



Answer all questions

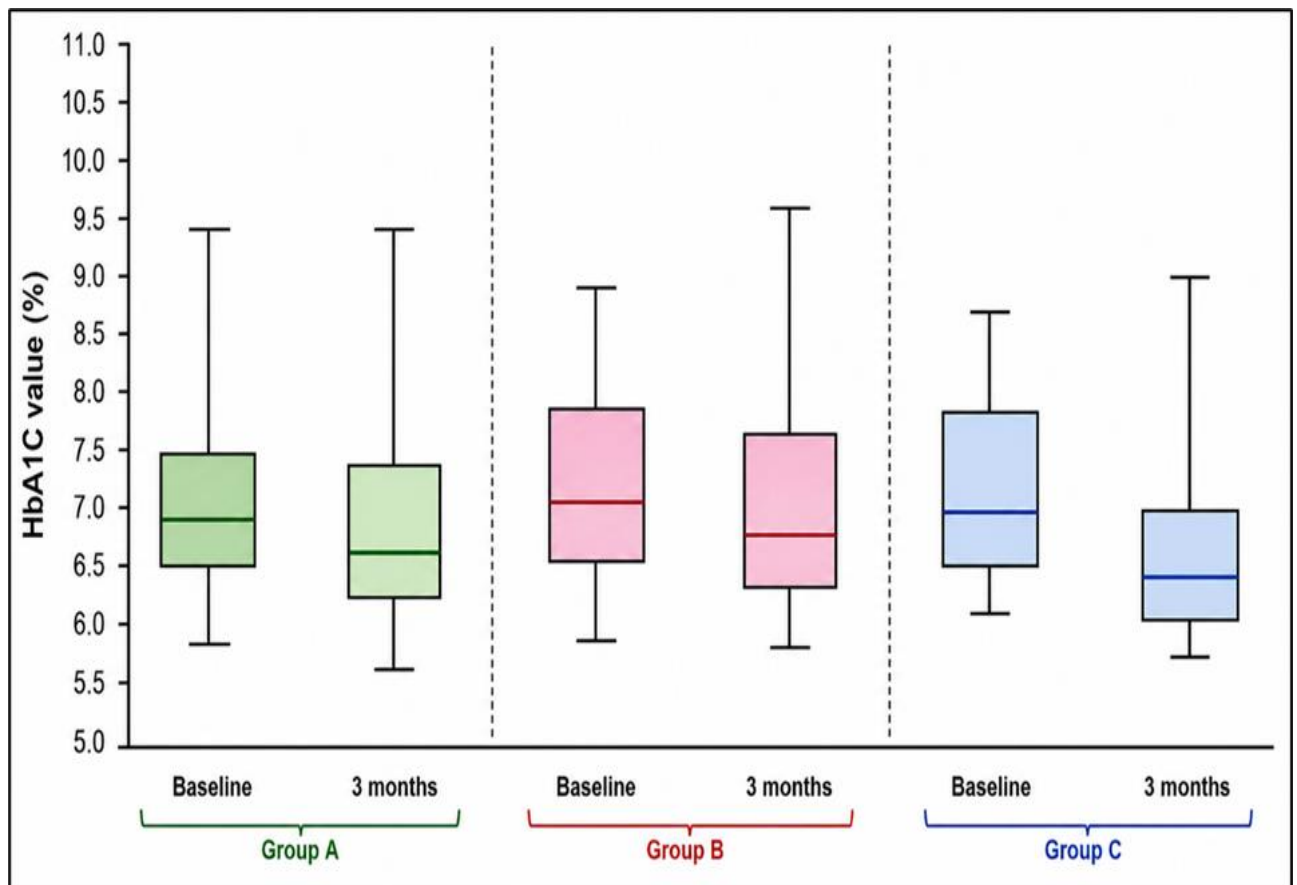
Illustrate your answers with labelled diagrams wherever necessary

Use only the space provided for answering

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1. A randomized controlled trial evaluated the effectiveness of three interventions in improving glycaemic control among three groups of patients (Groups A, B, and C) with diabetes mellitus. For the assessment of glycaemic control status, HbA1c less than 7% was classified as controlled, whereas HbA1c of 7% or greater was classified as uncontrolled.

- 1.1. The following figure shows HbA1c (%) values at baseline and after 3 months among participants in three intervention groups.



- 1.1.1. Identify the type of graph shown in the figure.

(05 marks)

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- 1.1.2. State **five (05)** descriptive statistics which can be identified by the type of graph you mentioned in 1.1.1. (10 marks)

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- 1.1.3. Compare the HbA1c distributions between baseline and 3 months in Group C using the information provided in the graph. (10 marks)

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- 1.1.4. Based on the graph, state the study group which appears to show the greatest reduction in HbA1c after 3 months, and justify your answer. (10 marks)

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- 1.1.5. If you are provided with the raw HbA1c measurements at baseline and at 3 months, state the most appropriate statistical test to compare the mean HbA1c values within Group A. (10 marks)

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- 1.1.6. If you are provided with the raw HbA1c measurements at baseline and at 3 months, state the most appropriate statistical test to compare the mean reduction in HbA1c values between Group B and Group C. (10 marks)

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1.2. The following table presents the comparison of glycaemic control status among the three study groups at baseline and at 3 months.

Group	Glycaemic control at baseline			Glycaemic control at 3 months		
	Uncontrolled n (%)	Controlled n (%)	Significance (df=2)	Uncontrolled n (%)	Controlled n (%)	Significance (df=2)
A	33 (55.0)	27 (45.0)	Test statistic = 0.872 p = 0.647	16 (26.7)	44 (73.3)	Test statistic = 7.548 p = 0.023
B	35 (58.3)	25 (41.7)		27 (45.0)	33 (55.0)	
C	38 (63.3)	22 (36.7)		14 (23.3)	46 (76.7)	

1.2.1. Identify the dependent variable and the independent variable in this study. (05 marks)

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1.2.2. Name the statistical test used to compare glycaemic control among the three study groups. (05 marks)

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1.2.3. Interpret the result obtained at baseline. (10 marks)

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1.2.4. Interpret the result obtained at 3 months. (10 marks)

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- 1.2.5. Calculate the percentage of absolute improvement of the glycaemic control for the three groups. (10 marks)

Group	Percentage of absolute improvement of the glycaemic control
A	
B	
C	

- 1.2.6. Which of the three groups has benefited most from the intervention? (05 marks)

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Faculty of Medicine, University of Ruhuna
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Community Medicine Paper I
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9.00 a.m. – 12.00 noon (3 hours)

Q2

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2. 2.1

2.1.1. Demographic data are important for decision making on public health policies.

a) State **three (03)** main sources of demographic data. (06 marks)

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b) Select two of the sources listed in 2.1.1.a and state **two (02)** advantages and **two (02)** limitations of each source. (16 marks)

Source of demographic data	Advantages	Limitations
1.	i.	i.
	ii.	ii.
2.	i.	i.
	ii.	ii.

2.1.2 Fertility measures are important to understand the reproductive health trends in a country.

a) State the difference between 'fertility rates' and 'reproduction rates'. (03 marks)

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b) The age-specific fertility rates (ASFR) of a population are given below.

Age group (years)	ASFR (per 1,000 women)
15–19	30
20–24	115
25–29	135
30–34	90
35–39	40
40–44	10

- i. Based on the data, identify the most important public health concern demonstrated by these fertility rates. (05 marks)

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- ii. Define the 'Total Fertility Rate (TFR)'. (05 marks)

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- iii. Calculate the TFR for the above population. (10 marks)

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- iv. Interpret the calculated TFR in relation to the fertility level of this population. (05 marks)

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2.2 A Public Health Midwife comes into contact with a 20-year-old, newly married female who has been diagnosed to have heart disease, in her area.

2.2.1 State **five (05)** measures each that should be taken by the field health staff to prevent the complications due to heart disease in this female in a future pregnancy.

a) during preconception care (15 marks)

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b) during antenatal care (15 marks)

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2.2.2 List **five (05)** factors that should be specifically considered when providing family planning services to the females with heart diseases in the reproductive age group. (20 marks)

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3. A considerable number of pregnant mothers in a rural health unit area are found to have unsatisfactory nutritional status during the antenatal clinic visits. The public health team plans to carry out a survey to identify the extent and the causes of the problem.

3.1. List **five (05)** nutritionally vulnerable groups of pregnant mothers, giving reasons for their increased vulnerability. (20 marks)

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3.2. State **five (05)** activities carried out under maternal and child health services to ensure nutritional well-being in pregnant mothers. (20 marks)

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- 3.3. State the nutritional supplements provided at the antenatal clinics to improve the nutritional status of the pregnant mothers, with the corresponding trimester in which they are given. (15 marks)

Trimester	Supplement/s

- 3.4. Outline the advice you would give to a pregnant mother to ensure optimal utilization of the above supplements. (15 marks)

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- 3.5. State the types of information required and how they can be used to assess the causes of nutritional problems among pregnant mothers in a health unit area. (30 marks)

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4.1. A 28-year-old male worker employed in a factory has got a severe crush injury to his left hand while operating a cutting machine during the night shift. He is not a regular worker of the factory. He had been recruited temporarily due to shortage of staff, and was working for extended hours.

The safety guard of the machine had been removed earlier in the day for repairs but was not reinstalled. There was no supervisor present at the time of the incident. The worker was brought to the Emergency Department by co-workers several hours after the incident.

4.1.1. What is the occupational health condition described in this scenario? (02 marks)

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4.1.2. Identify **four (04)** risk factors present in this scenario that contributed to the event. (12 marks)

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4.1.3. List the stages of the three-stage control model on prevention of such events. (06 marks)

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- 4.1.4. List **three (03)** actions per each stage listed under 4.1.3, that you would suggest to prevent occurrence of such incidents in this factory. (30 marks)

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4.2. Following several public complaints regarding unhygienic food handling practices in restaurants within a Medical Officer of Health (MOH) area, the MOH decided to strengthen the food sanitation activities to prevent food-borne diseases.

4.2.1. List **three (03)** public health personnel who have the legal authority to enforce food sanitation laws at primary care level in Sri Lanka. (05 marks)

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4.2.2. List **five (05)** key components that should be assessed during the inspection of a food handling establishment by public health personnel mentioned in 4.2.1. (10 marks)

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4.2.3 Outline **five (05)** legal responsibilities of the MOH in ensuring food sanitation under the Food Act and relevant regulations. (15 marks)

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4.2.4 Outline the measures that the MOH can implement to improve food sanitation and to prevent food-borne diseases in the community. (20 marks)

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5.1. Dengue viral infection was first serologically confirmed in Sri Lanka in 1962 and later on, it firmly established as an endemic disease in the country. Large epidemics were recorded in 2002, 2004, 2009, 2017 and 2019. Currently the country is experiencing a significant dengue outbreak.

5.1.1. Define the term 'endemic'.

(05 marks)

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5.1.2. Define the term 'epidemic'.

(05 marks)

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5.1.3. Name the national focal point responsible for controlling dengue viral infection in Sri Lanka.

(10 marks)

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5.2. State the most appropriate study design to achieve the following objectives, giving **two (02)** reasons to support your answer.

5.2.1. A group of medical students intends to describe the dengue control measures taken up by the people in the Galle municipality area. (15 marks)

Study design:

Reasons:

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5.2.2. A research team intends to test the efficacy of a newly developed vaccine against dengue virus. (15 marks)

Study design:

Reasons:

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5.3. Prior to 2017, dengue epidemics in Sri Lanka were predominantly caused by dengue virus serotype 1 (DENV-1). In 2017, the epidemic was mainly caused by dengue virus serotype 2 (DENV-2) with a higher death rate reported.

A research team intended to determine whether infection with DENV-2 was associated with a higher risk of developing complications than infection with DENV-1.

To investigate this, a retrospective cohort study was conducted using hospital records from the Infectious Disease Hospital (IDH), Sri Lanka, for patients admitted during the entire year 2017.

A total of 5200 patient records were analyzed. There were 1500 patients infected with DENV-1 and 3700 patients infected with DENV-2. The total number who had developed complications in the two groups were 15 and 170, respectively.

- 5.3.1. Write **two (02)** advantages of using retrospective cohort design to investigate the above objective. (10 marks)

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- 5.3.2. State the study hypothesis. (10 marks)

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- 5.3.3. Test the study hypothesis by constructing an appropriate 2 X 2 table and interpret the results. (30 marks)

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