

**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. The theory that describes supernaturally created primordial matter consisting of tiny hard and cold particles is

A Electromagnetic Theory.  
B Gaseous Mass Theory.  
C Solar Nebula Theory.  
D Big Bang Theory.

ii. The model which consists mostly of pie-shaped urban structure is

A Sector Model.  
B Urban Realms Model  
C Multiple Nuclei Model.  
D Concentric Zone Model.

iii. Which of the following best describe the characteristic of sedimentary rocks?

A they are closely banded  
B they are free from fossils  
C rocks are formed in strata  
D they are not easily weathered

iv. Which of the following is the component of remote sensing?

A software  
B method  
C sensor  
D data

v. The formation of water droplets on the cooler surface of objects such as stones, grass blades and plant leaves is

A frost.  
B dew.  
C mist.  
D fog.

vi. According to PHCB 2017, the total child bearing woman was 196,295 and the total live birth was 11,239. Calculate the general fertility rate.

- A 57.3
- B 47.3
- C 5.73
- D 4.73

vii. Ranging rods are coloured white and black or red and white or orange and white to

- A sight the station.
- B find the distance.
- C mark the objects.
- D make the object visible.

viii. The advantage of using biogas as a source of energy in Bhutan is

- A not affected by changing weather.
- B a continuous production of energy.
- C free of pollution and reduces methane gas emission.
- D renewable source of energy, which can be replenished by nature.

ix. The instrument shown below is used for conducting



- A Prismatic Compass Survey.
- B Total Station Survey.
- C Plane Table Survey.
- D Chain Survey.

x. The storm in which powerful winds accompanied by fall of irregular lumps of ice is a

- A thunderstorm.
- B windstorm.
- C snowstorm.
- D hailstorm.

xi. One of the challenges in preserving and promoting Bhutanese cultural heritage is the

- A introduction of strict rules and regulations.
- B influence of social media and other cultures.
- C strengthening of cultural values.
- D protection of heritage.

xii. Which of the following is an economic factor causing migration?

- A woman moving to her husband's place after marriage
- B strike or fighting between different groups of society
- C availability of better employment opportunities
- D increased birth rate and death rate

xiii. The hydropower project commissioned in 2019 generating 720 MW of electricity is

- A Dagachhu Hydropower Project.
- B Basochhu Hydropower Project.
- C Kurichhu Hydropower Project.
- D Mangdechhu Hydropower Project.

xiv. A relatively flat and broad plain formed by deposition of materials in the lower course of a river is

- A delta.
- B levee.
- C flood plain.
- D ox bow lake.

xv. Mediterranean type of climate with higher precipitation in the wettest month of winter season than the driest summer season is

- A B-climate.
- B C-climate.
- C D-climate.
- D E-climate.

**b) Write TRUE or FALSE for the following statements in the space provided. [5]**

i. Intra Dzongkhag migration and inter Dzongkhag migration are two common trends of migration in Bhutan.		
ii. Penck cycle of landform development is time dependent.		
iii. The Third Pole refers to a unique high mountain region centred on the Tibetan Plateau.		
iv. The five essential components of a Geographical Information System are hardware, software, data, methods and people.		
v. Urban to rural migration is the leading cause of unemployment.		

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. A person moving from Bhutan to Japan	a) immigration
	ii. Development of existing towns or establishment of new towns	b) electromagnetism
	iii. Fine grades of gravel, sand, silt and clay	c) emigration
	iv. Bonding glue that holds all of the existence into a form of tangible matter	d) surveying
	v. Cross border project to receive carbon credits under Kyoto protocol	e) Basochhu Hydro Power Project
		f) texture
		g) Dagachhu Hydro Power Project

d) Fill in the blanks with appropriate word/s. [5]

i. An outlying and functionally uniform part of urban areas adjacent to the central city is known as \_\_\_\_\_.

ii. The land surrounding urban centres which is economically linked with the urban centres is referred to as \_\_\_\_\_.

iii. The activities which encompass three overlapping phases such as emergency relief, rehabilitation and reconstruction is referred to as \_\_\_\_\_.

iv. The data which is related to shape, size and location of the features in GIS is known as \_\_\_\_\_.

v. The actual name of landform known as 'Basket of eggs topography' is

\_\_\_\_\_.

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

i. Why do we feel the matter when we tap on a hard surface? [1]


ii. 'Industrialisation leads to urbanisation'. Justify the statement with **TWO** reasons. [2]


iii. Write down **ONE** application of active remote sensing in our daily lives. [1]


iv. ‘Unemployment rate is increasing in Bhutan’. Support the statement with **TWO** reasons. [2]

v. How can we contribute to safeguard the water tower of Asia? Develop any **TWO** strategies. [2]

vi. The COVID-19 pandemic has affected the hydropower projects under construction and delayed its completion in Bhutan. Propose any **TWO** measures to overcome this issue.

[2]

**f) Map work**

[10]

In the outline map of Bhutan (page 24), mark/shade and name as per the instructions.

- i. Mark with a dot (●) and write ‘GNZ’ over the place where the largest statue of Guru Nangsi Zilnoen is located.
- ii. Locate with a dot (●) and write ‘FLD’ over the place where the disaster occurred to the cordyceps collectors on June 2021 due to a flash flood.
- iii. Locate with a dot (●) and write ‘MLD’ over the place that experienced maximum lockdown due to the COVID-19 pandemic.
- iv. Mark with a triangle (Δ ) and write ‘OGPP’ over the place where 600MW ongoing hydropower project is located in eastern Bhutan.

- v. Locate with a dot (●) and write 'DHUR' over the Thromde with the highest unemployment rate.
- vi. Shade and write 'MCD' over the Dzongkhag where major coal deposit is located.
- vii. Locate with a dot (●) and write 'TDAP' over the Thromde with a domestic airport.
- viii. Shade and write 'DMBG' over the Dzongkhag with the maximum number of biogas plants.
- ix. Shade and write 'DHGFR' over the Dzongkhag with the highest General Fertility Rate as per the PHCB 2017.
- x. Shade and write 'DMF' over the Dzongkhag with the maximum festivals.

**SECTION B [50 MARKS]**  
**ATTEMPT ANY FIVE QUESTIONS**

**Question 2**

a) Name any **TWO** processes of glacial erosion.

[1]


b) 'Traffic congestion is observed as one of the major problems in Thimphu Thromde'.  
Justify the statement with **TWO** reasons.

[2]


c) "Overall, the unemployment rate increases with increasing levels of education. There is a sharp increase in the unemployment rate from those who completed primary level to those with a secondary level of education." [2]

Do you agree with the above statement? Support with **TWO** reasons.

d) Trongsa recorded a total of 15 grams of water vapour at 25°C in July. What would be the relative humidity of the place if there are 25 grams of water vapour to saturate the air at the same temperature? [3]

e) As an expert in remote sensing, examine any **TWO** ways to enhance the agriculture sector using remote sensing technology. [2]

### Question 3

a) Examine any **FOUR** positive impacts of tourism in Bhutan.

[2]

b) ‘Preservation of intangible culture has become indispensable in the wake of modernisation in our country.’ As a cultural officer of a dzongkhag, write any **THREE** ways to preserve the intangible culture.

[3]

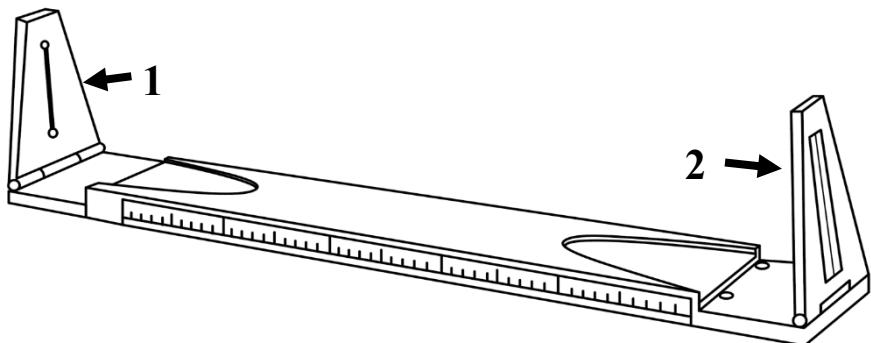

c) Compare solar energy with geo-thermal energy with **TWO** points each. [2]

<b>Solar energy</b>	<b>Geo-thermal energy</b>

d) What would happen if strong measures are not put in place on conserving the ice field of the Third Pole in Asia? Critically analyse with **THREE** points. [3]


## Question 4

a) Study the diagram given below and answer the questions that follow.



i. Name the parts marked as 1 and 2.

[1]


ii Write **ONE** use of the instrument

[½]

11. **What is the primary purpose of the *Journal of Clinical Endocrinology and Metabolism*?**

iii. What is the name of the instrument?

[½]

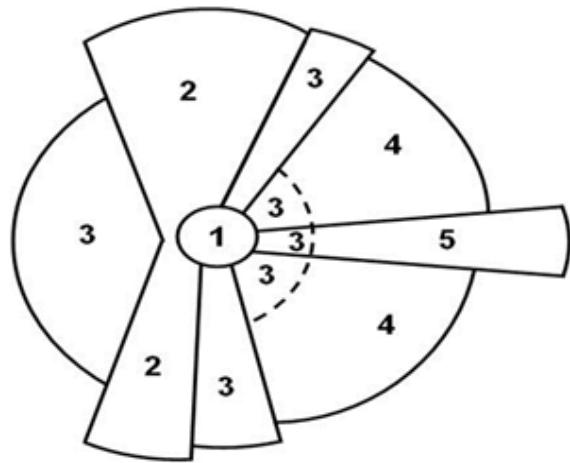
11. **What is the primary purpose of the *Journal of Clinical Endocrinology and Metabolism*?**

b) Forest fires are one of the major disasters which takes place during dry seasons when trees become most combustible and intense wind conditions prevail. [2]

Develop a preparedness plan to prevent forest fires based on the disaster management cycle.

c) Calculate Child Mortality Rate of a place where total deaths of children (age 1-5 years) in the calendar year was 500 and the total number of children (1-5 years) in the same year was 50,550. [3]

d) Study the diagram given below and answer the questions that follow.



i. What is the name of the model of the urban centre?

11. **What is the primary purpose of the *Journal of Clinical Endocrinology and Metabolism*?**

ii. Who introduced this model?

iii. What does numbers 3 and 5 represent?


iv. Mention **ONE** feature of Zone 1.

[1]


## Question 5

a) 'Rural to urban migration is more of a problem than help.' Support the statement with **THREE** justifications. [3]

b) Study the diagram given below and answer the questions that follow.



i. Identify and name the landforms shown.

[1½]

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ii. Mention the stage of running water where such landforms develop.

[1½]

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iii. Examine **ONE** economic importance of such landforms.

[1]


iv. Explain how it is formed.

[1]


c) Discuss any **TWO** applications of the Global Positioning System (GPS) in our daily lives. [2]

d) Access to cheap hydroelectricity has been considered as the driver of industrial growth in Bhutan. Support the statement with **TWO** points. [2]

## Question 6

a) How is the Gaseous Mass Hypothesis different from the Solar Nebula Theory?

[3]

b) If you are the Director General of the Tourism Council of Bhutan, how will you enhance the tourism industry in the country? Write down any **THREE** approaches.

[3]

c) Describe any **TWO** types of total station.

[2]

d) Design any **TWO** plans to generate more employment opportunities for the youths in urban areas. [2]

## Question 7

a) Differentiate between cirque glacier from valley glacier with **TWO** points each. [2]

b) What would be the total population of the 3<sup>rd</sup> largest city if the population of the largest city is 300000 as per rank size? [2]


c) Which type of precipitation is common above the alpine zone of Bhutan? Why? [2]  
Provide **ONE** reason to support your answer.


d) Define the term platform from remote sensing study. [1]


e) How will you strengthen cultural values within your family members? Write any **THREE** ways. [3]

### Map of Bhutan

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

