UMMUL-QURA HIGH SCHOOL

Arowona Bus-Stop, Amuloko, Ibadan, Oyo State

Second Term Examination, 2020/2021 Academic Session.

Subject: ENT/Elect. ***Class:*** SSS 2 ***Time:*** $2\frac{1}{2}$ hours

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

PAPER I & II [Objective and Theory]

SECTION A: OBJECTIVE (20 marks).

1. Earthing is necessary to give protection against ----.
   A. electric shock
   B. voltage fluctuation
   C. overloading
   D. high temperature of the conductors
2. Planning of electrical wiring work includes -----.
   A. site visit
   B. determining the customer load requirement
   C. calculating the maximum load demand
   D. all of the above
3. The method used by domestic electrician for checking the continuity in domestic wiring is ----.
   A. bulb test or lamp test
   B. neon tester
   C. residual current device test
   D. prospective short circuit test
4. The device that allow electrically operated equipment to be connected to the primary AC power supply in a building ----.
   A. MCB
   B. plug and socket
   C. ELCB
   D. fuse
5. The temperature range for lead-tin soldering process is ----.
   A. 40^0C to 100^0C
   B. 180^0C to 250^0C
   C. 300^0C to 500^0C
   D. 600^0C to 900^0C
6. In case of three core flexible cable the colour of the neutral is ----.
   A. blue
   B. black
   C. brown
   D. none of the above
7. Which one of the following is the maximum current carrying capacity for a single-core 6mm² 70°C thermoplastic insulation non-armoured cable, enclosed in a conduit on a wall, installed for a single-phase circuit?
   A. 31A
   B. 32A
   C. 36A
   D. 41A
8. Determining causes of operating errors and deciding what should be done to rectify the errors is called.
   A. repairing
   B. installation
   C. troubleshooting
   D. equipment selection

9. Technical skill of electrician to domestic solution includes the following ***except*** ----.
   A. critical thinking
   B. decision-making
   C. active listening
   D. Installing
10. According to standard color code, ___color is used for live wire.
   A. black
   B. green
   C. red
   D. any of the above
11. Fuse is a piece of wire of a material with ----.
   A. high melting point
   B. low melting point
   C. moderate melting point
   D. none the above
12. A soldering iron 'bit' is made of----.
   A. brass
   B. tin
   C. steel
   D. copper
13. According to house wiring rules as per IEE specification, the switchboard should be fitted at a eight of ----.
   A. 0.5 m
   B. 1.5 m
   C. 2.5 m
   D. 3.5 m
14. RCDs for protecting people have a rated tripping current (sensitivity) of not more than
   A. 40 mA
   B. 50 mA
   C. 30 mA
   D. 60 mA
15. When brazing is carried out ----.
   A. a joint is made between two parts by molten solder
   B. the edges of the joint melt and run together
   C. spelter forms an alloy with the flux
   D. flux prevents the work from melting
16. Water heaters exceeding 3 kW shall be permanently connected to a ____ rated circuit breaker or fuse with an isolator switch and residual current device
   A. 20A/32A
   B. 5A/10A
   C. 10A/12A
   D. none of the above
17. Which distribution system is more reliable? Is ----.
   A. ring mainstream
   B. tree system
   C. radial system
   D. all are equal reliable
18. Fuse wire should be connected to ----.
   A. phase wire only
   B. neutral wire only
   C. ground wire only
   D. both (b) and (c)
19. Heat for soldering process is supplied by ----.
   A. soldering iron
   B. induction furnace
   C. electric resistance method
   D. any of the above
20. If two switches are connected in series to a lamp/load, then ----.
   A. any one switch needs to be switched ON to energize the load

B. both the switches need to be switched ON to energize the load
C. only switch 1 need to be switched ON to energize the load
D. only switch 2 need to be switched ON to energize the load

21. The method to interconnect a switch, a fan and a fan regulator to an electric supply is ----.
A. connecting each of them in parallel to one another
B. connecting each of them in series to one another
C. connecting fan and regulator in parallel and switch in series to them
D. connecting fan and regulator in series and switch in parallel to them

22. The device used for protection from earth leakage current to prevent electric shocks is ----.
A. fuse
B. circuit breaker
C. residual current device
D. all of the above

23. The temperature range of brazing process is ----.
A. 150^0C to 250^0C
B. 250^0C to 450^0C
C. 500^0C to 700^0C
D. 700^0C to 900^0C

24. The device that are encouraged to be used for protection against heavy lighting strikes or over voltage is ----.
A. surge protection device
B. residual current device
C. both (a) and (b)
D. either (a) or (b)

25. The purpose of using flux in soldering is to ----.
A. increase fluidity of solder metal
B. feel up gaps left in a bad joint
C. carbon steel
D. prevent oxides forming

26. The test done to check the healthiness of the domestic wiring is ----.
A. polarity test
B. insulation resistance test
C. continuity test
D. all of the above

27. Fluorescent lamps using electronic ballast or high frequency electronic ballasts ----.
A. do not need capacitors
B. need capacitors
C. either (a) or (b)
D. none of the above

28. Earth Leakage Circuit Breaker (ELCB) is ----.
A. voltage operated protection
B. current operated protection
C. both (a) and (b)
D. none of the above

29. In case of short circuit, ____ current will flow in the circuit.
A. zero
B. very low
C. normal
D. very high current

30. Brazing is the process of ----.
A. joining plastic sheets
B. hard soldering using brass spelter
C. casing in brass
D. making steel look like brass

31. The service-mains connects ----.

A. distributor and consumer terminals
B. distributor and transformer
C. distributor and relay system
D. transformer and earth

32. The most preferred domestic wiring nowadays is ----.
A. casing and capping wiring
B. conduit wiring
C. cleat wiring
D. batten wiring

33. The purpose of using borax in brazing is to ----.
A. replace flux
B. dissolve oxides when heating the work
C. accelerate the formation of oxides on the work
D. prevent the spelter from melting too quickly

34. The basic needs of earthing is ----.
A. to protect human lives as well as provide safety to electrical devices and appliances from leakage current
B. to protect electric system and buildings from lighting
C. to serve as a return conductor in electric traction system and communication
D. all of the above

35. The commonly used flux for brazing is ----.
A. resin
B. NH4CL
C. borax
D. soft iron

36. A ___ is where the electrical supply is distributed from within the building.
A. switch board
B. distribution board
C. service lines
D. all of the above

37. The device that consists of short length of wire, generally of tinned copper is ----.
A. HRC fuse
B. cartridge fuse
C. re-wirable fuse
D. all of the above

38. How much supply is fed to the heating element of electric soldering iron through a switch?
A. 415 V AC
B. 415 V DC
C. 230 V AC
D. 230 V DC

39. The flux in brazing process is used in the form of ----.
A. Powder
B. liquid
C. paste
D. any of the above

40. Where must an overcurrent device be located in a circuit?

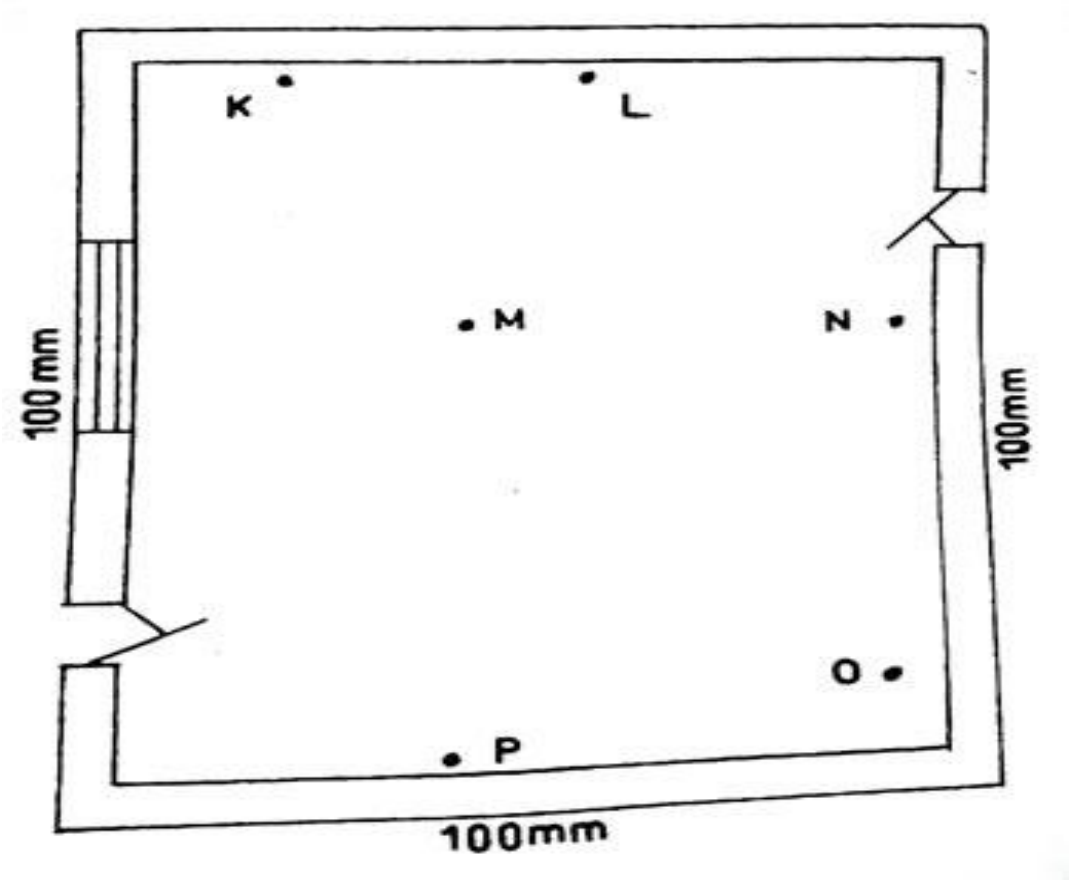
A. At the point where the conductor receives its supply
B. At the last outlet on the circuit
C. On the line side of the electric meter
D. At the first fitting or connector in the circuit

SECTION B: THEORY (50 marks).

Instructions: Answer question 1 in Part A and ***any two*** from Part B.

PART A: Test of Practical

1a. The diagram below shows the layout of a kitchen.



(i) Reproduce the diagram to specification.

b. Indicate the appropriate position of each of the following accessories on the diagram in 1(a):

i. cooker unit.
ii. 2-way switch.
iii. 13 A socket outlet.
iv. 15 A socket outlet.
v. incandescent lamp.
vi. 4-way MCB consumer unit

c. State the correct cable size for each of the accessories in 1a(a)(i). 20 marks.

PART B: Theory

2a. (i) Explain the procedure for preventing an overload or a short circuit in a domestic wiring.
(ii) What are the types of Domestic Wiring?

2b. (i) What are the advantages and Disadvantages of using Conduit wiring?
(ii) What are the protection devices used for domestic circuits?

15 marks

3a. State ***three*** precautions that should be taken to prevent accidents in electrical workshop.

3b. A fuse is an essential part of an electrical circuit. Explain:

i. its purpose.
ii. how it operates
iii. why the fuse element must be of current rating
iv. draw a labeled diagram of a rewireable fuse with the holder. 15 marks

4a. (i) Define the term illumination.
(ii) List ***three*** factors that would affect the illumination of a room.

4b. (i) Calculate the illumination of a plain 4 ***m*** vertically below a point of light source of 128 ***cd***.
(ii) State ***two*** types of conduit gauge.
(iii) Outline ***five*** steps in the procedure for threading metal conduit. 15 marks

5a. (i) State ***four*** precautions to be taken in charging a battery.
(ii) Give ***four*** differences between primary and secondary cells.
(iii) Explain briefly how a damaged socket can be replaced.

5b. (i) List ***four*** types of measuring instrument used in an electrical workshop.
(ii) State ***one*** use of any of instruments listed in 5b(i).

5c. (i) sketch the British Standard (BS) graphical symbols for the following devices:

i. fixed resistor.
ii. a.c motor
iii. fuse
iv. variable inductor
v. electric cell 15 marks