Surname: ………………………………...….

First Name: ……………………………….....

I.D./P.P.Nο: …….…………………………...

Candidate Nο: ………………………..….….

**A**



**REPUBLIC OF CYPRUS**

**MINISTRY OF COMMUNICATIONS & WORK**

**DEPARTMENT OF ELECTROMECHANICAL SERVICES**

**Electricity Regulations 1941 - 2004**

**EXAMINATION PARER**

**ELECTRICAL CONTRACTORS**

**LEFKOSIA**

**May 2009**

|  |  |  |  |
| --- | --- | --- | --- |
| **1.** | In a TT system, the earthing conductor of an electrical installation is: |  |  |
|  |  |  |  |  |
|  | (a) | The earthed neutral of the supply system |  |  |
|  |  |  |  |  |
|  | (b) | The circuit protective conductor |  |  |
|  |  |  |  |  |
|  | (c) | The conductor connecting the main earthing terminal with an extraneous conductive part |  |  |
|  |
|  |  |  |  |  |
|  | (d) | The conductor connecting the earth electrode with the main earthing terminal |  | **√** |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **2.** | Live conductors are:  |  |  |
|  |  |  |  |  |
|  | (a) | Phase conductors and the combined protective and neutral conductor  |  |  |
|  |
|  |  |  |  |  |
|  | (b) | Phase conductors only |  |  |
|  |  |  |  |  |
|  | (c) | In a single phase circuit, the phase and neutral conductors but in a three phase circuit, phase conductors only |  |  |
|  |
|  |  |  |  |  |
|  | (d) | Phase conductors and the neutral conductor but not the combined protective and neutral conductor |  | **√** |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **3.** | The unit and instrument of measurement of electrical power are: |  |  |
|  |  |  |  |  |
|  | (a) | Ohms / Wattmeter |  |  |
|  |  |  |  |  |
|  | (b) | Watt / Ammeter |  |  |
|  |  |  |  |  |
|  | (c) | Amper / Ammeter |  |  |
|  |  |  |  |  |
|  | (d) | Watt / Wattmeter |  | **√** |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **4.** | Two 6KW/230V and 4KW/230V electrical heating elements are connected in series. The total resistance of the combination is: |  |  |
|  |  |  |  |  |
|  | (a) | 10Ω |  |  |
|  |  |  |  |  |
|  | (b) | 4,3Ω |  |  |
|  |  |  |  |  |
|  | (c) | 5,3Ω |  | **√** |
|  |  |  |  |  |
|  | (d) | 5Ω |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **5.** | In a three phase electrical installation the voltage between the brown and grey phases is 173V. The voltage between the black phase and neutral is: |  |  |
|  |  |  |  |  |
|  | (a) | 299,29 V |  |  |
|  |  |  |  |  |
|  | (b) | 173 V |  |  |
|  |  |  |  |  |
|  | (c) | 100 V |  | **√** |
|  |  |  |  |  |
|  | (d) | 230 V |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **6.** | The voltage at the origin of a circuit supplying a 500W/230V floodlight is 226V. When the length of the supply cable is 50m, the voltage at the floodlight’s terminals is 220V. If the length of the supply cable is increased to 100m, the voltage at the floodlight’s terminals will be:  |  |  |
|  |  |  |  |  |
|  | (a) | 220V |  |  |
|  |  |  |  |  |
|  | (b) | 217V |  |  |
|  |  |  |  |  |
|  | (c) | 214V |  | **√** |
|  |  |  |  |  |
|  | (d) | 208V |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **7.** | In a TT supply system: |  |  |
|  |  |  |  |  |
|  | (a) | The earth electrode is electrically connected to the source earth |  |  |
|  |
|  |  |  |  |  |
|  | (b) | The earth electrode is electrically independent of the source earth |  | **√** |
|  |
|  |  |  |  |  |
|  | (c) | An earth electrode is not required |  |  |
|  |  |  |  |  |
|  | (d) | With the consent of the Electricity Authority of Cyprus the earth electrode can be electrically independent of the source earth |  |  |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **8.** | The Electrical Installation Certificate (form Η.Μ.Υ. 58.07-1) should be used: |  |  |
|  |  |  |  |  |
|  | (a) | For periodic inspections |  |  |
|  |  |  |  |  |
|  | (b) | For the initial certification of a new installation only |  |  |
|  |  |  |  |  |
|  | (c) | For the initial certification of a new installation or for an alteration or addition to an existing installation where new circuits have been included |  | **√** |
|  |
|  |  |  |  |  |
|  | (d) | For the initial certification of a new installation or for an alteration or addition to an existing installation in which new circuits have not been included |  |  |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **9.** | Following the inspection of an electrical installation by the Electricity Authority of Cyprus and the verification that this can be safely connected to the supply system and be used by the owner, the Electrical Installation Certificate (form Η.Μ.Υ. 58.07-1) is kept by: |  |  |
|  |  |  |  |  |
|  | (a) | The Electricity Authority of Cyprus, and is thereafter forwarded to the electrical contractor |  |  |
|  |
|  | (b) | The electrical contractor and is thereafter handed to the owner |  |  |
|  |
|  | (c) | The Electricity Authority of Cyprus, and is thereafter forwarded to the owner |  | **√** |
|  |
|  | (d) | The Electricity Authority of Cyprus, and is thereafter forwarded to the designer provided he was not present during inspection |  |  |
|  |

|  |  |  |  |
| --- | --- | --- | --- |
| **10.** | The insulation resistance measured at the main switchboard of an electrical installation was found to satisfy the requirements of the regulations. Despite that, each circuit should be tested separately if the measured value is: |  |  |
|  |  |  |  |  |
|  | (a) | Between 2 and 3,5 ΜΩ |  |  |
|  |  |  |  |  |
|  | (b) | Between 0,5 and 2,5 ΜΩ |  |  |
|  |  |  |  |  |
|  | (c) | Between 0,5 and 2 ΜΩ |  | **√** |
|  |  |  |  |  |
|  | (d) | Less than or equal to 2,5 ΜΩ |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **11.** | A Residual Current Breaker with overcurrent protection (RCBO) device provides protection against: |  |  |
|  |  |  |  |  |
|  | (a) | Earth leakage, overload, and short circuit  |  | **√** |
|  |  |  |  |  |
|  | (b) | Earth leakage, and short circuit |  |  |
|  |  |  |  |  |
|  | (c) | Earth leakage only |  |  |
|  |  |  |  |  |
|  | (d) | Overload, and short circuit only |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **12.** | According to the Electricity Regulations the person executing an electrical installation in a new building should place on the outside of the building a sign indicating: |  |  |
|  |  |  |  |  |
|  | (a) | His name and his Competency Certificate number |  |  |
|  |  |  |  |  |
|  | (b) | His name, and the name of the designer or the name of designing office |  | **√** |
|  |
|  |  |  |  |  |
|  | (c) | His name provided there is an existing temporary supply |  |  |
|  |
|  |  |  |  |  |
|  | (d) | His name, his address, his telephone number, and his Competency Certificate number |  |  |
|  |

|  |  |  |  |
| --- | --- | --- | --- |
| **13.** | According to the Electricity Regulations the following person(s) should be present during inspection by the Electricity Authority of Cyprus |  |  |
|  |  |  |  |  |
|  | (a) | The competent electrical contractor and the owner of the premises |  |  |
|  |
|  | (b) | The competent electrical contractor or his representative who must also be a competent electrical contractor |  |  |
|  |
|  |  |  |  |  |
|  | (c) | Both the competent designer and the competent electrical contractor  |  |  |
|  |
|  |  |  |  |  |
|  | (d) | The competent electrical contractor or his representative who must be a person under his employment |  | **√** |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **14.** | According to the 16th Edition of the regulations low voltage a.c. is a voltage: |  |  |
|  |  |  |  |  |
|  | (a) | Not exceeding 250V |  |  |
|  |  |  |  |  |
|  | (b) | Not exceeding 1000V but exceeding 50V |  | **√** |
|  |  |  |  |  |
|  | (c) | Exceeding 50V but not exceeding 500V |  |  |
|  |  |  |  |  |
|  | (d) | Exceeding 250V but not exceeding 1000V |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **15.** | The frequency of periodic inspection of an electrical installation shall be determined based on: |  |  |
|  |  |  |  |  |
|  | (a) | The recommendations of the Electricity Authority inspector |  |  |
|  |
|  | (b) | The maximum demand of the installation |  |  |
|  |  |  |  |  |
|  | (c) | The supply system  |  |  |
|  |  |  |  |  |
|  | (d) | The type of the installation |  | **√** |

|  |  |  |  |
| --- | --- | --- | --- |
| **16.** | The rated power of a single phase motor is 2,2HP. The equivalent power in Watts is: |  |  |
|  |  |  |  |  |
|  | (a) | 2200 |  |  |
|  |  |  |  |  |
|  | (b) | 1270 |  |  |
|  |  |  |  |  |
|  | (c) | 1641 |  | **√** |
|  |  |  |  |  |
|  | (d) | 1663 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **17.** | The maximum allowable starting current of a single phase motor having the following characteristics: |  |  |
|  |  |  |  |
|  |  | Power 2,5 ΗΡ |  |  |  |
|  |  | Voltage: 230V/1PH |  |  |  |
|  |  | Frequency: 50ΗZ |  |  |  |
|  |  | Power factor: 85% |  |  |  |
|  |  | is: |  |  |  |
|  |  |  |  |  |  |
|  | (a) | 8,1Α |  |  |
|  |  |  |  |  |
|  | (b) | 14,25Α |  |  |
|  |  |  |  |  |
|  | (c) | 24,3Α |  |  |
|  |  |  |  |  |
|  | (d) | 28,6Α |  | **√** |
|  |  |  |  |  |
|  |  |  |  |  |
| **18.** | Which one of the following equipment has a low power factor? |  |  |
|  |  |  |  |  |
|  | (a) | Εlectrical resistance oven |  |  |
|  |  |  |  |  |
|  | (b) | Fluorescent luminaire |  | **√** |
|  |  |  |  |  |
|  | (c) | Electrical resistance heater |  |  |
|  |  |  |  |  |
|  | (d) | None of the above |  |  |
| **19.** | The main earth leakage protection of an electrical installation is provided by a 100mA Residual Current Breaker with overcurrent protection (RCBO). The maximum allowable earth electrode resistance is: |  |  |
|  |  |  |  |  |
|  | (a) | 500 Ω |  |  |
|  |  |  |  |  |
|  | (b) | 0,2 ΚΩ |  | **√** |
|  |  |  |  |  |
|  | (c) | 0,1 ΚΩ |  |  |
|  |  |  |  |  |
|  | (d) | 166,67 Ω |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **20.** | Τhe value of resistance R2 has to be measured for every circuit of a TT system electrical installation and be recorded in Table A of the Electrical Installation Certificate (Form ΗΜΥ 58.07-1): |  |  |
|  |  |  |  |  |
|  | (a) | In order to ensure that every circuit is provided with a dedicated circuit protective conductor and also for the accurate calculation of touch voltage |  | **√** |
|  |
|  |  |  |  |  |
|  | (b) | For calculating the touch voltage |  |  |
|  |  |  |  |  |
|  | (c) | For calculating the operating time of the circuit protective device under short circuit |  |  |
|  |
|  |  |  |  |  |
|  | (d) | For calculating the operating time of the main protective device of the installation |  |  |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **21.** | According to the Electricity Regulations the supply voltage at consumer terminals shall be within the following limits: |  |  |
|  |  |  |  |  |
|  | (a) | ± 6% of the nominal supply voltage |  |  |
|  |  |  |  |  |
|  | (b) | +10%, -6% of the nominal supply voltage until the 31st of December 2009, and ± 10% thereafter |  | **√** |
|  |
|  | (c) | ± 6% of the nominal supply voltage until the 31st of December 2009, and +10%, -6% thereafter |  |  |
|  |
|  | (d) | ± 10% of the nominal supply voltage |  |  |
| **22.** | If the isolator of an electric lathe can not for practical reasons be installed close to the machine the regulations are fulfilled if provisions are made so that the remote isolator: |  |  |
|  |  |  |  |  |
|  | (a) | Latches in the OFF position |  |  |
|  |  |  |  |  |
|  | (b) | Locks in both the ON and OFF positions |  |  |
|  |  |  |  |  |
|  | (c) | Locks in the ON position |  |  |
|  |  |  |  |  |
|  | (d) | Locks in the OFF position |  | **√** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **23.** | Residual Current devices (RCDs) are used as the means of basic protection against: |  |  |
|  |  |  |  |  |
|  | (a) | Overload and direct contact in TN – C –S systems |  |  |
|  |  |  |  |  |
|  | (b) | Indirect contact in TT systems |  | **√** |
|  |  |  |  |  |
|  | (c) | Short circuit in ΤΤ και TN – C –S systems |  |  |
|  |  |  |  |  |
|  | (d) | Short circuit and overload in ΤΤ systems  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **24.** | Among other, a supplementary equipotential bonding contactor is a contactor connecting: |  |  |
|  |  |  |  |  |
|  | (a) | The main earthing terminal with the exposed-conductive-part of an electrical equipment |  |  |
|  |
|  |  |  |  |  |
|  | (b) | The main earthing terminal with the earth electrode |  |  |
|  |  |  |  |  |
|  | (c) | The earthing terminal of an electrical equipment with the exposed-conductive-part of the equipment |  |  |
|  |
|  |  |  |  |  |
|  | (d) | The exposed conductive parts of different electrical equipment |  | **√** |
|  |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **25.** | A non- mechanically protected supplementary equipotential bonding conductor should be not less than: |  |  |
|  |  |  |  |  |
|  | (a) | 1,5 mm² |  |  |
|  |  |  |  |  |
|  | (b) | 2,5 mm² |  |  |
|  |  |  |  |  |
|  | (c) | 4 mm² |  | **√** |
|  |  |  |  |  |
|  | (d) | 6 mm² |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **26.** | Where the main earthing terminal is not part of the main switchgear, a label should be secured adjacent to it durably marked with the words as follows: |  |  |
|  |  |  |  |  |
|  | (a) | Danger, Electrical Connection - Do not remove |  |  |
|  |  |  |  |  |
|  | (b) | Safety Electrical Connection - Do not remove |  | **√** |
|  |
|  | (c) | Danger, Earth Connections - Do not remove |  |  |
|  |  |  |  |  |
|  | (d) | Earth Connections for Safety Purpose - Do not remove |  |  |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **27.** | Which one of the following CAN NOT be used as an earth electrode? |  |  |
|  |  |  |  |  |
|  | (a) | Earth plates |  |  |
|  |  |  |  |  |
|  | (b) | Buried, building metal structural parts |  |  |
|  |
|  | (c) | Earth rods and earth pipes |  |  |
|  |  |  |  |  |
|  | (d) | Water supply system pipes |  | **√** |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **28.** | If protection is provided by an RCD in a TN-C-S system installation, the product of the earth fault loop impedance and the rated residual operating current (IΔΝ) of the device should not be higher than: |  |  |
|  |  |  |  |  |
|  | (a) | 10V |  |  |
|  |  |  |  |  |
|  | (b) | 25V |  |  |
|  |  |  |  |  |
|  | (c) | 40V |  |  |
|  |  |  |  |  |
|  | (d) | 50V |  | **√** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **29.** | The insulation resistance test of a 400V circuit should be carried out using a test voltage of: |  |  |
|  |  |  |  |  |
|  | (a) | 250V |  |  |
|  |  |  |  |  |
|  | (b) | 400V |  |  |
|  |  |  |  |  |
|  | (c) | 500V |  | **√** |
|  |  |  |  |  |
|  | (d) | 1000V |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **30.** | An 15 HP three phase electric motor having six terminal out of the stator needs a: |  |  |
|  |  |  |  |  |
|  | (a) | Star – Delta starter |  |  |
|  |  |  |  |  |
|  | (b) | A direct – on – line starter |  |  |
|  |  |  |  |  |
|  | (c) | An electronic soft starter |  | **√** |
|  |  |  |  |  |
|  | (d) | None of the above |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **31.** | Which of the following values is the smallest one: |  |  |
|  |  |  |  |  |
|  | (a) | 0,03Α |  |  |
|  |  |  |  |  |
|  | (b) | 0,1A |  |  |
|  |  |  |  |  |
|  | (c) | 20mA |  | **√** |
|  |  |  |  |  |
|  | (d) | 300mA |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **32.** | An electric heater can be supplied from a 13A/230V socket outlet provided that its rated power does not exceed: |  |  |
|  |  |  |  |  |
|  | (a) | 3120 W |  |  |
|  |  |  |  |  |
|  | (b) | 3000 W |  |  |
|  |  |  |  |  |
|  | (c) | 2990 W |  | **√** |
|  |  |  |  |  |
|  | (d) | 2950 W |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **33.** | A three phase electro-submersible pump bears the following markings: “400V, 50Hz, 20A, cosφ: 0,7, Class Η”. The active power of the pump is: |  |  |
|  |  |  |  |  |
|  | (a) | 13HP |  | **√** |
|  |  |  |  |  |
|  | (b) | 9,7HP |  |  |
|  |  |  |  |  |
|  | (c) | 7,5HP |  |  |
|  |  |  |  |  |
|  | (d) | 18,5HP |  |  |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **34.** | An electric motor is marked with “IP43”. This marking denotes: |  |  |
|  |  |  |  |  |
|  | (a) | The class of protection against electric shock |  |  |
|  |  |  |  |  |
|  | (b) | The degree of protection against moisture (first digit) and the degree of protection against dust (second digit) |  |  |
|  |
|  |  |  |  |  |
|  | (c) | The class of protection against electric shock and the number of poles of the isolator  |  |  |
|  |
|  |  |  |  |  |
|  | (d) | The degree of protection against dust (first digit) and the degree of protection against moisture (second digit) |  | **√** |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **35.** | A 230V/12V transformer supplies a number of 12V/50W lighting fittings. If the current at the transformer´s input is 0,66A the number of lighting fittings connected to its output is: |  |  |
|  |  |  |  |  |
|  | (a) | 1 |  |  |
|  |  |  |  |  |
|  | (b) | 5 |  |  |
|  |  |  |  |  |
|  | (c) | 3 |  | **√** |
|  |  |  |  |  |
|  | (d) | 4 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **36.** | A 2,8HP, 230V, 50Hz, cosφ:0,70, single - phase electric motor having an efficiency of 85% is supplied by a 230V circuit. The most suitable miniature circuit breaker (MCB) to be used for protection against overcurrent is: |  |  |
|  |  |  |  |  |
|  | (a) | 16Α Type D |  |  |
|  |  |  |  |  |
|  | (b) | 16Α Type B |  |  |
|  |  |  |  |  |
|  | (c) | 20Α Type C |  | **√** |
|  |  |  |  |  |
|  | (d) | 32Α Type B |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **37.** | The maximum allowable starting current for a 2,5KW/230V single – phase electric motor is |  |  |
|  |  |  |  |  |
|  | (a) | 1,5 times full load current |  | **√** |
|  |  |  |  |  |
|  | (b) | 2 times full load current |  |  |
|  |  |  |  |  |
|  | (c) | 3 times full load current |  |  |
|  |  |  |  |  |
|  | (d) | 5 times full load current |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **38.** | According to the Electricity Regulations the electrode resistance of the neutral point of a stand - by generator should be: |  |  |
|  |  |  |  |  |
|  | (a) | Less than 10Ω |  |  |
|  |  |  |  |  |
|  | (b) | Less than 1Ω |  | **√** |
|  |  |  |  |  |
|  | (c) | Related to the rated residual operating current (IΔΝ) of the RCBO at the origin of the installation |  |  |
|  |
|  |  |  |  |  |
|  | (d) | Related to the maximum demand of the installation |  |  |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **39.** | In caravan park installations the maximum number of socket outlets protected by a single RCD is: |  |  |
|  |  |  |  |  |
|  | (a) | 2 |  |  |
|  |  |  |  |  |
|  | (b) | 3 |  | **√** |
|  |  |  |  |  |
|  | (c) | 6 |  |  |
|  |  |  |  |  |
|  | (d) | 10 |  |  |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **40.** | After completion of an electrical installation the following tests should be carried out: |  |  |
|  |  |  |  |
|  | 1. | Earth electrode resistance |  |  |
|  | 2. | Insulation resistance |  |  |
|  | 3. | Continuity of protective conductors |  |  |
|  | 4. | Continuity of ring final circuit conductors |  |  |
|  |  |  |  |  |
|  | According to the 16th Edition of the Regulations, tests SHOULD be carried out in the following order:  |  |  |
|  |  |  |  |  |
|  | (a) | 1, 2, 3 και 4 |  |  |
|  |  |  |  |  |
|  | (b) | 3, 4, 2 και 1 |  | **√** |
|  |  |  |  |  |
|  | (c) | 2, 3, 1 και 4 |  |  |
|  |  |  |  |  |
|  | (d) | 4, 2, 1, και 3 |  |  |