

SECTION A [50 MARKS]
ANSWER ALL QUESTIONS

Question 1

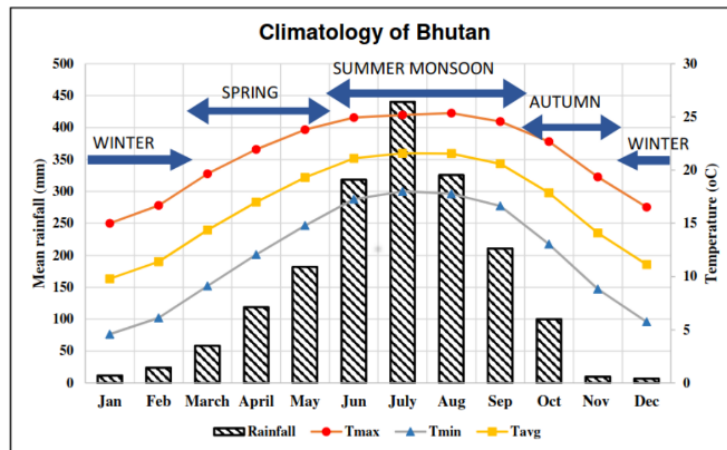
[10]

- a) For each question there are FOUR responses: A, B, C and D. Choose the corresponding letter of your response and CIRCLE it neatly. NO score will be awarded if you circle more than ONE letter.
- i. Topographic map in Bhutan uses India and adjacent countries series (IAC). What is the map number of the figure given below?

A	1	5	9	13	I	M
	2	6	10	14		
	3	7	E	15		
	4	8	12	16		
B	F		J		N	
C	G		K		O	
D	H		L		P	

- A 78E/10
- B 78E/11
- C 78E/12
- D 78E/15

- ii. The graph shows the change in rainfall of a place over a year. The rainfall increases from January to May because of



- A Direction of mountain ranges
- B Summer monsoon
- C Altitude of a place
- D Latitude of a place

- iii. The Big Bang theory was put forward by
- A George Lemaitre
 - B Alfred Wegner
 - C Edwin Hubble
 - D Schmidt
- iv. If it is 9 AM in Bhutan. What would be the time in London?
- A 2 AM
 - B 2 PM
 - C 3 AM
 - D 3 PM
- v. Gasa experiences cool summer and cold dry winter. Which of the following factors primarily determines the climate of the place?
- A Orientation of the mountain ranges
 - B Distance from the equator
 - C Altitude of the place
 - D Type of vegetation
- vi. Geologically, the Himalayas are relatively young, having formed around 50 to 70 million years ago. What geological process primarily led to the formation of Himalayas?
- A Volcanic activity
 - B Collision of tectonic plates
 - C Erosion and sedimentation
 - D Deposition of river sediments
- vii. Bhutan is recognised globally for its remarkable biodiversity, which is known for its wide variety of habitat. Which component of biodiversity does it refer to?
- A Genetic diversity
 - B Species diversity
 - C Ecosystem diversity
 - D Functional diversity
- viii. Which industry includes activities like research and development, and information and technology?
- A Tertiary industries
 - B Primary Industries
 - C Secondary Industries
 - D Quaternary industries
- ix. Which natural disaster caused significant damage to Punakha in 1994?
- A Earthquake
 - B Flood
 - C Landslide
 - D Glacial Lake Outburst Flood (GLOF)

x. The overall life expectancy of Bhutan in 2017 was 70.2 years, which is an increase of 3.9 years from 66.3 years in 2005. What are the factors which led to rise in life expectancy of Bhutan?

- i. Enhanced healthcare services
- ii. Increased education levels among the population
- iii. Implementation of policies focused on elderly care
- iv. Improved living standards, housing, and access to clean water

- A i, ii and iii
- B ii, iii and iv
- C i, iii and iv
- D i, ii and iv

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

Statements	Answer
i. The numbering system for topographic maps is always consistent globally.	i.
ii. Solar energy is the most reliable alternative energy source in Bhutan due to its geographic location.	ii.
iii. The Big Bang Theory suggests that planets are formed from the gradual accumulation of dust and gas particles.	iii.
iv. Mountain ranges affect the formation of precipitation in certain regions.	iv.
v. Biodiversity hotspots are regions with large number of unique species that are endangered.	v.

c) Fill in the blanks with appropriate word(s).

[5]

i.	Planetesimals collided and merged to form larger bodies called protoplanets. The process is called_____.
ii.	Regions located at high altitude generally experience _____ temperature compared to those at lower altitude.
iii.	Wide range in climatic conditions have resulted in different climatic zones. The altitude ranging from 200-2000 metres above sea level comes under _____ zone.
iv.	According to the continental drift theory, all the continents were once joined together as supercontinent called_____.
v.	Glaciers are receding at a faster rate due to global warming. The disaster caused due to retreating glacier is_____.

d) Match each item in column A with the most appropriate item in column B. Write the correct letter in the space provided in the 'answer' column.

[5]

Column A	Column B	Answer
i. Larger particles that are too heavy to be lifted by the wind are pushed and rolled along the ground.	a. Deposition	i.
ii. River loses energy and drops the material it has been carrying	b. Suspension	ii.
iii. Rock particles bounces along the ground up to 1.5 meters high	c. Saltation	iii.
iv. Soil particles carried by the wind strikes the rock surface.	d. Surface creep	iv.
v. Fine soil particles are lifted and held in the atmosphere.	e. Abrasion	v.
	f. Deflation	
	g. Erosion	

e) Study the extract of the survey Map of Mongar, No.78M/3 and answer the following questions.

i. What is the index contour interval of the given map? [1]

ii. Give the six-figure grid reference for the following spot heights: [1]

- a. 1950
- b. 590

iii. How is topographical map useful in planning outdoor activities such as hiking or campaign? Provide **TWO** reasons [2]

iv. Tourism plays a very important role in generating income and employment opportunities in Bhutan. How can you boost tourism industry of the place in the given map? Justify with **TWO** reasons. [2]

- v. The RF of the given map 78M/3 is 1: 50,000. If the RF of the map is 1: 600,000, what would be the statement scale of the map? [2]

--	--

- vi. If you are a Dzongkhag Agricultural Officer (DAO) and wants to promote advanced agricultural practices, which area in the topographical map do you think would be suitable for the purpose? Explain with **TWO** reasons. [2]

- vii. How is the drainage pattern in grid square 2030 different from 2060? [2]

- viii. Study the area in grid square 6060. Is the establishment of a large-scale agro-based industry feasible in it? Support your answer with **TWO** reasons. **[2]**

- ix. You are living in Kurizampa and wants to visit Serbum Gompa. Identify the mode of transport you would choose? **[1]**

- f) In the outline map of Asia provided: **[4]****

- i. Shade and name the largest hot desert located in South-western Asia.
- ii. Mark with (^^^) and name the mountain Urals.
- iii. Mark with thick lines and name Hwang Ho.
- iv. Shade and name the sea which is located on the border of Europe and Asia

- g) In the outline map of Bhutan provided: **[6]****

- i. Mark with thick line and name the river with the largest drainage basin in Bhutan.
- ii. Mark with 'X' and name the La (Pass) where 108 Druk Wangyal Chotens are found.
- iii. Mark with (▲) and name Jhomolhari.
- iv. Mark 'DZ' over the first dzong built by Zhabdrung Ngawang Namgyal.
- v. Mark with a thick dot (●) over the place where black necked crane festival is conducted annually.
- vi. Mark with a thick dot (●) and name Punakha Dzong.

SECTION B [50 MARKS]

ATTEMPT ANY FIVE QUESTIONS

Question 2.

- a) There are several types of equipment needed for plane table survey. Name the equipment shown below and write it's uses. **[2]**



- b) Population in the world is growing at the rate of around 0.91% in 2024. There is a decrease from 1.19% in 2015. Write **TWO** factors which have contributed to the drop in the population growth rate. **[2]**

- c) Alfred Wegner states that at one point of time, all of the continents were joined together as one large mass of land, then the land spread apart and drifted into their current positions. What would have happened if the continents remained as a single land mass called Pangaea. Write **TWO** consequences. [2]

- d) Mining brings about huge socio-economic benefits, but at the cost of environment. Do you agree? Support your stand with **TWO** reasons. [2]

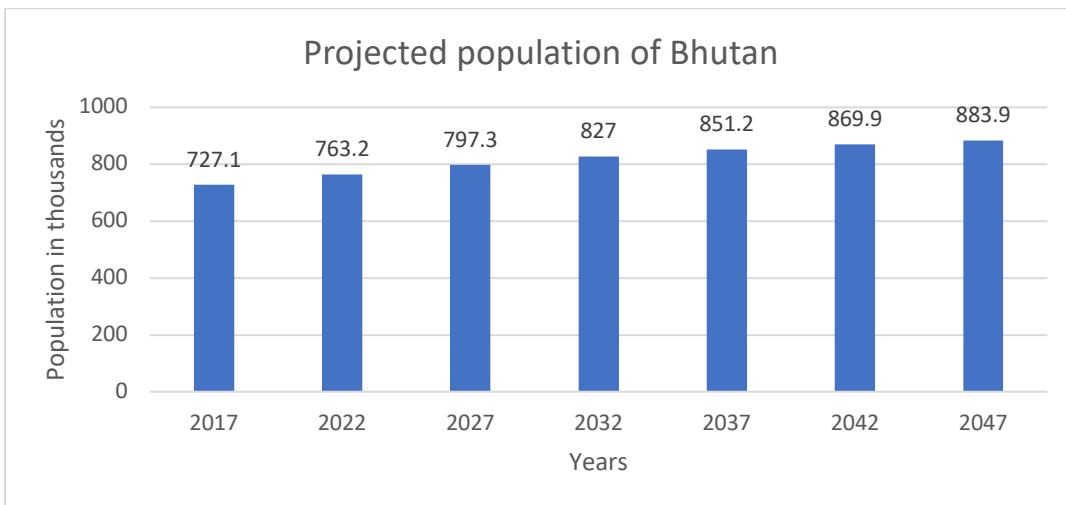
- e) Highlanders in Bhutan make a living by collecting cordyceps, while farmers in the southern part of Bhutan depend on agriculture for their livelihood. In line with the statement, if you are given the choice, where would you live and why? Give **TWO** reasons. [2]

Question 3

- a) Punakha valley is known for its fertile land and favourable climate and is one of Bhutan's key agricultural regions. However, farmers face challenges in adopting modern farming techniques and technologies. Justify with **TWO** points. [2]

Question 3

- a) The figure shows projected population of Bhutan, 2017-2047 (in thousands). Calculate the population growth from 2022 to 2027. [2]



--	--

- b) Punakha valley is known for its fertile land and favourable climate and is one of Bhutan's key agricultural regions. However, farmers face challenges in adopting modern farming techniques and technologies. Justify with **TWO** points. [2]

- c) Walter Christaller stated that people travel shorter distances to purchase basic necessities such as salt and rice in Central Place Theory. Elaborate. [2]

- d) Mitigating disasters involves a comprehensive approach that includes preparedness, response, recovery, and mitigation strategies. There have been more than 1,400 forest fire incidents in Bhutan in the last ten years. Suggest **TWO** methods to fight fire incidences. [2]

- e) When it is 5:48 PM in Singapore, it is 4 PM in New Delhi (77°E). What is the longitude of Singapore? [2]

--	--

Question 4

- a) Latitudes and longitudes play a pivotal role in diverse contexts due to their usefulness. Write **TWO** uses of latitude. [2]

- b) The population of Bhutan is unevenly distributed. If you are the Prime Minister of Bhutan, what **TWO** measures would you adopt to encourage people to settle in sparsely populated areas so that there is uniform distribution of population. [2]

- c) Greenwich Mean Time (GMT) plays a crucial role in the history of timekeeping, but it has limitations with the evolving needs of modern society. Support this statement with **TWO** reasons. **[2]**

- d) New pests, such as the fall armyworm, have posed a major damage to maize cultivation since 2019 in Bhutan. Also, Giant African Land Snails, have caused large damage to vegetable crops since 2010. Suggest **TWO** strategies to overcome such issues. **[2]**

- e) About 42,829 Bhutanese citizens are residing in 112 countries worldwide. Is it wise to migrate to other countries? Justify with **TWO** reasons. **[2]**

Question 5

a) The Geological Time Scale (GTS) is a system of chronological dating of geographical strata compared to time. Arrange the following era in chronological order. **[2]**

- i. Precambrian ii. Mesozoic. iii. Palaeozoic. iv. Cenozoic

b) The Solar Nebula Theory explains the formation and evolution of our solar system. It is a widely accepted model, why? **[3]**

c) Google Earth is a powerful geospatial tool that offers important features and functionalities necessary for our daily life. Justify with **ONE** reason. **[1]**

- d) Smart Factory Concept represents advanced technologies to create highly flexible, efficient, and automated manufacturing environments. Examine how it would reduce waste and improve resource utilisation. Mention **TWO** points. [2]

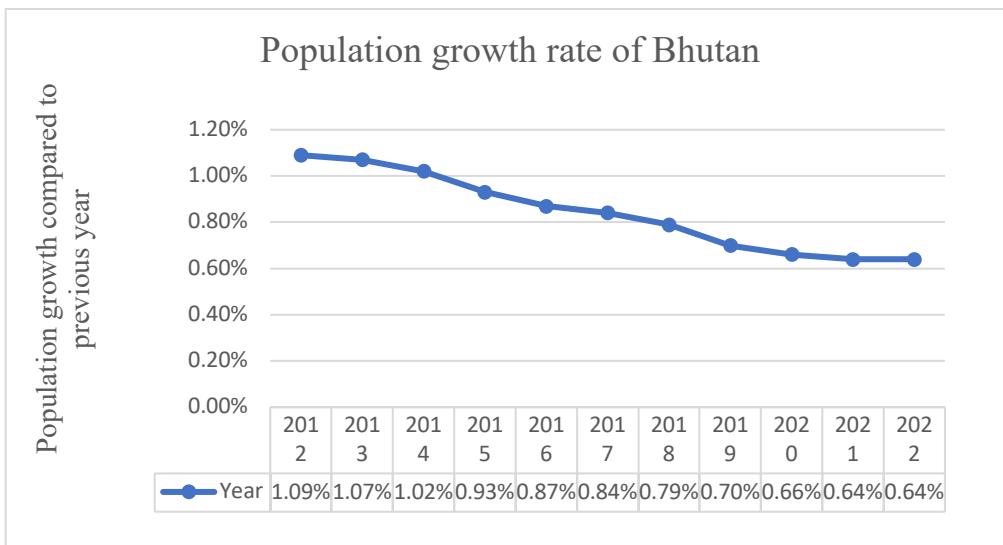
- e) The most widely adopted climate-smart agricultural practices in Bhutan include seed saving, crop rotation, and terracing. Do you think the practice of climate smart agriculture would increase agriculture productivity? Support your answer with **TWO** reasons. [2]

Question 6

- a) If you want to start an industry, what are the **TWO** most important factors you would consider before setting up the industry? [2]

- b) Bhutan is highly vulnerable to earthquakes as it lies in active seismic zones. How would you improve the structures to prevent from hazards? Write **TWO** ways to improve the building structures. [2]

- c) The graph shows the population growth rate in Bhutan from 2012 to 2022. The annual population growth in Bhutan gradually declined in the last ten years. What would be the consequences if a similar trend continues? [2]



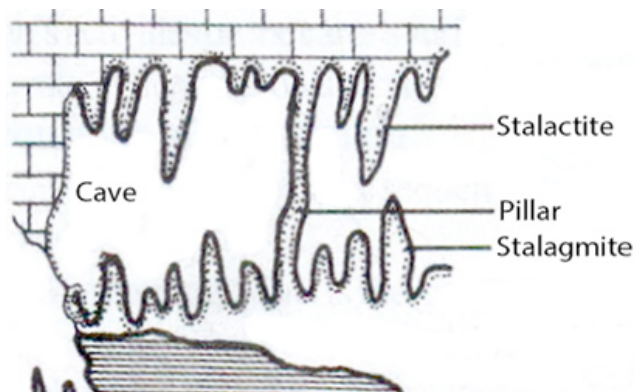
d) Compare species diversity with genetic diversity. [2]

Species Diversity	Genetic Diversity	

e) How does technology enhance the application of life saving skills in disaster scenarios? Provide **TWO** uses [2]

Question 7

a) The figure shows features formed as a result of depositional work of an underground water. Describe how stalagmite is formed. [2]



b) Write **TWO** negative impacts of tourism on Karst landscapes? [2]

c) Forest-based industry dominates in most Dzongkhags of Bhutan, except in Samtse and Sarpang. What are the long-term impacts of forest-based industries on forest ecosystems? [2]

d) Houses in Lunana have thick walls made of stone or rammed earth. The rooftops are typically sloped and made up of wood or slate. Why? Give **TWO** reasons [2]

- e) Many Bhutanese communities depend on biodiversity for their livelihood, including agriculture, forestry, and ecotourism. Develop a biodiversity protection plan in your community. **[2]**

