

ELECTRICAL TECHNOLOGY AND DIAGRAM 1  
5245

JUNE 2021

INTERMEDIATE LEVEL

Specialty Name (Specialty Code)	ELECTRICAL POWER SYSTEMS (EPS)
Centre No. & Name	
Candidate No.	
Candidate Name	JIGAGHA GERVIS LINYONG

Mobile phones are NOT allowed in the examination room.

5245 ELECTRICAL TECHNOLOGY AND DIAGRAM 1: MULTIPLE CHOICE QUESTION PAPER

1 Hour 30 Minutes

INSTRUCTIONS TO CANDIDATES

*Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.*

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

*Before the examination begins:*

3. Check that this question booklet is headed "Intermediate Level – 5245 ELECTRICAL TECHNOLOGY AND DIAGRAM 1.

4. Insert the information required in the spaces above.

5. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

**Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.**

Take care that you do not erase or fold the answer sheet or make any marks on it other than those asked for in these instructions.

*How to answer the questions in this examination:*

6. Answer ALL the 50 questions in this Examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: A, B, C and D. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.  
For example, if C is your correct answer, mark C as shown below:  
[A] [B] [C] [D]
8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. **At the end of the examination, the invigilators shall collect the answer sheet first and then the question booklets. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**
12. **Non Programmable Calculators are allowed**

Turn Over

1. Electrical installation must be divided into many circuits in order to
- A avoid the circuit to have the same supply
  - B limit the consequences of a fault of a circuit only to the circuit, by putting off only the circuit
  - C permit the consequences of a fault to the whole installation
  - D avoid the circuit to have the current

2.

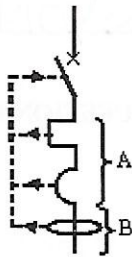


Figure 1

Figure 1 represents the symbol of a differential circuit breaker. The circuit breaker protects a circuit against

- A differential current only
- B short circuit current only
- C over load current only
- D short circuit, over load and leakage current

3. Switch gears are

- A electrical apparatus/appliances for control, regulation, protection and isolation;
- B electrical machines with switches and gears
- C electrical switches and gears
- D Simply switches and gears of apparatus/appliances

4. In a four wire flexible cable, the colour of the neutral conductor is

- A brown
- B black
- C blue
- D yellow

5. Which of these starting methods is not applicable to squirrel cage induction motors?

- A Rotoric
- B Statoric
- C star-delta
- D auto-transformer

6.

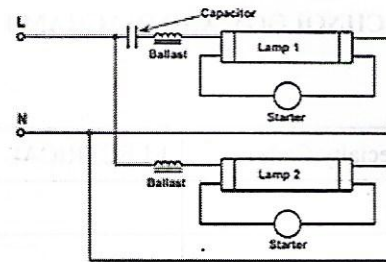


Figure 2

The circuit of figure 2 reduces

- A Radio interference effect
- B Stroboscopic effect
- C power factor effect
- D Arcing effect

7.

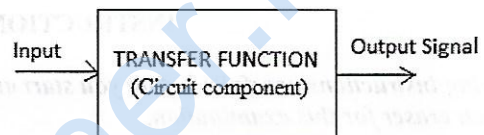


Figure 3

The diagram of the Figure 3 represents

- A an open loop system
- B a closed loop system
- C a transfer function system
- D input output system

8. Three main parts of a programmable logic controllers are:

- A CPU, Memory, Power supply
- B Input Interface, Output Interface, Processor
- C CPU, Processor, Memory
- D Input Interface, CPU, Output interface

9.

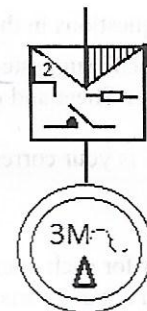


Figure 4

The number of starting steps of the starter diagram of figure 4 is

- A Five (5)
- B Three (3)
- C Four (4)
- D Two (2)

10. The connection of all the exposed metal parts of an installation to the general mass of the earth is called
- A earthing
  - B earth leakage protection
  - C equipotential bonding
  - D earth continuity conductor

11.

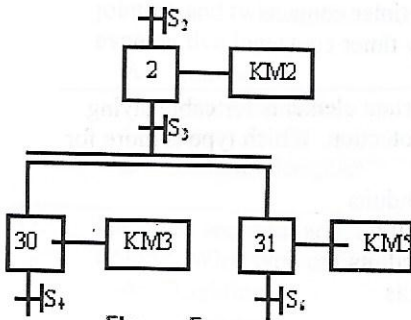


Figure 5

The sequence of the uncompleted GRAFCET of Figure 5 represents

- A AND Convergent
  - B OR Divergent
  - C OR Convergent
  - D AND Divergent
12. For an intermediate switch to function correctly in a circuit, it must be accompanied by
- A two 2-way switches
  - B two 1-way switches
  - C a 1-way switch and a 2-way switch
  - D a 2-way switch and an intermediate switch
13. In an installation where all security norms have been respected, one can be electrocuted by touching only the
- A neutral wire
  - B earth wire
  - C phase wire
  - D body of a load
14. Carbon arc lamps are commonly used in
- A Domestic lighting
  - B Street lighting
  - C Cinema projector
  - D Photography
15. The phase wire of an electric stove gets in contact with its metallic frame. In terms of electrical protection if the cook touches the stove:
- A it's a direct contact
  - B it's an indirect contact
  - C it's a manual contact.

D accidental contact

16. The voltage of a certain three phase squirrel cage induction motor is given by 220V/380V and the system is supplied by a 220V/380V-50Hz system. The windings of this motor are coupled in\_?
- A Star-Delta
  - B Delta
  - C Zig-Zag
  - D Star

17. The direction of rotation of a three-phase induction motor can be reversed by
- A connecting a capacitor in between any phase and neutral
  - B connecting an inductor in between any phase and neutral
  - C changing one phase
  - D interchanging any two phases

18. Which of the following medium is employed for the extinction of arc in air circuit breakers?
- A Water
  - B Air
  - C Oil
  - D SF6

19. Which of the following is not a braking method?
- A Braking by current injection
  - B Braking by counter voltage
  - C Braking by counter current
  - D Braking by electro brake

20. Which part in the switch start fluorescent lamp plays the role of an auto transformer in the instant start type?
- A Power factor capacitor
  - B Glow starter
  - C Circuit switch
  - D Ballast

21. Which of these is not a basic element of a GRAFCET?
- A Transition
  - B Step
  - C Directed link
  - D Initial Step

22. In overhead transmission aluminium is preferable to copper because it is
- A smaller in cross-sectional than area copper
  - B less efficient than copper
  - C lighter in weight than copper
  - D easy to lay than copper

23. Which of the following statement is true for an OFF-DELAY timer mounted on a contactor?
- A It starts timing when the contactor is energised
  - B It stops timing when the contactor is de-energised
  - C It starts timing when the contactor is de-energised
  - D It starts timing when the loads delay to be switched on

24. Two dissimilar metals with different temperature coefficient joint together is
- A an alloy
  - B a ferrous
  - C a pure metal
  - D a bimetallic

25. Which of the following turbines is suitable for a low water head water fall in a hydro-electric power plant?
- A Francis turbine
  - B Kaplan turbine
  - C Pelton turbine
  - D Reactive turbine

26.

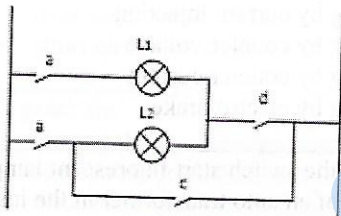


Figure 6

Considering the diagram of Figure 6,  $L_1=L_2=100W$ . To obtain the minimum heat from  $L_1$  and  $L_2$ , the switches which should be closed are

- A abd
  - B ac
  - C ad
  - D bd
27. The IEE regulations are important regulations in the field of electricity. What does the acronym IEE mean?
- A International Electrical Engineering
  - B Institute of Electrical Engineers
  - C Institute of Electrical and Electronics
  - D Institute of Elementary Engineers

28.

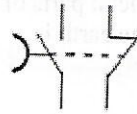


Figure 7

- The symbol in the Figure 7 represents a
- A Normally opened and normally closed contacts of a push button
  - B Time switch contacts
  - C ON-Delay timer contacts
  - D OFF-Delay timer contacts

29. Conduits are important elements for cable laying and mechanical protection. Which type is more for surface wiring?

- A Metallic conduits
- B Plastic conduits
- C Flexible conduits
- D PVC conduits

30. Incandescent lamps differ with the nature of their caps. Which of the following is not a lamp cap?

- A Bayonet cap
- B Edison cap
- C Bi-Pin cap
- D Miniature cap

31. Which of the following faults may likely not cause over voltage?

- A Insulation depreciation
- B Short circuit
- C Lightening on transmission lines
- D Unbalanced load in three phases

32. Generally, grounding is provided for the safety of

- A equipment
- B equipment and persons
- C persons
- D the installation

33. The main function of a fuse is to

- A protect the line
- B open the circuit
- C protect the appliance
- D prevent excessive currents

34. A fuse in a motor circuit provides protection against

- A overload
- B short-circuit and prolong-overload
- C open circuit, short circuit and overload
- D open circuit and short circuit

35. Electrical energy is transported on high voltage
- A because there are transformer to step up and down voltage
  - B because there are industries that need high voltages
  - C so as to reduce losses on the lines
  - D because the alternator generates very high voltage

36. The tool used for cutting, removing insulation, jointing and twisting the electric wires and cables even on live line is a
- A hammer
  - ~~B~~ long nose plier
  - C screw driver
  - D combination plier

37. The cross sectional area of a conductor core is  $1.5\text{mm}^2$ . What type of circuit is it?
- ~~A~~ Lighting
  - B Cookers
  - C Washing machines
  - D sockets

38. The formula  $\frac{\rho L}{A}$  is the
- A Resistance of a temperature influenced resistor
  - B resistance of a nonlinear resistor
  - ~~C~~ resistance of a non temperature influenced resistor
  - D resistance of a conductor of variable length

39.

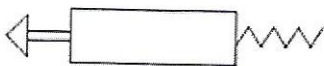


Figure 8

The symbol in Figure 8 represent which control organ in pneumatic?

- A Manually operated, spring return push button
  - B Plunger operated, spring return push button
  - C Pedal operated, spring return push button
  - ~~D~~ Air operated, spring return push button
40. Which of the following instruments is used to measure the speed of a rotating machine
- A Barometer
  - ~~B~~ Speedometer
  - C Tachomotor
  - D Kilometer

41. Electric spark appear between two electrical contacts as a result of
- A frequent closing and opening of the contacts
  - B poor insulation
  - ~~C~~ the type of materials used for the contacts
  - D the heavy load the contact is controlling

42. The role of acting cylinders in pneumatic circuits is to transform
- ~~A~~ mechanical energy into pneumatic energy
  - B mechanical energy into electrical energy
  - C pneumatic energy into mechanical energy
  - D pneumatic energy into electrical energy

43. When the starter of a fluorescent lamp is permanently short circuited
- A The lamp will come on
  - B The lamp will not come on
  - ~~C~~ The starter will be destroyed
  - D The choke will be destroyed

44. What will happen to a fluorescent lamp during starting if the starter is replaced with a closed switch?
- ~~A~~ The lamp will start without a problem
  - B There will be no current limitation and the bulb will blow off
  - C The lamp ends will glow steadily but will not start
  - D The lamp will experience flickering effect

45. With respect to three phase distribution network, the neutral conductor is obtained from
- A Each phase of the secondary windings linked to the earth
  - B Any two phases of the secondary of the transformer linked to the earth
  - ~~C~~ Non of the phases of the transformer linked to the earth
  - D The common point of the secondary of the transformer linked to the earth

46. The most suitable conductor for overhead lines is
- A Aluminium
  - ~~B~~ Silver
  - C Gold
  - D Copper

47. A receptivity in GRAFCET is associated to a transition while an action is associated to
- A an initial step
  - ~~B~~ a step
  - C a receptivity
  - D a directed links

48. The pressure pipeline that carries water from the upper dam to the turbine in a hydro-electric power plant is called a
- A Penstock
  - B Surge tank
  - C Governor
  - D Surge valve
- 
49. One disadvantage of an incandescent lamp over a fluorescent lamp is that
- A it has a longer life span
  - B it has a shorter life span
  - C lamp very costly
  - D it is easily affected by low voltage
- 
50. The primary source of energy for a hydro power plant depends on
- A fuel
  - B coal
  - C water
  - D sun
- 

**STOP**  
**GO BACK AND CHECK YOUR WORK**