding $10i_n$), D. unforeseen current flows in normal circuit operating conditions (most often not exceeding $1i_n$).	C
68.	B	On the basis of the path of the short-circuit current, the following types are distinguished: A. blinding and dark ones, B. metallic and arc ones, C. metallic and blinding ones, D. blinding and arc ones.	B
69.	B	If short-circuit current can flow through an electrical apparatus and it does not lead to exceeding the maximum temperature during n-seconds, such current is called:	A

		A. n-second current, B. surge current, C. initial current, D. return current.	
70.	B	The quantity of heat emitted by the device is described by the following formula: A. $Q = I \cdot R \cdot t$, B. $Q = I^2 \cdot R \cdot t$, C. $Q = U^2 \cdot R \cdot t$, D. $Q = U \cdot R \cdot t$,	B
71.	B	Contacts are divided into: A. fixed separable ones, moving inseparable ones, B. fixed separable ones, moving inseparable ones, C. fixed inseparable ones, moving inseparable ones, D. fixed separable ones, moving screw ones.	C
72.	B	The flow of electric current in gas is possible due to the phenomenon of: A. neutralisation through recombination in the electrode spacing, B. diffusion, C. dissociation, D. ionisation.	D
73.	B	In practical solutions of connector extinguishing chambers one or a number of simultaneous phenomena are used, speeding up the de-ionisation processes of the post-arc column, such as: A. forcing the arc to burn in wide gaps between the walls made from the material resistant to high temperatures of the arc, B. forcing the arc to burn in narrow gaps between the walls made from the material resistant to high temperatures of the arc, C. forcing the arc to burn in wide gaps between the walls made from the material which is not resistant to high temperatures of the arc, D. forcing the arc to burn in narrow gaps between the walls made from the material which is not resistant to high temperatures of the arc,	B

74.	B	The breakers are apparatuses which serve among others for: A. the creation of a visible gap in the circuit, B. the break of currents of up to $10i_{n,}$ C. the break of short-circuit currents, D. the break of running currents.	C
75.	B	The main components of circuit breakers are, among others: A. releases, B. auxiliary connectors, C. displays, D. extinguishing systems.	D
76.	B	The delay time setting range of a short-time delay short-circuit component of circuit breakers totals: A. 0.05 ÷ 0.5 s. B. 0.1 ÷ 0.5 s. C. 0.2 ÷ 0.5 s. D. 0.3 ÷ 0.5 s.	C
77.	B	The main operating categories of contactors are divided into: A. AC1÷AC5, DC1÷DC5, B. AC1÷AC4, DC1÷DC4, C. AC1÷AC4, DC1÷DC5, D. AC1÷AC5, DC1÷DC4.	C
78.	B	A thermal bimetallic relay overloaded with the current of 1.05 I_n in compliance with the standard shall be activated after: A. less than 40 minutes, B. more than 2 hours, C. more than 2 seconds, D. more than 5 seconds.	B
79.	B	The characteristics which are used in the analysis of the selective operation of fuses are:	B

		A. the shortest trip time ones, B. band ones, C. the longest trip time ones, D. cam ones.	
80.	B	The limited fuse current is: A. the greatest momentary short-circuit current value upon the activation of the fuse element, B. RMS current flowing in the circuit after the fuse has been replaced by means of a connection with negligible impedance, C. the highest expected RMS current (the current which might be expected if the breaking had not occurred), which the fuse element can break at a specific defined voltage and testing configuration without damage, D. the lowest RMS current flowing through the fuse element and activating it before the expiry of the agreed time.	A
81.	B	The protection shall comply, among others, with the following requirement: A. it shall not emit any gases, B. it shall not break the circuit under standard operation, i.e. during start-up when i = 6*i_n and set operation with i=i_n, C. it shall not make any noise, D. it shall not emit any light.	B
82.	B	According to the requirements of the Polish Register of Shipping (PRS), the batteries should be protected against: A. charging, B. gassing, C. overloading, D. short-circuit.	D
83.	B	External resistance of lead-acid batteries depends on: A. humidity and operating condition, B. humidity and structure, C. temperature and operating condition, D. temperature and humidity.	C
84.	B	Fluid losses in the electrolyte of lead-acid batteries shall be replenished with: A. rainwater, B. demineralised water, C. mineral water, D. boiled water.	B
85.	B	Which of the following is released when charging an alkaline battery:	B

		A. hydrogen, B. water, C. potassium hydroxide, D. nickel hydroxide,	
86.	B	Emergency lighting lamps shall be marked in: A. red, B. black, C. yellow, D. green,	A
87.	B	Detailed requirements concerning signalling and position lamps are contained in: A. the Solas convention and the regulations of the Polish Register of Shipping (PRS), B. the Marpol convention and the regulations of the Polish Register of Shipping (PRS), C. the COLREG convention and the regulations of the Polish Register of Shipping (PRS), D. the UNESCO convention and the regulations of the Polish Register of Shipping (PRS),	C
88.		A current transformer is a single-phase transformer operating permanently in: A. idle run conditions, B. rated fault conditions, C. rated duty conditions, D. overload conditions.	B
89.	B	Transformers are divided into the following types on the basis of their intended use: A. protection and overload ones, B. protection and idle ones, C. protection and measurement ones, D. protection and load ones.	C
90.	B	The error of a current transformer increases with: A. saturation, B. demagnetisation, C. temperature, D. humidity.	A