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 (≤360°)?
   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)?

A. For accessibility and comfort
B. To save water
C. To minimize pipe size
D. To reduce venting

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

Prepared by:

MICHAEL C. ARRIVAS, MAT
Course Facilitator

Approved by:

IRENE A. BINAG, MAT
Program Chairperson