

UMMUL QURA HIGH SHOOOL

Arowona Bus-Stop Amuloko Akanran Road, Ibadan.

Third-Term Examination

CLASS: SSS 2

SUBJECT: ENT/Elect.

DURATION: 2¹/₂ hours.

Instructions: Answer *all* questions in **Section A** and *three* in **Section B**.

SECTION A: OBJECTIVES

1. Which of the following tools is most suitable for cutting a conduit pipe?
A. Hacksaw.
B. Hand-drill.
C. Jigsaw.
D. Panel saw.
2. Which of the following fittings is *not* used in conduit wiring?
A. Clips.
B. Tee-box.
C. Terminal box.
D. Through.
3. A township distribution network is a/an ---- tension.
A. extra low.
B. extra high.
C. high.
D. low.
4. The following are overhead line supports *except* ---- insulator.
A. disc.
B. pin.
C. shackles
D. wooden.
5. Which of the following materials is used on a high tension overhead lines?
A. D-Iron.
B. Disc insulator.
C. L. T. Pole.
D. Shackle insulator.
6. Which of the following is *not* found in a distribution substation?
A. Bus-bar.
B. Feeder pillar.
C. Isolator.
D. Wall bracket.
7. Which of the following is a major sources of electricity supply in Nigeria?
A. Nuclear.
B. Wind.
C. Hydro.
D. Solar.
8. Overhead conductors are *mostly* made from
A. Copper.
B. Silver.
C. Iron.
D. Aluminum.
9. Which of the following is *not* a typical transmission/distribution voltage level?
A. 100 KV.
B. 415 KV.
C. 11 KV.
D. 33 KV.
10. Which of these materials is *not* used for surface conduit wiring?
A. Cleat.
B. Clip and nail.
C. Duct.
D. Joint box.
11. The outermost cover of a cable which gives it mechanical protection is known as the
A. armouring.
B. conduit.
C. insulation.
D. sheath.
12. A coupler is used to join two;
A. armoured cable.
B. conduit.
C. florescent fittings.
D. PVC cable.
13. Erection of a concrete pole can be made

easy by the use of a,

- A. crane.
- B. fork lift.
- C. grader.
- D. tipper.

14. All the following materials are used in electricity transmission system *except*;

- A. cross arm.
- B. energy meter.
- C. pot insulator.
- D. stay wire.

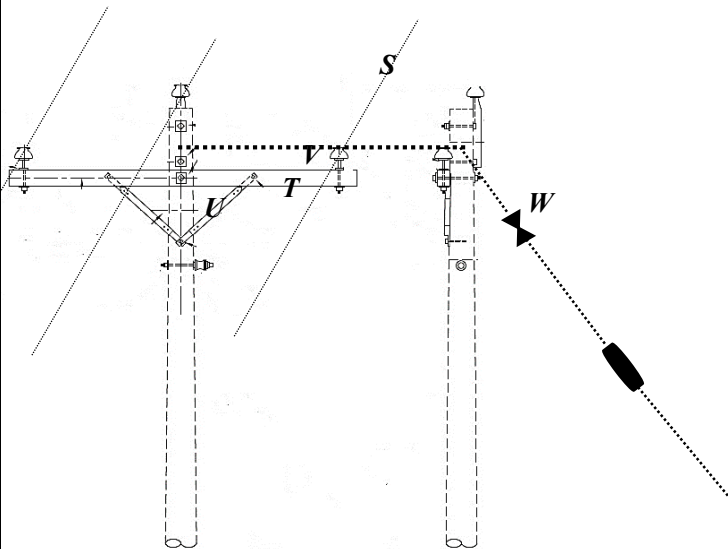
15. Which of the following materials has the highest electrical conductivity?

- A. Iron.
- B. Aluminum.
- C. Silver.
- D. Copper.

16. One of the reasons for the use of insulator in the angle stay system for pole support is

- A. cost effectiveness.
- B. protection against shock.
- C. beautification of the installation.
- D. protection against vandals.

Use the diagram below to answer question 17 – 20



17. What does part label *S* represent?

- A. High voltage line.
- B. Medium voltage line.
- C. Low voltage line.
- D. Extra low voltage line.

18. The part labelled *T* and *U* are respectively.

- A. cross arm and bridge.
- B. cross arm and legs.
- C. insulator and bridge.
- D. bridge and cross arm.

19. What does the part label *V* represent?

- A. Low tension voltage.
- B. Cross arm wire.
- C. Flying stay.
- D. Cross arm

20. The function of *W* is to;

- A. electrically isolate the lower part stay wire.
- B. mechanically balance the tension.
- C. ground the pole.
- D. translating the force.

21. The sharp edges of conduit are removed with the aid of

- A. a pair of plier.
- B. conduit reamer.
- C. hacksaw.
- D. long nose pliers.

22. The type of tool used to carryout tension on overhead line is;

- A. spanner.
- B. jack.
- C. wrench.
- D. tape.

23. The material that offers a low resistance to the flow of electric current is a/an;

- A. insulator.
- B. conductor.
- C. semi-condition
- D. cable.

24. The IEE regulation for a temporary installation is;

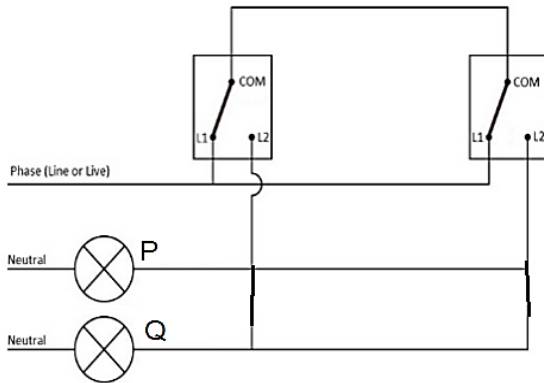
- A. 12 months.
- B. 6 months.
- C. 4 months.
- D. 3 months.

Use the diagram below to answer question 25 – 27.

25. How many joint box is needed to implement the lighting system above in a room?

- A. 1.
- B. 2.

- C. 3.
D. 4



26. What type of wiring method is implemented in the wiring system?
- ring method.
 - radial method.
 - parallel.
 - series-parallel.
27. If the switches are replaced by a 2-way-1-gang switch, and L1 and L2 are connected to **P** and **Q** respectively. The two bulbs
- will alternate on/off.
 - remain on or off.
 - remain off.
 - remain on.
28. In which of the following wiring systems is armoured cable most suitable?
- trucking.
 - surface.
 - underground.
 - conduit.
29. The end of a metallic conduit pipe is prepared for installation to avoid cable abrasion by the use of
- reamer.
 - spanner.
 - chisel.
 - flat-file.
30. Where a large number of cables are required for an installation, it is recommended to use
- light gauge conduit.
 - ducting.
 - heavy duty conduit.
 - trucking.
31. A fault which affects several sub-circuit is likely to originate from
- a sub-circuit feeding the ground of sub-circuit.
 - several sub-circuits feeding the group of sub-circuit.
 - a main feeding the group of sub-circuits.
 - several sub-main feeding the group of sub-circuit.
32. Which of the following materials is **not** used for overhead line insulator?
- Porcelain.
 - Glass.
 - PVC.
 - Steatite.
33. Which of the following is the main field of application of pin type insulator?
- Distribution system.
 - Transmission system.
 - Both A and B.
 - EHV transmission system.
34. A transmission line for operating voltage above 130 **KV** will consists of about ---- disc.
- 9 or 10
 - 3 or 10
 - 11 or 12
 - 13 or below.
35. Suspension insulators are made of
- glass
 - porcelain
 - steatite.
 - epoxy resin.
36. What is the most common causes of failure of overhead line insulator?
- Flash-over.
 - Mechanical stress.
 - Porosity of materials.
 - Improper verification.
37. A transmission line consists of 9 discs of suspension insulator in each string. What is the operating voltage of the transmission line?
- 11 **KV**

- B. 33 KV
- C. 66 KV
- D. 132 KV

38. Glass insulator **cannot** be used for voltage above

- A. 25 KV
- B. 11 KV
- C. 33 KV
- D. 50 KV

39. Which of the following insulator is used for insulating stay wire from pole?

- A. Pin type insulator.
- B. Shackle insulator.
- C. Suspension insulator.
- D. Stay insulator.

40. What is the effects of rain on string effectiveness? It

- A. becomes very low.
- B. reduces slightly.
- C. does not change.
- D. is improved.

41. Metallic shielding is provided on the underground cables to;

- A. reduce thermal resistance
- B. reduce corona effect
- C. control the electrostatic voltage stress
- D. all of the above

42. Underground cables are laid at sufficient depth so as to;

- A. minimize temperature stress
- B. minimize effects of shock and vibration owing to passing of vehicles
- C. avoid being unearthed easily owing to removal of soil
- D. both A and C

43. Which among these tests are to be conducted on wiring installations?

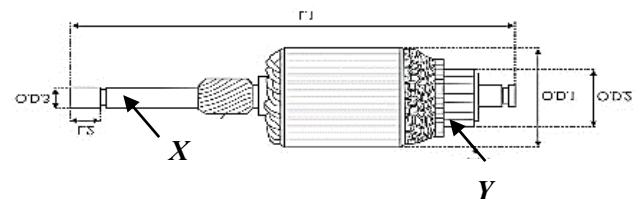
- A. Polarity of non-linked single pole switch
- B. Earth continuity path
- C. Earth resistance
- D. All of the above

44. What should be provided as the working space around the main switch to board according to IEE rule 51?

- A. 0.914

- B. 0.523
- C. 0.638
- D. 0.814

The diagram below represents a part of an electrical machine. Use it to answer question 45 – 47.



45. What part of electrical machine is represented by the diagram?

- A. Commutator
- B. Winding
- C. Armature
- D. Stator

46. What does the part label X represent?

- A. Shaft
- B. Bearing
- C. Core
- D. Commutator

47. What is the function of the part labelled Y?

- A. serves as power output source
- B. serves as power input
- C. converts ac emf to dc emf
- D. converts dc emf to ac emf

48. The material for providing armouring on cable is usually

- A. steel tape
- B. galvanized steel wire
- C. aluminum wire
- D. any of the above

49. The insulating material for cables should be

- A. acidic proof
- B. non-inflammable
- C. non-hygroscopic
- D. all of the above

50. Which of the following protects a cable against mechanical injuries?

- A. bedding
- B. sheath

C. armouring

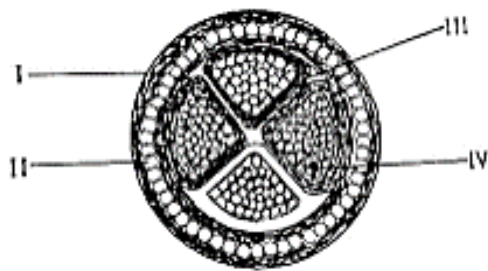
D. any of the above

SECTION B: THEORY AND TEST OF PRACTICAL

PART A: THEORY

Instructions: Answer question *one* and any other *two* from this part.

1. a-i. Mention *two* parts of DC machine.
a-ii. What is the name of the rotating part of a DC machine?
a-iii. Explain briefly why series DC generator is used as a booster.
b-i. List *three* types of DC generators
b-ii. Explain briefly the meaning of back-emf in a DC motor.
b-iii. State *two* methods of controlling the speed of DC motors.
b-iv. Why is the starting current of the DC motors dangerous to motors?
b-v. State *one* method of reducing starting current in DC motors.
c-i. Give *four* reasons for installation of protective devices.
c-ii. List *three* parts of a cable.
c-iii. List *two* types of cables used in providing temporary installations with one reason each.

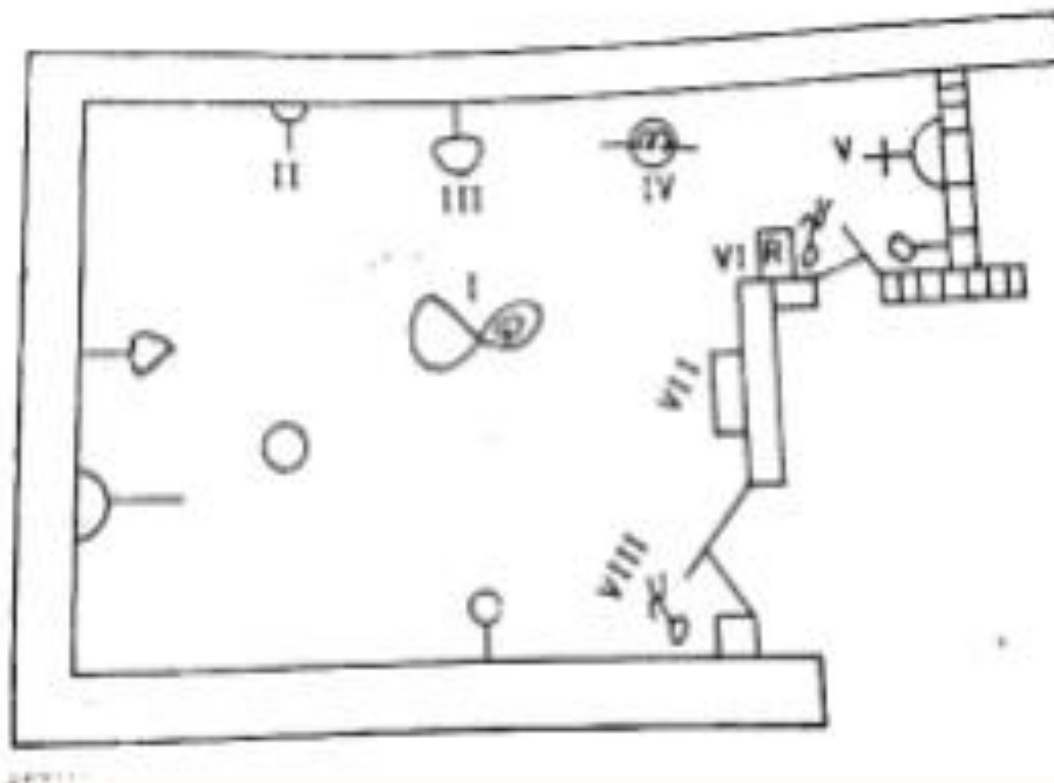


2. a-i. The diagram above illustrates a PVC armored cable. Study it and answer the following questions.
a-ii. Name part *I*, *II*, *III* and *IV*.
a-iii. State the precaution to be taken while installing PVC armored cable.
b-i. List *five* tools used in metallic conduit installations.
b-ii. Draw an incandescent lamp and label at least *four* parts on it.
3. a-i. Mention any *five* advantages of underground system of electrical distribution.
a-ii. Outline any *two* reasons why an electrical system should be protected.
b. Explain briefly the function of any *three* of the following instruments.
 - i. *megger*
 - ii. *ohmmeter*
 - iii. *voltmeter*
 - iv. *ammeter*
 - v. *photometer*
4. a. With the aid of a neat diagram, show the parts of a lead-covered paper insulated steel wire armored cables.
b. List any *three* factors to be considered when planning a house wiring.
c. State the standard cable size required for the following loads in a domestic installation.

PART B: TEST OF PRACTICAL

Instructions: Answer any ***one*** question from this part.

5a. The diagram below represents the electrical design of a living room. Identify the following electrical symbols;



SN	Symbols	Uses
<i>I</i>		
<i>II</i>		
<i>III</i>		
<i>IV</i>		
<i>V</i>		
<i>VI</i>		
<i>VII</i>		
<i>VIII</i>		

5b. With the aid of a well labelled diagram, illustrate the wiring diagram of a point of lamp controlled independently by two 1-gang-2-way switches.

6a. Copy and complete the table below. Fault in a fluorescent lamp circuit.

sn	Symptoms	Possible causes
1	Fuse blown when lamp is switched on	
2	Lamp appeared dead when switched on	

3	Lamp does not light but electrodes glow continuously	
4	Lamp makes repeated effort to start.	

- 6 b-i. Give **one** reason why a capacitor is connected between fluorescent lamp terminal.
b-ii. State **two** reasons why sodium lamps are used for street lighting.