

SECTION A [50 MARKS]
ANSWER ALL QUESTIONS

Question 1

a) **Direction: For multiple choice questions, there are four alternatives: A, B, C, and D. Choose the correct alternative and circle it. Do not circle more than ONE alternative. If there is more than one choice circled, NO score will be awarded.** [15]

- i. It is an object in which no nuclear fusion has occurred, unlike a star that is undergoing nuclear fusion. It becomes a star when nuclear fusion begins. Identify the object described above in Solar Nebula Theory.
 - A electron
 - B protostar
 - C primordial matter
 - D protoplanetary disk
- ii. This node is occupied by factories, which produce materials like chemicals, industrial machinery and steel. Mining and oil refining industries are also found in this node. Which node of the multiple-nuclei model is described above?
 - A industrial suburb
 - B heavy manufacturing
 - C outlying business district
 - D wholesale and light manufacturing
- iii. When the forces of heat by intrusion through deep burial and earth movement act together over large areas, widespread changes in rocks take place.
This process describes
 - A contact metamorphism.
 - B thermal metamorphism.
 - C dynamic metamorphism.
 - D regional metamorphism.
- iv. The ray that has the highest frequency under electromagnetic spectrum is
 - A gamma.
 - B infrared.
 - C ultraviolet.
 - D microwave.

- v. Fog is formed when moist air moves over a cold surface. The fog which is 300-600 metres deep is
- A frontal.
 - B radiation.
 - C advection.
 - D precipitation.
- vi. From a total population of 80,000 women in an area, the age group of 34-40 years is 3,000 and total live births in the same age group is 375. Calculate the specific age fertility rate.
- A 12
 - B 125
 - C 12.5
 - D 125.5
- vii. You can check the level of a plane table by looking at the position of the air bubble of the spirit level by placing it on
- A centre of a board.
 - B two corners of a board.
 - C three corners of a board.
 - D all four corners of a board.
- viii. Which of the following is a drawback of wind energy?
- A cannot be used at high altitudes
 - B causes natural resource depletion
 - C expensive and causes air pollution
 - D irregular supply of electricity and noise pollution
- ix. The technology developed by United States Department of Defence using 24 medium Earth Orbit satellites for the transmission of precise information is
- A total station.
 - B plane table survey.
 - C Global Positioning System.
 - D Geographical Information System.
- x. Bioterrorism is unique from other emerging hazards because
- A it is encountered by workers in the industry.
 - B it makes computers to behave in an intelligent manner.
 - C its effects are similar to flu, making the attack extremely difficult to control.
 - D it gives access to data illegally, encouraging frauds and traffic of unauthorized pornography.

xi. Identify the type of creative industry depicted in the picture given below.



- A Gaming
 - B Software and Apps
 - C Publishing and Media
 - D Advertising and Marketing
- xii. 'The factors such as war, strike or fighting between different groups or races of people compel them to move from one place to another.'
- The statement explains
- A political factor.
 - B economic factor.
 - C demographic factor.
 - D socio-cultural factor.
- xiii. The fully computerized hydropower project constructed with the technical and financial support from Austria is
- A Kurichhu Hydropower Project.
 - B Basochhu Hydropower Project.
 - C Dagachhu Hydropower Project.
 - D Mangdechhu Hydropower Project.
- xiv. The process in which large materials such as boulders are rolled and pushed along the river bed by the force of river is known as
- A traction.
 - B solution.
 - C saltation.
 - D suspension.

xv. Koeppen's classification of climate is based on two important elements of weather which are

- A wind and temperature.
- B precipitation and wind.
- C cloud and precipitation.
- D temperature and precipitation.

b) Write TRUE or FALSE for the following statements in the space provided.

[5]

i. The migration of people due to social or economic reasons is known as step-migration.	
ii. As per the Penck's model of landform development there is a featureless surface called 'Primarumpf'.	
iii. The Third Pole region comprises of countries such as Afghanistan, Bangladesh, Bhutan, China, Kyrgyzstan, Mongolia, Myanmar, Nepal, Pakistan, Tajikistan and Uzbekistan.	
iv. GPS consist of three segments, space, control and user.	
v. Migration is the first important component of demographic studies.	

c) Match each item under column A with the most appropriate item in column B.

[5]

Rewrite the correct pairs by writing the alphabet against the number in the space provided.

Answer	Column A	Column B
	i. Reproductive capacity of a woman during the entire reproductive period	a) structure
	ii. Process of making maps	b) galaxy
	iii. Granular, crumy and blocky	c) cartography
	iv. Huge collection of gas, dust and billions of stars	d) fecundity
	v. Water from the dam allowed to flow through a large pipe	e) fertility
		f) penstock
		g) universe

d) **Fill in the blanks with appropriate word/s.**

[5]

i. The part of a city characterised by dilapidated buildings, multi-occupancies and overcrowding with poor sanitation is a _____.	
ii. The city located on the fringes of a larger city which act as a regional hub is _____.	
iii. Viruses, fungi, bacteria and parasites that pose a threat to the people and other organisms are called _____.	
iv. A beam of light separated into a set of colours is called _____.	
v. Steep walled rock basin on the side of a mountain resembling the arm of a chair is known as _____.	

e) **Answer the following questions briefly.**

- i. How did cold and motionless matter become a hot nebula? [1]

- ii. “Unchecked population growth is the main cause of urban problems in Bhutan.” [2]

Support the statement with **TWO** reasons.

- iii. “In Bhutan, youth unemployment rate is observed to be higher than that of adults.” [2]
Justify the statement with **TWO** points.

- iv. State **ONE** application of active remote sensing in managing water resources. [1]

- v. How can the ten major countries existing within the Third Pole region reduce carbon [2]
emission to protect the environment?

- vi. How can we make hydroelectricity sustainable in our country? Write any **TWO** strategies. [2]

- f) **On the map of Bhutan:** [10]

- i. Shade and write 'DHTFR' over the Dzongkhag with the highest Total Fertility Rate as per PHCB 2017.
- ii. Mark with thick line (-) and write 'PRB' over the river drainage basin, which has high vulnerability of flooding due to Glacial Lake Outburst.
- iii. Mark and write 'FCD' over the dzongkhag declared as country's first casualty from the Covid-19 pandemic.
- iv. Mark with a triangle (Δ) and write 'SHPP' over the place where 115MW under construction hydropower project is located.
- v. Locate with a dot (\bullet) and write 'DLM' over the Dzongkhag with the highest out-migration as per PHCB 2017.
- vi. Shade and write 'DSD' over the Dzongkhag with maximum slate deposit.
- vii. Locate with a dot (\bullet) and write 'DWB' over the Dzongkhag known for Shagzo, making of traditional wooden cups and bowls (Dapa).
- viii. Mark with a dot (\bullet) and write 'DHS' over the place where hot spring is located in southern region.
- ix. Shade and write 'GMFR' over the Dzongkhag with the lowest General Marital Fertility Rate as per the PHCB 2017.
- x. Mark Shade and write 'DLEAP' over the dzongkhag with lowest percentage of economically active population as per PHCB 2017.

SECTION B [50 MARKS]
ATTEMPT ANY FIVE QUESTIONS

Question 2

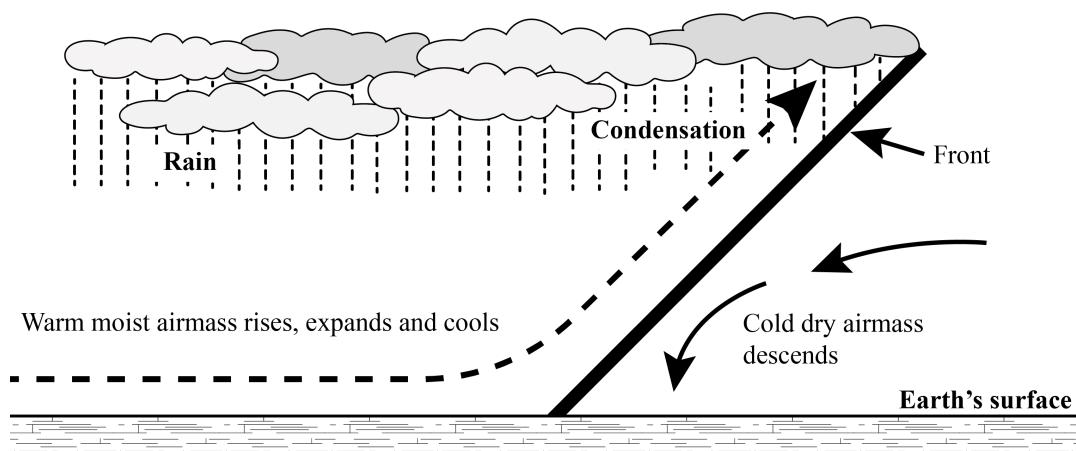
- i. Define glacial snout. [1]

- ii. 'Rural-urban transformation is one major cause of urbanization'. Support the statement with **TWO** reasons. [2]

- iii. According to PHCB 2017, "Urban women have lower fertility rate in the younger age group than women in the rural areas." Justify the statement with **TWO** reasons. [2]

iv. Interpret the diagram of a type of rainfall given below in relation to its formation.

[3]



- v. As an expert in remote sensing technology, examine any **TWO** ways to manage mineral resources. [2]

Question 3

- i. Examine any **FOUR** positive impacts of hydropower projects in our country. [2]

- ii. According to the Labour Force Survey 2021, “out of 338,376 economically active persons, 16,250 were without work, and actively seeking for work during the reference period. This translates to an unemployment rate of 4.8%.” [3]

Suggest any **THREE** measures to improve unemployment rate in Bhutan.

- iii. Differentiate between bio-mass energy resources and nuclear energy resources with **TWO** points each. [2]

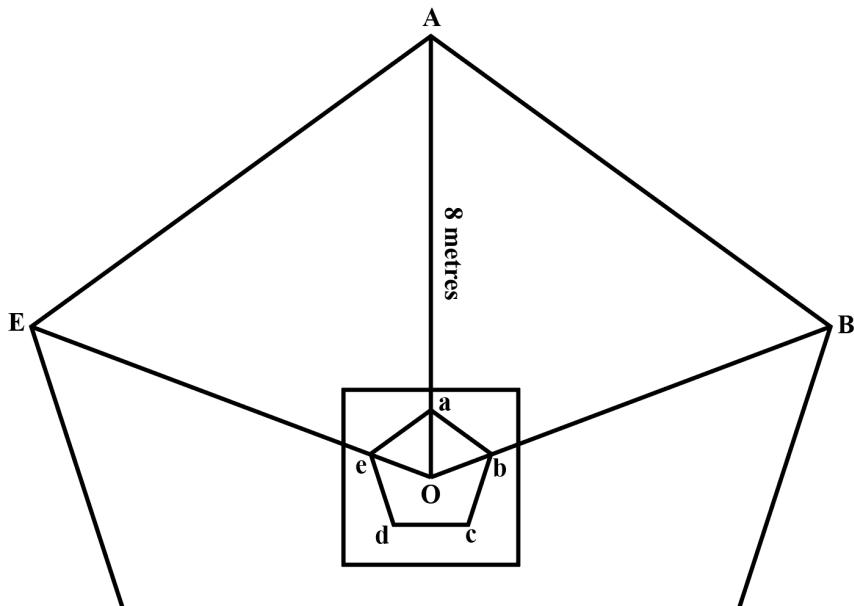
Biomass Energy	Nuclear Energy

- iv. The unique high-mountain regions centred on the Tibetan Plateau is commonly referred to as the Third Pole. Why? Support your answer with **THREE** reasons. [3]

Question 4

- i. Assume the scale of map is 1cm to 2m and the R: F is 1: 200. If the distance between station O to station A is 8m on the ground, what will be the distance between station O to station 'a' on the map?

[2]



- ii. Study the figure and answer the question.

[2]



Do you think Artificial Intelligence pose more risk than benefit? Support your answer with **TWO** justifications.

- iii. Calculate the crude birth rate of a place with a population of 80,880 if total live birth is 720 out of 780 and the total women in the reproductive age group is 4,080.

[3]

iv. Study the diagram and answer the question that follows.



Urban sprawl is the unrestricted growth in many urban areas which must be stopped. Suggest **THREE** feasible measures to address this issue.

[3]

Question 5

i. *'International migration has more advantages than disadvantages.'*

[3]

Defend the statement with **THREE** justifications.

- ii. Study the picture of glacial land features given below and answer the questions that follow.



1) Identify and name the landform.

[1]

2) Explain how it is formed.

[2]

- iii. How is Global Positioning System technology used in monitoring traffic and providing weather alert? Write any **TWO** ways.

[2]

- iv. The topography of Bhutan provides an advantage for harnessing hydroelectricity but [2]
acts as a barrier to other economic sectors.

Justify the statement with **TWO** valid points.

Question 6

- i. Compare Solar Nebula Theory with Electromagnetic Theory.

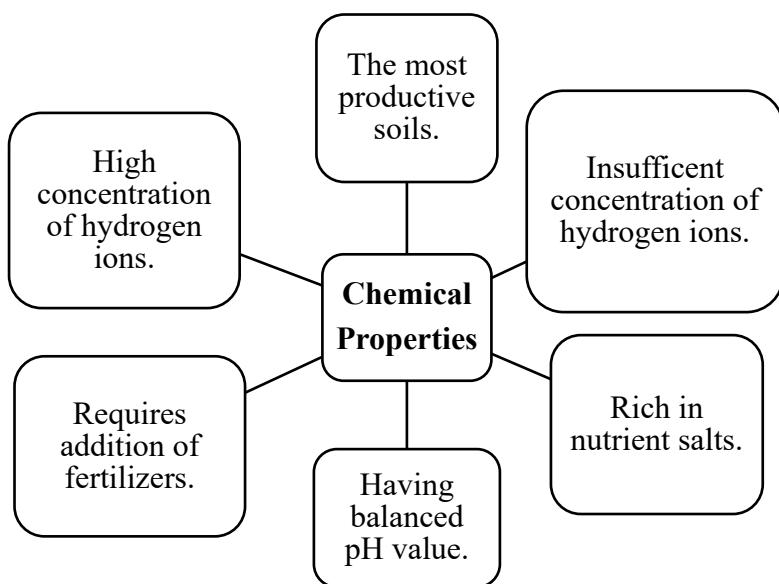
[3]

- ii. Discuss any **TWO** disadvantages of using total station.

[2]

iii. Refer the data given in the chart and answer the question.

[3]



Identify the chemical properties and write under respective soil types given in the table below.

Alkaline Soil	Acidic Soil	Neutral Soil	

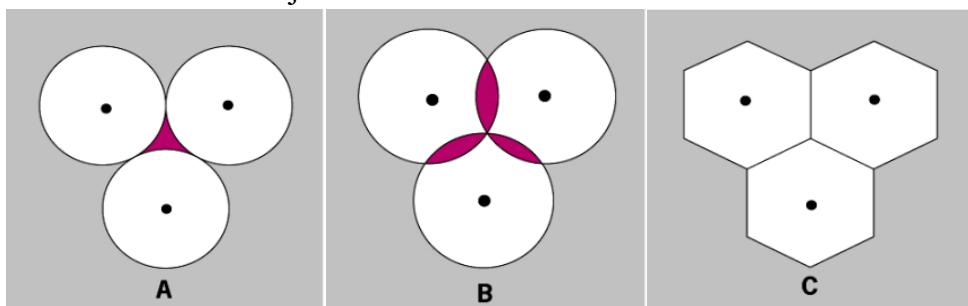
iv. According to PHCB 2017, Gasa Dzongkhag recorded the highest death rate amongst children aged 1 year and below. Assuming you are the Dzongkhag Health Officer, design any **TWO** plans to bring down infant mortality rate.

[2]

Question 7

- i. Compare gradients of the slope with volume of river in youthful and mature stages. [2]

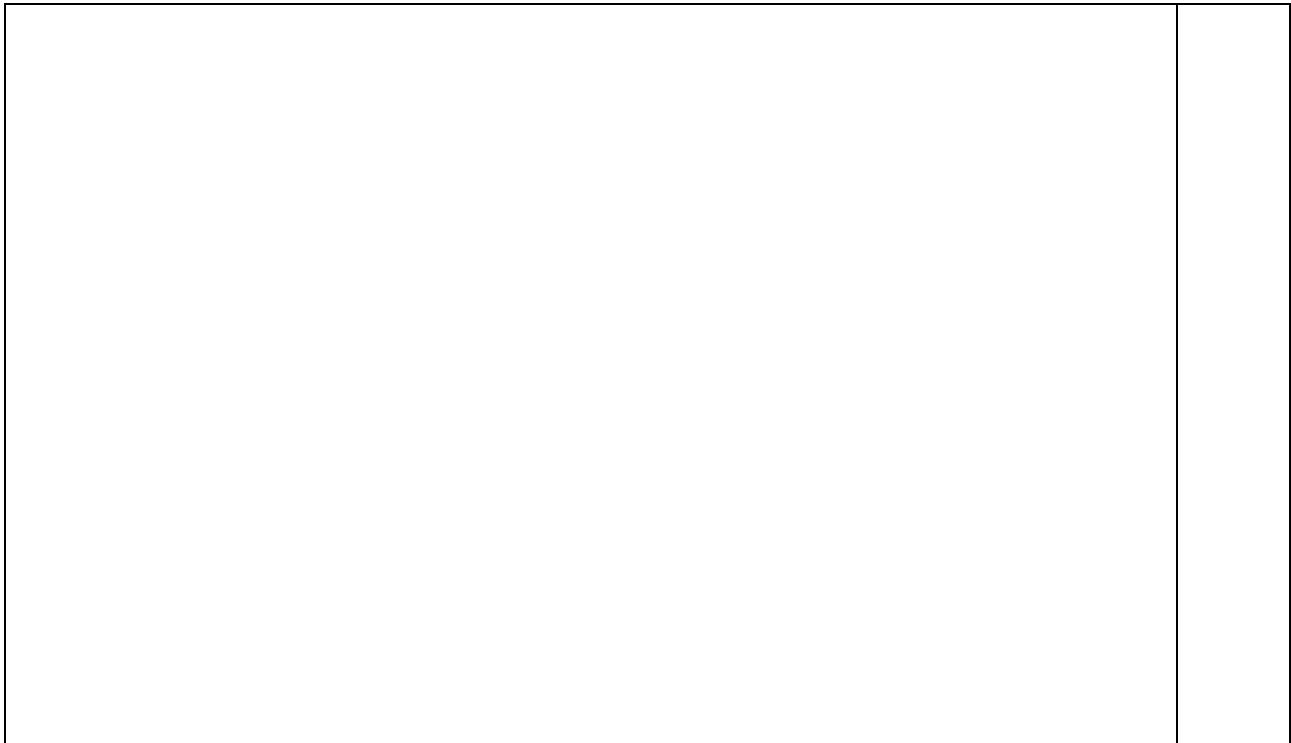
- ii. Which of the following diagrams resolves the problems of central place serving hinterland? Write **ONE** justification. [2]



- iii. Examine any **THREE** conditions under which condensation take place. [3]

iv. Draw a neat sketch or diagram and label it to show three types of vector data in geographic information system.

[3]



Map of Bhutan

This map is to be used for Question 1 (f).

