

## BINDURA UNIVERSITY OF SCIENCE EDUCATION

## FACULTY OF SCIENCE AND ENGINEERING

## DEPARTMENT: HEALTH SCIENCES

DEC 2021

PROGRAMME: Post Graduate Diploma in Infection Prevention and Control  
.....STUDENT REGISTRATION NUMBER  
.....

COURSE CODE (1): IPC105 HOSPITAL DESIGN AND THE BUILT ENVIRONMENT

DURATION: 2 HOURS

TOTAL MARKS: 90 MARKS

## INSTRUCTIONS TO CANDIDATES

Use a BLUE/BLACK pen. Do not write with a pencil.Answer ALL questions  
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## Section A: Spot test (20 Marks)

Instructions: Each slide will be displayed once for two minutes. You should respond to the questions and write your answer within the two minutes allowed for each slide. Write your answers in the spaces corresponding to each slide and question.

  
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Slide 1 (Instruction slide)

Slide 2: Question 1

The sluice room is  
  
.....  
.....  
.....

[2 marks]

**Slide 3: Question 2**

The room has \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_ [2 marks]**Slide 4: Question 3**

The risks in the ward are \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2 marks]**Slide 5: Question 4**

The picture shows \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_ [2 marks]**Slide 6: Question 5**

The neonatal unit looks

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2 marks]**Slide 7: Question 6**

The picture shows \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_ [2 marks]**Slide 8: Question 7**

The air system will be tested \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_ [2 marks]

**Slide 9: Question 8**

The bath tub is \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [2 marks]

**Slide 10: Question 9**

The sink is \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [2 marks]

**Slide 11: Question 10**

The picture shows \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [2 marks]

**Section B: Multiple Choice questions (20 marks)**

**Instructions:** Encircle the correct answer. Each question carries one (1) mark.

1. An acceptable distance between beds on an ordinary ward (from the middle of each bed) is:
  - a) 1.5m
  - b) 2m
  - c) 2.5m
  - d) 3m
  - e) 3.5m
  
2. The LEAST important factor required for effective hand-washing in hospitals is:
  - a) Liquid soap
  - b) Appropriately situated hand wash basins
  - c) Posters saying "wash your hands"
  - d) Elbow operated taps
  - e) Paper towels
  
3. The best layout for wards which will allow cohort isolation is:
  - a) Nightingale (dormitory) wards
  - b) Race track wards
  - c) Bay wards
  - d) Semi-circular wards
  - e) L-shaped wards
  
4. The main purpose of a central sterile processing unit is:
  - a) Storage of clean equipment
  - b) Providing sterile equipment to the operating theatre
  - c) Storing sterile equipment
  - d) Pharmacy of the operating theatre
  - e) Packing instruments

5. Infection control practitioners should be involved in healthcare facility design:
  - a) Just before the ward is opened to admit new patients
  - b) Just before the renovation work of an existing facility starts
  - c) After the approved plans have been received from the architect
  - d) When the ideas for the building or renovation are first being discussed
  - e) Just before the building of a new health facility starts
6. Operating theatres should:
  - a) Be mechanically ventilated under negative pressure
  - b) Be kept at temperatures between 24 and 28°C
  - c) Routinely sterilize their own surgical equipment in the theatre
  - d) Have well-demarcated 'clean' and 'sterile' zones
  - e) Have the maximum number of people possible during surgery
7. The main source of airborne contamination in the operation theatre is:
  - a) The patient
  - b) Contaminated instruments
  - c) Theatre staff
  - d) The ventilation
  - e) Environmental surfaces
8. The following are acceptable waste treatment and disposal options for a health facility:
  - a) Open pit burning
  - b) Burning in drums
  - c) Open-burn cement block incinerators
  - d) Non-burn technologies
  - e) Small on-site incinerators

9. What combination of PPE is needed for waste collection?
- a) Latex examination gloves, plastic apron and cap
  - b) Sterile gloves, gumboots, heavy duty apron
  - c) Utility gloves, heavy duty apron and gumboots
  - d) Goggles, latex examination gloves and cap
  - e) Cover shoes, cap and visor
10. The number of air changes per hour (ACH) recommend for airborne isolation is:
- a) 100
  - b) 6-12
  - c) 15-20
  - d) 10-30
  - e) 50
11. According to WHO WASH requirements, what is the minimum quantity of water required in a Cholera treatment centre?
- a) 15l/patient/day
  - b) 30l/patient/day
  - c) 40l/patient/day
  - d) 60l/patient/day
  - e) 50l/patient/day
12. Leftover food in the kitchen can be re-heated:
- a) As many times as possible until it is finished
  - b) Twice only
  - c) Four times only
  - d) Once only
  - e) Three times only

13. The following are considered as high-touch surfaces except:
- a) Light switches
  - b) Door knobs
  - c) Chairs
  - d) Walls
  - e) Toilet flush handles
14. Disinfection is a process in addition to cleaning. Disinfection is necessary when:
- a) A patient touches a door handle
  - b) An item comes into contact with mucous membranes
  - c) After using a single-use bedpan
  - d) A patient has a health care acquired infection
  - e) There is no water for cleaning
15. A pseudomonas outbreak in the burns unit could be related to all of the following except:
- a) Shared treatment
  - b) Common bath tub
  - c) Contaminated equipment such as mattresses
  - d) The hands of a care provider
  - e) Site of Burn
16. The correct procedure to remove used bed linen is:
- a) Remove all linen and take it to the laundry room
  - b) Put on PPE, roll and fold the linen into a bundle taking care not to shake it and take it to the laundry room
  - c) Put on PPE, shake it to remove any objects, fold into a bundle and take it to the laundry room
  - d) Put on PPE, roll and fold the linen into a bundle taking care not to shake it and place it in the correct laundry bag close at hand
  - e) Wearing gloves before removing linen

17. A patient with scabies has to be put in isolation. The best place to isolate him is:
- a) A negative-pressure isolation room.
  - b) A private room
  - c) A semi-private room with any client
  - d) A room with another client with scabies
  - e) The far end of an open ward
18. Support services staff:
- a) Are at lower risk for pathogen exposure than clinical staff
  - b) Should receive pre-employment hepatitis B immunisation
  - c) Are not required to wear personal protective equipment
  - d) Have no need for training in infection prevention and control
  - e) Can be exempted from performing hand hygiene
19. Maximum natural ventilation may be achieved by:
- a) Making sure there are no openings on opposite walls
  - b) Keeping windows open during the day shift only
  - c) Designing rooms with 5% floor space being open-able window area on walls
  - d) Orienting the building layout at design stage to use the prevailing wind direction
  - e) Sealing windows when there are risks of burglaries
20. Accident and emergency units:
- a) Do not require isolation rooms/bays
  - b) Should have sharps containers within easy reach of every bed
  - c) Must have negative pressure ventilation
  - d) Are not high-risk areas for needle stick injuries
  - e) Have no need for hand wash basins



**SECTION C: Short answer questions (50 marks)****INSTRUCTIONS:** Answer ALL questions

1. a) Explain the focus of the World Health Organisation (WHO) core component 8.

[2 marks]

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- b) Describe how addressing the aspects of Core component 8 can lead to improved hand hygiene compliance

[3 marks]

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2. The three elements that come together at the point of care in a health facility are:

[3 marks]

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3. a) Define “dead legs” and “blind ends” in pipe works in hospitals water systems.

[4 marks]

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b) How do dead legs and blind ends contaminate water sources?

[1 mark]

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4. Four essential zones that should be considered in terms of infrastructure in specialized units such as intensive care units (ICU) are: [4 marks]

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5. From an IPC perspective, describe five factors to consider when building a new hospital? [5 marks]

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6. There are plans to refurbish a Maternity and Obstetrics Unit. Outline any five important structural requirements that should be available in the new unit. [5 marks]

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7. The emergency department of a large tertiary hospital is being renovated. The hospital's IPC team is invited to be part of the renovation team and to give input on the layout of the department.

a. Explain where in the emergency department would be the best place to have the sluice room. [2 marks]

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b. Describe two best places to put sharps containers in the emergency department.

[2 marks]

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c. Explain whether it is necessary to have an isolation facility within the emergency department. [2 marks]

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8. Outline the differences between negative and positive pressure ventilation and give examples of patients who are cared under each. [4 marks]

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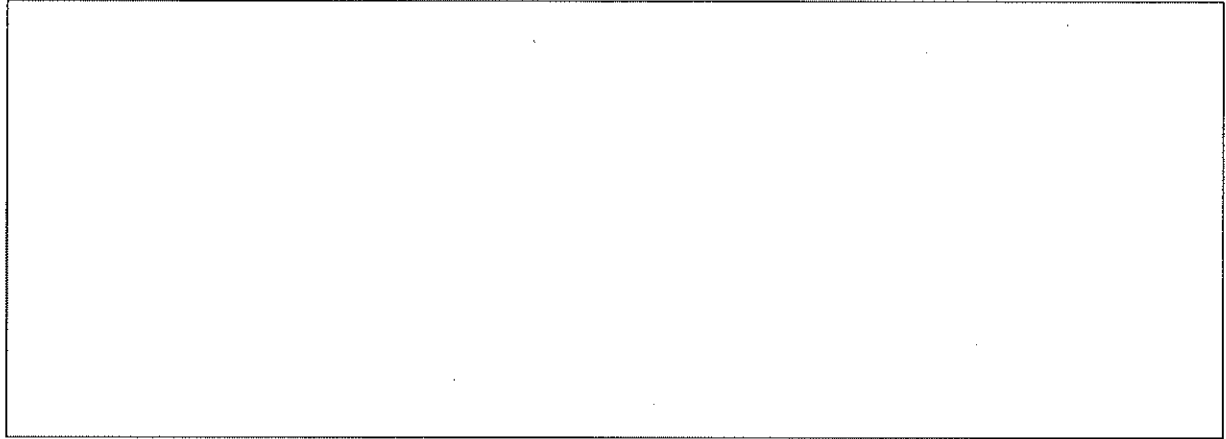
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9. Calculate the number of air changes per hour in a side room with 2 windows each 1mX1m, the room dimensions are 3m X 4m X 5m. The flow rate of air is 0.15m/s. Show your working. [7 marks]



10. Outline six (6) steps involved in the planning and designing process of a health care facility. [6 marks]

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END OF PAPER