

**POLITEKNIK**  
Jabatan Pengajian Politeknik

EXAMINATION AND EVALUATION DIVISION  
DEPARTMENT OF POLYTECHNIC EDUCATION  
(MINISTRY OF HIGHER EDUCATION)

CIVIL ENGINEERING DEPARTMENT

FINAL EXAMINATION  
JUNE 2012 SESSION

**CA305 : BUILDING SERVICES 2**

**DATE : 20 NOVEMBER 2012 (TUESDAY)**  
**DURATION : 02.30 PM – 04.30 PM**

---

This paper consists of **TWELVE (12)** pages including the front page.

**SECTION A : OBJECTIVE (25 QUESTIONS – ANSWER ALL)**

**SECTION B : ESSAY (4 QUESTIONS – ANSWER 3 ONLY)**

---

**CONFIDENTIAL**  
**DO NOT OPEN THIS QUESTION PAPER UNTIL INSTRUCTED BY**  
**THE CHIEF INVIGILATOR**

(The CLO stated is for reference only)

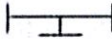





**SECTION A**

**OBJECTIVES (25 marks)**

Instruction: This section consists of 25 objective questions. Write your answers in the answer booklet.

1. The single phase system in electrical supply is commonly used for (CLO 1)  
certain aspects as follows, **EXCEPT**
  - A. Lighting
  - B. Heating
  - C. Cooking
  - D. Cooling
  
2. State the usage of electricity in electrical supply system in the (CLO 2)  
building :-
  - I. Safety
  - II. Industry/commercial
  - III. Media
  - IV Entertainment
  - A. I,II
  - B. I,III,IV
  - C I,II,IV
  - D. All of the above

3. Which of the following is **NOT** an unconventional source of energy? (CLO 1)
- A. Tidal power
  - B. Geothermal energy
  - C. Nuclear energy
  - D. Wind power
4. Which of the following plants operates at the lowest cost? (CLO 2)
- A. Gas turbine plant
  - B. Thermal power plant
  - C. Nuclear power plant
  - D. Hydroelectric plant.
5. Identify the **CORRECT** graphic symbol in the domestic electrical layout. (CLO 1)
- A.  Fluorescent fitting, ceiling-mounted type
  - B.  Fluorescent fitting, wall-mounted type
  - C.  One way 5A switch
  - D.  Globe fitting, Incandescent bulb, ceiling-mounted type
6. In natural ventilation the rate of air movement depends on ... (CLO 1)
- A. the relative difference between high pressure and low pressure
  - B. the low degree of air pressure
  - C. the relative difference between high slope and low slope

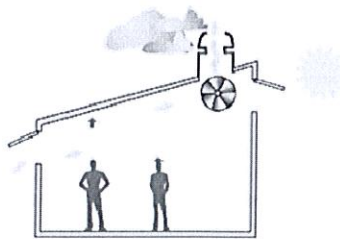
D. the moisture content in air pressure

7. “Natural ventilation is the process of supplying and removing air without using any mechanical appliances”. (CLO 1)

The above process refers to the flow of external air into an indoor space as a result of

- A. pressure and temperature differences  
 B. heat and temperature control.  
 C. pressure and humidity differences  
 D. humidity content.

8. (CLO 2)



*Figure 1*

Figure 1 shows a mechanical ventilation system.

Which of the following is **TRUE** about the system?

- A. The system consists of natural inlet and mechanical outlet  
 B. The system consists of mechanical inlet and natural extract  
 C. The system consists of mechanical inlet and extract  
 D. The system consists of natural inlet and natural extract

9. What is the **MOST** important component of an air conditioning system? (CLO 1)
- A. Condenser coil
  - B. Fan
  - C. Cooling coil
  - D. Compressor
10. The driving force for refrigeration in vapours absorption refrigeration plants is: (CLO 1)
- A. Mechanical energy
  - B. Electrical energy
  - C. Thermal energy
  - D. All of the above
11. Why is it important to have an air conditioner in a building? (CLO 1)
- A. Comfort, luxury, to cycle the air, and healthy
  - B. Comfort, Working Performance, Healthy and equipment
  - C. Working performance, healthy and building orientation
  - D. Experience, comfort and working performance
12. Below are examples of façade treatment and design, **EXCEPT**:- (CLO 1)
- A. The colour wrap.
  - B. The custom cabinet
  - C. Build cover for a window air-conditioning unit.

- D. A.H.U room that holds collection of air from the outside.
13. “Heat pumps are very eco-friendly because they utilize natural heat from the air to provide heating or air conditioning. In the summer, pumps work in reverse to cool your home.” (CLO 2)  
These statement refers to ...
- A. A portable air conditioning unit.
  - B. Using water pump for Air Conditioning.
  - C. Using heat pumps for Air Conditioning.
  - D. Using air pumps for Air Conditioning.
14. One of the design strategy for passive fire protection is (CLO 1)
- A. Fire extinguisher
  - B. Fire hydrant
  - C. Compartmentation
  - D. Sprinkler system
15. Wet riser system comprises components listed below (CLO 2)
- A. Water tank, standby pump and extinguisher
  - B. Riser pipes, standby pump and extinguisher
  - C. Water tank, standby pump and riser pipes
  - D. Water tank, extinguisher and means of escape



21. 1. Types of combustion in fire triangle are; (CLO 1)
- I solids combustion
  - II air combustion
  - III gases combustion
  - IV metals combustion
- A. I, II and III
- B. I, II and IV
- C. II, III and IV
- D. All of the above

22. Which of the following combustible materials is **INCORRECTLY** matched to the fire classification in UBBL? (CLO 3)

<u>Fire Class</u>	<u>Type of fuel</u>
A. Class A	wood, paper
B. Class B	cooking oil
C. Class C	computer unit
D. Class D	magnesium powder

23. Which of the following items is not an active Fire Prevention Equipment? (CLO 2)
- A. Weather Fire Fighting Vehicle
- B. Smoke Detector
- C. Sprinkler
- D. Fire Rated Door

24. Landing Valve is usually located at the (CLO 2)
- A. Wall
  - B. Staircases
  - C. Lobbies
  - D. Fire access lobbies
25. Which of following statements is not true about automatic fire prevention system? (CLO 2)
- A. A System to detect fire before it spreads to other parts of the building.
  - B. Fire detection and warning are issued by the computer control system from the control room
  - C. The system will stop the supply of electricity and water
  - D. Control room will activate fire fighting facilities such as sprinkler

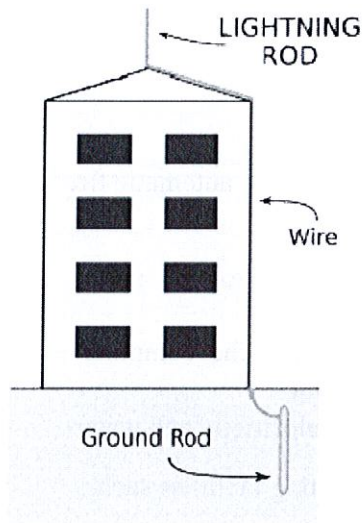


SECTION B

STRUCTURED (75 marks)

Instruction: This section consists of 4 structured questions. Answer only **THREE (3)** questions.

QUESTION 1



- (a) Based on the diagram above, explain why lightning rod needs to be installed on top of the building. CLO 2  
(5 marks)
- (b) List three advantages of lightning system installation. CLO 2  
(6 marks)
- (c) Sketch graphic symbols used in the domestic electrical layout as listed in the table below : CLO 2  
(14 marks)

1. fuse	2. main switch	3. fan
4. air condition switch	5. outlet socket	6. one way switch
7. meter	8. two way switch	9. intermediate switch
10. ELCB	11. wall mount lamp	12. fluorescent lamp
13. ceiling incandescent	14. computer data outlet	

**QUESTION 2**

- a) Give **THREE (3)** advantages and **TWO (2)** disadvantages of air conditioning system. (CLO 2)  
(5 marks)
- b) Explain unitary air conditioning system for: (CLO 2)
1. Window unit. (6 marks)
  2. Split unit. (6 marks)
- c) Discuss architectural design considerations related to air conditioning systems of facade treatment. (CLO 3)  
(8 marks)

**QUESTION 3**

- (a) What is Passive Fire Prevention System and give **THREE (3)** examples. (CLO 2)  
(5 Marks)
- (b) Give **FIVE (5)** classes of burning and explain how to stop it. CLO 2  
(10 marks)
- (c) Explain **FIVE (5)** factors that cause blaze in the building. CLO 2  
(10 marks)

**QUESTION 4**

- (a) State **FIVE (5)** causes of fire CLO 2  
(5 marks)
- (b) List **FOUR (4)** different types of portable fire extinguishers and name their classes. CLO 2  
(8 marks)
- (c) Explain with the aid of sketches the requirement of staircases needed by Fire and Rescue Department Malaysia (JBPM). CLO 2  
(12 marks)