



The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)



UMANAND PRASAD SCHOOL OF MEDICINE & HEALTH
SCIENCES
Semester 2, 2025

FINAL EXAMINATION PAPER

BPHC 308: CLIMATE CHANGE IMPACTS, FOOD
SECURITY, NUTRITIONAL HEALTH AND DISEASE
CONTROL

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. This paper contains four (4) sections A, B, C and D. All questions are compulsory to answer **except** section A and D have choices.
6. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
7. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-40	Multiple Choice	40	60 minutes
B	41-53	Short Answer Questions	30	60 minutes
C	54-57	Long Answer Questions	20	40 minutes
D	58-59	Essays (Choose Any ONE out of Two)	10	20 minutes
		TOTAL	100	180 Minutes

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Section A: Multiple Choice Questions (40 marks)

1. **Which of the following climate change treaties was the first to set legally binding emission reduction targets for developed countries?**
 - A. United Nations Framework Convention on Climate Change (UNFCCC)
 - B. Kyoto Protocol
 - C. Paris Agreement
 - D. Doha Amendment
2. **Which international treaty first established a global framework to address climate change?**
 - A. Kyoto Protocol
 - B. Montreal Protocol
 - C. UNFCCC (United Nations Framework Convention on Climate Change)
 - D. Paris Agreement
3. **In which year was the UNFCCC adopted?**
 - A. 1987
 - B. 1992
 - C. 1997
 - D. 2015
4. **The Kyoto Protocol (1997) primarily focused on:**
 - A. Voluntary emission reduction pledges
 - B. Legally binding emission reduction targets for developed countries
 - C. Phasing out ozone-depleting substances
 - D. Forest conservation only
5. **What is the main goal of the Paris Agreement (2015)?**
 - A. Limit global warming to below 3°C compared to pre-industrial levels
 - B. Limit global warming to well below 2°C, and pursue efforts for 1.5°
 - C. Establish only carbon trading markets
 - D. Provide binding emission reduction targets for developing countries
6. **Which human activity most directly affects the atmosphere in the Earth system?**
 - A. Deforestation
 - B. Mining
 - C. Burning fossil fuels
 - D. Urbanization
7. **The water cycle is an example of interaction mainly between:**
 - A. Atmosphere and biosphere
 - B. Hydrosphere and atmosphere
 - C. Lithosphere and biosphere
 - D. Atmosphere and lithosphere

8. **Which process converts atmospheric nitrogen (N₂) into a usable form for plants?**
 - A. Nitrification
 - B. Denitrification
 - C. Nitrogen fixation
 - D. Ammonification
9. **The process of converting ammonium into nitrites and nitrates is called:**
 - A. Ammonification
 - B. Nitrification
 - C. Denitrification
 - D. Fixation
10. **Which sector contributes the most to global greenhouse gas emissions?**
 - A. Agriculture
 - B. Industry
 - C. Energy (fossil fuel combustion)
 - D. Waste management
11. **Which of the following is a renewable source of energy that can reduce greenhouse gas emissions?**
 - A. Coal
 - B. Oil
 - C. Solar power
 - D. Natural gas
12. **Which human activity contributes most directly to methane (CH₄) emissions?**
 - A. Industrial waste
 - B. Livestock farming and rice cultivation
 - C. Transport emissions
 - D. Deforestation
13. **Which of the following is an example of climate change, rather than just global warming?**
 - A. The increase in average global temperature by 1.1°C since pre-industrial times
 - B. Melting of glaciers in the Arctic due to temperature rise
 - C. Increased frequency of cyclones and floods worldwide
 - D. Higher atmospheric concentration of carbon dioxide
14. **Which phenomenon reflects climate change rather than just global warming?**
 - A. The burning of fossil fuels increasing CO₂
 - B. A rise in average surface temperature.
 - C. Shifts in rainfall patterns and drought occurrences
 - D. trapping of heat in the atmosphere by greenhouse gases

15. Which is the most accurate statement?
- A. Global warming causes climate change
 - B. Climate change causes global warming
 - C. Global warming and climate change mean exactly the same thing
 - D. Neither is linked to greenhouse gases.
16. Which of the following gases is NOT a greenhouse gas?
- A. Carbon dioxide (CO₂)
 - B. Methane (CH₄)
 - C. Nitrous oxide (N₂O)
 - D. Oxygen (O₂)
17. The greenhouse effect occurs mainly due to absorption of:
- A. Visible sunlight
 - B. Ultraviolet radiation
 - C. Infrared radiation (heat)
 - D. Radio waves
18. Risk is generally understood as a function of:
- A. Hazard × Vulnerability ÷ Capacity
 - B. Hazard + Vulnerability
 - C. Hazard × Vulnerability ÷ Exposure
 - D. Hazard × Vulnerability × Exposure
19. Food insecurity linked to climate change is mainly a:
- A. Direct physical effect
 - B. Indirect socio-economic impact
 - C. Meteorological condition
 - D. Adaptation measure
20. Which of the following is an example of food *availability*?
- A. A family being able to buy vegetables from the local market
 - B. A farmer harvesting rice after the rainy season
 - C. A child receiving proper nutrition from school meals
 - D. A government providing food subsidies
21. Food utilization mainly refers to:
- A. Nutritional value, food safety, and proper biological use of food
 - B. The quantity of food grown in a country
 - C. The cost of transporting food
 - D. Stockpiling food for emergencies

22. Which of the following is the best example of industrial and environmental change leading to a new infection pattern?
- A. Use of antibiotics in hospitals
 - B. Urbanization creating breeding grounds for dengue mosquitoes
 - C. Traditional farming systems
 - D. Genetic predisposition to disease
23. Which of the following best describes the meteorological perspective of climate change?
- A. The long-term average of weather patterns over time
 - B. Short-term variations in rainfall and temperature
 - C. Sudden and unpredictable weather events
 - D. The geological impact of volcanic eruptions
24. Which meteorological factor is MOST affected by climate change?
- A. Wind speed
 - B. Air pressure
 - C. Rainfall patterns
 - D. Soil pH
25. Which of the following is an *environmental impact* of climate change?
- A. Ocean acidification
 - B. Melting glaciers
 - C. Biodiversity loss
 - D. All of the above
26. A Pacific Island records an increase in average annual temperature of 1.2°C over the last 50 years, accompanied by a 20% decline in annual rainfall. Which environmental impact is MOST likely?
- A. Increased freshwater availability
 - B. Coral reef recovery
 - C. Prolonged drought and water scarcity
 - D. Expansion of wetland ecosystems
27. A small island community notes an increase in cyclone intensity over the past decade. From an environmental perspective, which of the following is a key secondary impact?
- A. Destruction of coastal forests and mangroves
 - B. Increased rainfall in desert regions
 - C. Decrease in greenhouse gas concentrations
 - D. Formation of new mountains

28. Data show a consistent rise in atmospheric CO₂ concentration beyond 420 ppm. From an environmental and meteorological perspective, which combination of impacts is **MOST** likely?
- A. Ocean acidification + Glacier melting
 - B. Ozone depletion + Volcanic eruptions
 - C. Deforestation + Plate tectonics
 - D. Reduced desertification + Soil fertility increase
29. Which subsystem of Earth includes all living organisms?
- A. Lithosphere
 - B. Atmosphere
 - C. Biosphere
 - D. Hydrosphere
30. Which of the following statements is **TRUE** about Earth's system?
- A. Energy enters and leaves freely, matter cycles within
 - B. Both matter and energy enter freely
 - C. Neither matter nor energy enters or leaves
 - D. Matter enters freely, energy cycles within
31. How long does CO₂ remain in the atmosphere?
- A. CO₂ washes out the atmosphere seasonally
 - B. CO₂ remains in the atmosphere for 5-10 years
 - C. CO₂ remains in the atmosphere for 15-20 years
 - D. CO₂ remains in the atmosphere for up to 200 years or more
32. Which country below is considered to be the most vulnerable to the impacts of climate change?
- A. New Zealand
 - B. Somalia
 - C. Burkina Faso
 - D. Papua New Guinea
33. Without the Earth's atmosphere, the Earth's average temperature would be well below the ----- temperature of water (Select the appropriate answer)
- A. Boiling
 - B. Freezing
 - C. Vaporization
 - D. None of the above

34. What source of livestock production accounts for the highest carbon emission rates?
- A. Chicken
 - B. Cow dairy
 - C. Beef
 - D. Pork
35. Agriculture processes emit more carbon dioxide than all road transportation.
- A. True
 - B. False
36. With increase CO₂ concentrations in atmosphere, ocean productivity could increase due to acidification.
- A. True
 - B. False
37. The changes in the world's ecosystems does not contribute to the cycle of infectious disease.
- A. True
 - B. False
38. Climate is affected by abiotic factors which include:
- A. Transpiration
 - B. Evaporation
 - C. Respiration
 - D. Photosynthesis
39. Crop Susceptibility to climate change can be due to Biotic effects like:
- A. Temperature change
 - B. Precipitation changes
 - C. Pest pressures
 - D. Humidity
40. The chemical energy of photosynthesis can be passed onto the earth by:
- A. Biomass consumption
 - B. Decomposition
 - C. Consumer organisms
 - D. All of the above

Section B: Mix and Match & Short Answer Questions (30 marks)

41. Match the following terms on explanations below

- A. **Temperature**
 - B. **Humidity**
 - C. **Precipitation (rain, snow, hail, etc.)**
 - D. **Air pressure**
 - E. **Cloud cover**
 - F. **Solar radiation & sunshine duration**
 - G. **Sea level rise**
 - H. **Renewable Energy**
 - I. **Extreme weather**
 - J. **Climate Mitigation**
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- a. Which element of the meteorological environment measures the amount of water vapor in the air? _____
 - b. Which element of the meteorological environment determines the amount of sunlight reaching the Earth's surface? _____
 - c. Which element of meteorology directly influences storm formation? _____
 - d. Which element is critical for understanding drought and flood patterns? _____
 - e. Cloud formation is part of which meteorological element? _____
 - f. What is the most important element of the meteorological environment influencing climate? _____
 - g. Caused by melting ice caps and thermal expansion of oceans _____
 - h. Efforts to reduce greenhouse gas emissions _____
 - i. Unusual, intense storms, floods, or droughts _____
 - j. Use of solar, wind, and hydro power _____

Write briefly on the following:

- 42. Differentiate between weather and climate.
- 43. Explain how the greenhouse effect contributes to global warming.
- 44. What is the role of carbon dioxide in altering the Earth's climate system?
- 45. How does deforestation contribute to climate change?
- 46. Why is the earth considered a "system"?
- 47. How do the Earth's subsystems interact with each other?
- 48. What are the four main subsystems of the Earth system?
- 49. What role does the atmosphere play in the Earth system?
- 50. List the four dimensions of food security?
- 51. What is climate adaptation?
- 52. What is climate mitigation?
- 53. Why are small island nations like Fiji vulnerable to climate change?

Section C: Long Answer Questions (20 marks) (5 marks each)

- 54. Define geopolitics and how does climate change influence it?
- 55. Explain the concept of colonization and discuss how it reshaped the political, economic, and cultural landscapes of colonized societies.
- 56. Explain how land use changes contribute to climate change?
- 57. Discuss how biotic factors affect the climate with suitable examples.

Section D: Long Essay (10 marks)

Select only **ONE** essay.

- 58. Climate change is a result of disturbances in both abiotic and biotic factors. Discuss?
- 59. "Discuss how climate change affects agriculture and how agricultural practices contribute to climate change."

