

Sample Questions for Paper 4 Building Services & Environmental Controls

Basic Principle

1. Which of the following is fundamental in preventing the spread of legionnaires' disease in building services installations?
- A. Using CFC refrigerants for chiller plants
 - B. Using single-stack drainage system to avoid cross contamination
 - C. Using water strainers to filter the incoming water at the supply mains
 - D. Carrying out regular inspection and maintenance to the water-cooled air-conditioning plants

Ans : D

2. Which of the following can **only** generate "sensible heat" (rather than "latent heat") inside a building?
- A. Coffee maker
 - B. Taking a shower
 - C. Heat generated by light bulb
 - D. Body heat generated by occupants

Ans. : C

3. What does the unit W/m^2K in respect of the performance of building materials refer to?
- A. Shading coefficient
 - B. Energy efficiency ratio
 - C. Thermal transmittance
 - D. Life cycle assessment analysis

Ans. : C

Sustainable Design & Environmental Issues

4. Which of the following is **not** an assessment criteria for green assessment system BEAM Plus?
- A. Cost effectiveness
 - B. Barrier-free access
 - C. Life Cycle Assessment
 - D. Nature Outlook Assessment

Ans. : A

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5. Which of the following is **least** effective to reduce “heat island effects” in designing an open air car parking lot?
- A. Using natural asphalt for paving
 - B. Planting trees to provide shading
 - C. Providing a roof cover of high solar reflectance
 - D. Laying a lawn with traffickable open-grid paving

Ans : A

6. The glazing that gives the **lowest** OTTV is
- A. skylight with double glazing.
 - B. west facing single glazed window
 - C. east facing single glazed window
 - D. south facing single glazed window

Ans. : D

7. Which of the following statements is **incorrect** in respect of Air Ventilation Assessment (AVA) Studies for a new building development?
- A. Computational fluid dynamics analysis can check the wind permeabilities at difference levels.
 - B. Wind tunnel test must be carried out on a scaled model in order to get a more accurate result.
 - C. Pedestrian comfort is the main objective of the AVA study.
 - D. Landscaping is not taken into account normally.

Ans. : D

8. Which of the following is **not** a benchmark for environmental performance assessment?
- A. LEED
 - B. BEAM
 - C. GBTools
 - D. Gini coefficient

Ans. : D

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9. Which of the following are the underlying criteria for achieving a “carbon neutral” building?
- (1) limiting energy consumption.
 - (2) stopping any carbon emissions.
 - (3) adopting a renewable energy source.
 - (4) keeping its carbon footprint within a pre-set limit.
- A. (1) and (3) only.
B. (1) and (4) only.
C. (2) and (3) only.
D. (2) and (4) only

Ans. : A

Ventilating Air Conditioning & Heat

10. Which of the following is **true** for underfloor air conditioning system?
- A. It uses more fan power.
 - B. It is not suitable for winter heating.
 - C. The circulated comfort zone covers the finished floor to the false ceiling.
 - D. It is more effective than the conventional air conditioning system when used in a computer data centre.

Ans. : D

11. The heat rejection capacity of the cooling tower system of a hotel is estimated to be 600 TR. What is the optimum choice for the cooling tower?
- A. 1 no. of 600 TR package cooling tower
 - B. 1 no. of 900 TR package cooling tower
 - C. 2 nos. of 450 TR package cooling tower
 - D. 3 nos. of 300 TR package cooling tower

Ans. : D

12. Which of the following actions may **best** help maintain human comfort even in an increased indoor temperature?
- A. Lowering the humidity
 - B. Re-circulating the air supply
 - C. Lowering the lighting intensity
 - D. Increasing the ventilation rate

Ans : A

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Fire Safety

13. Which of the following premises should be provided with smoke extraction system?

- A. Dangerous goods store
- B. Double-storey carpark basement
- C. Atrium with a compartment volume of 20,000m³
- D. Hotel guest rooms' common internal corridor with fixed windows

Ans. : D

14. Which of the following does **not** affect the sizing of sprinkler water tanks in Hong Kong?

- A. Type of building
- B. Occupancy of building
- C. Direct fire link to fire station
- D. Number of water source or supply

Ans. : B

15. Which of the following are valid benefits of FM200 system, which is commonly adopted as the fire-fighting provision for computer centres?

- (1) Plant room is not a must.
- (2) Water is not necessary for fire fighting.
- (3) Easy to reinstate the system after false alarm.
- (4) Less expensive than pre-action sprinkler system.

- A. (1) and (2) only
- B. (1) and (4) only
- C. (2) and (3) only
- D. (3) and (4) only

Ans : A

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Pipe & Drainage

16. Which of the following pipes without internal lining is **not** acceptable to the Water Authority for use as cold/hot/salt water inside service within a building?

- A. uPVC pipe
- B. Copper pipe
- C. Cast iron pipe
- D. Galvanized steel pipe

Ans : D

17. Which of the following is **not** correct according to the Water Authority's requirements on water flushing device?

- A. Valveless syphonic type is acceptable.
- B. Dual-flush may be provided by the valveless-type device.
- C. Valve-type is acceptable if the flushing volume is kept within 7.5 litres.
- D. It is possible to use valve-type flushing device triggered by infra-red sensor.

Ans. : B

18. Which of the following plumbing installations is **not** acceptable to the Water Authority?

- A. Using cast iron pipe in a cold/salt water inside service.
- B. Drinking fountain connected to the mains water supply system.
- C. Branching of water supply pipe downstream of the water meter.
- D. Installation of water filter in the water tank at roof with non-return valve upstream of the filter.

Ans. : B

Electrical

19. Which of the following combinations reflects the commonly recommended lighting intensities in line with the design guide of the Chartered Institution of Building Services Engineers (CIBSE)?

	<u>Offices</u>	<u>Fire Escape Stairs</u>
A.	200 lux	30 lux
B.	300 lux	50 lux
C.	400 lux	80 lux
D.	500 lux	100 lux

Ans. : D

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20. Which of the following are **correct** as an energy efficient measure on lighting installation?

- (1) Replace “thin” fluorescent tube (T5 lamp) with “fat” tube (T8 lamp)
 - (2) Replace incandescent lamp with compact fluorescent lamp
 - (3) Replace conventional exit sign with LED exit sign
 - (4) Use motion sensor as an on/off control
- A. (1) and (2) only
B. (3) and (4) only
C. (1), (2) and (3) only
D. (2), (3) and (4) only

Ans : D

21. Which of the following services provision is **not** required for Main Switch Room?

- A. Mechanical ventilation
- B. Lighting
- C. Gas flooding protection
- D. Equipotential bonding

Ans. : C

Lifts & Escalators

22. A lift machine room shall be designed

- A. to be accessible from common area.
- B. with access complying with the minimum standard prescribed under Code of Practices for Means of Escape.
- C. with a minimum clear headroom of 2.3 m.
- D. to be protected by fire sprinklers.

Ans. : A

23. What is the minimum clear headroom of escalator measured at the edge of steps to ceiling above?

- A. 2.0 m
- B. 2.1 m
- C. 2.3 m
- D. 2.5 m

Ans. : C

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24. Which of the following parameters does **not** affect the lift waiting time?

- A. Rated load
- B. Number of stops
- C. Door closing time
- D. Handling capacity

Ans. : A

Acoustics

25. The most effective design solution to mitigate traffic noise impact to a low rise residential development adjacent to a major highway is to provide

- A. a row of tall trees at the site boundary as noise barrier.
- B. a commercial podium as noise barrier with the residential development set back from the podium edge.
- C. balcony as noise barrier
- D. window sill as noise barrier

Ans. : B

26. Which of the following is **not** conducive to enhancing the sound insulation property of a window?

- A. Increasing the U-value of the window assembly.
- B. Increasing the air gap width of double-glazed window.
- C. Increasing the glass thickness of single-glazed window.
- D. Using unequal glass thicknesses for the two glass panes of double-glazed window.

Ans. : A

27. Which of the following is **not** considered as an effective way of reducing noise nuisance from construction activities?

- A. Use of hydraulic crushers
- B. Adoption of percussive piling
- C. Disposal of rubble through plastic chutes
- D. Erection of acoustic barriers around the construction site

Ans : B

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Miscellaneous

28. Which of the following represents the inverted cone of order of desirability as summarized by the Environmental Protection Department for managing construction and demolition wastes in Hong Kong?

- A. Avoid – Minimise – Recycle – Treat – Dispose
- B. Redesign – Reuse – Recycle – Retreat – Landfill
- C. Reduce – Reuse – Recycle – Refill – Redesign
- D. Reduce – Reuse – Rehabilitate – Recycle – Landfill

Ans. : A

29. Given the same thickness of typical wall or roof construction, which of the following has the **lowest** value of transmission co-efficient (i.e. U value)?

- A. concrete with cement sand plaster
- B. brick with cement sand plaster
- C. timber panel
- D. metal panel with fibre glass

Ans. : D

30. The main objective of producing combined building services drawing is to

- A. provide a useful tool for maintenance in the related inside services
- B. identify the problematic areas for services and structural co-ordination
- C. help finalise the schematic designs of all related building services trades
- D. show all related services elements on one drawing for ease of inspection

Ans. : B