(Pages : 3) **N – 4061**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme Under CBCSS

Geography

Core Course

GG 1141 — PRINCIPLES OF GEOMORPHOLOGY

(2014 to 2017 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **all** questions. **Each** question carries **1** mark.

1. Geomorphology is the study of _____.

2. The concept of geosynclines was propounded by _____.

3. Tetrahedral hypothesis postulated by _____.

4. Example of old fold mountain _____.

5. The enlarged form of the volcanic vent is known as _____.

6. The science that deals with the seismic waves is called _____.

7. Decomposition and disintegration of rocks due to chemical reactions is known as _____.

P.T.O.

8. The deserts having mobile sands are called _____.

9. Rock-cut flat surfaces in front of cliffs in the erosional work of sea waves are called _____.

10. _____ is the acceleration of erosive power of the fluvial process (rivers) caused by a Variety of factors.

(10 × 1 = 10 Marks)

II. Answer any **eight** questions. Answer should not exceed a paragraph. **Each** question carries **2** marks.

11. What are the Terrestrial planets?

12. Distinguish between Sial and Sima.

13. What is a Longitude?

14. Write a short note on Block Mountains.

15. Give an account of Orogeny.

16. What is Rift Valley?

17. Explain the mechanism of Sheeting.

18. Give a short note on Monadnacks.

19. Explain the formation of yardangs.

20. Distinguish between stalactite and stalagmite.

21. Explain the mechanism of Mushroom rock.

22. Why our earth is unique planet?

(8 × 2 = 16 Marks)

III. Answer any **six** questions. Answer should not exceed 120 words. **Each** question carries **4** marks.

23. Describe the Big Bang Theory.

24. Briefly write about the principles of Uniformitarianism.

25. Critically evaluates the theory of Isostacy put forth by Pratt and Airy.

26. Define plate tectonics and examine the causes and effects of plate tectonics.

27. Illustrates various types of Faults.

28. What are exogenitic forces? Explain.

29. Briefly explain about the origin and types of soil.

30. What are the major topographies produced by the vulcanicity? Explain.

31. Explain the different types of Moraines and its origin.

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. **Each** question carries **15** marks.

32. Briefly explain the classifications of mountains and the process of mountain building.

33. Give a geographical account on the world distribution of Earthquakes.

34. Describe the Continental drift theory with illustration.

35. Explain the erosional and depositional landforms produced by running water.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 4062**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme Under CBCSS

Geography

Core Course

GG 1141 — PRINCIPLES OF GEOMORPHOLOGY

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** the questions in a word or in not more than two sentences.

1. An imaginary circle on the surface of a sphere whose center is the center of the sphere is known as _____.

2. The movement of the earth around the sun in a fixed path or orbit is called _____.

3. Crescent-shaped sand dune produced by the action of wind predominately from one direction is called _____.

4. The process of wearing away of landmass by various processes like weathering, mass movement, erosion and transportation is known as _____.

5. The boundary zone between the Earth's crust and the mantle is _____.

6. A seismic intensity scale used for measuring the intensity of shaking produced by an earthquake is _____.

P.T.O.

7. A plateau area that has been severely eroded such that the relief is sharp is called _____.

8. A layer parallel to the soil surface whose physical, chemical and biological characteristics differ from the layers above the beneath. The earth surface is called _____.

9. An icicle-shaped formation that hangs from the ceiling of a cave produced by precipitation of minerals from dripping water is called _____.

10. The mean radius of the Earth is _____.

(10 × 1 = 10 Marks)

II. Answer any **eight** of the following questions in a paragraph, **each** question carries **2** marks.

11. What is a latitude?

12. What are planetesimals?

13. Define the term tetrahedron.

14. Explain the three types of plate boundaries.

15. What is a standard time?

16. What is a geoid?

17. Distinguish between mud flow and debris flow.

18. Distinguish between normal and reverse faults.

19. What do you mean by cycle of erosion?

20. What is a terminal moraine?

21. Explain how waterfalls differ from rapids.

22. Prepare a note on the types of mountains.

(8 × 2 = 16 Marks)

III. Answer any **six** of the following questions in 120 words. **Each** question carries **4** marks.

23. Give an account of the types of Plains.

24. Briefly discuss nebular hypothesis.

25. Attempt a classification of the types of weathering.

26. Critically evaluate the binary star theory.

27. Briefly discuss the structure of the earth.

28. Discuss the erosional features formed by underground water.

29. Critically evaluate the theory of isostasy put forward by Pratt and Airy.

30. Explain the parts of a fold with the help of a diagram.

31. Explain the major causes of earthquakes.

(6 × 4 = 24 Marks)

IV. Write an essay on any **two** of the following. **Each** question carries **15** marks.

32. Briefly explain the theory of plate tectonics.

33. Explain the distribution of the major relief features of the earth.

34. Prepare a detailed account of the types of fold with illustrations.

35. Give a detailed account of soil profiles.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 4063**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme Under CBCSS

Geography

Core Course

GG 1141 — PRINCIPLES OF GEOMORPHOLOGY

(2020 Admission onwards)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions in a word or in not more than **two** sentences.

1. Water vapour and gases in the atmosphere were contributed by _____ process.

2. The theory explains the pair of stars in orbit around their common center of gravity.

3. A trough of stratified rock in which the beds dip toward each other from either side is known as _____.

4. The depression formed at the mouth of a volcanic vent is called _____.

5. Tetrahedral hypothesis postulated by _____.

6. The zone of separation between core and mantle is _____.

7. When magma reaches the earth's surface it is called _____.

P.T.O.

8. Tombolo is a feature formed due to the action of _____.

9. Name the instrument used to record the motion of the ground during an earthquake.

10. Kettle like small depression in the rocky beds of the river valleys are called _____.

(10 × 1 = 10 Marks)

II. Answer any **eight** questions in a paragraph, **each** question carries **2** marks.

11. How is a recumbent fold formed?

12. What do you mean by fumaroles?

13. Name the different kind of earthquake waves.

14. What are convergent plate boundaries?

15. What is soil profile?

16. Distinguish between alluvial plain and lacustrine plain.

17. What are the main assumptions of interstellar dust hypothesis?

18. What do you mean by Exogenic forces?

19. State the meaning of Isostasy.

20. Distinguish between Focus and Epicenter.

21. What is latitude and longitude?

22. What are the different types of lakes?

23. What do you meant by blind valley?

24. What is exfoliation in rocks?

25. Name the erosional features of sea waves.

26. What do you mean by strike and dip?

(8 × 2 = 16 Marks)

III. Answer any **six** questions in not more than **120** words each, **each** question carries **4** marks.

27. List out the demerits of Wegner's Continental Drift Theory.

28. What are nappes? Explain its formation with illustration.

29. Explain the erosional features of running water with illustration.

30. Attempt a detailed classification of mountains.

31. Describe gaseous hypothesis theory about the origin of earth.

32. Describe briefly the type of volcanic eruption and explain each.

33. Explain the depositional features of wind with illustration.

34. Describe any two theories on the origin of earth.

35. What is the cause of season on earth and explain the season in Northern and Southern hemisphere?

36. What is a moraine? Describe different kind of moraines.

37. Distinguish between symmetrical and asymmetrical fold.

38. Write a note on tidal hypothesis.

(6 × 4 = 24 Marks)

IV. Write an essay on any **two**, **each** question carries **15** marks.

39. Describe the process of faulting and its types with illustration.

40. Explain the structure and composition of the earth.

41. Briefly describe soil formation and soil classification.

42. Give a detailed account on concept of normal cycle of erosion.

43. What is weathering? Write in detail about the different kinds of weathering.

44. Explain the erosional and depositional landforms formed due to the work of glaciers.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 4064**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme under CBCSS

Geology

Complementary Course for Geography

GL 1131 : PHYSICAL GEOLOGY

(2013 – 2019 Admission)

Time : 3 Hours Max. Marks : 80

Instruction: Draw neat sketches wherever necessary.

I. Answer questions 1 to 10 in **one** word or maximum **2** sentences.

1. The slowest mass wasting process.

2. The discontinuity which separates mantle and core.

3. The most common landslides in Kerala.

4. The successive vertical layers of soil.

5. The upper level of zone of saturation.

6. The orogeny which caused the collision of Laurasia and Gondwanaland to form the single land.

7. A formation of hot water which ejected periodically.

P.T.O.

8. The temperature above which a material looses its magnetism.

9. The weathering process which involves the action of plants and animals

10. Age of the earth

(10 × 1 = 10 Marks)

II. Short answer (not to exceed **one** paragraph). Answer any **eight** questions.

11. Orogenic movements

12. Seismic waves

13. Geosyncline

14. Erosion

15. Crust

16. Sedimentary rocks

17. Perched water table

18. Stalacmite

19. Soil profile

20. Oxidation

21. Lithosphere

22. Transform plates

(8 × 2 = 16 Marks)

III. Short essay questions (not to exceed **120** words). Answer any **six** questions.

23. Absolute dating

24. Sea floor spreading

25. Paleomagnetism

26. Major soils of Kerala

27. Porosity and permeability

28. Rock cycle

29. Causes of landslides

30. Types of mountain

31. Sources of ground water

(6 × 4 = 24 Marks)

IV. Long essay. Answer any **two** questions. Illustrate with neat diagrams.

32. Write an essay on the geological work of ground water.

33. Discuss briefly about the internal structure of the earth with neat sketches.

34. What is weathering? Describe about different types of weathering.

35. Describe about the different types and classification of mass movements.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 4065**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme under CBCSS

Geology

Complementary Course for Geography

GL 1311 – PHYSICAL GEOLOGY

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark.

1. The inner core is ———————— kilometers thick.

2. ———————— rocks originate when particles settle out of water or air, or by precipitation of minerals from water.

3. How old do geologists believe the Earth is?

4. The chemical alteration of Earth materials brought on by reactions with some fluid or gas phase while at the Earth's surface is called ————————

5. What term is used to describe rocks being folded upwards?

6. Gravitational forces that cause rock or soll to slide down slopes are called ————————.

7. Define aquitard.

8. What is Groundwater?

9. During sediment transportation by wind or water, particles bounce and are scrapped against others. This process is referred to as ————————.

10. What are the three major causes of rocks to a fault?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each questions carries **2** marks.

11. How to determine the relative age of rocks?

12. How is the geologic time scale organized?

13. What are endogenic forces?

14. What is meant by weathering?

15. What is the process of ice wedging?

16. What is contact metamorphism?

17. Mention any four examples of dynamic metamorphic rocks?

18. What is an artesian aquifer?

19. What are the three types of fold mountains?

20. Which are the different types of wells?

21. What is Evaporation?

22. Discuss briefly about debris fall?

23. What is aquifuge?

24. Which are the five main types of volcanoes?

25. What is an exfoliation?

26. What is an era and which are the 4 eras in the geologic time scale?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. Each questions carries **4** marks.

27. Describe the internal structure of the earth with a neat diagram.

28. Briefly explain the metamorphism and types.

29. Discuss the convergent boundary with a neat sketch?

30. Write a short note on seafloor spreading.

31. What is paleomagnetism and why is it important?

32. Briefly explain about types of chemical weathering.

33. Explain the rotational slip mass wasting

34. Discuss the recharging properties of three types of aquifers.

35. What is the difference between a landslide and debris flow?

36. What is a soil profile?

37. What are the causes and effects of landslides?

38. What are Fault mountains? Give a neat diagram.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. Each questions carries **15** marks.

39. Write an essay on the geological time scale.

40. Elaborate in detail about the rock cycle process with a neat sketch.

41. Discuss in detail the soil formation and types of soil.

42. Write an essay on volcanic mountains.

43. Discuss in detail the different types of mass movement.

44. Write an essay on the geological work of groundwater.

(2 × 15 = 30 Marks)

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(Pages : 6) **N – 4067**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1131.3 : DESCRIPTIVE STATISTICS

(2017 – 2019 Admission)

Time : 3 Hours Max. Marks : 80

Use of Scientific Calculator is permitted.

SECTION – A

Answer **all** questions, each carries **1** mark.

1. Which is the highest level data measurement?

2. Give the example of a nominal level data.

3. What is the difference between qualitative and quantitative data?

4. Name any two graphical methods suitable for nominal data.

5. Sum of the deviations of a set of observations from their mean is ————————.

6. Among the two correlations –0.60 and 0.20, which is the strongest correlation?

7. Kurtosis measure ———————— of a distribution.

8. A graph that can be used to identify the nature of relation between two variables is ————————.

9. Write the relation between fourth raw moment and fourth central moment.

10. What is the correlation between x and y if they are connected by the relation $x + y - 3 = 0$?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions, each carries **2** marks.

11. With the help of an example explain, what is meant by an ordinal level data?

12. For the data given below construct a frequency and relative frequency tables.

    11, 4, 10, 4, 9, 3, 8, 10, 3, 14, 1, 10, 3, 5, 2, 2, 5, 6, 1, 2, 2, 3, 7, 1, 3, 7, 8, 10, 1, 4, 7, 5, 2, 2, 5, 1, 1, 3, 3, 1, 2, 1.

13. A recent survey showed that the typical Indian car owner spends Rs.2,950 per month on operating expenses. Below is a breakdown of the various expenditure items. Draw an appropriate chart to portray the data

Expenditure Item	Amount
Fuel	603
Interest on car loan	279
Repairs	930
Insurance and license	646
Depreciation	492

14. Explain the difference between a histogram and a Bar chart.

15. The following is the percent change in net income from last year to this year for a sample of 12 construction companies.

    5, 1, –10, –6, 5, 12, 7, 8, 2, 5, –1, 11

    Compute the mode.

16. Wendy's Restaurant sold medium, large and Biggie-sized soft drinks for Rs.9, Rs.12, and Rs.15 respectively. Of the last 10 drinks sold, 3 were medium, 4 were large, and 3 were Biggie sized. Find the mean price of the last 10 drinks sold.

17. A sample of n = 7 scores has a mean of M = 16. One score in the sample is changed from 6 to 20. What is the value for the new sample mean?

18. For the data given below compute the first and third quartiles.

    38, 40, 41, 45, 48, 48, 50, 50, 51, 51, 52, 52, 53, 54, 55, 55, 55, 56, 56, 57

19. The first four moments of a distribution about the value 5 of a variable are 2, 20, 40 and 50. Find the mean and the coefficient of skeweness.

20. If the GPA of the students in an examinations are 4.3, 4.9, 7.2, 6.7 and 11.6. Compute the standard deviation.

21. If the range of 100 observations is 320. What is the maximum observation in the set if the minimum is 500?

22. Explain the need of statistics in scientific studies.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions each carries **4** marks.

23. Using any suitable graphical technique estimate the median of the following data

Class:	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Freq:	3	6	24	64	50	29	14	6	4

24. The following table gives the marks obtained by some students. Calculate the mode :

Marks:	0-10	10-20	20-30	30-40	40-50
Freq:	3	13	18	12	5

25. The rainfall in centimetres of 14 districts was measured by the state department, But the measurement of, one of the districts was lost due to a damage in the instrument. An expert inspected the instrument suggested that the measurement was not over 7 centimetres. The mean of the remaining 13 observations was 7. Prove that the mean μ of all the 14 districts satisfies the inequality $6.5 \leq \mu \leq 7$.

26. From the sample prices of shares X and Y given below, state which share is more suitable for investment based consistency of price?

X:	5	4	2	3	6	8	2	1	9
Y:	7	7	5	5	6	7	3	4	2

27. The following data gives the frequency distribution of the wages of 72 labourers in a factory. Find the mean deviation about mean

Wages:	13-17	18-22	23-27	28-32	33-37	38-42	43-47	48-52	53-57
Labourer:	2	22	19	14	3	4	6	1	1

28. Compute the first three central moments of the data.

Class:	0-10	10-20	20-30	30-40
Freq:	2	22	19	14

29. Compute the correlation between X and Y and comment on the nature of relation

X:	3	5	6	7	10	11
Y:	8	12	11	14	16	17

30. For the two regression lines $8X - 10Y + 65 = 0$ and $40X - 18Y - 214 = 0$, determine the mean of *x* and *y*. Further, determine which one is the regression equation of X on *Y* and which one is the regression equation of *Y* on *X*.

31. Explain the concept of correlation analysis and regression analysis. What you mean by the statement "correlation does not imply causation"?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions each carrying **15** marks.

32. The following data give the one-way commuting times (in minutes) from home to work for a random sample of 50 workers.

23, 17, 34, 26, 18, 33, 46, 42, 12, 37, 44, 15, 22, 19, 28, 32, 18,
39, 40, 48, 16, 11, 9, 24, 18, 26, 31, 7, 30, 15, 18, 22, 29, 32,
30, 21, 19, 14, 26, 37, 25, 36, 23, 39, 42, 46, 29, 17, 24, 31

(a) Construct a frequency distribution using the classes 0-9, 10-19, 20-29, 30-39 and 40-49.

(b) Calculate the relative frequency and percentage for each class.

(c) Construct a histogram for the percentage distribution made in part b.

(d) What percentage of the workers in this sample commute for 30 minutes or more?

(e) Prepare the cumulative frequency, cumulative relative frequency, and cumulative percentage distributions using the table of part a.

33. The following data gives the number of text messages sent by a high school student on 40 randomly selected days during 2015:

32, 33, 33, 34, 35, 36, 37, 37, 37, 37, 38, 39, 40, 41, 41, 42, 42, 42, 43, 44, 44,
45, 45, 45, 47, 47, 47, 47, 47, 48, 48, 49, 50, 50, 51, 52, 53, 54, 59, 64

Calculate the values of the three quartiles Q_1, Q_2, Q_3 and the interquartile range Q_3, Q_1. Where does the value 49 fall in relation to these quartiles?

34. Calculate the first four central moments from the following data :

Rainfall(cm):	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No.of days:	3	5	9	15	21	10	7

Also compute the Pearson's coefficient of skewness and kurtosis.

35. For the following data find the equation to the best fitting exponential curve of the form $y = a e^{bx}$

x	1	2	3	4	5	6
y	1.7	4.5	13.5	40.2	124.0	280

Estimate the value of y when x = 8.

(2 × 15 = 30 Marks)

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(Pages : 6) **N – 4068**

Reg. No. : .....

Name : .....

First Semester B.Sc Degree Examination, June 2022

First Degree Programme Under CBCSS

Statistics

Complementary Course for Geography

ST 1131.3 : DESCRIPTIVE STATISTICS

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Which average is suitable for ordinal data?

2. The largest value is 60 and smallest value 40 and the number of classes desired is 5, then what is the width of the classes for forming a frequency distribution?

3. The average of squared deviations from the arithmetic mean is known as _____.

4. Find median of the following observations:

   10, 8, 6, 12, 5, 9, 11, 7, 16, 4, 14, 2

5. If for a distribution, Q1 = 10, Median = 16 and Q3 = 18, state the nature of skewness.

6. If the Karl Pearson coefficient of correlation between *X* and *Y* is 0.8, and regression coefficient of *X* on Y is 0.32, what is the regression coefficient of *Y* on *X*?

P.T.O.

7. Mean deviation is minimum when measured from _____.

8. Which measure of dispersion is appropriate in case of open end classes?

9. A distribution which is more flat-topped than a normal curve is known as _____.

10. What are the limits for correlation coefficient?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. **Each** question carries **2** marks.

11. Point out the objectives of classifying data.

12. Define frequency polygon. How is frequency polygon different from a frequency curve?

13. What is meant by measure of central tendency?

14. Define coefficient of variation, what purpose does it serve?

15. The mean mark of 100 students was found to be 40. Later on it was discovered that a score of 53 was misread as 83. Find the correct mean corresponding to the correct score.

16. In a moderately asymmetrical distribution, mode and mean are 40 and 36 respectively. Find the approximate value of median.

17. Define range. What are its merits?

18. Define Karl Pearson correlation coefficient.

19. Distinguish between qualitative and quantitative classifications.

20. The following data represent the number of books issued by a library on 12 different days.

    96, 180, 98, 75, 270, 80, 102, 100, 94, 75, 200, 610.

    Find quartile deviation

21. The variance and fourth central moment of a distribution are 2 and 11. Find coefficient of kurtosis.

22. Why median is called a positional average?

23. What are ogives? What is its use?

24. Find the standard deviation of 2, 1, 3, 2,4

25. From the equation of regression lines, $4X + 3Y + 7 = 0$ and $3X + 4Y + 8 = 0$, find mean values of X and Y.

26. Define Bowlyes measure of skewness.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. **Each** question carries **4** marks.

27. Explain briefly the important functions of Statistics.

28. What are the advantages of representing statistical data by diagrams and graphs?

29. Define dispersion. Why is standard deviation considered to be the most reliable measure of dispersion?

30. The arithmetic mean and standard deviation of a set of 9 observations are 43 and 5 respectively. If an observation 63 is added to the set, find the mean and standard deviation of 10 observations.

31. Distinguish between positive and negative correlations with examples.

32. Define rank correlation. Write down the Spearman rank correlation formula.

33. Explain briefly the need of statistical analysis in scientific studies.

34. Calculate mean deviation about mean for the following data:

Class	0-2	2-4	4-6	6-8
Frequency	4	2	5	3

35. The first four moments about origin of a distribution are 1, 4, 10, and 96 respectively. Comment upon the nature of distribution.

36. Karl Pearson coefficient of skewness of a distribution is 0.5. If the mean, median and mode of the distribution are 45,42 and 36 respectively. Find the coefficient of variation.

37. The coefficient of rank correlation of marks obtained by 10 students in two particular subjects was found to be 0.2. It was later discovered that the difference in ranks in two subjects obtained by one of the students was wrongly taken as 9 instead of 7. Find the correct value of rank correlation coefficient.

38. Obtain the equations of two lines of regression from the following information:

	X	Y
Arithmetic mean	36	85
Standard Deviation	11	8

Coefficient of correlation between X and Y is 0.66

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

39. (a) Explain the different scales of data measurements with examples.

(b) Draw the histogram for the following data:

Variable	100-110	110-120	120-130	130-140	140-150
Frequency	16	28	49	35	30

(c) Distinguish between subdivided and multiple bar diagrams.

40. (a) What are the desirable properties of a good average? Compare the merits and demerits of median and mode as measures of central tendency.

(b) Calculate median and mode for the following distribution:

Variable	0-20	20-40	40-60	60-80	80-100
Frequency	3	17	27	20	9

41. (a) Compute mean and standard deviation of following frequency distribution of marks:

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of students	3	61	132	153	140	51	2

(b) Compare the merits and demerits of mean deviation and quartile deviation as measures of dispersion.

42. (a) Fit an exponential curve of the form $y = ab^x$ to the following data:

x	1	2	3	4	5	6	7	8
y	1.1	1.2	1.8	2.5	3.6	4.7	6.6	9.1

(b) Explain scatter diagram method of measuring correlation in a bivariate distribution.

43. (a) Calculate coefficient of skewness based upon quartiles from the following frequency distribution:

Class	0-15	15-30	30-45	45-60	60-75	75-90	Above 90
frequency	20	30	30	35	45	15	5

(b) Calculate coefficient of correlation between X and Y series from the following data:

	Series X	Series Y
No. of pairs of observations	15	15
Arithmetic Mean	25	18
Standard deviation	3.01	3.03
Sum of squares of deviations from mean	136	138

Summation of product deviations of *X* and *Y* series from their respective means is 122.

44. Write short notes on the following:

(a) Functions of classification of data

(b) Frequency distribution

(c) Pie diagram

(d) Percentiles

(e) Correlation and regression

(2 × 15 = 30 Marks)

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(Pages : 3) **M – 2421**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Geology

Complementary Course

GL 1231 – GEOMORPHOLOGY AND MINERALOGY

(2014 - 2019 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions. Very short answer type questions (One word to Maximum 2 sentences)

1. Triangular shaped deposit seen at the river mouth.
2. Undersea mountain with a flat top.
3. Part of a river, where there is a sharp change in the channel slope.
4. A shallow depression by persistent movements of wind.
5. Small depressions ion the landscape of ten filled with water that form post - glaciation.
6. The point where the earthquake originates.
7. A pyroclastic material range from 2 to 64 mm.
8. Composition of Earth's core.
9. Fourth mineral in Moh's Scale of Hardness.
10. Phenomenon of producing electricity when a mineral is applied with stress.

(10 × 1 = 10 Marks)

P.T.O.

II. Answer any **eight** questions. Short answer questions (Not to exceed one paragraph)

11. Braided river.

12. Karst topography.

13. Moraines.

14. Continental crust

15. Longshore currents.

16. Sea mounts.

17. Atolls.

18. Hawaiian eruption.

19. Epicentre.

20. Lustre.

21. Streak.

22. Magnetite.

($8 \times 2 = 16$ Marks)

III. Answer any **six** questions short essay questions (Not to exceed 120 words).

23. Stream profile.

24. Fluvial Aggradational landforms.

25. Erosional features of glaciers.

26. Types of coral reefs.

27. Continental margin.

28. Discontinuities in the interiors of earth.

29. Calcite and Magnesite.

30. Types of Coal.

31. Fracture and cleavage.

(6 × 4 = 24 Marks)

IV. Answer any two questions. Long essay questions.

32. Write an essay on Geological work of winds.

33. Write an essay on ocean floor topography.

34. What are earthquakes? Give an account of their principal causes and effects.

35. Give an account on the classification and products of volcanoes.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 2422**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme Under CBCSS

Statistics

Complementary Course for Geography

ST 1231.3 : STATISTICAL METHODS

(2014 – 2016 Admission)

Time : 3 Hours Max. Marks : 80

Instruction : Use of Scientific calculator permitted. Graph paper shall be provided.

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Describe sample space. Give example.
2. Define mutually exclusive events.
3. Define probability density function.
4. Describe mathematical expectation.
5. Find the mean of binomial distribution.
6. Define Poisson distribution.
7. Describe sampling units.
8. Describe purposive sampling.
9. State Baye's theorem.
10. Describe correlation coefficient.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. **Each** question carries **2** marks.

11. Describe empirical definition of probability and mention its limitations.

12. Describe mutually independent events.

13. Two dice are thrown. Find the probability that

    (a) Total of the numbers on the dice is 12

    (b) Two dice show same number.

14. If $P(X = x) = \frac{x}{15}, x = 1,2,3,4,5$. Find $P(x \leq 3)$.

15. A random variable x has the probability density function $f(x) = kx^2(1 - x^3), 0 \leq x \leq 1$. Find k.

16. Find the mean and variance of Poisson distribution.

17. Describe Sampling errors.

18. Describe probability sampling. Give one example.

19. Let X be a binomial variate such that $P(x = 2) = 9P(x = 4)$, find the value of P when $n = 6$.

20. State and prove multiplication theorem on probability.

21. Describe Spearman's rank correlation coefficient.

22. Obtain the relationship between correlation and regression coefficients.

($8 \times 2 = 16$ Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

23. Let A and B be two events such that $P(A) = 0.4, P(B) = 0.3$ of $P(A \cap B) = 0.2$. Find

    (a) $P(\overline{A \cup B})$;

    (b) $P(\overline{A} \cup B)$

    (c) $P[\overline{A} \cap (A \cup B)]$

    (d) $P(A/\overline{B})$.

24. For any two events A and B, Prove that $P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B)$.

25. A random variable X has the probability function $f(x) = \frac{100}{x^2}, x \geq 100$. Find

    (a) $P(x \leq 150)$

    (b) $P[x < 200 / x > 150]$

26. An unbiased coin is tossed four time and let X denote the number of heads occured. Find the expected value of X.

27. Find the mode of Poission distribution.

28. What are the properties of normal distribution?

29. Describe stratified random sampling. Explain the situations where it is used.

30. Explain the lottery method of selecting a simple random sample without replacement.

31. With usual notations show that correlation coefficient is independent of change of origin and scale.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

32. (a) If the letters of the word 'REGULATIONS' be arranged at random, What is the probability that there will be exactly three letters in between *R* and *E*?

    (b) A and B alternatively cut a pack of cards and the pack is shuffled after each cut. If A starts the game is continued until one cuts a diamond card. What are the respective chances of A and B first cutting a diamond card?

33. (a) The length of time (in minutes) that a certain lady speaks on the telephone is found to be random phenomenon with the probability function

$$f(x) = \begin{cases} Ae^{-x/5} & x > 0 \\ 0 & otherwise \end{cases}$$

(i) Find A

(ii) Probability that she talks over phone

(1) more than 10 minute

(2) less than 5 minutes

(b) A random variable X has the following probability distribution.

x	0	1	2	3	4	5	6	7	8
$P(x)$	k	$3k$	$5k$	$7k$	$9k$	$11k$	$13k$	$15k$	$17k$

Find k. Also find the distribution function.

34. Obtain the recurrence relation of probabilities of Poisson distribution.

Fit a Poisson distribution for the following data.

x	0	1	2	3	4	5	6	7	8
frequency	56	156	132	92	37	22	4	0	1

35. The following are the marks in statistics (x) and mathematics (y) of 10 students

x	56	55	58	58	57	56	60	64	69	57
y	*68*	67	67	70	65	68	70	66	68	66

Calculate the correlation coefficient between X and Y. Also estimate the marks in mathematics of a student who secures 62 marks in statistics.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **M – 2423**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Geography

Foundation Course

GG 1221 : FUNDAMENTALS OF GIS AND REMOTE SENSING

(2014–2017 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions in a word or in not more than **two** sentences. **Each** question carries **1** mark.

1. Active Remote sensing
2. Albedo
3. Georeferencing
4. Platforms
5. Attribute data
6. Vertical air photos
7. Path Row
8. SQL
9. Co-ordinates
10. NASA

(10 × 1 = 10 Marks)

P.T.O.

II. Answer any **eight** questions in a paragraph each. **Each** question carries **2** marks.

11. Define spectral reflectance profile. Illustrate and discuss reflectance of Water.

12. Distinguish between active and Passive remote sensing

13. Give an account on GPS.

14. Discuss the properties of satellite imageries.

15. Differentiate between Along track scanning and Across track scanning.

16. What is meant by spectral signature?

17. What are the uses of GPS in GIS?

18. List out the uses of imageries.

19. What is meant by Point mode map digitizing?

20. What is Central point linear cartograms?

21. Brief an account of satellite remote sensing programmes of France.

22. Differentiate between Raster and vector data.

(8 × 2 = 16 Marks)

III. Answer any **six** questions in not more than 120 words each. **Each** question carries **4** marks.

23. Discuss the characteristics of electromagnetic radiation.

24. Provide a brief account of the different kind of sensors used in remote sensing.

25. Discuss the major kinds of Resolution.

26. Discuss the components of Remote sensing.

27. Give an account on the Functions of database management system.

28. Discuss the applications remote sensing in natural resource management.

29. Discuss the characteristics of spatial data.

30. What are Methods of attribute data error checking?

31. List out the components of GIS.

(6 × 4 = 24 Marks)

IV. Write essay on any **two**. **Each** question carries **15** marks.

32. Write essay on the elements of visual image interpretation?

33. Explain the various methods of data input in GIS.

34. Illustrate with examples the vector and raster overlay applications in GIS. List out the problems affecting overlay.

35. Briefly discuss of remote sensing programmes in India and its Applications.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 2424**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1231.3 : SAMPLING AND PROBABILITY DISTRIBUTIONS

(2017-2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each carries **1** mark.

1. What is a sample?

2. Define sampling frame.

3. What is the probability of selecting a boy from a class containing 4 boys and 3 girls?

4. In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?

5. Define conditional probability.

6. State addition theorem for two events.

7. Define distribution function of a random variable.

8. Can the function $f(x) = -\frac{1}{2}, \frac{1}{2}, \frac{1}{2}$ when x = 2, 3 and 4 respectively and 0 elsewhere be a pdf?

9. Define Bernoulli distribution.

10. Name the distribution in which mean is equal to variance.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each carries **2** marks.

11. Distinguish between census and sampling.

12. What is the difference between probability and non probability sampling?

13. Define mutually exclusive and mutually exhaustive events.

14. If $P(A) = \frac{2}{3}, P(B) = \frac{4}{9}$ and $P(A \cap B) = \frac{8}{27}$, examine whether A and B are independent?

15. What is the probability of getting a spade or an ace from a pack or cards?

16. Write down the sample space for tossing a coin until a head appears.

17. State Baye's theorem.

18. For the pmf, $p(x) = k\left(\frac{1}{2}\right)^x$, $x = 0, 1, 2, ...$, find k.

19. Distinguish between discrete and continuous random variables.

20. What are the axioms of probability mass function?

21. Define Poisson distribution and give a situation in real life where the distribution is likely to be realized.

22. In five throws of a fair coin, find the chance of getting 3 heads.

($8 \times 2 = 16$ Marks)

SECTION – C

Answer **any six** questions. Each carries **4** marks.

23. Distinguish between sampling and non sampling errors.

24. List some sources of secoudary data.

25. The probability that a student passes Statistics test is 2/3 and probability that he passes both Statistics and Mathematics test is 14/45. The probability that he passes at least one test is 4/5. What is the probability that he passes Mathematics test?

26. Give classical and axiomatic definition of probability.

27. Obtain the probability distribution of the number of heads when three coins are tossed together.

28. Given $P(A) = 0.30$, $P(B) = 0.78$, $P(A \cap B) = 0.16$. Find the probability of

    (a) At least one of the events occurs

    (b) Exactly one of the event occurs

    (c) None of the event occurs.

29. If a discrete random variable has the probability function as

x	0	1	2	3	4	5	6	7	8
$p(x)$:	k	2k	3k	5k	5k	4k	3k	2k	k

    then find k. Also find $E(X)$.

30. If a Poisson variate X is such that $P(X=1)=2P(x=2)$, find $P(X=0)$, mean and variance.

31. X is normally distributed and mean of X is 12 and standard deviation is 4. Find the probability of (a) $P(X \geq 20)$ and $P(0 \leq X \leq 12)$.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer **any two** questions. Each carries **15** marks.

32. Explain

    (a) Simple random sampling

    (b) Stratified sampling

    (c) Systematic sampling

33. From a group of 8 children, 5 boys and 3 girls, three children are selected at random. Calculate the probabilities that the selected group contains (a) no girl, (b) only one girl, (c) one particular girl, (d) at least one girl, and (e) more girls than boys.

34. In a bolt factory machines, A, B and C manufacture respectively 25%, 35% and 40% of the total. Of their output, 5,4,2 per cent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B and C?

35. A random variable Z takes the values –2,0, 3 and 8 with probabilities 1/12, 1/2, 1/6 and 1/4 respectively. Write down its distribution function and find $P(Z \geq 1)$ and $P(-1 < Z < 8)$.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **M – 2425**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Geography

Foundation Course

GG 1221 : FUNDAMENTALS OF GIS AND REMOTE SENSING

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions in a word or not more than **two** sentences. **Each** question carries **1** mark.

1. What is electromagnetic spectrum?.
2. What is spectral signature?.
3. What is Dispersion? -
4. Expand the term SLAR.
5. Name the part of the electromagnetic spectrum that can be detected by the human eye.
6. Define swath.
7. Define spectral reflectance curve.
8. What are Fiducial marks?
9. List out the components of an information system.
10. Define pixel.

(10 × 1 = 10 Marks)

P.T.O.

II. Answer any **eight** questions in a paragraph each. **Each** question carries **2** marks.

11. Define Orthorectification.

12. Write a note on atmospheric window.

13. Define photographic scale.

14. Differentiate between multispectral and hyperspectral scanners.

15. What do you mean by LIDAR?

16. Prepare a note on SPOT series mission.

17. Write a note on Low Earth Orbit.

18. Differentiate between spatial and attribute data.

19. Write a note on EOS-01.

20. Explain euclidean distance.

21. Explain the structure of vector data.

22. List out the advantages of manual map digitization.

(8 × 2 = 16 Marks)

III. Answer any **six** questions in not more than 120 words each. **Each** question carries **4** marks.

23. Explain the passive and active remote sensing with examples.

24. Prepare a brief account of the types of aerial photos.

25. Distinguish between push broom scanning and whisk broom scanning.

26. Discuss the advantages of satellite remote sensing.

27. Explain temporal resolution. How it is important in remote sensing?

28. Prepare a brief account on LANDSAT programme.

29. Briefly explain the sources of attribute data.

30. Discuss in detail the characteristics of spatial data.

31. Give an account of methods of data input in GIS.

($6 \times 4 = 24$ Marks)

IV. Write essays on any **two**. Each question carries **15** marks.

32. Give a detailed account on the working principles of remote sensing.

33. Give an account on applications of remote sensing.

34. Prepare a detailed account on the components of GIS.

35. Elaborate the sources of error and its rectification methods in GIS.

($2 \times 15 = 30$ Marks)

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(Pages : 4) **M – 2426**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Geography

Foundation Course

GG 1221 : FUNDAMENTALS OF GIS AND REMOTE SENSING

(2020 Admission Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A

I. Answer **all** questions in a word or not more than **two** sentences.

1. What is the altitudinal distance of a geostationary satellite from the earth?

2. Which remote sensing depends natural sources of energy?.

3. What refers to the relative brightness or colour of objects in an image?.

4. What is the Chinese satellite-based positioning systems?

5. What is a collection of software tools for the entry, organization, storage, and output of data?

6. What is the process of assigning a geographic or projection coordinate to a data item that is based on a street address, town, and state or country?

7. What is the science of measuring the shape of the Earth and locations on or in the Earth?

P.T.O.

8. What is the spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation?

9. What is the science and technology of obtaining spatial measurements and other geometrically reliable derived products from photographs?

10. What is a raster set of elevations, usually spaced in a uniform horizontal grid?

(10 × 1 = 10 Marks)

SECTION – B

II. Answer any **eight** questions in a paragraph each.

11. Define EMR.

12. What is Atmospheric Windows?

13. What is Thermal scanner?

14. Define Overlaps.

15. IRNSS or NAVIC

16. What is the scale of the air photos?

17. What IIRS?

18. What is SPOT?

19. List out the advantages of satellite imageries.

20. What is digital image processing?

21. What is photo mosaic?

22. What is topology?

23. What is vector and raster data?

24. What is Swath?

25. Define overlay analysis.

26. What is silver line polygon?.

(8 × 2 = 16 Marks)

SECTION – C

III. Answer any **six** questions in not more than 120 words.

27. Describe the resolution of a sensor.

28. Briefly explain the active and passive remote sensing.

29. Explain the concept and function of GPS.

30. What are the types of air photo?

31. Briefly explain the satellite programme of France.

32. Bring out the advantage of satellite remote sensing.

33. Describe the components of GIS.

34. Briefly explain about georeferencing.

35. Write a short note on data input methods in GIS.

36. Briefly explain the types of data errors in GIS.

37. Briefly explain the overlay analysis. Identify, What are the overlay methods?

38. What do you mean by buffering and explain types of buffering technique?

(6 × 4 = 24 Marks)

SECTION – D

IV. Write essay on any **two**.

39. Explain the history and development of remote sensing.

40. Describe about the spectral signature concepts. Identify what are the characteristic of EMR interaction with soil particles.

41. Briefly explain different types of scattering in remote sensing.

42. Briefly explain the characteristics of spatial data.

43. Briefly explain the elements of visual image interpretation.

44. Describe the importance of GIS in management and planning.

($2 \times 15 = 30$ Marks)

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(Pages : 4) **M – 2427**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Geology

Complementary Course

GL 1231 : GEOMORPHOLOGY AND MINERALOGY

(2020 Admission Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A (Very Short Answer type)

Answer **all** questions (**One** word or **one** sentence). **Each** question carries **1** mark.

1. Sorted sediment deposited by a stream.
2. A coral reef that develops as a circular reef surrounding a lagoon.
3. Seismic waves that pass through the interior of the Earth
4. The tendency of a mineral to break along preferred planes
5. Discontinuity between Crust and Mantle.
6. Type of lustre seen in quartz.
7. Composition of Gypsum.
8. Name a mineral crystallizing in Tetragonal system.

P.T.O.

9. The record of an earthquake produced by seismograph.

10. A steep walled valley shaped by glacial erosion.

(10 × 1 = 10 Marks)

SECTION – B (Short answer type)

Answer any **eight** questions. **Each** question carries **2** marks.

11. Diagnostic properties of Quartz.

12. Composition of Magnetite and Chromite.

13. Moh's scale of Hardness.

14. Cleavage and fracture.

15. Faces and edges of Crystals.

16. Crystal axes of Isometric crystals.

17. Seismic belts of the world.

18. Magnitude of Earthquakes

19. Central and fissure types of volcanic eruption.

20. Continental shelf and Continental slope.

21. Continental glaciers.

22. V shaped valley.

23. Erosional work of streams.

24. Alluvial plain.

25. End moraines.

26. Deflation hollows.

(8 × 2 = 16 Marks)

SECTION – C

Not to exceed **120** words. Answer any **six** questions. **Each** question carries **4** marks.

27. Types of Streams

28. Degradational landforms of streams.

29. Features associated with mountain glaciers.

30. Types of Dunes.

31. Causes of sea level changes.

32. Coral reefs.

33. Products of volcanic eruption.

34. Types of Seismic waves.

35. Write a note on ore forming minerals.

36. Compare the physical properties of Biotite and Hornblende.

37. Describe the diagnostic properties of Kyanite and Sillimanite.

38. Describe the importance of magnetism and hardness in mineral identification with suitable examples.

(6 × 4 = 24 Marks)

SECTION – D (Long Answer Type)

Answer any **two** questions. **Each** question carries **15** marks.

39. Write an essay on physical properties of minerals.

40. Describe the significance of crystal study in mineral identification.

41. Describe the interior of the Earth as inferred from seismic studies.

42. Write an essay on geological action of wind.

43. Elaborate the role of stream as a geological agent.

44. Describe the features of Submarine topography with neat sketches.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 2428**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme Under CBCSS

Statistics

Complementary Course for Geography

ST 1231.3 : SAMPLING AND PROBABILITY DISTRIBUTIONS

(2020 Admission Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Define sample space.
2. Define non-sampling errors.
3. What do you mean by Simple Random Sampling?
4. Define an event.
5. Define conditional probability.
6. Give the classical definition of probability.
7. Define a discrete random variable.
8. What are the properties of a probability density function?

P.T.O.

9. Define a Bernoulli random variable.

10. Write the probability mass function of a Binomial random variable.

($10 \times 1 = 10$ Marks)

SECTION – B

Answer any **eight** questions. **Each** question carries **2** marks.

11. What are the sources of primary and secondary data?

12. Define probability sampling. Name some of them.

13. What is the advantage of stratification of a data?

14. Distinguish between deterministic and random experiments. Give examples.

15. What do you mean by exhaustive and equally likely events?

16. What are the disadvantages of the frequency definition of probability?

17. What the important properties of classical definition of probability?

18. A single card is drawn at random from a standard deck of 52 playing cards. Find the probability that the card is a red king.

19. If $P(A) = 0.3$, $P(B^C) = 0.4$, $P(A \cap B) = 0.2$, find (a) $P(A/B)$ and (b) $P(A \cup B)$.

20. Give the axiomatic definition of probability stating clearly the axioms involved.

21. Define distribution function of a random variable and hence mention its properties.

22. Define the probability density function of a continuous random variable X.

23. Mention the important properties of mathematical expectation.

24. A Binomial distribution has parameters $n = 9$ and $p = 1/3$, find its mean and variance.

25. Give some applications of a Poisson distribution.

26. If X has a Normal distribution with mean μ and a standard deviation σ, what is

    (a) $P(X > \mu)$ and (b) $P(X > \mu + 1.96\sigma)$.

($8 \times 2 = 16$ Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

27. What are the advantages and disadvantages of using a secondary data?

28. Explain the lottery method of drawing a simple random sample without replacement.

29. What do you mean by non-probability sampling techniques? Explain any one such method of sampling.

30. Distinguish between mutually exclusive and independent events. Give examples of each.

31. Explain the mistakes if any in the following statements.

    (a) $P(A) = 0.1,\ P(A \cap B) = 0.2$, (b) $P(A) = 0.87$, $P(A \cup B) = 0.78$.

32. Tom speaks truth in 30 percent cases and Jerry speaks truth in 25 percent cases. What is the probability that they would contradict each other?

33. Define conditional probability of an event. How it is used to define the independence of any two events?

34. Given $P(A) = P(B) = P(C) = 0.4$, $P(A \cap B) = P(A \cap C) = P(B \cap C) = 0.2$ and $P(A \cap B \cap C) = 0.1$, find the probabilities of (a) at least one of the events and (b) none of the events happen.

35. Two unbiased dice are rolled once and observe the face numbers that come up. Write the sample space and find the probability that both the faces show the same numbers.

36. If $f(x) = \frac{1}{3}$ for $x = 0, 1, 2$ is the probability mass function of a random variable X, then find $E(X)$ and $V(X)$.

37. Mention some important properties of the Binomial distribution.

38. Narrate the importance and some properties of the Normal distribution.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

39. Discuss on Stratified Random Sampling and Systematic Random Sampling techniques. What are their advantages and disadvantages?

40. A discrete random variable X has the following probability function :

X = x :	0	1	2	3	4	5	6	7	8
p(x):	k	3k	5k	7k	9k	11k	13k	15k	17k

Find

(a) the value of k, (b) P(X<3), (c) P(0<X<2), (d) P($X \leq 1$) and (e) P(X>7).

41. State and prove the addition law of probability of two events. State the law for three events.

42. There are 2 bags, each containing respectively 4 white and 3 black balls and 3 white and 7 black balls. A bag is chosen at random and a ball is drawn from it. Find the probability that the ball is white. If the ball is white, what is the probability that it is from the first bag?

43. The probability mass function of a random variable X is as follows. Find the distribution function, mean and variance of X.

X = x :	–3	–2	–1	0	1	2	3
p(x):	0.05	0.10	0.30	0	0.30	0.15	0.10

44. An unbiased coin is tossed 3 times independently and we observe the number of times the head occurs. Write down the (a) sample space, (b) probability mass function, (c) distribution function and also find the probabilities that there is (d) no heads, (e) exactly one head and (f) atmost 2 heads occurring.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 2631**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022.

First Degree Programme under CBCSS

Geology

Complementary Course for Geography

GL 1331 – PETROLOGY AND STRUCTURAL GEOLOGY

(2013 – 2018 Admission)

Time : 3 Hours Max. Marks : 80

(Draw neat sketches wherever necessary)

I. Answer **all** questions in one word or maximum up to two sentences.

1. Schistosity
2. Recumbent fold
3. Essential minerals of diorite
4. Hade
5. Geanticline
6. Ripple marks
7. Laterite
8. Mafic magma

P.T.O.

9. Synform

10. Arenites

(10 × 1 = 10 Marks)

II. Write short answers to **any eight** of the following

11. Pahoehoe lava

12. Overturned fold

13. Slickenside

14. Pumice

15. Contour

16. Pegmatite

17. Attitude of formations

18. Convolute bedding

19. Rift valley

20. Oligomictic conglomerate

21. Stylolitic joints

22. Primary magma

(8 × 2 = 16 Marks)

III. Write short essays on **any six** of the following

23. Parts of a fold

24. Major textural classes of sedimentary rocks

25. Physical properties of magma

26. Lineation

27. Granulites

28. Structural landforms

29. Factors of metamorphism

30. Discordant intrusive forms

31. Mechanics of jointing

(6 × 4 = 24 Marks)

IV. Write long essays on **any two** of the following:

32. Compare between topographical and geological maps. Add a note on the techniques of their preparation.

33. Describe the various textures of igneous rocks.

34. Explain development of foliations in deformed rocks. Describe the different types of foliations.

35. Describe the different types of metamorphism based on geological setting.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 2632**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme Under CBCSS

Statistics

Complementary Course for Geography

ST 1331.3 –– STATISTICAL INFERENCE

(2013-2016 Admissions)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each carries **1** mark.

1. Define estimator.
2. What are the desirable properties of a good estimator?
3. Find an unbiased estimator of the parameter of Poisson distribution.
4. Define sufficient estimator.
5. Define t-statistics.
6. Describe null hypothesis.
7. Define power of a test.
8. Define simple hypothesis. Give an example.

P.T.O.

9. Give the test statistic used to test significance of proportion.

10. Describe critical region.

($10 \times 1 = 10$ Marks)

SECTION – B

Answer any **eight** questions. Each carries **2** marks.

11. Describe confidence interval.

12. If $(x_1, x_2, \ldots x_n)$ is a random sample from a normal population $N(\mu, 1)$, show that $t = \frac{1}{n}\varepsilon^n x_i^2$ is unbiased estimator of $\mu^2 + 1$.

13. Distinguish between Standard Deviation (SD) and Standard Error (SE).

14. Explain the method of moments.

15. Define chi-square statistic and mention one of its applications.

16. Describe two types of errors in testing of hypotheses.

17. State central limit theorem.

18. Discuss the large sample test for testing the significance of mean.

19. Discuss the small sample test for the significance of variance.

20. Give the test statistics used to test the equality of two proportions.

21. Obtain the 100(1-α)% confidence interval of population mean based on a large sample of size n from $N(N, \sigma_0^2)$.

22. Describe F-statistic and mention one of its applications.

($8 \times 2 = 16$ Marks)

SECTION – C

Answer any **six** questions. Each carries **4** marks.

23. Obtain an unbiased estimator of population variance. Examine whether it is a consistent estimator.

24. Find the sufficient estimator of P in $B(n, P)$.

25. A random sample of 500 apples was taken from a large consignment and 60 were found to be bad. Obtain 98% confidence interval for the proportion of bad apples in the consignment ($(z_{01} = 2.33)$.

26. Before an increase in excise duty on tea, 800 persons out of 1,000 were found to be tea drinkers. After an increase in excise duty 800 out of 1,200 were tea drinkers. Examine whether there is decrease in the consumption of tea at 5% level.

27. Describe small sample test for equality of two variances.

28. Find the moment estimators of m of n in $f(x,m,n) = \frac{m^n}{\sqrt{n}} e^{-mx} x^{n-1}$, $x > 0$.

29. Obtain the sampling distribution of the mean of samples from a normal population.

30. Describe paired t-test.

31. Test the hypothesis that $\sigma = 10$, given that sample standard deviation is 15 for a random sample size 50 from a normal population.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer any **two** questions. Each carries **15** marks.

32. (a) Describe the method of interval estimation.

(b) Obtain the confidence interval for the proposition of success of a binominal population.

(c) A medical study showed 57 of 300 persons failed to recover from a particular disease. Find 95% confidence interval for the mortality rate of the disease.

33. (a) Describe the relation between χ^2, t and F.

(b) Two random samples gave the following results.

	Size	Mean	Sum of squares of deviations from mean
Sample I	10	15	90
Sample II	12	14	108

Test whether the samples can be from same normal population.

34. (a) Describe efficiency of an estimator.

A random sample $(X_1, X_2, X_3, X_4, X_5)$ of size 5 drawn from a $N(\mu, \sigma^2)$ population, consider the following estimators

$$t_1 = (X_1 + X_2 + X_3 + X_4 + X_5)/5;\ t_2 = \frac{X_1 + X_2}{2} + X_3$$

$$t_3 = (2X_1 + X_2 + \lambda X_3)/3$$

(i) Find the value of λ such that t_3 is unbiased estimator of μ.

(ii) Examine whether t_1 and t_2 are unbiased for μ

(iii) Which estimator is more efficient?

(b) Obtain the sufficient estimators of μ and σ^2 in $N(\mu, \sigma^2)$.

35. Explain large sample test for testing the equality of two means.

Random samples drawn from two countries gave the following data relating to the heights of adult males

	Country A	Country B
Mean height	67.42	67.25
S.D.	2.58	2.5
Sample size	1000	1200

(a) Is the difference between means significant?

(b) Is the difference between standard deviation significant?

($2 \times 15 = 30$ Marks)

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(Pages : 4) **N – 2633**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1331.3 : STATISTICAL INFERENCE

(2017 & 2018 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Define a statistic.

2. What is the distribution of the sample mean if observations are from a Normal population?

3. Define a chi-square random variable.

4. What do you mean by statistical inference?

5. What is called confidence coefficient?

6. Define a hypothesis.

7. What is power of a test?

8. Which parametric test is usually carried out in large samples?

P.T.O.

9. When do you go for a small sample test?

10. Write the test statistic for testing the specified population proportion.

($10 \times 1 = 10$ Marks)

SECTION – B

Answer any **eight** questions. **Each** question carries **2** marks.

11. Define a student's t statistic. What are the uses of it?

12. What do you mean by degrees of freedom? Give an example.

13. State the central limit theorem, clearly mentioning the assumptions involved.

14. Mention the properties of good estimate.

15. Show that the sample mean is an unbiased and consistent estimate of the parameter of a Poisson distribution.

16. What is the difference between an estimate and an estimator?

17. Define the two types of errors in testing of hypotheses.

18. Describe the steps in a statistical test procedure.

19. How can you decide whether a test is one-tailed or two tailed.

20. Give the test for the mean of a population where the population S.D is unknown and the sample size is less than 30.

21. How can we test $H_0 : \sigma^2 = \sigma_0^2$ (specified value) against $H_1 : \sigma > \sigma_0^2$ of a Normal population?

22. What are the assumptions in a χ^2 test?

($8 \times 2 = 16$ Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

23. Define an F statistic and discuss its applications.

24. Distinguish between point estimation and interval estimation.

25. Obtain the confidence interval for the mean of Normal population when σ is known.

26. Distinguish between simple and composite hypothesis.

27. Discuss the method of moments.

28. Explain the test for the testing $H_0 : \mu = \mu_0$ *Vs* $H_1 : \mu = \mu_1$, when the specified value $\mu_0 > \mu_1$ and σ^2 is unknown.

29. Describe the procedure for testing the equality of proportions of samples from two populations.

30. Explain the test for the equality of variances of two Normal populations.

31. Discuss the paired t test, mentioning the assumptions involved.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

32. Establish the inter relations between the χ^2, t and F statistics. Give an example of each one of these statistics.

33. A random sample size of 16 obtained from a Normal population with variance 6.25 and mean μ is 23,29,27,21,28,25,22,18,31,30,27,20,25,24,20,22. Determine (1) a point estimate for μ and (2) a 95% confidence interval for μ.

34. Two independent samples from population are shown below. Test whether the two populations have the same variance.

Sample I	60	65	71	74	76	82	85	87		
Sample II	61	66	67	85	78	63	85	86	88	91

35. (a) A factory was producing electric bulbs of average life of 2000 hours. A new process was introduced with the hope that the length of life of the bulbs would increase. A sample of 50 bulbs produced by the new process and was found to have an average life length of 2200 hours and S.D 300. Examine whether it is reasonable to think that the length of the life of the bulbs has increased.

(b) Two samples of sizes 12 and 10 respectively gave the following data:

mean of the first sample = 1050, S.D of the first sample = 68, mean of the second sample = 980, S.D. of the second sample = 74. Test the equality of means of the populations at 5% level.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **N – 2635**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Geography

Core Course

GG 1341 : CLIMATOLOGY AND OCEANOGRAPHY

(2014–2017 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions in a word or **not** more than **two** sentences.

1. Evaporation that occurs directly from the solid phase below the melting point is ——————

2. Define temperature inversion.

3. Which layer of atmosphere is defined as the 'Theatre for all weather phenomena'?

4. The warm and dry winds in North America is known as ——————

5. What is the name of tropical cyclone formed in the Western Australia?

6. The amount of solar energy absorbed directly by the atmosphere is ——————

7. Differentiate Cove and cave.

8. Peru current is also called as ——————

P.T.O.

9. What is marginal sea?

10. What is high tide line?

(10 × 1 = 10 Marks)

II. Answer any **eight** questions in a paragraph each.

11. How do land and sea breeze occur?

12. What is solar insolation? List out the factors affect the distribution of insolation?

13. Write a note on horse latitude.

14. Write a note on convective region of the atmosphere.

15. Differentiate weather and climate.

16. What are condensation and its different forms of condensation?

17. Give an account on the weather conditions associated with anticyclone.

18. What do you mean by ionosphere? Discuss their significance.

19. What is mid Atlantic ridge? Why it is important?

20. What is submarine canyon?

21. Differentiate spring tide and neap tide.

22. Give a note on Gulf Stream.

(8 × 2 = 16 Marks)

III. Answer any **six** of the following in not more than **120** words.

23. Describe the different types of rainfall.

24. Write a note on classification of low level clouds.

25. Explain the causes and effects of global warming.

26. Explain the planetary wind system.

27. Explain the formation and characteristics of tropical cyclone.

28. Discuss the ozone depletion.

29. Describe the bottom relief of the Indian Ocean.

30. Explain the importance of marine resources.

31. Give an account on the relief features of an ocean.

(6 × 4 = 24 Marks)

IV. Write an **essay** on any **two** of the following.

32. Write an essay on the composition and structure of the atmosphere.

33. What is an air mass? Explain different types of air masses.

34. Describe the currents of Pacific Ocean.

35. Explain the formation and types of coral reefs.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 2636**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Geography

Core Course

GG 1341 : CLIMATOLOGY AND OCEANOGRAPHY

(2018 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions in a word or not more than two sentences. Each carries **1** mark. :

1. The portion of incident radiation reflected back from a surface of a body is called ————————

2. The increase of temperature with increasing altitude in the troposphere is called ————————

3. The lines joining the places of equal atmospheric pressure is called ————————

4. A high velocity wind blowing in the upper troposphere is called ————————

5. A slopping boundary between two opposing air masses is called ————————

6. Tropical cyclone in Australia is known as ————————

7. Name the deepest oceanic trench

8. A coralline platform lying close to the shore extending outwards from the mainland ————————

P.T.O.

9. A large amount of floating sea weed gathers in the North Atlantic ocean is known as ————————

10. A very high tide occurs when the sun, moon and earth are almost in the same line ————————

(10 × 1 = 10 Marks)

II. Answer **any eight** questions in a paragraph each. Each carries **2** marks.

11. What is temperature inversion?

12. Give a brief note on ozone depletion.

13. Differentiate fog and mist.

14. What is advection?

15. Write a note on convectional rain.

16. What is mistral?

17. What is tropical cyclone?

18. Write a short note on evaporation.

19. Prepare a brief note on abyssal plain.

20. What are guyots?

21. Write a brief note on barrier reef.

22. What is isohaline?

(8 × 2 = 16 Marks)

III. Answer **any six** of the following in **not** more than **120** words. Each carries **4** marks.

23. Explain the factors controlling insolation.

24. Prepare a brief note on local winds.

25. Explain planetary winds.

26. Classify and explain air clouds.

27. Explain the characteristics of temperate cyclone.

28. Write a note on global warming.

29. Write a note on horizontal distribution of temperature of oceans.

30. Prepare a note on tides.

31. Classify and explain coral reef and its formations.

(6 × 4 = 24 Marks)

IV. Write an essay on **any two** of the following. Each carries **15** marks.

32. Describe the major pressure belts of the world.

33. Classify and explain the major types of air masses in the world

34. Describe the bottom relief of the Pacific ocean.

35. Explain the currents of Atlantic ocean.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 2637**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022.

First Degree Programme under CBCSS

Geology

Complementary Course for Geography

GL 1331 – PETROLOGY AND STRUCTURAL GEOLOGY

(2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Instruction : Draw neat sketches wherever necessary

I. Answer questions 1 to 10 in one word or maximum 2 sentences:

1. The last mineral assume to crystallize from a melt.

2. Fold with horizontal axial plane

3. Dip measured in any direction other than true dip.

4. Hornfels are examples for which type of metamorphism.

5. The coarse grained equivalent of basalt.

6. The term used to represent the *size,* shape and arrangement of the component minerals in the sedimentary rocks.

7. Process of extensive chemical changes during metamorphic transformation

8. A reverse fault in which the fault plane is inclined at an angle equal to or less than 45°

9. Grain size for coarse grained igneous rocks.

10. The metamorphic product of shale.

(10 × 1 = 10 Marks)

SECTION – B

II. Short answer (not to exceed one paragraph). Answer **any eight**. Each question carries **2** marks.

11. Regional metamorphism

12. Secondary structures

13. Synform

14. Hade

15. Basalt

16. Clinometer compass

17. Apparent dip

18. Types of magma

19. Slickenside

20. Anticline

21. Sills

22. Outcrops

23. Directive texture

24. Gabbro

25. Quartzite

26. Strike slip fault

(8 × 2 = 16 Marks)

SECTION – C

III. Short essay questions (not to exceed **120** words). Answer **any six**. Each question carries **4** marks.

27. Types of joints

28. Isoclinal and recumbent folds

29. Classification of igneous rocks based on colour

30. Discontinuous reaction series

31. Agents of metamorphism

32. Geological maps

33. Foliation and Lineation

34. Charnockite and khondalite

35. Classification of igneous rocks based on silica content

36. Metamorphic zone and grade

37. Porphyritic texture

38. Metamorphic differentiation

(6 × 4 = 24 Marks)

SECTION – D

IV. Long essay. Answer **any two**. Illustrate with neat diagrams. Each question carries **15** marks.

39. What is a fault? Explain different types faults in the field with neat sketches.

40. Describe major type of textures seen in the igneous rocks.

41. Write an essay about different types of unconformities and its recognition in the field.

42. Discuss the major primary structures of sedimentary rocks.

43. Give an account of the classification of sandstones.

44. Write an essay on the discordant forms present in the igneous rocks with neat sketches.

(2 × 15 = 30 Marks)

———————

(Pages : 4) **N – 2638**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Geology

Complementary Course for Geography

GL 1331 – Geology III – PETROLOGY AND STRUCTURAL GEOLOGY

(2020 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A (Very Short Answer type)

Answer **all** question (One word or **one** sentence); **Each** carries **1** mark.

1. A type of extrusive volcanic rock, produced when lava with a very high content of water and gases is discharged from a volcano.

2. Name the igneous rock formed as a result of cooling of mafic lava on the earth's surface.

3. Name a clastic sedimentary rock that are composed of large angular fragments.

4. A foliated metamorphic rock that is primarily composed of quartz, mica, chlorite, and sericite.

5. The name given to a visible exposure of bedrock or ancient superficial deposits on the surface of the Earth.

6. The term used to represent "a time during which no sediments were preserved in a region or were subsequently eroded before the next deposition".

P.T.O.

7. A very tight fold, in which the limbs are parallel or nearly parallel to one another is called.

8. A lowland region that forms where Earth's tectonic plates move apart.

9. A break of natural origin in a layer or body of rock that lacks visible or measurable movement parallel to the surface of the fracture.

10. Name the type of metamorphism occuring adjacent to igneous intrusions.

(10 × 1 = 10 Marks)

SECTION – B (Short answer type)

Answer any **eight** questions, Each carries **2** marks.

11. Recumbent fold

12. Porphyritic texture

13. Fabric

14. Dunite

15. Nappe

16. Clastic and non-clastic sedimentary rocks

17. Laterite

18. Charnockite

19. Protolith

20. Apparent dip and True dip

21. Topographical maps

22. Host and Graben

23. Geosyncline

24. Shale

25. Brittle and Ductile deformation

26. Pegmatite

(8 × 2 = 16 Marks)

SECTION – C

(Short essay type not to exceed **120** words) Answer any **six** questions; Each carries **4** marks.

27. Monocline and anticline

28. Foliation and lineation.

29. Types of unconformities and its geological significance.

30. Types of metamorphism.

31. Differentiate schist, gneiss and granulites.

32. Discordant and concordant forms.

33. Texture of igneous rocks.

34. Explain stress and strain. Add a note on its types.

35. Primary and secondary sedimentary structures.

36. Udden Wentworth grade scale.

37. Lava and its types.

38. Differentiate the granite, gabbro and syenite rocks.

(6 × 4 = 24 Marks)

SECTION – D (Long essay type)

Answer any **two** questions. **Each** carries **15** marks.

39. Define joint. Explain geometrical classification of joints. Add a note on the geological significance of joints.

40. Write an essay on the geometric descriptions and classification of folds?

41. Discuss with neat diagrams the texture of metamorphic rocks?

42. Define fault. Explain the parts of a fault. Add a note on the types of faults.

43. Write an essay on the classification of igneous rocks.

44. What is magma? Explain the various characteristics of magama.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 2639**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1331.3 – STATISTICAL INFERENCE

(2019 & 2020 Admission)

Time : 3 Hours Max. Marks : 80

(Use of statistical Table and Calculator and Permitted)

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Define parameter.
2. What are degrees of freedom?
3. Define efficient estimator.
4. What is an interval estimate?
5. Define the term ‘test of hypotheses’.
6. Define Type I error.
7. Define test statistic.

P.T.O.

8. Give the test statistic for testing the equality of means of two independent small samples.

9. State the test statistic for testing $H_0 : p = p_0$ against $H_1 : p \neq p_0$

10. Define critical region.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. **Each** question carries **2** marks.

11. Define F distribution.

12. Write the distribution of chi square.

13. State central limit theorem.

14. Define consistent estimators.

15. Define point estimation and give an example.

16. Give the formula for obtaining confidence limits for the difference between the mean of two normal populations.

17. Define type II error and power of the test.

18. Distinguish between simple and composite hypotheses.

19. What are the uses of standard error?

20. What are the assumptions of t test?

21. Define t distribution.

22. If the sample values are 1,3,4,5,6,9, then find the SD of the sample mean.

23. Define the level of significance.

24. Define sampling distributions.

25. Show that F statistic is the ratio of two chi square statistics.

26. Write the F statistic for equality of variance.

($8 \times 2 = 16$ Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

27. Explain the procedure of one sample test for mean.

28. If T is an unbiased estimator of θ, show that T^2 and $\sqrt{T}$ are the biased estimator of θ^2 and $\sqrt{\theta}$ respectively.

29. Show that sample mean $\bar{x}$ is the consistent estimator for the population mean μ

30. If the mean age at death of 64 men engaged in an occupation is 52.4 years with standard deviation of 10.2 years. What are the 98% confidence limits for the mean age of all men in that occupation?

31. Briefly explain the desirable properties of a good estimate.

32. Explain the procedure for testing the variance of a population.

33. Examine whether the sample variance is an unbiased estimator of the population variance for a normal population $N(\mu, \sigma^2)$.

34. Prove that in estimating the mean of normal population, sample mean is more efficient than the sample median. (variance of sample median = $\frac{\pi\sigma^2}{2n}$)

35. The hypothesis $H_0 : \theta = 2$ is accepted against $H_1 : \theta = 5$ if $X \leq 3$ when X has an exponential distribution with mean θ. Find the probability of type I error.

36. Explain the procedure for testing the proportion of success of a population.

37. Define F statistic and write the pdf of F distribution.

38. Briefly define the term 'Statistical Inference'.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

39. Obtain the 95%, 98% and 99% confidence interval for the mean of a normal population $N(\mu, \sigma^2)$.

40. Estimate μ and σ^2 by the method of moments for the normal distribution $N(\mu, \sigma^2)$.

41. Before an increase in excise duty on tea 800 persons out of a sample 1000 persons were found to be tea drinkers. After an increase in duty 800 people tea drinkers in a sample of 1200 people. Test whether there is significant decrease in the consumption of tea after the increase in duty.

42. The following are samples from two independent normal populations. Test the hypothesis that they have the same mean assuming that the variances are equal by taking the level of significance as 5%.

    Sample 1: 14, 18, 12, 9, 16, 24, 20, 21, 19, 17

    Sample 2: 20, 24, 18, 16, 26, 25, 18

43. A farmer surveyed 4 acres of land and found the following production of rice in quintals, 1269, 1271, 1263, 1265 and decided that his production should have a SD of 2 quintals. Test at 5% level of significance whether his data is consistent with his supposition.

44. (a) Given in the usual notation

    $n1 = 400 \qquad \bar{x}1 = 250 \qquad \sigma 1 = 40$

    $n2 = 400 \qquad \bar{x}2 = 220 \qquad \sigma 2 = 55$

    Test whether the two samples have come from populations having the same mean.

    (b) A sample of 900 members is found to have a mean of 3.4 cm and SD 2.61. Could it be reasonably regarded as a sample from a large population whose mean is 3.25 cm. Use two tailed test for 1% level of significance.

($2 \times 15 = 30$ Marks)

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(Pages : 4) **N – 2640**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Geography

Core Course

GG 1341 : CLIMATOLOGY AND OCEANOGRAPHY

(2019 & 2020 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **all** questions. **Each** question carries **1** mark.

1. The zone which separating different air masses are called as ——————

2. Ozone layer lies in ——————

3. Evaporation that occurs directly from the solid phase below the melting point.

4. Roaring forties blows among the Latitudes of ——————

5. The Coriolis force is the result of ——————

6. Mango shower occurs in which Indian states ——————

7. The small and microscopic organisms drifting or floating in the sea or fresh water is ——————

P.T.O.

8. Ocean acidification describes the decrease in ocean pH that is caused by the missions of which gas.

9. Peru current is also called as ——————

10. The tidal bulge is caused due to ——————

(10 × 1 = 10 Marks)

II. Answer any **eight** questions. Answer should not exceed a paragraph. **Each** question carries **2** marks.

11. Convection

12. Katabatic winds

13. Evapotranspiration

14. Doldrums

15. Fog

16. Importance of atmosphere

17. Terrestrial radiation

18. Advection

19. Normal Lapse Rate

20. Continental shelf

21. Gulf

22. Marginal sea

23. Trenches

24. Cove

25. Sea Mounts

26. East Pacific Rise

(8 × 2 = 16 Marks)

III. Answer any **six** questions. Answer should not exceed **120** words. **Each** question carries **4** marks.

27. Briefly describe the apparent shift of global pressure belts.

28. Write a short note on global warming.

29. Give a detailed account on forms of precipitation.

30. Explain the process involved in condensation.

31. Write about earth's heat budget.

32. Write a note on the composition of atmosphere.

33. Define evaporation and state why it varies in various parts of earth.

34. What are the factors that influence ocean currents?

35. Differentiate between high tide and low tide.

36. Explain the importance of ocean.

37. Discuss the major currents of Pacific Ocean.

38. What are the factors controlling the horizontal distribution of temperature in the ocean?

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. **Each** question carries **15** marks.

39. Briefly explain the structure of atmosphere

40. Describe the origin, characteristics and types of tropical cyclone

41. Explain the mechanism and characteristic associated with monsoon.

42. What is an ocean floor? Give an account on the prominent features of an ocean floor.

43. Discuss the factors affecting the salinity of ocean.

43. Explain the types of coral reefs and their formation.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 7850**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Geography

Core Course

GG 1441 : HUMAN GEOGRAPHY

(2014-2017 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **ALL** questions. **Each** question carries **One** mark.

1. Who wrote the book Geographia Generalis?

2. _____ type of settlements, houses are built in close vicinity to each other.

3. Who advocated the gravity for migration pattern in 1889.

4. Name the visible imprint of human activity and culture on the landscape.

5. What is Local or regional characteristics of a language?

6. Name the effects of distance on interaction, generally the greater the distance the less interaction.

7. Name the religion that is particular to one, culturally distinct, group of people.

8. What is a set of sounds, combination of sounds, and symbols that are used for communication?

9. Humboldt wrote his famous book ‘Cosmos’ after he conducted fieldwork in _____ continent.

10. Theories of spatial organization draw mainly from _____

(10 × 1 = 10 Marks)

II. Answer **any Eight** questions not exceeding a paragraph. Each question carries **Two** marks.

11. Define Ontology.

12. What is space?

13. Define Complemetarity.

14. What is Transhumance?

15. Define Cultural complex.

16. What are the Cultural minorities of the world?

17. Define Glocalization.

18. What is Linguafranca?

19. What is sedentary agriculture?

20. Define ethnic religion.

21. List out major settlement pattern.

22. Name the types of rural settlement.

(8 × 2 = 16 Marks)

III. Answer **any Six** questions not exceeding 120 words. Each question carries **Four** marks.

23. Briefly explain the contributions of Yi fu Tuan.

24. List out the Contribution of Halford Mackinder.

25. Make a note on the contribution of Edward Soja.

26. What are the contribution of Peter Hagget?

27. Define culture hearth? List out types.

28. Briefly explain about components of culture.

29. Briefly explain about Universal religion.

30. Explain the principles of Buddhism.

31. Briefly explain the problems of Urbanization.

(6 × 4 = 24 Marks)

IV. Answer any **Two** questions. **Each** carries **15** marks.

32. Make a note on the contributions of David Harvey, Doreen Massey and Neil smith.

33. Give an account of classification of languages.

34. Briefly explain about Edward Ullman model of spatial interaction.

35. Briefly explain the Urban Morphology.

(2 × 15 = 30 Marks)

———————

(Pages : 3) **N – 7851**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Geography

Core Course

GG 1441 : HUMAN GEOGRAPHY

(2018 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **all** questions. **Each** questions carries **1** marks.

1. Cosmos was the monumental work of _____.

2. Who gave the concept of Stop and go determinism?.

3. The number of people per unit area of arable land is called _____.

4. The action of coming to live permanently in a foreign country is called _____.

5. Gujjars and Bakkarwals are _____.

6. A language that is adopted as a common language between speakers whose native languages are different is called _____.

7. Who is the author of Anthropogeography?.

8. The dividing line between India and China is called _____.

9. The beliefs that the natural environment provides limited choices for human behaviour _____.

10. Concentric Zone Model for urban land use was developed by _____.

(10 × 1 = 10 Marks)

II. Answer **any** eight questions. not exceeding a paragraph. **Each** question carries **2** marks.

11. What is Neo determinism?

12. Who is a migrant?

13. What do you mean by spatial behaviour?

14. Define culture region.

15. What are the pull factors of migration.

16. What do you mean by commutation?

17. What is intervening opportunity in spatial interaction model?

18. What is demographic transition?

19. What is physiological density?

20. What do you understand by population growth?

21. What is urbanisation?

22. Define slum.

(8 × 2 = 16 Marks)

III. Answer **any six** questions. not exceeding **120** words. **Each** question carries **4** marks.

23. Explain the types of rural settlements.

24. Explain the push factors of migration.

25. Briefly discuss the world pattern of languages.

26. Write a short note on world population density.

27. Briefly discuss the contributions of Alexander Von Humboldt.

28. Explain the nature and scope of human geography.

29. Discuss the demographic attributes of population.

30. Write a note on International migration.

31. Briefly describe Burgess Model to explain urban morphology.

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. **Each** question carries **15** marks.

32. Describe the types of migration and explain its relevance of study in human geography.

33. Explain the major religions of the world and demonstrate its world distributions.

34. Explain the types and patterns of human settlements in the world.

35. What is urbanisation? Give an account on world urbanisations and major urban problems.

(2 × 15 = 30 Marks)

———————

(Pages : 3) **N – 7852**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Geology

Complementary Course for Geography

GL 1431 : STRATIGRAPHY, PALEONTOLOGY AND ECONOMIC GEOLOGY

(2013-2018 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer in a word/**one** or **two** sentence (Answer **all** questions)

1. The idea that a dike transecting bedding must be younger than the bedding it crosses is called

2. Subdivision of Formations.

3. A long period representing break in sedimentation or erosion.

4. A fossil record of biological activity but not the preserved remains of the plant or animal itself.

5. A fine joining line which separate the free cheeks and fixed cheeks.

6. Pelecypods with two adductor muscles.

7. A spine extending backwards from the side of cephalon.

8. The deposits that have formed simultaneously with the enclosing rock.

9. The metal content of an ore.

10. An yellow coloured sulphide ore of copper and iron.

(10 × 1 = 10 Marks)

II. Write short notes on any **eight**, (each answer not exceeding a paragraph)

11. The Law of Faunal Succession.

12. Period.

13. Disconformity.

14. Overlap.

15. Petrifaction

16. Terebratula.

17. Gastroliths.

18. Cardinal Area.

19. Evaporite Deposits.

20. Gossan.

21. Mesothermal deposits.

22. Bauxite.

(8 × 2 = 16 Marks)

III. Write short essay on any **six**. (Each answer not to exceed **120** words)

23. Principle of lateral continuity.

24. Correlation.

25. The warkallai formation.

26. Write notes on various conditions of preservation of entire organism.

27. General morphology of gastropod.

28. Uses of Fossils.

29. Metasomatism.

30. Different Ranks of Coal.

31. Residual Deposits.

(6 × 4 = 24 Marks)

IV. Write essay on any **two.**

32. Discuss the Geologic timescale and various time units.

33. Write an essay on the morphology, classification geological history of the Brachipods.

34. Write an essay on coal and lignite deposits in India.

35. Write an essay on Cavity filling deposits.

(2 × 15 = 30 Marks)

———————

(Pages : 4) **N – 7853**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1431.3 : STATISTICAL TECHNIQUES FOR GEOGRAPHY

(2013 – 2016 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each carries **1** mark.

1. Write any one nonparametric test for goodness for fit.
2. What is the advantage of non-parametric test?
3. What are assignable causes?
4. Name the Statistician who introduced the technique of ANOVA.
5. What is the use of Moran's 1 test?
6. What are spatial patterns?
7. What is a median test?
8. Give any one usage of Kolmogrov-Smirnov test.
9. Give an example of point pattern.
10. What is a quadrat?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. Each question carries 2 marks.

11. When to use the parametric and non-parametric test?

12. What is the Chi-Square Test of Homogeneity?

13. What is sign test? When it is used?

14. What indication can one get from the number of runs?

15. Give a practical situation where ANOVA can be applied.

16. What do you mean by two-way classification model?

17. Discuss about systematic point pattern.

18. State the test statistic used in Mann Whitney test.

19. What are the applications of point pattern analysis?

20. Describe the variance – mean ratio test.

21. Give two examples for non-parametric tests.

22. What is a contingency table?

($8 \times 2 = 16$ Marks)

SECTION – C

Answer **any six** questions Each question carries **4** marks.

23. What are the Advantages and Disadvantages of Non-Parametric Test?

24. Explain the Chi-square test for independence of two attributes. What is the null hypothesis tested?

25. Write a short note on test for randomness.

26. Explain the procedure of Kruskal-Wallis test.

27. Distinguish between regular lattice and irregular lattice.

28. Explain contiguity test for regular patterns.

29. State any two advantages and disadvantages of quadrant analysis.

30. A random sample of paired observation is given below (10, 11), (11,13), (12, 10), (13,13),(14,15),(11,14),(12,13),(13,12),(10,8),(10,13),(14,15),(15,17),(15,13) (11,10),(8,9),(9,9),(11,9),(12,14),(13,11),(11,11) Apply approximately nonparametric test. Test whether there is any gain in B = X–Y at Level of significance. $\alpha = 0.05$.

31. What is ANOVA? What are the basic common assumption made for analysis of variance?

($6 \times 4 = 24$ Marks)

SECTION – D

Answer **any two** questions. Each question carries **15** marks.

32. Two sample polls of votes for two candidates A and B for a public office are taken, one from among the residents of rural areas and the other from urban. The results are given in the adjoining table. Examine whether the nature of the area is related to voting preference in this election.

Area	Votes for		Total
	A	B	
Rural	620	380	1000
Urban	350	450	1000
Total	1170	830	2000

33. Explain in detail the two sample tests used in non parametric testing problems.

34. Below are given the yield (in kg) per acre for 5 trial plots of 4 varieties of treatment.

Plot No.	Treatment			
	1	2	3	4
1	42	48	68	80
2	50	66	52	94
3	62	68	76	78
4	34	78	64	82
5	52	70	70	66

Carry out an analysis of variance and state your conclusion.

35. Describe the contiguity test for spatial auto correlation. State any three advantages and disadvantages of the Contiguity test.

($2 \times 15 = 30$ Marks)

———————

(Pages : 6) **N – 7854**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1431.3 : STATISTICAL TECHNIQUES FOR GEOGRAPHY

(2017 – 2018 Admission)

Time : 3 Hours Max. Marks : 80

Use of scientific calculator and statistical table are allowed.

PART – I

Answer **all** questions. **Each** question carries **1** mark.

1. If all frequencies of classes are the same, what is the value of Chi square statistic?

2. What is the degrees of freedom for Chi square statistic in case of contingency table of order 2×2?

3. Name the distribution utilised by sign test.

4. Name the test which is analogous to Chi square test of goodness of fit.

5. State the null hypothesis of one way ANOVA.

6. Which test is applied in ANOVA technique?

7. Define run.

8. Name the parametric test equivalent to Kruskal—Wallis test.

9. What is quadrat analysis?

10. Define variogram.

(10 × 1 = 10 Marks)

PART – II

Answer any **eight** questions. **Each** question carries **2** marks.

11. What is meant by chi square goodness of fit?

12. Find the value of Chi square statistic for a contingency table.

	B_1	B_2
A_1	12	8
A_2	13	10

13. The production of lignite in India from 1975 to 1985 in Mn. Tonnes was 3.03, 4.02, 3.58, 3.30, 2.90, 5.11, 6.31, 6.93, 7.30, 7.80, 8.03 It is expected that the median production of lignite in India is 5 Mn. Tonnes/ year. To test H_0: M = 5.0, find the value of T^- in Wilcoxen's signed rank test.

14. How Wilcoxen signed rank test differ from sign test?

15. Give the layout of two way ANOVA table.

16. When will you prefer a non parametric test?

17. How to resolve the problem of zero difference in sign test?

18. Write the test statistic for Kruskal Wallis test.

19. What do you understand by analysis of variance?

20. Explain the concept of spatial data.

21. What do you meant by autocorrelation structure?

22. Explain regular lattice pattern.

($8 \times 2 = 16$ Marks)

PART – III

Answer any **six** questions. **Each** question carries **4** marks.

23. Compare parametric and non-parametric tests.

24. Four coins are tossed 80 times. The distribution of number of heads is given below.

Number of heads :	0	1	2	3	4	Total
Frequency :	4	20	32	18	6	80

Apply Chi square test at 1 % level of significance if the coin is unbiased.

25. Following is a sequence of heads (H) and tails (T) in tossing of a coin 14 times.

HTTHHHTHTTHHTH

Test whether the heads and tails occur in random order. (Given $\alpha = 0.05, r_L = 2, r_U = 12$)

26. If the observed and theoretical cumulative distribution functions are,

Observed c.d.f:	0.038	0.066	0.093	0.177	0.288	0.316	0.371
Theoretical c.d.f:	0.036	0.042	0.129	0.159	0.243	0.275	0.238

Find the value of K - S statistic.

27. Following are the yields of maize in q/ha recorded from an experiment and arranged in ascending order with median M = 20.

15.4, 16.4, 17.3, 18.2, 19.2, 20.9, 22.7,23.6, 24.5

Test H_0: $M = 20$ *vs* $H_1 : M \neq 20$ at $\alpha = 0.05$

28. Write about the assumptions of ANOVA.

29. Ten boys of the same age were given a special diet. The increase in their weights were as follows. Using the sign test examine whether there is reason to believe that the diet increases as weight of children.

6,6, 1,3,3, 1,3, -2,4, -2

30. The following data represent a sample of size 20 from U[0, 1]: 0.277, 0.435, 0.130, 0.143, 0.853, 0.889, 0.294, 0.697, 0.940, 0.648, 0.324, 0.482, 0.540, 0.152, 0.477, 0.667, 0.741, 0.882, 0.885, 0.740. Apply the signed rank test to test $H_0 : \xi_{1/2} = 0.5 \, vs \, H_1 : \xi_{1/2} \neq 0.5$

31. Explain random and systematic point pattern.

($6 \times 4 = 24$ Marks)

PART– IV

Answer any **two** questions. **Each** question carries **15** marks.

32. (a) Explain Chi square test of independence of attributes.

(b) Two sample polls of votes for two candidates A and B for a public office are taken, one from among the residents of rural areas and the other from urban. The results are given in the adjoining table. Examine whether the nature of the area is related to voting preference in this election.

Area	Votes for		Total
	A	B	
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

33. Give the scores of two groups of persons, the one under placebo and the other under drug are as follows:

Score under placebo(X)	Scores under drug(Y)
10	20
13	14
12	7
15	9
16	17
8	18
6	19
	25
	24

Test that distributions of scores under placebo and under drug are identical using Mann-Whitney U test. [Table value of U for $n_1 = 7, n_2 = 9$ and $\alpha = 0.05$ is 12]

34. The following data represents lifetimes (hours) of batteries for two different brands:

Brand A :	40	30	40	45	55	30
Brand B :	50	50	45	55	60	40

Do the two brands differ with respect to average life?

[Use K – S test, $D_{6,6,0.05} = \frac{4}{6}$]

35. A sample of 15 consumers provided the following product ratings for three different products. Five comments were randomly assigned to test and rate each product. Use Kruskal-Wallis test and $\alpha = 0.05$ to determine whether there is a significant difference among the ratings for the products.

A	B	C
50	80	60
62	95	45
75	98	30
48	87	58
65	90	57

($2 \times 15 = 30$ Marks)

(Pages : 3) **N – 7855**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Geography

Core Course

GG 1441 — HUMAN GEOGRAPHY

(2019 Admission Onwards)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **all** questions. Each question carries 1 mark.

1. Caral Ritter belongs to ———————— Geographer.
2. Vidal de la Blache belongs to ———————— country.
3. Movement of people from one place to another is called _____.
4. The fifth stage of demographic transition theory is the death rate is ———————— than birth rate.
5. Calculation of population each unit area or unit volume is called ————————.
6. A first language is the language a person has learned from ————————.
7. ———————— the largest religion in India.
8. The second highest religion in the world is _____.
9. The first concentric zone of Burgess model is _____.
10. Linear settlement is called ———————— settlement.

(10 × 1 = 10 Marks)

P.T.O.

II. Answer any **eight** questions. Answer should not exceed a paragraph. Each question carries **2** marks.

11. What is determinism?

12. Give the basic concept of Space.

13. How to find spatial locations?

14. Mention the term transferability.

15. Bring out the role of distance in Gravity model.

16. What is information flow?

17. Define the term Migration.

18. Find out the causes of Urban to Urban migration.

19. Give a note on culture traits.

20. Define Cultural Ecology.

21. Mention the term Language change.

22. What is meant by Traditional Regions?

23. What is Secularism?

24. Define 'Urban'.

25. State the rings in the Burgess model.

26. Mention the causes of air pollution in urban areas.

(8 × 2 = 16 Marks)

III. Answer any **six** questions. Answer should not exceed **120** words. Each question carries **4** marks.

27. Discuss about Neo-Determinism concept.

28. Mention the contribution of Vidal-de la Blache.

29. Describe the spatial behavior in the spatial interaction model.

30. Write a note on Optimum population.

31. Write a note on perception of environment.

32. Discuss about Medical tourism and its migration.

33. Explain the process of Cultural Ecology.

34. Describe about language families — Give example.

35. Give a note on Universalizing religions and its characteristics.

36. Write a note on the nature of Traditional religions.

37. Describe about Urban settlement pattern.

38. Explain the causes of urban pollution.

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. Each question carries **15** marks.

39. Explain Alexandar Von Humboldt and Carl Ritter's contribution to geography.

40. Discuss about critical appreciation of Edward Ullman Gravity model.

41. Analyse the factors affection density of Population.

42. Describe about the structure of culture and its nature.

43. Write a note on the classification of language and its world pattern.

44. Analyse about the types and pattern of rural settlement and their functions.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 7856**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Geology

Complementary Course for Geography

GL 1431 : STRATIGRAPHY, PALEONTOLOGY AND ECONOMIC GEOLOGY

(2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A (Very short answer type)

Answer **all** questions in (**one** word or **one** sentence). **Each** question carries **1** mark.

1. The scientist who proposed ‘Principle of Uniformitarianism’.
2. State the principle of original horizontality
3. What is a trace fossil?
4. Trilobites belong to Phylum ————————
5. The mineral from which the metal can be economically extracted is called
6. The common ore mineral of bauxite seen associated with laterite
7. Placer deposits are formed by ———————— concentration
8. An ore of Lead

P.T.O.

9. The major lignite field of Tamil Nadu

10. In Kudremukh, iron ores are seen as ————————————

(10 × 1 = 10 Marks)

SECTION – B (Short Answer type)

Answer **any eight** questions. **Each** question carries **2** marks.

11. Order of superposition

12. Hadean eon

13. Palaeozoic Era

14. Warkalai formation

15. Palaeobotany

16. Fossil wood

17. Terebratula

18. Thorax

19. Evaporite

20. Contact aureole

21. Gangue mineral

22. Beach placer

23. BIF

24. Bauxite

25. Bombay High

26. Bokaro coal field

(8 × 2 = 16 Marks)

SECTION – C (Short essay type)

Answer **any six** questions. (Not to exceed 120 words). **Each** question carries **4** marks.

27. Briefly explain the basic principles of stratigraphy
28. Explain the basic time units used in the Geological time scale
29. Give an account of the geological divisions of India
30. Describe in brief about the Tertiaries of Kerala
31. Describe the various branches of palaeontology
32. Explain the morphology of brachiopods
33. Give an account of the various uses of fossils
34. Briefly explain the magmatic processes of ore formation
35. Describe the supergene sulphide enrichment
36. Give an account of the Nellore Mica Belt
37. Describe about the Manganese deposits of Chindwara
38. Give a brief account of the Koraput Aluminium deposits.

($6 \times 4 = 24$ Marks)

SECTION – D (Long essay type)

Answer **any two** questions. **Each** question carries **15** marks.

39. Describe the hydrothermal processes of ore formation
40. Explain the important aspects of Bokaro coal field
41. Explain the processes of ore formation by residual and mechanical concentration
42. Write in brief about the methods of fossilization
43. Give an account of the Geological Time Scale
44. Explain the different geological formations of Kerala

($2 \times 15 = 30$ Marks)

———————

(Pages : 4) **N – 7857**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Geology

Complementary Course for Geography

GL 1431 : STRATIGRAPHY, PALEONTOLOGY AND ECONOMIC GEOLOGY

(2020 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A (Very Short Answer Type)

Answer **all** questions (**one** word or a sentence). **Each** carries **1** mark.

1. Name of the period known as “age of dinosaurs”.
2. Shell of plecypods with only one adductor muscle
3. The metal content of an ore
4. Kudremukh in Karnataka is famous for _____ deposits.
5. Common ore of Aluminium.
6. Law of uniformitarianism was proposed by _____.
7. An industrial mineral which is having long, fine, flexible, soft and silky fibres.

8. Hydrothermal mineral deposit formed at shallow depth and relatively low temperatures.

9. The axial part of the cephalon which is arched prominently above the two lateral cheeks.

10. Age of Warkalli Formation.

(10 × 1 = 10 Marks)

SECTION – B (Short Answer Type)

Answer any **eight** questions **Each** carries **2** marks.

11. Epoch

12. Jurassic Period

13. Trichinapalli formation

14. Placer deposits

15. Pallial Sinus

16. Sinistral coiling of gastropods

17. Hinge line of brachiopods

18. Ore minerals

19. Cutoff grade of ore

20. Disseminated deposits

21. Syngenetic deposits

22. Gossan

23. Wall rock alteration

24. Kolar gold field

25. Nellore mica belt

26. Bombay high

(8 × 2 = 16 Marks)

SECTION – C (Short Essay Type)

Answer any **six** questions. **Each** carries **4** marks.

27. Palaeozoic Era

28. Dharwar craton

29. Archaean formation of Kerala

30. General morphology of Arthropods

31. Uses of fossils

32. Morphology of Bivalves

33. Industrial minerals

34. Contact metamorphism

35. Evaporates

36. Lead and Zinc deposits of India

37. Mode of occurrence of iron minerals

38. Hydrothermal deposits

(6 × 4 = 24 Marks)

SECTION – D (Long Essay Type)

Answer any **two** questions. **Each** carries **15** marks.

39. Describe the basic principles of stratigraphy .

40. Give a detailed account on tertiary and quaternary formations of Kerala.

41. Define fossil and describe the types of fossilization.

42. Write an essay on the general morphological features of gastropods.

43. Describe the origin and occurrence of petroleum. Add a note on its distribution in India.

44. Describe the process and formation of Gold deposits. Add brief account of Geographical distribution of gold deposits in India.

(2 × 15 = 30 Marks)

———————

(Pages : 6) **N – 7858**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Geography

ST 1431.3 : STATISTICAL TECHNIQUES FOR GEOGRAPHY

(2019 Admission onwards)

Time : 3 Hours Max. Marks : 80

(Use of Statistical table and Calculator are Permitted)

PART – A

Answer **all** questions. Each question carries **1** mark.

1. Give one limitation of non parametric inference.

2. Find the degrees of freedom of a chi square test of independence of 4×3 cross table?

3. To test the randomness of a sample. the appropriate test is ——————

4. What do you meant by tied observations?

5. Name a test to test two populations have same distribution.

6. Name a test for goodness of fit of Poisson distribution.

P.T.O.

7. Write the null hypothesis of single sample run test.

8. Give the formula for Kolmogorov- Smirnov distance of two samples.

9. Define systematic point pattern.

10. Give the concept of spatial data.

(10 × 1 = 10 Marks)

PART – B

Answer **any eight** questions. Each question carries **2** marks.

11. What do von understand by non-parametric inference?

12. What assumptions are generally made for a nonparametric test?

13. Define a run in a sequence of symbols.

14. Explain the concept of Median test.

15. Give the concept of Mann Whitney U test.

16. Give the names of any four one sample nonparametric tests.

17. How to resolve the problem of zero differences in sign test?

18. How can one apply Wilcoxon's signed-ranked test for matched-paired observations?

19. Give the columns of a one way ANOVA table.

20. Give the assumptions of Kruskal-Wallis test.

21. Write the test statistic of Kruskal-Wallis test.

22. Define random point pattern.

23. Define quadrant analysis.

24. Define autocorrelation.

25. Define semivariogram.

26. Explain irregular lattice pattern.

($8 \times 2 = 16$ Marks)

PART – C

Answer **any six** questions. Each question carries **4** marks.

27. The following is the arrangement of defective D, and non-defective N, pieces produced in the given order by a certain machine:

    N N N N N D D D D N N N N N N N N N D D N N D D D D.

    Test for randomness at the 0.01 level of significance.

28. For the null hypothesis that median value is 8. Compute T^+, T^- and T from the data:

    11, 3, 8, 10, 2, 5, 9, 15, 16, 13.

29. Explain the Kolmogorov-Smirnov test of goodness of fit in case of one sample.

30. Briefly explain the concept of one way analysis of variance with assumptions of the population.

31. Explain how the Kruskal-Wallis test statistic modified in case of ties.

32. How Wilcoxon's signed rank test is differing from sign test?

33. Compare the Chi-square lest of goodness of fit with Kolmogorov-Smirnov test.

34. The number of scooter accidents per month in a certain town were as follows:

    12, 8, 20, 2, 14,10, 15, 6, 9, 4.

    Are these frequencies in agreement with the belief that accident conditions were the same during this 10 month period? Use $\alpha = 5\%$.

35. An experiment with an immunization of cattle from tuberculosis gave the following results:

	Died/Affected	Unaffected
Inoculated	12	26
Not inoculated	16	6

    Examine the effect of vaccine in controlling susceptibility of tuberculosis. Use $\alpha = 5\%$.

36. What is U-statistics? Compute U_A and U_B for the following data :

    A 60 45 23 32

    B 10 25 20 54 32 65 8

37. Explain two way analysis of variance. Write the two way ANOVA table.

38. Explain contiguity test of regular pattern.

($6 \times 4 = 24$ Marks)

PART – D

Answer **any two** questions. Each question carries **15** marks.

39. Fit a binomial distribution for the following data and also test the goodness of fit.

x	0	1	2	3	4	5	6
f	5	18	28	12	7	6	4

40. Fit a Poisson distribution for the following distribution and also test the goodness of fit.

x	0	1	2	3	4	5	Total
f	142	156	69	27	5	1	400

41. As part of the investigation of the collapse of the root of a building, a testing laboratory is given all the available bolts that connected the steel structure at three different positions on the roof. The forces required to shear each of these bolts (coded values) are as follows:

Position 1	90	82	79	98	83	91	
Position 2	105	89	93	104	89	95	86
Position 3	83	89	80	94			

Perform an analysis of variance to test at the 0.05 level of significance whether the differences among the sample mean at the 3 positions are significant.

42. A farmer applies three types' fertilizers on 4 separate plots. The figure on yield per acre are tabulated below:

Fertilizers	Yield/Plot				Total
	A	B	C	D	
Nitrogen	6	4	8	6	24
Potash	7	6	6	9	28
Phosphates	8	5	10	9	32

Use two way analysis of variance to determine whether the plots are materially different in fertility and also the three fertilizers make any material difference in yields. Use $\alpha = 5\%$.

43. An experiment, designed to compare three methods for preventing corrosion, yielded the following maximum depths of pits (in thousandths of an inch) in pieces of wire subjected to the respective treatments:

Method A	77	54	67	74	71	66	
Method B	60	41	59	65	62	64	52
Method C	49	52	69	47	56		

Use Kruskal-Wallis test the null hypothesis that the three samples come from identical populations. Use $\alpha = 5\%$.

44. The data below shows the salaries (in '000Rs) in randomly selected advertisements in two different occupations:

Education	22	40	18	25	15	23	16	19	21	30
Marketing	28	24	20	45	50	39	26	55	48	41	42

Use the Mann-Whitney test at 1% level of significance to test that the median salary in the fields of education is lower than the median salary in the fiedls of marketing.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **N – 1417**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Geography

Core Course

GG 1641 : CARTOGRAPHY

(2014 Admission & 2017 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **all** questions. **Each** question carries **1** mark.

1. Which scale of representation is called international scale?

2. Cartography is derived from ———————— word.

3. Where is the Headquarters of Survey of India?

4. Who first calculated the circumference of the earth?

5. Who was the first surveyor general of India?

6. Which instrument is used for enlargement and reducing maps?

7. What is the direction of geographic north pole?

8. What is cardinal points?

9. What is the angular distance from the center of the earth north or south of the equator?

10. What is the scale of one inch or quarter degree sheet?

(10 × 1 = 10 Marks)

II. Answer any **eight** questions. Answer should not exceed a paragraph. **Each** question carries **2** marks.

11. Distinguish between large scale map and small scale map.

12. What is cardinal point?

13. What are the style of lettering?

14. Write a short note on the Indians Contribution in Cartography.

15. What is topographic Maps?

16. What is Mappamundi?

17. What is quantitative point symbols?

18. What is Choropleth map ?

19. What is Conventional projection?

20. What are the method of representing scale on a map?

21. Write a short note on cadastral map.

22. Write a short note on marginal information of topographical map.

(8 × 2 = 16 Marks)

III. Answer any **six** questions. Answer should not exceed **120** words. **Each** question carries **4** marks.

23. Briefly explain the contribution of Greek cartography.

24. Describe the elements of generalization.

25. What you mean by map design and layout?

26. Define the construction of maps for neo literates.

27. Briefly explain about Symbolization in a map.

28. Explain the contributions of Romans in cartography

29. What do you mean by format of a map?

30. Briefly explains the cartographic appreciation of topographic maps.

31. List out the conventional signs and symbols used in physiographical features in SOI maps.

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. **Each** question carries **15** marks.

32. Briefly explain cartography as a science of human communication.

33. Describe qualitative thematic Maps with suitable example.

34. Briefly explains the numbering of topographical maps in India.

35. Write an essay on the maps for the Blind.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 1418**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

GEOGRAPHY

Core Course

GG 1641 : CARTOGRAPHY

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in **a word**. Answer **all** questions. **Each** question carries **1** mark.

1. Cartography is derived from ———————— word.

2. Who wrote the book Geographica?

3. Who first calculated the circumference of earth?

4. Which Indian scholar calculated circumference of earth?

5. Name the term used to represent the height of a point on the ground above the MSL in a topographical sheet.

6. Where is the Headquarters of Survey of India?

7. Which colour is used to represent contour line?

8. What is the scale of 56*A*/12 Toposheet?

P.T.O.

9. Name the imaginary line connecting place have the same amount of rainfall.

10. Letterpress is also known as ————————————

(10 × 1 = 10 Marks)

II. Answer any **eight** questions. Answer should not exceed a paragraph. **Each** question carries **2** marks.

11. What is Planimetric map?

12. Define Isopleth map.

13. What is TO map?

14. Define Mappamundi?

15. List out the major work of Aryabatta.

16. What are the mechanical methods of enlargement and reduction of maps?

17. What is Inset map?

18. What are the different type of large scale maps?

19. What is map lay out?

20. What is graphical scale?

21. What is theory of visual perception?

22. Name the size of lettering.

23. What is Topographical map?

24. What is mechanics of lettering?

25. List out the significance of maps for children.

26. What is conventional signs and symbols?

(8 × 2 = 16 Marks)

III. Answer any **six** questions. Answer should not exceed **120** words. **Each** question carries **4** marks.

27. Briefly explain the scientific base of cartography.

28. List out the contribution of Greek scholars.

29. Briefly explain the problems of compilation of maps.

30. Give a brief account on constraints in map design.

31. Prepare a note on development of cartography in the recent period.

32. Describe the principles of map design and lay out.

33. Briefly explain components of lettering in map.

34. Distinguish between line and area symbols.

35. Briefly explains the elements of cartographic appreciation of topographic maps.

36. List out the conventional signs and symbols used in cultural features SOI maps.

37. Describe the significance of maps for business organizations.

38. Write a note on duplicating process in map reproduction.

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. **Each** question carries **15** marks.

39. Briefly explain cartography as a science of human communication.

40. Briefly explain the classification of maps.

41. What is thematic mapping? Briefly explain qualitative and quantitative thematic mapping.

42. What is generalization? Briefly explain elements of generalization.

43. What is special purpose maps? Describe planning and designing of special purpose maps.

44. Describe numbering of survey of India topographical sheets.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **N – 1421**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Geography

Core Course

GG 1642 : ENVIRONMENTAL GEOGRAPHY

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer **all** questions in a word or not more than **two** sentences. Each Question carries **1** mark.

1. Name the terrestrial part of the biosphere is divisible into enormous regions.
2. The primary producers are called as ————————.
3. 'Gadgil Committee Report' and 'Kasturirangan Committee Report', are related to ————————.
4. What is a small area of land that contains an exceptional number of endemic species and are at high risk from human activities.?
5. ———————— are special entities (sites) for how human beings and nature can co-exist while respecting each other's needs.
6. What is the steps of trophic levels expressed in a diagrammatic way?
7. ———————— is a zone of junction between two or more diverse ecosystems.
8. Name the unique functional role or place of a species in an ecosystem.
9. Name the total flora and fauna of a region.
10. What is the total mass of living organisms on Earth or per unit area of landscape; also,the weight of the living organisms in an ecosystem?.

(10 × 1 = 10 Marks)

P.T.O.

II. Answer **any eight** questions. Answer should not exceed a paragraph. Each question carries **2** marks.

11. Who led Narmada Bachao Andolan? What was the major project behind it?
12. Write a short note on micro consumers.
13. List out the biosphere reserve in Kerala.
14. Define climax community with example.
15. Discuss the importance of studying food chain in an ecosystem.
16. What is meant by an ecological threshold?.
17. What is a Madhav Gadgil Committee?
18. Kaziranga National Park
19. What is Biological Oxygen Demand?
20. Define Eutrophication.
21. What does UNFCC stands for?
22. What do you mean by a carbon footprint ?
23. What is IPCC?
24. What are hydro meteorological hazards?
25. Write a short note on Sundarlal Bahuguna.
26. What are the three principles of ecosystem sustainability?

(8 × 2 = 16 Marks)

III. Answer **any six**. Answer should not exceed **120** words. Each question carries **4** marks.

27. Briefly explain about Chipko Movement.
28. Brief about the recent environmental movements that happened in Kerala.
29. Write on land degradation and its major causes.
30. Discuss about the role of NITI Ayog of Government of India in environmental planning.
31. Discuss the importance of studying food chain in an ecosystem with respect to forests.

32. Explain the factors contributing to urban heat islands and remedial measures.
33. Briefly explain the causes of the recent Kerala landslides and its impacts.
34. What are the methods of soil conservation?
35. Write a short note on Tundra biome.
36. Critically examine the Green Revolution in India.
37. Describe the Environmental Impact Assessment and its strategies.
38. Write a short note on the significance of Biogas plants as renewable energy source.

(6 × 4 = 24 Marks)

IV. Answer **any two** questions. Each question carries **15** marks.

39. Explain in detail about the non-conventional energy resources.
40. Explain the components of sustainable development and role of governments and citizens to achieve it.
41. Explain the major environmental movements in India.
42. Describe the types of air pollutants and air pollution issues in India.
43. Describe in detail about the Natural Disasters that hit Kerala during monsoon season.
44. Write about various types and elements of ecosystems.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 1423**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Geography

Elective Course

GG 1661 : AN INTRODUCTION TO DISASTER MANAGEMENT

(2014 Admission & 2017 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following in a word. Answer **all** questions. Each question carries **1** mark.

1. What is water related natural hazard?

2. What gives the extent to which a community is affected by a disaster?

3. What type of disasters are very fast moving and are consequently very difficult to predict or prevent?

4. What is the systematic procedure to assess the likelihood of an event occurring and its socio-economic impact?

5. What is the sudden and extreme volume of water that comes on rapidly over a relatively small area causing inundation; can result in very heavy loss of life and destruction of property?

6. What is the measures which can minimize the effects of hazards when they occur measures may be of either “structural” or “non-structural” nature?

7. What is a Slow Onset Disasters?

P.T.O.

8. What is the study of the occurrence of diseases in human population science of epidemics?

9. What is the stock of essential items like food and such commodities required at the time of disaster?

10. What is the severe psychological or physiological stresses?

(10 × 1 = 10 Marks)

II. Answer any **eight** questions. Answer should **not** exceed a paragraph. Each question carries **2** marks.

11. What is disaster?

12. Define disaster management.

13. What is emergency management?

14. List out the Okhi cyclone and its impact.

15. List out the Impact of Super Cyclonic Storm Amphan.

16. What is village disaster management plan?

17. What is participatory capacity vulnerability assessment?

18. Define earth quake.

19. What you mean by disaster mitigation?

20. Define Antartic ozone hole.

21. Assess the causes of heat wave.

22. What is hypothermia?

(8 × 2 = 16 Marks)

III. Answer any **six** questions. Answer should not exceed **120** words. Each question carries **4** marks.

23. Briefly explain the classification of Disasters.

24. Assess the Impact of Sea Level Rise on Indian Coastal Zones.

25. What do you understand by Risk? Give suitable examples of elements at Risk in specific disasters your locality.

26. Describe the disaster management cycle.

27. What do you understand by disaster management strategy adapted by panchayat raj institutions? Give suitable examples.

28. Describe the disaster and hazard prone areas of India.

29. Briefly explain the disaster management plan of Kerala Govt to tackle the flood and associated risk.

30. Describe about strategies of Risk Reduction.

31. Briefly list out the components of disaster management.

(6 × 4 = 24 Marks)

IV. Answer any **two** questions. Each question carries **15** marks.

32. Disaster planning and prevention play a dominant role in risk reduction. Discuss.

33. Briefly explain village disaster management plan implemented in Kerala with example.

34. Briefly explain the Socio-economic measures to tackle vulnerabilities.

35. Discuss the significance of planning with particular reference of Disaster prevention, preparedness and mitigation.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 1424**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Geography

Elective Course

GG 1661 : AN INTRODUCTION TO DISASTER MANAGEMENT

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

I. Answer the following questions in a **word** or not more than **two** sentences.

1. Likelihood of loss of life, injury or destruction and damage from a disaster in a given period of time is known as ————————

2. ———————— is a natural disaster that occurs when snow rapidly flows down a mountain.

3. NDMA stands for ————————

4. A low pressure system with wind speed more than 221 km/h is called a ————

5. The seismic waves that cause maximum destruction is ————————

6. A series of giant waves in a water body caused by the displacement of a large volume of water, generally in an ocean or a large lake is known as ————————

7. A roughly circular region of calm weather at the centre of tropical cyclone is known as ——————

8. National Institute of Disaster Management was inaugurated on ——————

9. A disease that becomes unusually widespread and even global in its reach is referred to as ——————

10. Bhopal gas tragedy is an example of ——————— disaster

(10 × 1 = 10 Marks)

II. Answer any **eight** of the following questions in a paragraph.

11. Define hazard.

12. Reservoir induced earthquakes.

13. What do you mean by Landslide Risk Mitigation Scheme?

14. Prepare a note on SDMA.

15. Explain the term disaster resilience.

16. What do you mean by geo-hydrological hazard?

17. What does the term agricultural drought?

18. What is meant by structural measures for disaster risk reduction?

19. What is a landslide hazard zonation map?

20. Write down the key principles of inclusive disaster risk reduction policies.

21. Point out the role of unaffiliated volunteers in disaster response.

22. Explain the major challenges in earthquake risk reduction.

23. Briefly explain the impact of land use change.

24. Prepare a note on the significance of culture sensitive disaster management.

25. Write down the importance of indigenous knowledge in disaster prevention.

26. Write an account on institutional mechanisms for disaster management in Kerala.

(8 × 2 = 16 Marks)

III. Answer any **Six** of the following questions in not more than **120** words.

27. Discuss the interrelationship between hazard, risk, vulnerability, and resilience.

28. Examine the factors affecting disaster vulnerability.

29. Attempt a brief classification of disasters.

30. Briefly explain the roles and responsibilities of communities in disaster management.

31. Write a note on the cyclone prone areas of India.

32. Prepare a detailed account of earthquake prone areas of India.

33. Discuss the structural and non structural measures for risk reduction in cyclone prone areas.

34. Prepare a note on the drought prone areas of Kerala.

35. Suggest few precautionary measures to mitigate the effects of landslides.

36. Discuss the measures to mitigate the impact of climate change.

37. Prepare a note on the differential impacts of disasters on caste, class, gender and age.

38. Briefly discuss the negative impacts of volcanic eruption.

(6 × 4 = 24 Marks)

IV. Write an **essay** on any **two** of the following.

39. Briefly discuss the causes and impacts of disasters.

40. Give an account of the disaster management cycle.

41. Discuss the hazard and vulnerability profile of India with respect to flood.

42. Give a detailed account of the consequences of earthquakes.

43. Discuss in detail the interconnections between development and disasters.

44. Explain the impacts of disasters on health, society, economy and environment.

($2 \times 15 = 30$ Marks)

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