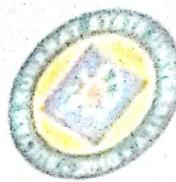


Republic of the Philippines
SULTN KUDARAT STATE UNIVERSITY



College of Industrial Technology
MIDTERM EXAM IN DT 312
ELECTRICAL, ELECTRONICS, PLUMBING AND SANITATION LAYOUT
FOR BINDTECH-DRAFTING TECH.3
2ND Semester, S.Y. 2025 – 2026

Instruction: Read each question carefully and select the correct answer. Use the answer sheet for your answers.

1. Which symbol represents a single-pole switch in Philippine electrical diagrams?
 - A. Circle with dot
 - B. Break in line with diagonal slash
 - C. Rectangle with lever
 - D. Two parallel lines
2. What is the standard household voltage in the Philippines?
 - A. 120V, 60Hz
 - B. 240V, 50Hz
 - C. 220V, 60Hz
 - D. 110V, 50Hz
3. What does GFCI stand for?
 - A. Ground Flow Current Indicator
 - B. General Function Circuit Indicator
 - C. Ground Fault Circuit Interrupter
 - D. General Fuse Control Input
4. Which panel distributes electricity to circuits within a building?
 - A. Motor control
 - B. Main Distribution Panel
 - C. Junction box
 - D. Sub-panel
5. Which conductor is symbolized by a line with three descending lines?
 - A. Neutral wire
 - B. Ground wire
 - C. Hot wire
 - D. Conduit
6. Why are GFCI outlets required in bathrooms and kitchens?
 - A. To protect against electrical shock
 - B. To improve lighting
 - C. To reduce power consumption
 - D. To increase voltage supply
7. Why must conduits have limited bends ($\leq 360^\circ$)?
 - A. To save conduit cost
 - B. For aesthetic reasons
 - C. To reduce grounding needs
 - D. To make wire pulling easier
8. Why is grounding necessary in electrical systems?
 - A. To safely discharge fault current
 - B. To save energy
 - C. For additional load capacity
 - D. To eliminate circuit breakers
9. Why are copper wires preferred in residential wiring?
 - A. They have better conductivity and durability
 - B. They are more flexible
 - C. They are fireproof
 - D. They are cheaper than aluminum
10. Why are three-way switches common in staircases?
 - A. To control lights from two locations
 - B. To save energy
 - C. For aesthetics
 - D. To reduce wire usage
11. A house needs outlets every 3 meters along walls. Which code is this requirement based on?
 - A. NEC
 - B. OSHA
 - C. IEC
 - D. PEC
12. A building has a load of 20 kW. Which code provides the correct panel rating and breaker sizing?
 - A. Fire Code
 - B. Philippine Electrical Code
 - C. OSHA
 - D. National Building Code only
13. If a classroom requires 220V appliances, which outlet should be installed?
 - A. Weatherproof only
 - B. GFCI
 - C. Two-prong
 - D. Three-prong 220V
14. A technician uses a sweep bend in a conduit run. What is the purpose?
 - A. To beautify design
 - B. To support outlet placement
 - C. To reduce wire pulling difficulty
 - D. To lower grounding

If a factory uses 3-phase motors, which outlet type is required?

- A. GFCI
- B. Heavy-duty 3-phase
- C. Two-prong
- D. Standard residential

16. A homeowner installed outlets without GFCI in the bathroom. What risk does this pose?

- A. Fire hazard only
- B. Higher energy bill
- C. Electric shock hazard
- D. Poor lighting

17. If lights flicker when large appliances run, what is the likely issue?

- A. Proper grounding
- B. Overloaded circuits
- C. Proper conductor size
- D. Proper breaker size

18. A conduit run sags because clamps were placed every 3 meters. Which rule was violated?

- A. Breaker sizing
- B. PEC spacing requirement
- C. Load calculation
- D. Voltage rating

19. A commercial office has emergency lights missing. Which compliance is lacking?

- A. PEC
- B. Energy Code
- C. Fire Safety Code
- D. Plumbing Code

20. Which is the MOST important factor in choosing breaker size?

- A. Wire color
- B. Continuous load rating
- C. Appliance brand
- D. Conduit size

21. Which electrical design decision best ensures energy efficiency?

- A. Installing incandescent bulbs
- B. Avoiding grounding
- C. Using LED lighting
- D. Oversizing breakers

22. Which factor is MOST critical when submitting electrical plans to LGU?

- A. Compliance with PEC
- B. Wall color
- C. Teacher preference
- D. Number of outlets

23. You are tasked to design a residential layout. What is the FIRST step?

- A. Install breakers
- B. Load calculation
- C. Submit inspection
- D. Buy materials

24. How would you redesign outlets in a wet area to ensure safety?

- A. Use extension cords
- B. Use GFCI outlets

- C. Use two-prong
- D. Install none

25. A company wants an energy-efficient layout. What innovation should you add?

- A. Random placements
- B. LED fixtures and energy-saving layouts
- C. Incandescent bulbs
- D. Overloaded outlets

26. What does a dashed line represent in plumbing blueprints?

- A. Vent pipe
- B. Water supply pipe
- C. Drainage pipe
- D. Fixture symbol

27. What symbol is used for a Water Closet (WC)?

- A. U-shaped trap
- B. Circle with "WC"
- C. Arrow
- D. Rectangle with faucet

28. What is the function of a P-trap?

- A. Prevent sewer gases from entering
- B. Store wastewater
- C. Increase pressure
- D. Collect stormwater

29. What does a cleanout provide?

- A. Extra water flow
- B. Access for clearing blockages
- C. Venting
- D. Additional drainage

30. Which fixture requires a minimum 100 mm soil pipe?

- A. Kitchen sink
- B. Shower
- C. Water Closet
- D. Lavatory sink

31. Why are vent pipes required in plumbing?

- A. To reduce slope requirements
- B. To clean pipes
- C. To prevent siphoning of traps
- D. To increase water speed

32. Why must stormwater and sanitary drains be separated?

- A. To increase water pressure
- B. To minimize fixture spacing
- C. To reduce cross-contamination and system overload
- D. To reduce pipe diameter

33. Why is pipe slope critical in drainage design?

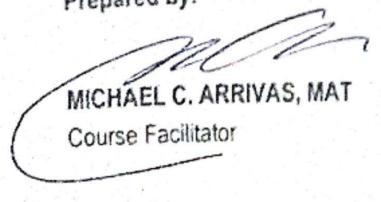
- A. Improves aesthetics
- B. Minimizes venting
- C. Ensures gravity flow and prevents clogging
- D. Reduces pipe material cost

34. Why are valves installed near fixtures?

- A. To trap air
- B. To reduce pipe slope
- C. To store water
- D. To isolate flow for maintenance

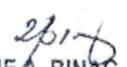
- Why must toilets have minimum clearance (60 cm from center)?
- For accessibility and comfort
 - To save water
 - To minimize pipe size
 - To reduce venting
36. A plumber installs a G.I. pipe for outdoor exposure. Why is this correct?
- It avoids venting
 - It eliminates slope
 - It is cheaper
 - It resists mechanical damage
37. If a sink requires 15 mm pipe, which supply line size should be used?
- 15 mm
 - 25 mm
 - 100 mm
 - 10 mm
38. A plumber groups bathroom fixtures close together. What principle is followed?
- Aesthetic design only
 - Minimize pipe runs and simplify venting
 - Increase cost
 - Increase slope
39. If grease causes clogs in the kitchen sink, what is the best preventive design?
- Larger waste pipe (50–75 mm)
 - Shared vent
 - Reduced slope
 - Use storm drain
40. If a roof drain is connected to sanitary drainage, what problem may occur?
- Reduced slope
 - System overload and backflow
 - Increased water supply
 - Stronger venting
41. If a trap is dry, what will most likely happen?
- Sewer gases enter the building
 - Faster water flow
 - Lower pressure
 - Reduced drainage
42. A plumber notices constant blockages in long runs. What is likely missing?
- Valves
 - Cleanouts
 - Slope
 - Fixtures
43. If fixtures gurgle when draining, what system fault is indicated?
- Oversized pipe
 - Poor venting
 - Strong slope
 - Excess water supply
44. A plumber installs a toilet using a 50 mm waste pipe. What error is made?
- Fixture clearance wrong
 - Pipe size is too small
 - Vent pipe missing
 - Wrong slope
45. Which factor BEST indicates proper water supply system design?
- Adequate pressure and flow at all fixtures
 - Small pipe diameters
 - Long pipe runs
 - Lack of valves
46. Which material is BEST for sanitary drainage pipes in Philippine homes?
- Lead
 - Rubber
 - Copper
 - PVC/UPVC
47. Which factor is MOST critical for plumbing safety?
- Compliance with Philippine Plumbing Code
 - Many fixtures
 - Large pipes
 - High water meter reading
48. If you were designing a bathroom, what should you do FIRST?
- Place only a sink
 - Skip water supply
 - Install vent pipes randomly
 - Identify fixture layout
49. How can stormwater drainage be improved in flood-prone areas?
- Connect to toilets
 - Reduce venting
 - Minimize slope
 - Add gutters and soak pits
50. If designing a new plumbing system for a house, which innovation would improve efficiency?
- Use oversized soil pipes only
 - Eliminate traps
 - Use water-saving fixtures and proper pipe sizing
 - Share vent and drain pipes

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