higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NONNATIONAL CERTIFICATE

INSTALLATION RULES
(First Paper)

(11040412)

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09:00–12:00

This question paper consists of 6 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NONNATIONAL CERTIFICATE
INSTALLATION RULES
(First paper)
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.

2. Read all the questions carefully.

3. Number the answers according to the numbering system used in this question paper.

4. Answers must comply with the relevant codes and/or requirements of the SANS publications (latest edition) and the Occupational Health and Safety Act regulations and must show that candidates understand the context of the relevant question.

5. To pass, candidates must obtain 50% in PAPER 1 as well as in PAPER 2. Both examination papers may be written during the same examination period. Candidates need not pass both examinations during the same trimester, but the second examination must be passed within 12 months of the first. If not, both papers will have to be rewritten. Candidates obtaining 75% in any one of the examinations will be permanently exempted from rewriting that examination. A statement in this regard will be issued to the candidate.

6. For accreditation purposes all candidates must meet the requirements prescribed by the Department of Labour.

7. Work neatly.

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QUESTION 1: OCCUPATIONAL HEALTH AND SAFETY ACT NO 85 OF 1993

1.1 With regard to the above act, what is the employer's responsibilities regarding the issuing and use of personal protective equipment (PPE)? (3)

1.2 No employer or user shall use or permit the use of a portable electric light where the operating voltage exceeds 50 V.

State the exceptions to this rule. (7)

[10]

QUESTION 2: SANS 10198-2 OF 2004: THE SELECTION, HANDLING AND INSTALLATION OF ELECTRIC POWER CABLES OF RATING NOT EXCEEDING 33 KV

2.1 State FIVE factors that might affect the sustained current rating of a cable (5)

2.2 Which FIVE details must be submitted to Telkom when a proposed power cable is to be installed? (5)

[10]

QUESTION 3: SANS 10292 OF 2001: EARTHING OF LOW VOLTAGE (LV) DISTRIBUTION SYSTEM DEFINITIONS AND ABBREVIATIONS

Define each of the following terms:

3.1 Alive

3.2 Combined neutral and earth cable

3.3 Consumer's electrical installation

3.4 Earthed

3.5 Low voltage (LV)

3.6 PE conductor

3.7 PEN conductor

3.8 Point of supply

3.9 Source earthing

3.10 Supplier

(10 × 1) **[10]**

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QUESTION 4: SANS 10142-1 OF 2017: SPECIAL INSTALLATIONS OR LOCATIONS: CARAVAN PARKS, MOBILE HOMES AND MARINAS

Give SIX requirements regarding socket outlets that supplies caravans. **[10]**

QUESTION 5: SANS 10142-1 OF 2017: SPECIAL INSTALLATIONS OR LOCATIONS: MEDICAL LOCATION

Explain SIX locations for which, in the event of a power failure, the changeover period to the safety power supply source shall not exceed 30 seconds before the necessary minimum number of luminaires are supplied from a safety power supply source. **[10]**

QUESTION 6: SANS 10142-1 OF 2017: SPECIAL INSTALLATIONS OR LOCATIONS: ALTERNATIVE SUPPLIES

6.1 Complete the following paragraph by writing only the missing word or words next to the question number (6.1.1–6.1.7) in the ANSWER BOOK.

Overcurrent protection and isolation shall be located (6.1.1) … to the output terminals of each alternative supply unit, except where the cable connecting the unit to the (6.1.2) … is mechanically protected and is regarded to be within the fault-free zone of the distribution board where (6.1.3) … is installed. The magnetic characteristics of the circuit breaker shall have a low (6.1.4) … in view of high impedance in the cable of a generator or of the current limiting characteristics in the case of a static (6.1.5) … ups. Downstream co-ordination shall take this into account. To be consistent with the rest of this part of SANS 10142, (6.1.6) … is required for the protection of the conductors, but might also provide protection to the (6.1.7) …

(7 × 1) (7)

6.2 Complete the following sentence by writing only the missing word or words next to the question number (6.2.1–6.2.3) in the ANSWER BOOK.

Where an alternative supply system is intended to operate in parallel with the (6.2.1) … or where two or more alternate supply systems may operate in parallel, circulating (6.2.2) … shall be limited so that the (6.2.3) … of the conductors is not exceeded.

(3 × 1) (3)

[10]

QUESTION 7: SANS 10142-1 OF 2017: COMPLIANCE

7.1 Fully state the requirements regarding notices, labels and rating plates. (4)

7.2 Give 12 topics regarding notices, labels and rating plates. (12 × ½) (6)

[10]

QUESTION 8: SANS 10142-1 OF 2017: ANNEXURE E: RECOMMENDED BENDING OF CABLES

TABLE E1 includes recommendations for the minimum radius of curvature of cables.

Complete the missing information in the TABLE below by choosing an answer from the list below. Write only the answer next to the question number (8.1–8.10) in the ANSWER BOOK

.

NOTE: *d* is the overall diameter of the cable

2d; 4d; 15d; 10d; d≤10; 10<d; ≤25; 12d; 40<d; 25<d≤40; d<15; 6d; 8d; 3d

TYPE OF CABLE	TYPE OF SHEATHING	DIAMETER OF CABLE MM	MINIMUM RADIUS OF CURVATURE
PVC insulated, that complies with relevant requirements of SANS 1507	Unsheathed	8.1 8.2 8.3 8.4	8.5 8.6 8.7
	Sheathed but unarmoured		8.8
	Armoured		8.9
Paper-insulated	Lead sheathed		8.10

(10 × 1) **[10]**

QUESTION 9: SANS 10142-1 OF 2017: ANNEXURE J: ELECTRICITY SUPPLY SYSTEM

Draw a labelled diagram of a TT system earthing **[10]**

QUESTION 10: SANS 10142-1 OF 2017: ANNEXURE M: AUTHORITY FOR ISSUING A TEST REPORT AND A CERTIFICATE OF COMPLIANCE

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (10.1–10.10) in the ANSWER BOOK.

Single phase installations:

10.1 May be installed by any person.

10.2 Report and COC may be issued by electrical tester for single phase only.

10.3 Test report and COC may be issued by master installation electrician.

Two phase, three phase and DC installations:

10.4 May be installed by any person under control of a single-phase tester.

10.5 May be installed by any person under control of installation electrician.

10.6 Test report and COC may be issued by installation electrician.

10.7 Test report and COC may be issued by master installation electrician.

Specialised installation:

10.8 Includes hazardous, medical, explosive, petroleum and caravan park installation.

10.9 May be installed by any person under control of master installation electrician.

10.10 Test report and COC may be issued by master installation electrician.

(10 × 1) **[10]**

TOTAL: 100

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