APPENDICES
Geography Lesson Transcripts in Information Processing Models

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LESSON TRANSCRIPTS IN INFORMATION PROCESSING MODELS (TPM)

Subject: Geography
Standard: IX
Name of the Unit: Water in the Atmosphere
No. of Lesson Units: 14

Models selected:
- a) Concept Attainment Model (CAM)
- b) Advance Organizer Model (AOM)
- c) Inquiry Training Model (ITM)

Name of the lesson units:
1. Water in three states and water cycle
2. Evaporation and water vapour
3. Humidity and its measurement
4. Troposphere and Green house effect
5. Condensation and its various forms
6. Dew and Hoar frost
7. Mist, fog and smog
8. Clouds—its various forms
9. Precipitation—conditions and characteristics
10. Snow, Hail and Hail stone
11. Orographic Rainfall
12. Convectional Rainfall
13. Cyclonic Rainfall
14. Border Rainfall
CONCEPT ATTAINMENT MODEL
LESSON UNIT NO. V

Name of the Lesson Unit : Condensation-Various forms.

Planning guide for the concept attainment model

1. Analysis of the concept
   i) Name of the concept
      Condensation

2. Essential attributes of the concept:
   i) Cooling of air masses
   ii) High relative humidity
   iii) Presence of plenty of dust particles
   iv) Rising up of the warm moist air
   v) Atmospheric air is saturated with water vapour
   vi) Heat energy absorbed in evaporation should be released
   vii) Temperature should reach dew point
   viii) Calm and long winter nights

Non-essential attributes
   i) sources of accessible water bodies
   ii) rate of evaporation
   iii) proportion of water vapour in the atmosphere
   iv) different types of condensation
   v) existence of the three states of water
   vi) shape and size of the liquid source of water
   vii) different types of humidity
   viii) other types of variable gas present in the atmosphere
   ix) various non-metallic elements present in the atmosphere

State the rule
   The change of water vapour into droplets of water or crystals of ice.

Type of model applied
   Reception Model of concept attainment
Reception Strategy

Wholistic

Learning modality

Experiment, direct observation of nature, scenery, charts, Diagrams, pictures and slides.

Behavioural objectives

The IXth standard students recognise the attributes of the concept ‘condensation’ correctly. They locate the unlabelled examples correctly. They generate additional examples of the concept ‘condensation’. They form concept rules and define the concept in their own words. They compare the effectiveness of different strategies they used.

Positive exemplars

Experiments

i) Ice cubes in a shiny metal can
ii) Cold juice taken from the freezer and exposed to open air
iii) Glass ventilation in winter morning
iv) City and village climate in the summer nights
v) Pictures of different forms of condensation
   -dew
   -snow
   -hoar frost
   -white frost
   -mist
   -fog
   high clouds, low clouds, and middle clouds

Negative exemplars

Experiments

i) Boiling water in the oven
ii) Hot water in a shiny metal can
iii) Hot drinks in crockery
iv) Mineral water in plastic bottles
v) Water in ponds, oceans in tropical region
vi) Cold drinks exposed to open air
vii) Hot drinks in the oven,
viii) Hot drinks kept in thermo flask
ix) Rainy water on metallised road
x) Picture of salt pan
xi) Wet clothes spread out in summer noon/wet hair after bathing
xii) Open bottle of mercury
xiii) White washing of the room

Phases of the Model

Phase one: Presentation of data and identification of the concept

A. Generating opening moves to initiate the first phase of the model

Today we are going to play a game. I will give you some examples of a particular concept. If the given examples contain the concept, I will denote it as 'yes' example. If it does not contain the concept I will note it as a 'no' example. You have to say what is that particular concept I have in my mind. You will be provided more 'yes' examples and 'no' examples alternatively. By observing the 'yes' and 'no' examples you can formulate a concept rule based on the attributes of the concept you have identified.

Now let us see an example which is a 'yes'.

The teacher puts the flannel board on the map stand and demonstrates different pictures related to the topic 'condensation' and the teacher asks the students, "what is the concept I have in my mind?"
The teacher shows the second ‘yes’ example to the students in the form of an experiment. Fill a shiny metal can with two thirds of water. Add some ice cubes into the metal can and stir with a thermometer. Set the can on the table and add some more ice cubes into the metal can. After some time drops of liquid are formed on the side of the can.

The students compare the first and second examples and formulate certain hypothesis regarding the concept. The teacher demonstrates another experiment which does not contain the concept. The teacher shows the third positive example to the students. That is an experiment which symbolically demonstrates the city and village climate in the summer nights. It is a positive example of the concept.

The teacher demonstrates another example which does not contain the concept. The students frame the hypothesis regarding the concept.

The students identify the positive example as a transition occurring in the positive example. That is, the liquid water is changed into crystals of ice or ice drops in semi liquid form.

The teacher demonstrates additional positive and negative examples alternatively. In all the positive examples the state of water is in liquid or crystal form. But in all the negative examples the state of water is either in gaseous or liquid form.

The students draw inference regarding the conditions suitable for the cooling of the gaseous water. Again, the high relative humidity is also essential for
cooling of the water vapour. Presence of plenty of dust particles is also necessary for effective condensation of the water vapour.

Based on the attributes of the concept the students re-formulate the concept rule and state it in their own words.

**Phase two: Testing of the attainment of the concept.**

The teacher gives certain unlabelled examples and asks them to identify whether it is a positive or negative example.

The teacher asks the students to give certain examples from their previous experience. They compare the polar and equatorial region. Cold juice taken from the freezer and exposed to the air produces droplets of water on the side of the container.

The teacher takes an ice cube from the thermo flask and hot water from the flask and says ice cube is a positive example. The students classify the different forms of condensation from their own observation of nature. They remember the mist and dew seen above the surface of the earth in winter season come under the various forms of condensation. They also remember clouds in the sky are also a form of condensation.

The students also remember certain negative examples from their observation of nature. The students draw an inference that condensation is just opposite to evaporation. So all the positive examples in the evaporation are negative examples for condensation. The students remember all the positive examples they
have seen in the evaporation are applied as negative examples.

Phase three: Analysis of the thinking process

A. Generating opening moves to initiate the third phase of the model

The teacher asks the students to make a follow up work on the process they followed in attaining the concept 'condensation'. The students analyse the role of positive and negative examples in attaining the concept 'condensation'. The students remember the strategies they followed in the identification of the concept. First of all they endeavoured to understand the common characteristic in the first positive example. By comparing the positive and negative examples and testing the hypothesis which they have taken from the positive and negative examples they came to a conclusion regarding the characteristics of the concept. Then they attempted to understand whether this characteristics is present or absent in all the negative examples. They distinguished the character which is prominent in the positive example. From these inferences they deduce that the change of water vapour into droplets of water or crystals of ice is the theme of the topic. The teacher reformulates their concept and gives the new terminology which is termed as 'condensation'. The students also analyse which positive example helped them most to attain a clue regarding the concept. All of them share their experience in the framing of hypothesis and testing their hypothesis by using the positive and negative examples.
ADVANCE ORGANIZER MODEL
LESSON UNIT NO. 5

Name of the Lesson Unit: Condensation - Various forms

Planning Guide for the Advance Organizer Model

1) Identification of facts, concepts, process, principles and generalisations

   a) Facts

   Condensation is a process of changing Water Vapour into tiny droplets of water or ice crystals. Condensation is just reverse to the process of evaporation. Condensation takes place when temperature of air falls below dew point. When air rises, it expands and increase in volume. The compression or expansion of air causes change in temperature without any addition or subtraction of energy. Condensation takes place when dew point is below freezing point and above freezing point. Condensation takes place on the ground or on natural objects and in the air close to the earth's surface or at some height in the troposphere.

   b) Concepts

   Condensation

   The process by which atmospheric water vapour changes into water or ice crystals.

   Normal lapse rate

   The rate at which the temperature decreases in rising and expanding air.

   Dry adiabatic rate

   The rate at which the temperature of the rising and expanding dry air will decrease.

   Wet adiabatic rate

   The rate at which the rising and expanding saturated air release the latent heat lead to fall in temperature.

   Adiabatic cooling

   The fall in temperature due to lifting of air to heights.

   Saturation point

   The limit up to which an air can hold moisture at a given temperature.
Dew point
The temperature at which an air becomes saturated

Drizzle
It is precipitation from stratiform clouds in the form of very small and very numerous drops of water which float in the air for a long time before falling

Sleet
Rain which freezes as it falls from a warm mass of air through a cold layer near the surface. It is a mixture of snow and rain or partially melted falling snow.

Snow
Snow is a collection of ice crystals.

Hail
Raindrops when taken to higher elevation by ascending air current freeze and form hail stone, an ice-pellet.

c) Process
The process of changing water vapour into tiny droplets of water or ice crystals.

d) Principle
The rate and amount of condensation is directly related to the relative humidity and the amount of cooling.

e) Generalisation
When the relative humidity is low and the temperature of the air is high, a lot of cooling of the air will be necessary to bring the temperature down below dew point.

2. Nature of Advance Organizer:
Expository

3. Essential characteristic of the Advance Organizer
Propositional in nature and of higher abstraction and generality

4. Major idea in the organizer
Condensation can be explicit in different forms in nature
5. **Highlights of new information**
   Water Vapour is condensed under suitable conditions
   Condensation is a process just opposite to the evaporation
   Examples of condensation and application of the principle in the practical life situations.

6. **Presentation of the Advance Organizer**
   Flash cards and sentence cards-written in bold colourful letter.

7. **Presentation of the learning task**
   Students observe experiments related to the topic condensation
   Cites illustrations with regard to the different forms of condensation
   Identification of the process and conditions of the cooling of the Water Vapour
   Basic theory behind the occurrence of artificial rainfall

8. **Behavioural Objectives**
   Acquisition, retention and transfer of the information
   Processing of information in meaningful way

9. **Inferences and assumptions made in the new learning task**
   Condensation is a heat releasing process and it is just opposite to the process of evaporation.

10. **Techniques for promoting active reception learning**
    Observe nature and interrelate various natural phenomena in logical order
    Prepare concept map based on major and minor concepts
    Collect pictures related to natural beauty
    Draw pictures and keep albums.

11. **Techniques for promoting critical approach to information**
    Using and explaining the concepts in multi-contexts
    Students generate examples from their own experience with nature

Students draw concept map and explains the propositions used in the concept map

12. **Techniques for strengthening cognitive structure**
    Analyses the concept in practical life situations
    Presenting examples of the concept from practical situations
    Do experiments related to the process condensation at home. Draw inferences
    and conclusions based on the newly acquired information
Phases of the Model

Phase one: Presentation of the Organizer

**Advance Organizers**

(i) Cooling of the saturated air—the turning point of condensation

(ii) Change of water vapour into droplets of water or crystals of ice—as a heat releasing process.

The advance organizer presented here is a proposition of higher level abstraction and generality than the learning task itself. Before coming to the introduction of the advance organizer the teacher clarifies the aims of the lesson.

In order to give orientation to the process of condensation the teacher elicits their previous knowledge and experiences related to their everyday life situations. They recall the fact that water exists in the atmosphere in three states—solid, liquid, and gaseous states.

From the previous class they gather information regarding the process of evaporation as the transition of water into gaseous form. In this transition

**Advance organizer is presented**

**Clarifies the aim of the lesson.**

**Identifying the attributes of the learning task.**

**Explains the Theme**
molecules of water remain the same in evaporation and condensation. In evaporation air absorbs water vapour like a sponge and soaks up liquid water. Air expands as it gets warmer. Water expands when it freeze. As it does so, the spaces between the air molecules grow larger, allowing the air to absorb more water. Evaporation is a heat absorption process. Today we were going to study a procedure just opposite to the evaporation.

The teacher introduces the advance organizer on flash card. The students are promoted to share their experiences from their day to day life situations.

Phase two: Presentation of the learning task

From their every day life situations the students recall certain experiences related to the topic ‘condensation’. For example, in very cold countries in winter season the cold air outside the room chills the warm air inside the room. We can see droplets of water on the glass window early in the morning.

While we put some ice cubes in a steel glass after some time droplets of water begin to form on the outer side of the glass.

The teacher explains the conditions for the process of condensation. In long winter nights the air is calm and clear and reaches the dew point, the water vapour in the atmosphere is condensed. So condensation is caused by falling of temperature to the dew point.

While we put a mirror in the freezer for about an hour and then take it back and take a breath on to the mirror, the water vapour in the atmosphere is condensed and droplets of water merged and run down the

Projecting the advance organizer on a flash card.

Links the material to the organizer.

Makes the logical order of the learning material.

Provides multi-contexts.
The teacher gives another example in the form of an experiment. Take a steel tumbler and pour water into the tumbler about two thirds of the glass. Put some ice cubes into the tumbler and stir gently. Add more ice cubes into the tumbler and observe the outer side of the glass. Drops of liquid begin to form on the side of the glass.

Students observe the experiment. They draw inference regarding the condensation process which has taken place in the experiment. Showing the picture of glaze, wet snow, rain differentiates the condensation process taken place in glaze, wet snow, rain, dry snow, sleet, hail, hailstone, and clouds.
The students explain the procedure in their own words. The teacher gives additional examples from the life situations of the students. A man drinks hot tea with spectacles on his nose, what will happen? The teacher gives the concept in multi contexts. While we put a table spoon against steam from boiling water, what will happen?

The teacher prompts the students to give more examples from their daily life situations. The students remember the example of boiling rice in an oven.
While we cover the kettle with a metal lid we can see drops of water on the lid if we expose it in the open air.

The teacher gives the example of artificial rain as a process of condensation in the atmosphere. Minute particles of silver iodide are sprinkled from the atmosphere as an agent of condensation.

The students identify the process involved in various forms of condensation. The teacher shows the pictorial illustration of artificial rainfall to students.
**CONденSAtion**

Condensation takes place at dew point, below freezing point, and above freezing point. Conditions include high humidity and cooling of air mass. Condensation nuclei elements include dust, salt, and aerosols. High moisture air and contact with cold surface contribute to the process.
They are cooling of the air mass, or falling of the temperature, high humidity, and the presence of plenty of dust particles. The teacher demonstrates the concept map including the major and minor concepts. The students explain the major concept and identify the relationship between different concepts. The teacher asks the students to identify the different forms of condensation.

Looking on the concept map the students explain the inter relation ship between the major and minor concepts. They draw inference regarding the congenial condition for the effective condensation.

Phase three: Strengthening of cognitive organization

Using a summary chart the teacher consolidates the major points of the lesson on condensation. In order to elicit a critical approach to the subject matter the teacher prompts the students to establish certain relationship between various concepts coming under the topic ‘condensation’ Their attention is drawn to the process of collecting and detailed information on various forms of condensation and the process involved in it.

The teacher draws the attention of the students towards the practical application of the process of condensation. The processes involved in air conditioning and the function of fridge and freezer, pasteurisation of milk, the functions of cold storage etc.

The students recapitulate the major points of the learning task and prepare the black board summary of the essential attributes and elements of the subject matter

Makes the organization more explicit

prepares concept map...

makes logical order and establishes relationship between major and minor concepts

Summarises main points

Promotes active reception learning

Recapitulates major points
INQUIRY TRAINING MODEL
LESSON UNIT NO.V
Name of the Lesson Unit : Condensation – Various forms
Planning Guide for the Inquiry Training Model

Educational (Behavioural) Objectives
1. The pupils develop scientific process skills

Specifications
(i) The pupils develop intellectual strategies to establish causal relationship among the phenomena
(ii) Observe the natural phenomena of the environment
(iii) The pupils draw inference regarding the occurrence of various physical phenomena

2. The pupils apply the acquired knowledge of the process of condensation in every day life situations.

Specifications
(i) They analyse the conditions suitable for the process of condensation
(ii) The pupils make predictions about the climatic conditions and weather conditions

Supporting Material
Conduct experiments to underline the elements involved in the process of condensation.
Flow chart showing the process involved in the transition of water vapour into droplets of water
Pictures showing various forms of condensation
Specimen of different forms of condensation
Scenario from practical life situations

Phases of the Model
Today we are going to study a new topic in Geography in a puzzling manner. In contrast to the regular way of presenting ideas, I follow a quite novel way to introduce things in the present class. I give you a problem

Phase One
The teacher generates opening moves
and you have to find out the answer of that problem by asking as many questions as possible. The questions should be framed in such a way that they can be answered by either 'yes' or 'no'. If your questions are not framed as required, I will ask you to rephrase your question accordingly. The teacher explains certain technical terms coming in the new model in simple terms. They are the terms like experimentation, verification, hypothesis, etc. They are not so familiar with the secondary school students.

**Encounter with the problem: Discrepant event**

Take a steel tumbler and pour water into the tumbler about twothird's of the glass. Put some ice cubes into the tumbler and stir gently. Add more ice cubes into the tumbler and observe the side of the glass. Some drops of liquid begin to form on the side of the glass. Why?

**Phase two: Data gathering verification question**

To find out further details about the puzzling event you may now begin the inquiry by asking questions which can be answered by 'yes' or 'no'. In order to include all aspects of the issue the questions pertain to objects, conditions, events and property of the event.

**Verify objects**

1. Is the tumbler made of steel?
2. Is it wet before doing the experiment?

**Verify events**

1. Is the water poured into the tumbler cold?
2. Do the drops appear on the side of the glass before putting the ice cube?
Verify conditions
Do the drops appear on the side of the glass if it is made of plastic?
Do the drops appear on the side of a glass tumbler?
Verify properties
Can we pour any other liquid in the place of water?
Can we add cold water in the place of ice cubes?
Phase three: Data gathering – Experimentation
Generating opening moves to initiate the third phase of the model
You have already gathered certain information to verify the hypothesis you have in your mind. Now it is the time to experiment your hypothesis by asking data gathering experimentation questions. The questions should begin with either 'if' or 'suppose.' The answers should be given as 'yes' or 'no.'
Objects
1. If the tumbler is not made of steel will it show any difference?
2. If the tumbler is made of plastic can we see drops of water on the side of the tumbler?
Events
1. If we wipe out the drops seen outside the glass tumbler with ice cube will the drops appear again?
2. If we put the glass tumbler in the freezer will the drops appear again?
Conditions
1. If the liquid in the glass tumbler is changed can we do the experiment in the open air on a sunny day?
2. If the air is much cold, will there be any change in the...
drops of water seen out side the steel tumbler?

Properties

Suppose, we put no water in the tumbler and put the empty tumbler in the freezer. will there be any change inside and outside of the tumbler?

Suppose, we put a mirror in the place of a steel tumbler in the freezer do we expect any difference in the effect?

Phase four: Formulating an explanation

Generating opening moves to initiate the fourth phase of the model.

You have verified and tested the hypothesis which you have in your mind. Now you can formulate certain theories based on the verification and experimentation questions.

Developing the theory

Simple linear causation

Condensation occurs when the water vapour is cooled

Theory of properties

Condensation takes place on electrons and ions. During long winter nights most often the air is calm and clear and the temperature reaches the dew point. The water vapour in the atmosphere is condensed due to the falling of the temperature to the dew point.

Analogy

Without changing the basic characteristic, a mature personality can adjust to his environment.

Application of generalisation

In summer people prefer cool drinks to hot drinks.
To keep fish and meat for a long time in a fresh way put them in the freezer.

Add ice cubes in the soda water to give cooling effect.

Air conditioners are used to condense the hot air in the tropical regions.

Flowers are more fresh and attractive in cold climate than in arid climate.

**Phase Five: Analysis of the Inquiry Process**

They pick out the questions which indicate the object, conditions, events and properties of the puzzling event.

**Discussion of the elements of Inquiry**

Why did you ask questions related to the elements of the puzzling event?

They are:

- temperature of the surrounding atmosphere
- length of the day and night
- transition of the state of water into the three states
- presence of aerosoles in the atmosphere
- presence or absence of clouds and winds
- Material of the container
- proportion of water content in the air
- falling of temperature up to the freezing point or dew point

- Pick out the questions which exemplify the characteristics of objects, conditions, events and properties.
- Which question helped you most in formulating the theoretical background of the issue under consideration?
TEACHING ANALYSIS GUIDE FOR THE RECEPTION MODEL OF CONCEPT ATTAINMENT

This guide is designed to help you analyse the process of teaching as you practice the Reception Model of Concept Attainment. The analysis focuses on aspects of teaching that are important to the syntax of the model, the teacher's role, and specific teaching skills.

The Guide consists of a series of questions and phrases. As you observe a practice session, analyse the teaching using the rating scale that appears opposite each question and statement. This scale uses the following items:

**Thoroughly.** This item signifies that the teacher engaged in the behaviour to the point where students were responding comfortably and fluently. Appropriateness varies from situation to situation. For example, young children may need more assistance in describing the exemplars than older ones.

**Partially.** This item signifies that the teacher engaged in appropriate behaviour, but not as thoroughly as possible. There is some doubt about whether the students are responding fully.

**Missing.** The teacher did not engage in the behaviour; there appears to be a loss in student response or probably will be one.

**Not Needed.** The teacher did not explicitly manifest the behaviour, but there is no loss. Either the behaviour was included in others or the students began to respond appropriately without being led to.

For each question or statement in the Guide, tick the term that best describes the teacher's behaviour.
PHASE ONE: Presentation of Data and Identification of the Concept

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<tr>
<td>1.</td>
<td>Did your teacher state the purpose of the game?</td>
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<td>2.</td>
<td>Did the teacher explain the procedures of the game (how the 'yeses' and no's function)?</td>
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<td>3.</td>
<td>Did the initial 'yes' clearly contain the essential attributes?</td>
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<td>4.</td>
<td>If teaching a conjunctive concept, did the teacher begin with a 'yes' exemplar?</td>
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Or

If teaching a disjunctive concept, did the teacher begin with a 'no' exemplar followed by a 'yes'? | | | |

| 5. | Did the teacher ask questions that focused students' thinking on the essential attributes? | | | |
| 6. | Did the teacher ask the students to compare the ‘yes’ exemplars? | | | |
| 7. | Did the teacher ask the students to contrast the attributes of the ‘yes’ exemplars with those of the ‘no’ exemplars? | | | |
| 8. | Did the teacher present labeled exemplars? | | | |
| 9. | Did the teacher ask the students to generate and test hypotheses about the identity of the concept? | | | |
10 Did the teacher ask the students to name the concept? 

11 Did the teacher ask the students to state the essential attributes of the concept?

PHASE TWO: Testing Attainment of the Concept

12 After the concept was agreed upon, did the teacher present additional exemplars and ask whether they contained the concept?

13 Did the teacher ask the students to justify their answers?

14 Were the students able to supply their own exemplars to fit the concept?

15 Did the teacher ask the students to justify their exemplars by identifying the essential attributes?

PHASE THREE: Analysis of Thinking Strategies

16 Did the teacher ask the students to describe the thinking processes they used in attaining the concept?

17 Did the teacher ask the students to reflect on the roles of attributes and concepts in their thinking strategies?

18 Did the teacher ask the students to evaluate the effectiveness of their strategies?
TEACHING ANALYSIS GUIDE FOR THE ADVANCE ORGANIZER MODEL

This guide is designed to help you analyse the process of teaching as you practice the Advance Organizer Model. The analysis focuses on aspects of teaching that are important to the syntax of the model, the teacher's role, and specific teaching skills.

The Guide consists of a series of questions and phrases. As you observe a practice session, analyse the teaching using the rating scale that appears opposite each question and statement. This scale uses the following items:

Thoroughly. This item signifies that the teacher engaged in the behaviour to the point where students were responding comfortably and fluently. Appropriateness varies from situation to situation. For example, the extensiveness of the Advance Organizer will depend on prior instruction in the subject area and the learner's age level.

Partially. This item signifies that the teacher engaged in appropriate behaviour, but not as thoroughly as possible. There is some doubt about whether the students are responding fully.

Missing. The teacher did not engage in the behaviour; there appears to be a loss in student response or probably will be one.

Not Needed. The teacher did not explicitly manifest the behaviour, but there is no loss. Either the behaviour was included in others or the students began to respond appropriately without being led to.

For each question or statement in the Guide, tick the term that best describes the teacher's behaviour.

PHASE ONE: Presentation of Data and Identification of the Concept

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<td>1 Did the teacher clarify the aims of the presentation?</td>
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2. Was an advance organizer presented?  
   If so, was it expository or comparative?

3. Did the organizer presentation identify, clarify or explain the essential characteristics of the concept or proposition that serves as the organizer?

4. Did the organizer presentation include examples of the organizer?

5. Was the language or terms of the subsummer (organizer) repeated or otherwise emphasized?

6. Did the teacher prompt awareness of relevant knowledge or experience in the learner's background?

**PHASE TWO: Presentation of the Learning Task or Material**

7. Was the learning material presented?  
   Thoroughly  Partially  Missing  Not Needed

8. Did the teacher develop the material in the logical order of the learning material and make the order explicit to the student-for instance, the rough outlines and explanations?

9. Did the teacher use procedures that enhanced the organization of the presentation, such as rule-example-rule, explaining links, diagrams, and verbal markers of importance?
10. Did the teacher use procedures for maintaining attention, such as varying audio stimuli, using supplemental media, and inserting questions into the presentation? 

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**PHASE THREE: Strengthening Cognitive Organization**

11. Did the teacher use principles of integrative reconciliation (reminding students of the larger picture, summarizing the major attributes of the new material, repeating precise definitions, asking for the differences between parallel subsumers, relating learning material to subsumer)? 

12. Did the teacher ask questions and make explanations that promoted active reception learning? 

13. Did the teacher facilitate a critical approach to information (the recognition of assumptions, inferences, and contradictions)? 

14. Did the teacher attempt to clarify students' misunderstandings or confusions?
TEACHING ANALYSIS GUIDE FOR THE INQUIRY TRAINING MODEL

This guide is designed to help you analyse the process of teaching as you practice the Inquiry Training Model. The analysis focuses on aspects of teaching that are important to the syntax of the model, the teacher's role, and specific teaching skills.

The Guide consists of a series of questions and phrases. As you observe a practice session, analyse the teaching using the rating scale that appears opposite each question and statement. This scale uses the following items:

**Thoroughly.** This item signifies that the teacher engaged in the behaviour to the point where students were responding comfortably and fluently. Appropriateness varies from situation to situation. For example, discrepant events need to be presented differently to learners of different ages.

**Partially.** This item signifies that the teacher engaged in appropriate behaviour, but not as thoroughly as possible. There is some doubt about whether the students are responding fully.

**Missing.** The teacher did not engage in the behaviour; there appears to be a loss in student response or probably will be one.

**Not Needed.** The teacher did not explicitly manifest the behaviour, but there is no loss. Either the behaviour was included in others or the students began to respond appropriately without being led to.

For each question or statement in the Guide, tick the term that best describes the teacher's behaviour.

A. PHASE ONE: Encounter with the Problem

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<tr>
<td>1. Did the teacher present a discrepant event?</td>
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<td>2. Were the inquiry procedures explained to the students'?</td>
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<td>3. Was the problem (discrepan) clear to the students'?</td>
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</table>
B. Phase Two: Data Gathering: Verification

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<td>4</td>
<td>Was the inquiry directed toward verification of conditions, events, objects, and property?</td>
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<td>Did the teacher ensure that students ask only &quot;yes&quot; or &quot;no&quot; questions by asking students to reformulate their questions, by pointing out invalid questions, and by refusing to answer open-ended questions?</td>
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<td>Did the teacher press students to clarify the terms and conditions of their questions?</td>
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<td>If necessary, was there a summary of the inquiry up to this point?</td>
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<td>8</td>
<td>Was there a formulation or redefinition of the problem?</td>
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C. Phase Three: Data Gathering: Experimentation

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<td>Did the teacher invite testing (experimenting) of relationships and/or isolation of relevant variables?</td>
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<td>10</td>
<td>Where appropriate, did the teacher use the language of the inquiry process— for instance, identifying student questions as &quot;theories&quot; and inviting &quot;experimentation&quot; or &quot;testing&quot;?</td>
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</table>
D. Phase Four: Formulation of an Explanation

11. If necessary, did the teacher induce students to formulate a rule or explanation of the discrepant event?
12. Did the teacher press for clearer statement of theories and support for generalizations?

E. Phase Five: Analysis of Inquiry

13. Was there a recapitulation of the steps of the inquiry?
14. Was there a discussion of the elements of inquiry, such as data gathering, testing, hypothesizing?

II. THE TEACHER’S ROLE

15. Were all inquiries accepted in a non-evaluative manner?
16. Were interaction among students encouraged?
17. Was the language of inquiry introduced?

III. TEACHING SKILLS

18. Paraphrasing students’ ideas
19. Summarizing, or inviting summaries
20. Focusing
SCHOOL OF PEDAGOGICAL SCIENCES
MAHATMA GANDHI UNIVERSITY
KOTTAYAM

Appendix C

ACHIEVEMENT TEST
(ROUGH DRAFT - FORM A)

General Instructions

There are 80 questions in this question paper. To each question four choices are given by way of answers marked as A, B, C and D. Among the multiple choices only one answer is correct. Find out the correct one and write the letter of your choice which denotes it in the given answer sheet. Each question carries one mark. Every question should be answered. Any kind of rewriting or overwriting is not allowed. If you have to change your answer, strike the earlier one and answer again in new bracket and write the correct answer in it.

Name of the School

Maximum marks: 80

Name of the Student

Time: 1 1/2 Hrs.

GEOGRAPHY

1. The invisible form of water present in the atmosphere?
   A. Water vapour  B. Snow  C. Fog  D. Mist

2. The element which stands against condensation?
   A. High humidity  B. Presence of aerosols  C. Cloudy sky  D. Low temperature

3. The most dynamic sphere in the atmosphere?
   A. Lithosphere  B. Hydrosphere  C. Biosphere  D. Troposphere

4. The process of changing the water vapour in the atmosphere into droplets of water or crystals of ice is called.
   A. Condensation  B. Dew point  C. Condensation nuclei  D. Hail

5. A smog-occurring town in Kerala?
   A. Thrissur  B. Kollam  C. Thiruvananthapuram  D. Ernakulam
6. Compared with fog what is the special feature of mist?
   A. Seen as clouds   B. Seen over the mountains   C. Condensing on a cold surface   D. Seen over water bodies

7. Clouds which appear as horizontal sheets?
   A. Nimbus   B. Stratus   C. Cumulous   D. Cirrus

8. The leeward side of the mountain where there is no rainfall?
   A. Scanty rainfall region   B. Moderate rainfall region   C. Desert region   D. Rain shadow region

9. The process which leads to continuous condensation of clouds?
   A. Precipitation   B. Snow   C. Fog   D. Hail

10. The process of changing liquid water into gaseous state?
    A. Saturation point   B. Condensation   C. Evaporation   D. Clouds

11. The gaseous envelop of the earth which is subject to gravitational force?
    A. Homosphere   B. Heterosphere   C. Atmosphere   D. Troposphere

12. The cloud which develops vertically?
    A. Cumulous   B. Stratus   C. Cirrus   D. Nimbus

13. Another name of 4 o’clock rain?
    A. Border rainfall   B. Orographic rainfall   C. Convectional rainfall   D. Cyclonic rainfall

14. A determining factor which influence weather and climate?
    A. Physiography   B. Water vapour   C. Atmospheric pressure   D. Humidity

15. In which way is the convectional rain formed?
    A. By cyclone   B. By excessive heating and cooling   C. By advection   D. By conduction

16. The percentage of exploitable water which is available on earth?
    A. 0.63%   B. 0.3%   C. 0.02%   D. 0.05%

17. The season in which mist and fog are formed?
    A. Summer   B. Autumn   C. Spring   D. Winter

18. A common form of precipitation?
    A. Hail   B. Snow   C. Rain   D. Water vapour
A critical temperature at which the saturated air begins to condense?
A. Dew point  B. Saturation point  C. Condensation nucleus  D. Insolation

The reason for the floating of the clouds in the sky?
A. Atmospheric pressure  B. Winds  C. Humidity  D. Tiny size

An instrument which measures relative humidity?
A. Hygrometer  B. Cronometer  C. Anemometer  D. Barometer

The reason for occurring cyclonic rainfall?
A. Surrounding air is concentrated in the middle  B. Air is dispersed on four sides  C. High pressure is formed in the sea  D. Low pressure is formed on earth

The clouds that are seen like wispy feather?
A. Cumulous  B. Nimbus  C. Cirrus  D. Stratus

Border rainfalls occurs in
A. Summer  B. Winter  C. Autumn  D. spring

What is the percentage of water concentrated in the oceans?
A. 94%  B. 97%  C. 91%  D. 71%

Orographic rainfall generally occurs as
A. By the nearness of oceans  B. The influence of mountains  C. By Cyclone  D. By Advection

The sphere in which clouds and rain are formed?
A. Stratosphere  B. Heterosphere  C. Homosphere  D. Troposphere

The special feature of conventional rainfall?
A. Occurs throughout the year  B. Occurs only in the border areas  C. Falls on slopes of valleys  D. Falls throughout the day

The rainfall which is related to mountains?
A. Convectional rainfall  B. Orographic rainfall  C. Cyclonic rainfall  D. 4 O’clock rainfall

A unique element on earth?
A. Man  B. Living organisms  C. Plants  D. Non-living elements
31. A variable gas in the atmosphere?
   A. Nitrogen  B. Argon  C. Water vapour  D. Helium
32. The main source of energy?
   A. Thermal centres  B. Electricity  C. Sun  D. Atomic power
33. The important element which helps to classify cirrus and stratus clouds?
   A. Height  B. Weight  C. Shape  D. Colour
34. The gas seen in the atmosphere in the lowest amount?
   A. Nitrogen  B. Argon  C. Nitrous oxide  D. Carbon dioxide
35. The Earth’s protective cover against harmful ultra-violet rays?
   A. Atmosphere  B. Clouds  C. Ionosphere  D. Ozone layer
36. The process of growing the size of water droplets in the atmosphere?
   A. Precipitation  B. Glaciers  C. Rain  D. Hail
37. In which season do we get 80% of the rainfall in our region?
   A. South western monsoon season  B. North eastern monsoon season
   C. Return season of monsoon  D. Winter season
38. How are the different parts of the earth heated by thermal distribution?
   A. In balanced way  B. Unbalanced way  C. Inclination of sun’s rays
   D. Through convection
39. The process by which nature provides fresh water for man?
   A. Precipitation  B. Underground water  C. Rain  D. Water cycle
40. The atmosphere is made up of
   A. Gas compounds  B. Organic elements  C. Inorganic elements
   D. Ozone Layers
41. The region where we get rain throughout the year?
   A. High latitude region  B. Mediterranean region  C. Equatorial region
   D. Monsoon region
42. The unit used for measuring atmospheric pressure?
   A. Degree  B. Decibel  C. Hates  D. Millibar
43. The sphere in which gases are seen in separate layers?
   A. Troposphere  B. Heterosphere  C. Thermosphere  D. Homosphere
44. By which process is atmosphere heated mainly?
   A. Horizontally   B. Vertically   C. From lower layer to upper
   D. From upper layer to lower

45. The estimated quantity of moisture air that passes into the air in one second?
   A. 16 million tonnes   B. 10 million tonnes   C. 4 million tonnes
   D. 0.3 million tonnes

46. Which thermometer in a hygrometer shows high reading when put in a fully saturated condition?
   A. Dry bulb thermometer   B. Wet bulb thermometer   C. Temperature varies in two thermometers   D. Temperature is the same in the two

47. From the following diagram denote which one shows the relation between temperature and evaporation


48. A possible phenomenon which occurs in a winter night having a clear sky?
   A. Vertical distribution of pressure   B. Formation of dew and hoar frost
   C. Formation of fog and mist   D. Horizontal distribution of pressure

49. A characteristic which is not related to cyclonic rainfall?
   A. The duration of rainfall is very short   B. Heavy rainfall   C. Rainfall occurs only after mid day   D. A low pressure belt is formed

50. The phenomenon of inversion of temperature is widely present in
   A. Inter mountain valleys   B. Plains   C. Coastal areas   D. Plateaus

51. The atmospheric pressure is high in the lower layers of the atmosphere. The reason is.
   A. Air is heavier   B. Humidity is high   C. Movement of air is low
   D. Sun rays do not fall directly

52. Polar region is colder than other regions of temperature zones because
   A. Elevation of that place from the seal level   B. It receives less solar energy
   C. Quantity of air is high   D. Horizontal distribution of air
53. The rate of evaporation in ocean is high compared to continents. Because
   A. The quantity of water in the ocean is high    B. Ocean water is heated and cooled slowly
   C. Land is heated and cooled fast         D. Sea breeze increases the rate of evaporation.

54. Water vapour is mixed up with other gases present in the atmosphere. Because
   A. It changes its state according to place and time    B. Opaqueness of water vapour
   C. Exists in the atmosphere as a variable gas    D. It spreads out in the atmosphere

55. The proportion of water vapour in the atmosphere is not stable. Because:
   A. It is mixed up with other gases in the atmosphere   B. It cannot be measured
   C. It rises up above in the sky    D. It cannot be seen.

56. Air pollution affects the ecological balance of the atmosphere. Because:
   A. It increases the temperature    B. It increases the rate of rainfall
   C. Impurities act as a condensation nuclei    D. It inversely affects the climate

57. Water vapour acts as a decisive factor in the atmosphere. From this you can infer that:
   A. Life on earth depends on water vapour   B. Determines the climate of the earth
   C. Seasonal changes occur    D. Controls the rate of evaporation

58. North India is hotter than south India but the sweating is less there. because
   A. The amount of accessible water is low    B. the climate is more dry
   C. Presence of condensation nuclei is low    D. Relative humidity is low

59. The formation of dew and hoar frost is high in winter than in summer. From this you can infer
   A. Influence of sea breeze is high    B. Days are longer in summer
   C. Nights are longer in winter    D. None of these

60. Dew is seen on leaves, flowers and grass on all days, but hoarfrost is seen only in particular places. Why?
   A. Condensation occurs only on a cold surface    B. Temperature is below freezing point
   C. Sky is cloudless   D. Days are longer than nights
61. The possibility of occurring smog in Delhi is higher than that of Kerala. From this you can infer that:
   A. Less forest in Delhi   B. Density of population is high   C. Delhi is a city
   D. Large number of factories and industrial centres are located in Delhi

62. The colour of the clouds in the sky is different, the main reason for this phenomenon is:
   A. Way of slanting sun's rays   B. Size of the water droplets are different
   C. Heights and size of the clouds are different   D. None of these

63. All clouds are not rain clouds. From this you can infer:
   A. Clouds are different   B. Size of the droplets are different   C. Some clouds rise up in the sky   D. Some clouds are not condensed

64. The following are the readings shown in a hygrometer for four consecutive days. Among these readings which is the day the relative humidity is very low.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Days</th>
<th>Dry bulb thermometer</th>
<th>Wet bulb thermometer</th>
</tr>
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<td>1.</td>
<td>Wednesday</td>
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<td>32</td>
</tr>
<tr>
<td>2.</td>
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<tr>
<td>3.</td>
<td>Friday</td>
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</tr>
<tr>
<td>4.</td>
<td>Saturday</td>
<td>36</td>
<td>31</td>
</tr>
</tbody>
</table>

A. Wednesday  B. Thursday  C. Friday  D. Saturday
65. The rate of rainfall is very low in high latitudes. From this you can infer that
   A. The rate of evaporation is low  
   B. Atmospheric pressure is low
   C. Condensation does not occur  
   D. The ability to absorb water vapour is low in high latitude

66. The specific feature of the particles of water in mist as compared with fog
   A. Big in size  
   B. Small in size  
   C. Same in size  
   D. Much moisturised than fog

67. The rate of rainfall varies from place to place and time to time. From this you can infer that.
   A. Climate is different  
   B. Slanting of sun’s rays is different  
   C. Condensation process is different  
   D. Clouds are not changed into rain drops

68. Suppose you can see no fog over water bodies. What inference can you draw from this?
   A. Evaporation has not occurred  
   B. In the day time atmosphere is cloudy  
   C. Relative humidity is low  
   D. Condensation nuclei is high

69. Rise in the temperature increased the capacity to absorb more water vapour. What inference can you draw from this?
   A. Increase in temperature influences the rate of evaporation  
   B. Increase in temperature expands the air and rises up above  
   C. The pressure of the air decreases while the temperature rises  
   D. Air becomes dry and less humid with rise in temperature

70. The percentage of humidity present in the atmosphere as compared to its full capacity is called
   A. Absolute humidity  
   B. Relative humidity  
   C. Dew point  
   D. Saturation point

71. In torrid zones the cyclonic rainfall is very strong. But in temperate regions it is relatively weak. What inference can you draw from this?
   A. In torrid zones cold and hot air currents meet together  
   B. They do not meet in the temperate regions  
   C. Convection is high in torrid zones  
   D. Advection is strong in temperate regions
72. We keep the rain gauge away from buildings and trees. What is the inference drawn from this?
   A. Shadow of the buildings and trees covers the apparatus  
   B. To avoid damage  
   C. To get the solar radiation directly  
   D. To measure the rainfall correctly

73. Relative humidity varies from place to place. The main reason for this:
   A. Presence of aerosols  
   B. The temperature of the atmosphere varies from place to place  
   C. Variation in the rate of rainfall  
   D. Specific characteristic of air currents

74. In the absence of water vapour life on earth is impossible because:
   A. Proportion of oxygen is reduced  
   B. Level of water in the ocean rises  
   C. Draught and natural calamities will occur  
   D. Photosynthesis does not occur

75. Take a shiny metal can and put some ice cubes in it. After some time droplets of water are formed on the side of the can. What is the reason?
   A. The cap of the can is not tight  
   B. Condensation takes place  
   C. Evaporation takes place  
   D. Humidity is low

76. Fogs are seen in places where warm and cold currents join. What is the reason?
   A. Temperature in the atmosphere varies  
   B. By insolation  
   C. By convection  
   D. By the rise of humid air in the atmosphere

77. The temperature in the thermosphere is measured by using artificial satellites mounted in rockets. What inference can you draw from this?
   A. Oxygen is not available  
   B. Ultra violet solar radiation affects  
   C. Temperature decreases to its minimum  
   D. Temperature is very high

78. On a cold morning take a mirror and breathe on it. What is the phenomenon you see on the mirror?
   A. Condensation of moisture air  
   B. Breathing air  
   C. Water vapour in the air  
   D. Nothing can be seen

79. In the eastern side of the western ghats the rate of rainfall is low. What inference can you draw from this?
   A. Temperature is high in eastern side  
   B. It is a rain shadow region  
   C. Seasonal variation is clear  
   D. Peculiarity of trade winds
Find the correct pair from the column.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
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<tr>
<td>a. Climatic zone</td>
<td>p. Stratosphere</td>
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<tr>
<td>b. Isotherms</td>
<td>q. Tropopause</td>
</tr>
<tr>
<td>c. Transition zone</td>
<td>r. Ionosphere</td>
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<tr>
<td>d. Transmission of Radio waves</td>
<td>s. Troposphere</td>
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<td>e. Ozonosphere</td>
<td>t. Thermosphere</td>
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A. ds  B. et  C. as  D. eq
### Appendix D

**Item Analysis Data and Scoring Key of the Draft test of Immediate posttest**

(Form: A) in Geography for Standard IX

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**Note:**

DI - Difficulty Index

DP - Discriminating power

R - Item Rejected

A - Item Accepted

SK - Scoring Key

SA - Serial arrangement of the items accepted
SCHOOL OF PEDAGOGICAL SCIENCES
MAHATMA GANDHI UNIVERSITY, KOTTAYAM

ACHIEVEMENT TEST - FORM A

Name of the School: SCHOOL OF PEDAGOGICAL SCIENCES
Name of the Student: Max. Marks: 40
Std. IX

1. അടിപ്ലാങ്ക് വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കുൽ B) മക്കൽ C) മക്കാള D) മക്കാളം

2. ആബാദൻ സൂര്യൻ എഴുന്നാറും പുരുഷാഭിനന്ദ എന്ന് രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

3. ആബാദൻ സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

4. മക്കൾ മക്കരുത് അന്ന് പുരുഷാഭിനന്ദ എന്ന് രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

5. പുരുഷാഭിനന്ദ സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

6. മക്കൽ മക്കരുത് വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

7. മക്കൽ മക്കരുത് മക്കൽ മക്കരുത്
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

8. മക്കൽ മക്കരുത് മക്കൽ സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

9. മക്കൽ മക്കരുത് മക്കൽ സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

10. മക്കൽ മക്കരുത് സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

11. മക്കൽ മക്കരുത് വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

12. സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

13. മക്കൽ മക്കരുത് സൂര്യൻ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

14. മക്കൽ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) 94% B) 97% C) 79% D) 71%

15. വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

16. മക്കൽ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം

17. മക്കൽ വിദ്യാഭ്യാസ സജ്ജീകൃതം രേഖക്കുഴി
A) മക്കൽ B) മക്കരുത് C) മക്കരുതു D) മക്കാളം
18. ഉണ്മക്കൂര തണ്ടുകൊണ്ടു നിന്ന് പ്രത്യക്ഷമായി സാന്നിദ്ധ്യത്തിലെ പ്രയോജനമായ വിഷയം
   A) കൊപ്പി ചട്ടം മതി 
   B) പിഞ്ഞ മതി 
   C) പരിഗണണം 
   D) ബോധം 
   18( )

19. സൈന്യത്തിന്റെ വിജയം പ്രത്യക്ഷം അന്തേശം വിഷയം ഉണ്മക്കൂരയിൽ പ്രത്യക്ഷമായി
   A) സാന്നിദ്ധ്യത്തിലെ പ്രയോജനം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   19( )

20. തോട്ടത്തിൽ ഉണ്ടാക്കുന്ന മാർഗ്ഗത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യക്ഷമായി വ്യക്തം
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   20( )

21. തോട്ടത്തിൽ ഉണ്ടാവുന്ന പ്രാവൃത്തിയെത്തുന്ന പ്രാവൃത്തി ഉണ്മക്കൂരയിലാണ് പ്രത്യക്ഷമായി
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   21( )

22. മുഖ്യമായും മറ്റുമായും പ്രത്യേകിത്തിന്റെ വ്യക്തിയെ പ്രത്യേകിത്തിന്റെ വലിയ വിഷയങ്ങളിലെ പ്രയോജനം ഉണ്മക്കൂരയിലാണ് പ്രത്യേകിത്തിന്റെ വലിയ വിഷയങ്ങളിലെ പ്രയോജനം
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   22( )

23. സൈന്യത്തിന്റെ പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യക്ഷമായി വ്യക്തം പ്രോത്സാഹിക്കുന്ന വിഷയങ്ങളാണ്
   A) 
   B) 
   C) 
   D) 
   23( )

24. സൈന്യത്തിന്റെ പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ സാന്നിദ്ധ്യത്തിൽ പ്രത്യേകിത്തിന്റെ വിഷയം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   24( )

25. സൈന്യത്തിന്റെ പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   25( )

26. സൈന്യത്തിന്റെ പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം ഉണ്മക്കൂരയിൽ
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   26( )

27. മുഖ്യമായും പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം ഉണ്മക്കൂരയിൽ
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   27( )

28. മുഖ്യമായും പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം ഉണ്മക്കൂരയിൽ
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   28( )

29. സൈന്യത്തിൻകം പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം ഉണ്മക്കൂരയിൽ
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   29( )

30. മുഖ്യമായും പ്രത്യേകിത്തിന്റെ പ്രയോജനം ഉണ്മക്കൂരയിൽ പ്രത്യേകിത്തിന്റെ വിഷയം
   A) പരിഗണണം 
   B) പിഞ്ഞ പ്രയോജനം 
   C) പരിഗണണം 
   D) ബോധം 
   30( )
<table>
<thead>
<tr>
<th>നിര</th>
<th>പ്രാംബാധികാരം</th>
<th>സി.എൻ.എം. സി.എൻ.എം.</th>
<th>സി.എൻ.എം. സി.എൻ.എം.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>പ്രാംബാധികാരം</td>
<td>36</td>
<td>32</td>
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<td>2</td>
<td>പ്രാംബാധികാരം</td>
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<tr>
<td>3</td>
<td>പ്രാംബാധികാരം</td>
<td>35</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>പ്രാംബാധികാരം</td>
<td>36</td>
<td>31</td>
</tr>
</tbody>
</table>

A) പ്രാംബാധികാരം B) പ്രാംബാധികാരം C) പ്രാംബാധികാരം D) പ്രാംബാധികാരം

32. കണക്കാണ്ടത്തിൽ എന്ന ശ്രമം മുന്നിൽ അയക്കേണ്ടത് എന്നാണ്‌. മുന്നിൽ അയക്കേണ്ട ശേഷം, എന്നാണ്‌. എന്നാണ്‌. എന്നാണ്‌.
A) കണക്കാണ്ടത്തിൽ എന്നാണ്‌. B) എന്നാണ്‌. C) എന്നാണ്‌. D) എന്നാണ്‌.

33. എന്നാണ്‌ ഒരു പ്രാംബാധികാരം എന്നാണ്‌ പ്രാംബാധികാരം എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌.
A) പ്രാംബാധികാരം B) എന്നാണ്‌. C) എന്നാണ്‌. D) എന്നാണ്‌.

34. എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌.
A) എന്നാണ്‌ B) എന്നാണ്‌. C) എന്നാണ്‌. D) എന്നാണ്‌.

35. എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌.
A) എന്നാണ്‌ B) എന്നാണ്‌. C) എന്നാണ്‌. D) എന്നാണ്‌.

36. എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌.
A) എന്നാണ്‌ B) എന്നാണ്‌. C) എന്നാണ്‌. D) എന്നാണ്‌.

37. എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌ എന്നാണ്‌.

A) എന്നാണ്‌ B) എന്നാണ്‌. C) എന്നാണ്‌. D) എന്നാണ്‌.
Appendix F

SCHOOL OF PEDAGOGICAL SCIENCES
MAHATMA GANDHI UNIVERSITY
KOTTAYAM
ACHIEVEMENT TEST
(ROUGH DRAFT -FORM B)

General Instructions

There are 80 questions in this question paper. To each question four choices are given by way of answers, marked as A, B, C and D. Among the multiple choices only one answer is correct. Find out the correct one and write the letter of our choice which denotes it in the given answer sheet. Each question carries one mark. Every question should be answered. Any kind of rewriting is not allowed. If you want to change your answer, strike the earlier one and write the correct answer again.

Name of the School: 
Name of the Student: 

Maximum Marks: 80
Time : 1 ½ Hrs.

Standard: IX

GEOGRAPHY

1. Name a variable gas in the atmosphere
   A. Nitrogen  B. Argon  C. Water vapour  D. Helium

2. An imaginary line on the map joining places having equal rainfall
   A. Isotherms  B. Isobars  C. Contour lines  D. Isohyets

3. The sphere of environment where three states of water are visible
   A. Lithosphere  B. Hydrosphere  C. Biosphere  D. Atmosphere

4. The phenomenon opposite to evaporation is
   A. Condensation  B. Saturation  C. Super cooling of water  D. Formation of clouds

5. The tasteless, odourless and transparent gas in the atmosphere.
   A. Oxygen  B. Hydrogen  C. Carbon dioxide  D. Water vapour

6. The process involved in the formation of hail is
   A. Condensation of ice flakes  B. Condensation of rain drops  C. Condensation of saturated air  D. Melting of snow
The sphere which acts as a reflector of radio waves
A. Atmosphere  B. Ionosphere  C. Homosphere  D. Thermosphere

Precipitation in the form of ice balls
A. Hail  B. Hailstone  C. Icebergs  D. Ice flakes

A common characteristic of fog and mist
A. Appear as clouds  B. Visibility is the same  C. Size of the particle of water is the same  D. Appear as smoky

The temperature zone which is the coldest
A. torrid zone  B. Frigid zone  C. Moderate zone  D. Temperate zone

The leeward side of the mountain where there is no rainfall
A. Desert region  B. Rain shadow region  C. Scanty rainfall region  D. Moderate rainfall region

Where does the snowfall often occur?
A. On polar region  B. On high mountains  C. On border regions  D. Interior of the continents

Clouds which are thick, dark grey or black in colour
A. Cumulous  B. Nimbus  C. Stratus  D. Cirrus

Clouds which are seen in places of heavy industries
A. Cirrus  B. Cumulous  C. Smog  D. Nimbus

The unit used for measuring rainfall is
A. Centimetre  B. Centigramm  C. Centilitre  D. Centigrade

Cyclone rainfall is very heavy in
A. Tropical regions  B. Temperate regions  C. Moderate regions  D. Frigid regions

The special feature of water droplets of mist over fog is
A. More moistened  B. Visibility is short  C. Visibility is long  D. Particle of water is tiny

The most dynamic sphere in the atmosphere is
A. Homosphere  B. Ionosphere  C. Biosphere  D. Troposphere
19. The process of changing liquid water into gaseous state
   A. Saturation point  B. Condensation  C. Evaporation  D. Formation of clouds

20. Which of the following comes under the biological environment?
   A. Earth  B. Plants  C. Rainfall  D. Air

21. The instrument used for measuring relative humidity is
   A. Chronometer  B. Animometer  C. Barometer  D. Hydrometer

22. Which of the following statement is incorrect about conventional rainfall?
   A. Conventional rainfall occurs daily  B. Air moves upward as convection currents
   C. Condensation reaches maximum in the afternoon
   D. It is limited to coastal areas

23. The clouds which develop vertically
   A. Strato-cumulus  B. Strato-nimbus  C. Stratus  D. Nimbus

24. Which of the following is a watery planet?
   A. Earth  B. Venus  C. Saturn  D. Mars

25. Another name of 4 O' clock rainfall is
   A. Border rainfall  B. Orographic rainfall  C. Conventional rainfall
   D. Relief rainfall

26. The major season for varying size and shape of snow flakes
   A. Crystals of ice join together  B. Molecules are join together
   C. Condensation occurs in very low temperature  D. None of these

27. The clouds which cause continuous rain and snowfall
   A. Nimbus  B. Cirrus  C. Stratus  D. Cumulous

28. Which sphere of the environment serves as a vital link between oceans and continents?
   A. Hydrosphere  B. Lithosphere  C. Atmosphere  D. Biosphere

29. The element which the dry air can absorb more
   A. Oxygen  B. Water vapour  C. Humidity  D. Carbon di-oxide

30. The clouds which appear as horizontal sheets
   A. Cirrus  B. Cumulous  C. Stratus  D. Nimbus

31. The protective cover which shields the earth from the extreme thermal heat
A. Clouds  b. Atmosphere  C. Ozone layer  D. Ionosphere

32. The characteristic feature which is not related to border rainfall
A. It is caused by sea breeze in winter  B. It occurs in coastal areas
C. Air mass in land is cooled and condensed  D. It occurs in equatorial regions

33. The process where by water vapour is condensed in the air and falls to the earth is called
A. Frozen ice  B. Condensation  C. Precipitation  D. Moving ice

34. Which is the gas seen in the lowest amount in the atmosphere
A. Nitrogen  B. Argon  C. Nitrous oxide  D. Hydrogen

35. The size of the water droplets in the cloud varies from
A. 0.02-0.06mm  B. 0.03mm - 0.04 mm  C. 0.08mm- 0.06 mm  D. 0.01-0.09mm

36. How are the different parts of the atmosphere heated?
A. In a balanced way  B. Unbalanced way
C. Through inclination of sun’s rays  D. Through convection

37. The process by which nature provides fresh water for man
A. Precipitation  B. Water cycle  C. Rainfall  D. Ground water

38. A characteristic which is not related to cyclonic rainfall
A. Low pressure is formed  B. Air converges at the centre  C. Cold air pushes the warm air upwards  D. Rainfall occurs only after mid-day

39. Among the following statements which one is incorrect
A. Hoarfrost is helpful for the growth of vegetation  B. The maximum visibility in mist is up to 2 kilometres  C. Atmosphere is being heated by solar radiation  D. Snow is a part of water in atmosphere

40. Which is the most suitable climate for the formation of hoarfrost?
A. Low dew point  B. Low condensation nuclei  C. High humidity  D. Low saturation point

41. The phenomenon of inversion of temperature is widely present in
A. Mountain tops  B. Inter mountain valleys  C. Plateaus  D. Plains

42. The name for the wispy feather-like clouds is
A. Cirro-stratus  B. Strato-cumulous  C. Cirrus  D. Cumulous
43. The estimated quantity of water vapour that passes into the atmosphere within each second
   A. 16 million tonnes  B. 14 million tonnes  C. 4 million tonnes  D. 0.3 million tonnes
44. Orographic rainfall generally occurs through
   A. Nearness to ocean  B. Influence of mountains  C. Cyclone  D. Advection
45. The critical temperature at which air is fully saturated and begins to condense
   A. Dew point  B. Saturation point  C. Condensation nuclei  D. Condensation point
46. Among the following concepts which is the one not related to the process of condensation
   A. Evaporation  B. Water vapour  C. Clouds  D. Rainfall
47. A unique element on earth
   A. Plants  B. Animals  C. Biological organisms  D. Man
48. The process of changing water vapour into droplets of water or crystals of ice is called
   A. Condensation  B. condensation nuclei  C. Saturation point  D. Hailstone
49. The element which stands as a hindrance for condensation
   A. High humidity  B. Presence of aerosols  C. Cloudy sky  D. Low temperature
50. The most destructive effect of hailstone is
   A. Making bad climate  B. Destructive to standing crops  C. Destructive to rate species  D. Destructive to human beings
51. The maximum proportion of world's water which is accessible for man's use
   A. 0.63%  B. 0.03%  C. 0.02%  D. 0.05%
52. Aeroplanes fly usually above the tropopause. What inference can you draw from this?
   A. Temperature increases highly  B. Air movements are almost horizontal  
   C. To guard themselves from bumpy air pockets  D. Temperature decreased all on a sudden
53. The process involved in the formation of hail stone is
   A. Condensation of clouds  B. Condensation of water vapour  C. Condensation of ice flakes  D. Condensation of rain drops in the sky

54. The least possible type of rainfall in Kerala
   A. Conventional rainfall  B. Orographic rainfall  C. Border rainfall  D. Cyclonic rainfall

55. Which of the following is a wrong statement?
   A. Evaporation always takes place in nature  B. Dust particles play a prominent role in the formation of clouds  C. Condensation takes place as a result of falling of temperature  D. Evaporation takes place by reaching saturation point

56. The main source of energy
   A. Thermal centres  B. Electricity  C. Sun  D. Atomic power

57. The sphere in which clouds, snow and rain are formed
   A. Troposphere  B. Stratosphere  C. Mesosphere  D. Thermosphere

58. Annual rainfall of 10 countries of the world is given below

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Name of the Country</th>
<th>Rate of rainfall (in centimetres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Germany</td>
<td>64</td>
</tr>
<tr>
<td>2</td>
<td>Canada</td>
<td>250</td>
</tr>
<tr>
<td>3</td>
<td>Pakistan</td>
<td>25</td>
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<tr>
<td>6</td>
<td>Poland</td>
<td>92</td>
</tr>
<tr>
<td>7</td>
<td>Green land</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>Algeria</td>
<td>128</td>
</tr>
<tr>
<td>9</td>
<td>Ice land</td>
<td>76</td>
</tr>
<tr>
<td>10</td>
<td>Sambia</td>
<td>130</td>
</tr>
</tbody>
</table>

Among these countries which one is a heavy rainfall region
   A. Sambia  B. Canada  C. Algeria  D. Brazil
59. Which one is a scanty rainfall region?
   A. Greenland  B. Pakistan  C. Algeria  D. Iceland

60. Which one is a desert region?
   A. Greenland  B. Poland  C. Iceland  D. Canada

61. Which one is a moderate rainfall region?
   A. Germany  B. Saudi Arabia  C. Brazil  D. Poland

62. The following are the readings shown in a hygrometer for four consecutive days
   On which day relative humidity is moderate?

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Dry bulb thermometer (in centimetres)</th>
<th>Wet bulb thermometer (in centimetres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monday 36</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>Tuesday 34</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>Wednesday 35</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>Thursday 36</td>
<td>31</td>
</tr>
</tbody>
</table>

A. Monday  B. Tuesday  C. Wednesday  D. Thursday

63. On which day relative humidity is very low?
   A. Monday  B. Tuesday  C. Wednesday  D. None of these

64. On which day relative humidity is very high?
   A. Monday  B. Tuesday  C. Wednesday  D. Thursday

65. Water vapour acts as a decisive factor. Without this life cannot exist on earth.
   What inference can you draw from this statement?
   A. There is no rainfall  B. It reduce the amount of oxygen in the air  C. Water level in the sea increases  D. the process of photosynthesis is not possible

66. Different places on earth receives different types and varieties of rainfall and precipitation Why?
   A. Condensation process is different  B. Weather and climate are different  C. Amount of aerosols is different  D. Slant of sun’s rays are different
67. Relative humidity is different and varies from place to place. What is the main reason for this variation?
   A. Source of accessible water   B. Altitude   C. Seasons   D. Ocean currents

68. Cloudy days are warmer than a clear day. What inference can you draw from this statement?
   A. Green house effect is present   B. Dew point is low   C. Condensation nuclei is less   D. Rate of evaporation is high

69. Some clouds are dark and grey, while others are silvery white. What inference can you draw from this statement?
   A. Dark clouds are rain clouds   B. Sunlight is obstructed by dark clouds   C. Dark clouds form in the upper layers of atmosphere   D. Dark clouds are whispy and feather like

70. We must keep the rain gauge away from trees and buildings. Why?
   A. To avoid dangers   B. To avoid shadows   C. To measure the rainfall correctly   D. To get direct sun light.

71. The rate of evaporation is greater over oceans than on continents. What inference can you draw from this statement?
   A. In oceans the amount of accessible water is more   B. Water takes much time to be cooled   C. Continents take much time to be hot and cooled   D. Sea breeze increases the rate of evaporation

72. Which thermometer in the picture of a hygrometer shows high temperature before rain?
   A. Wet bulb thermometer   B. Temperature is same in two thermometers   C. Dry bulb thermometer   D. Temperature varies simultaneously in two thermometers

73. While hailstone is subjected to experimentation there will be a number of layers as in an onion. What inference can you draw from this statement?
   A. Difference in relatively humidity   B. Frozen droplets are tossed many times in clouds   C. Hailstone is formed from snow flakes   D. None of these
74. The most important condition to form crystals of ice from water vapour:
   A. Temperature should be below saturation point  
   B. Temperature should be above saturation point  
   C. Temperature should be above dew point  
   D. Temperature should be below 0°C.

75. A wide variation is observed between the rate of rain fall in Mumbai and Pune, while the distance between these two places is only a few kilometres. What inference can you draw from this statement?
   A. Influence of mountains  
   B. Influence of convection  
   C. Influence of oceans  
   D. Influence of low pressure systems

76. Water vapour is mixed up with other gases present in the atmosphere. Why?
   A. Water vapour is a variable gas  
   B. It exists in a transparent state  
   C. It exists in gaseous form  
   D. It is odourless and tasteless

77. For getting artificial rainfall minute particles of silver iodide are sprinkled from atmosphere. What inference can you draw from this statement?
   A. Rainfall occurs through chemical reaction  
   B. Humidity in the atmosphere is increased  
   C. Acts as a condensation nuclei  
   D. It helps to increase the temperature of the atmosphere

78. Dew is sticking more on metallic objects than on non-metallic objects. What inference can you grab from this statement?
   A. Metals are good conductors  
   B. Condensation nuclei is high for metals  
   C. Magnetic power of metals is high  
   D. Snow point in metals is high

79. Fogs are seen over water bodies in the evening while in the morning they disappear. What inference can you draw from this statement?
   A. In the morning fogs become clouds  
   B. Fogs are evaporated  
   C. Fogs are drawn out by land breeze  
   D. Fogs are removed by sea breeze

80. Dew and hoar frosts are formed more in the winter nights than in the summer nights. Why?
   A. Winter nights are more cold and longer than summer nights  
   B. Atmosphere is more cloudy  
   C. Amount of aerosoles is high  
   D. Winter days are more longer than summer days.
**Appendix G**

Item Analysis Data and Scoring key of the Draft test of Delayed posttest (Form: B) in Geography for Standard IX

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Note:
DI  Difficulty Index
DP-Discriminating power
R-Item Rejected
A-Item Accepted
SK-Score Key
SA-Serial arrangement of the items accepted
SCHOOL OF PEDAGOGICAL SCIENCES
MAHATMA GANDHI UNIVERSITY, KOTTAYAM

ACHEVENT TEST - FORM: B

Time: 40 Mints
Max. Marks: 40

Name of the Student: ____________________________
Std. IX

1. Which of the following is a 4th century BC, a) Socrates b) Plato c) Aristotle d) Aristotle & Socrates
   Answer: b) Plato

2. Which of the following is a 14th Century BC, a) Homer b) Dante c) Shakespeare d) Milton
   Answer: a) Homer

3. The first civilization in the India is a) Harappan b) Mauryan c) Gupta d) Satavahana
   Answer: a) Harappan

4. The first Indian suicide is a) Socrates b) Buddha c) Confucius d) Jesus
   Answer: b) Buddha

5. The first Indian dictionary is a) Sanskrit b) Tamil c) Maithili d) Bihari
   Answer: a) Sanskrit

6. The first Indian republic is a) India b) Bangladesh c) Pakistan d) Sri Lanka
   Answer: a) India

7. The first Indian university is a) Nalanda b) Vikrama c) Mahindra d) Nalanda
   Answer: a) Nalanda

8. The first Indian satellite is a) Aryabhatt b) Rohini c) Kiran d) Rohini
   Answer: a) Aryabhatt

9. The first Indian abroad to get Nobel prize is a) Rabindranath Tagore b) Rabindranath Tagore c) Rabindranath Tagore d) Rabindranath Tagore
   Answer: a) Rabindranath Tagore

10. The first Indian to get a gold medal in Olympics is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

11. The first Indian to get a silver medal in Olympics is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

12. The first Indian to get a bronze medal in Olympics is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

13. The first Indian to get a silver medal in Commonwealth games is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

14. The first Indian to get a bronze medal in Commonwealth games is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

15. The first Indian to get a gold medal in Commonwealth games is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

16. The first Indian to get a silver medal in Commonwealth games is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh

17. The first Indian to get a bronze medal in Commonwealth games is a) Milkha Singh b) K. M. Balam c) K. M. Balam d) Milkha Singh
    Answer: a) Milkha Singh
18. എന്തു പ്രകാരമാണിതെങ്കിൽ എന്താണ് പ്രാണിക്കാണെങ്കിൽ എന്തുപ്രകാരമാണ്

A) സസ്തനി പരാമർശം വിഷയം എന്തുപ്രകാരമാണ് B) എന്തുപ്രകാരമാണ്

B) പരാജയപ്പിടിച്ചില്ലാത്ത പരാജയപ്പിൽ എന്തുപ്രകാരമാണ്

C) പരാജയപ്പിൽ എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

D) എന്തുപ്രകാരമാണ്

19. എന്തു പ്രകാരമാണിഷെങ്കിൽ എന്താണ് പ്രാണിക്കാണെങ്കിൽ എന്തുപ്രകാരമാണ്

A) 16 B) 10 C) 4 D) 0.3

20. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി എന്തുപ്രകാരമാണ് B) എത്രയാണ് എത്രയാണ്

C) എത്രയാണ് എത്രയാണ് D) എന്തുപ്രകാരമാണ്

21. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

22. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

23. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

24. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

25. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

26. എന്തുപ്രകാരമാണിതെന്തുപ്രകാരമാണ്

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണ് D) എന്തുപ്രകാരമാണ്

27. എന്തുപ്രകാരമാണി

A) എന്തുപ്രകാരമാണി B) എന്തുപ്രകാരമാണ്

C) എന്തുപ്രകാരമാണി D) എന്തുപ്രകാരമാണ്

28. എന്തുപ്രകാരമാണി

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C) എന്തുപ്രകാരമാണി D) എന്തുപ്രകാരമാണി

29. എന്തുപ്രകാരമാണി

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<tr>
<td>പെഴ്സി</td>
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30. താഴെ പ്രദർശിപ്പിക്കുന്ന അക്സലിനുള്ള വിശാലി നിരീക്ഷണം നിർവഹിക്കുന്നു. പൊതുവിനും, പരിസ്ഥിതിയും
അന്വേഷണാവൃത്തികൾ ഉണ്ടാകാം.
A) പലായനം നൽകാൻ സാധ്യമായ വിജ്ഞാനാവശേഷമാണ് B) ആഭ്യന്തര ജീവിതം അന്വേഷണാവൃത്തികൾ
C) പ്രകൃതിയുടെ വ്യവസ്ഥ സ്ഥിരമാക്കാൻ വാണിജ്യാതിതികൾ D) പ്രകൃതി അതോറിസ്റ്റാച.

31. പ്രകൃതിയുടെ അഭിവൃദ്ധിയിൽ മനോഹരമായ പരിസ്ഥിതിയും അന്വേഷണാവൃത്തികൾ ഉണ്ടാകാം. ദൃശ്യം മുകളിലെ നിരീക്ഷണം അന്വേഷണാവൃത്തികൾ
A) പലായനം നൽകാൻ സാധ്യമാണ് B) ആഭ്യന്തര ജീവിതം കൊണ്ടുവരുന്നു.
C) ആവശ്യകതാപരമായ വിജ്ഞാനാവശേഷമാണ് D) പ്രകൃതി അതോറിസ്റ്റാച.

32. പലത്തിനും പ്രകൃതിയുടെ ഭാവനയിൽ അന്വേഷണാവൃത്തികൾ ഉണ്ടാകാം. ജീവിതം മുകളിലെ നിരീക്ഷണം അന്വേഷണാവൃത്തികൾ
A) പലായനം നൽകാൻ സാധ്യമാണ് B) ആഭ്യന്തര ജീവിതം അന്വേഷണാവൃത്തികൾ
C) പ്രകൃതിയുടെ വ്യവസ്ഥ സ്ഥിരമാക്കാൻ വാണിജ്യാതിതികൾ
D) പ്രകൃതി അതോറിസ്റ്റാച.

33. പ്രകൃതിയുടെ അന്വേഷണാവൃത്തികൾ ഉണ്ടാകാം. ജീവിതം മുകളിലെ നിരീക്ഷണം അന്വേഷണാവൃത്തികൾ
A) പലായനം നൽകാൻ സാധ്യമാണ് B) ആഭ്യന്തര ജീവിതം അന്വേഷണാവൃത്തികൾ
C) പ്രകൃതിയുടെ വ്യവസ്ഥ സ്ഥിരമാക്കാൻ വാണിജ്യാതിതികൾ
D) പ്രകൃതി അതോറിസ്റ്റാച.

34. പലത്തിനും അന്വേഷണാവൃത്തികൾ ഉണ്ടാകാം. ജീവിതം മുകളിലെ നിരീക്ഷണം അന്വേഷണാവൃത്തികൾ
A) പലായനം നൽകാൻ സാധ്യമാണ് B) ആഭ്യന്തര ജീവിതം അന്വേഷണാവൃത്തികൾ
C) പ്രകൃതിയുടെ വ്യവസ്ഥ സ്ഥിരമാക്കാൻ വാണിജ്യാതിതികൾ
D) പ്രകൃതി അതോറിസ്റ്റാച.
## Kerala Nonverbal Group Test of Intelligence

### Response Sheet

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ATTITUDE TOWARDS LEARNING GEOGRAPHY SCALE
(ROUGH DRAFT)

General Instructions

Certain statements regarding attitude towards learning Geography are given below. After reading each statement carefully you have to mark your response to the statement on the response sheet provided along with the questionnaire. Five choices are noted down. They are:

AA-Strongly agree
A-Agree
N-Neutral
D-Disagree
DD-Strongly disagree

You have to put a circle round the letter which you feel more applicable to yourself. All the statements must be responded.

1. Geography is not an interesting subject for me.
2. Only very intelligent students can grasp the abstract concepts in Geography.
3. It is essential to study Geography for getting knowledge about the universe.
4. I feel happy in doing experiments related to Geography.
5. It is not necessary to give much importance to Geography in the school syllabus.
6. Learning Geography helps me to understand other school subjects more clearly.
7. I spend only a very little time for studying Geography.
8. Man is a helpless being before the powers of nature.
9. To rely on horoscope is not a good practice.
10. I study Geography for getting higher marks in the examination.
11. I observe curiously the different climatic changes.
12. Anybody can understand Geography easily.
13. If I go for higher studies I shall not choose Geography as my optional subject.
14. Whenever I begin to study Geography I feel tired.
15. I feel happy when we get Geography period everyday.
16. Geography can be learned simply by reading the text book.
17. Compared with other science subjects Geography is not an important one.
18. I can study Geography by relating it with my life.
19. Learning Geography helps me to stand for environmental protection.
20. When I watch T.V. it is easy for me to understand the Geographical importance of a place.
21. The content material included in Geography syllabus is useless for life.
22. Observation and direct learning are good methods for learning Geography.
23. Most of the topics in the Geography text book are interesting for me.
24. Geologists succeed in forecasting the ecological imbalances.
25. In certain situations nature is a teacher to me.
26. Learning Geography helps the person to lead a useful and successful life.
27. Nature provides enough materials for every man to live in happiness.
28. It is a waste of time to go deep into the mysteries of nature.
29. The creativity of students is not explored properly in the Geography class.
30. The facilities available in schools are not adequate for the study of Geography.
31. It is easy for me to score high marks in Geography.
32. Observation of nature and its beauty develops an aesthetic sense in me.
33. Learning Geography has nothing to do with national progress.
34. Many topics in Geography are not related to life situations.
35. Selfishness is the cause of poverty.
36. Learning Geography helps to change many false beliefs of people.
37. Man has no control over nature.
38. Future generations will lead a more comfortable life than the present generation.
39. Geographical discoveries are not subject to any modification in the near future.
40. Geography is a subject that everybody can easily understand.
41. There is nothing more to be discovered in the interior of the earth.
42. Many superstitions are scientifically baseless.
Technology increases the comforts of man.
It is not possible to make error in geographical discoveries.
Destiny of an individual is decided in advance.
Anger of God is showered on man in the form of famine, earth quakes and other natural calamities.
In forecasting the future of a person astrological calculations are correct.
Certain Geographical problems can not be solved by man.
Geologists do not give much importance to human welfare activities.
There is nothing new to be discovered in nature.
It is a national waste to spend too much money for space researches.
Man is responsible for most of the miseries that occur in nature.
I feel happy when the teacher is absent in the geography period.
I am filled with wonder while I see tides and waves in the sea.
It is necessary to believe in a cause for the occurrence of any event.
Inventions and discoveries make the life of man more miserable.
Knowledge of volcanic eruptions helps man to avoid the tragedies related to them.
Space researches improve the cultural growth of man.
Learning Geography helps man to think above caste, colour and creed.
Scientific inventions do much harm to the moral and ethical life of man.
I love nature as my mother.
Compared with the scientific and technological growth geography is not improved much.
Birds flying over the sky attract me much.
A sense of wonder fills my mind when I see rainbow in the sky.
I experience great delight in watching sunrise and sunset.
I feel happy in watching different varieties of clouds.
Science helps man to overcome natural calamities.
India is too poor a country to spend money in space research.
I find no meaning in learning geographical principles.
Power of observation and critical thinking are not developed in geographical class.
Reading and explaining important points is the usual way of teaching Geography. It is better to study Geography by visiting places of geographical importance than following the textbook method. I usually avoid the opportunity for acquiring more information related to Geography. I can easily relate geographical concepts and facts with other subjects. Learning Geography prepares man for future life. The contributions of Geologists are appreciable. Conservation of environment and scientific progress do not go together. Learning Geography helps man to tackle problems of life. The method followed in teaching Geography is not satisfactory. It is not possible to make mistakes in scientific discoveries.
### Appendix K

**Item Analysis Data of the scale of attitude Towards Geography Learning**

*(Draft Form)*

<table>
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**Note:**
- **PI** - Positive item
- **NI** - Negative item
- **R** - Rejected
- **A** - Accepted
- **SA** - Serial arrangement of items accepted
Attitude Towards Learning Geography Scale (ATGS)

1. Strongly Agree (AA) - Strongly Disagree (DD)
2. Agree (A) - Disagree (D)
3. Neutral (N) - Neutral (N)

AA - Strongly Agree (mammal, mammalian) D - Disagree (mammal, mammalian)
A - Agree (mammal, mammalian) D - Strongly Disagree (mammal, mammalian)
N - Neutral (mammal, mammalian) N - Neutral (mammal, mammalian)

1. Do you agree that learning geography is an enjoyable activity?
2. Do you feel that geography will be useful in your future career?
3. Do you think geography is relevant to your daily life?
4. Do you believe that geography will help you in understanding the world?
5. Do you think geography is important in understanding cultural differences?
6. Do you think geography is important in understanding environmental issues?
7. Do you think geography is important in understanding technological advancements?
8. Do you believe that geography will help you in decision-making processes?
9. Do you think geography is important in understanding economic issues?
10. Do you believe that geography is important in understanding social issues?
11. Do you think geography is important in understanding political issues?
12. Do you think geography is important in understanding historical events?
13. Do you think geography is important in understanding natural disasters?
14. Do you think geography is important in understanding human behavior?
15. Do you think geography is important in understanding environmental issues?
### School of Pedagogical Science  
**Mahatma Gandhi University, Kottayam**  
**Attitude Towards Learning Geography Scale (ATLGS) Response Sheet**

1. गुरूदेव   
2. महात्मा  
3. गंगाधर   
4. गुरूजी   
5. जयस्वल   
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Appendix M
This questionnaire is to evaluate you personally based on the factors which influence you in studying Geography. There are 80 questions in this questionnaire. Each question carries three options. They are (1) Always (II) Occurs rarely (III) Never occurs.

After reading each question carefully, put a \( \checkmark \) mark for the option which is quite appropriate in your opinion. Answers should be put only in the appropriate column in the score sheet.

1. In your Geography class do you use globe, map etc.?
2. Do you read books, magazines etc., related to Geography?
3. Do you discuss in groups the exercises and other practical works given in your textbooks?
4. Do you discuss and clarify your doubts regarding tough home works with your teachers or friends?
5. Does your teacher give special study programmes and extra activities for the bright students in your class?
6. Is there any opportunity for the weak students to study along with the bright students?
7. Do you have the freedom to ask questions in your class?
8. Do you get guidance from your teachers to react against corruption, hoarding, adulteration etc.?
9. Do you visit sites of earthquake, landslide etc.?
10. Do you keep paper cuttings related to Geography?
11. Do you have hobbies like coin collection, stamp collection etc.?
12. Do you collect and label soils, rocks, fossils, etc.?
13. Do you have a personal atlas and a study habit to use it?
14. Does your Geography teacher give necessary guidance before conducting study tours?
15. Do you prepare route map and put it on the bulletin board as a preparation for study tours?
16. Do you have the opportunity to read news bulletin in the morning assembly?
17. Do you get practice in the preparation of items for the bulletin board?
18. Do you discuss in your class social evils like pollution, energy crisis etc.?
19. Do you have pen friends?
20. Do you prepare notes from your extra reading?
21. Do you collect information and note down it for future use while going on study tours in planetariums, museums etc.
22. Do you watch educational programmes on TV?
23. Do you get training to relate learning with life experience?
24. Are you a member of NCC, Scout etc.?
25. Do you discuss the developments in the field of Geography in your class?
26. Do you present skit or role-play in your class?
27. Do you prepare charts, maps, diagrams etc in-groups?
28. Do you present items related to Geography in science exhibition?
29. Do you get training to observe the physical features of the earth?
30. Do you compare the geographical topics with other science topics?
31. Do you conduct experiments at school related to Geography problems?
32. Do you collect photos of important Scientists and Geologists?
33. Do you discuss in groups the important issues of current politics?
34. Do you apply modern techniques to study place names?
35. Do you get training to watch educational programmes or documentary films on TV?
36. Do you prepare documentaries for TV or radio programmes?
37. Do you prepare weather charts in your class?
38. Do you get training in the preparation of geographical equipment?
39. Are you interested in doing geographical experiments at home?

40. Do you participate in discussions and quiz programmes related to geographical problems?

41. Do you collect current news for participating in quiz competitions?

42. Are you a member of any clubs?

43. Do you spend your time creatively while your teacher is absent?

44. Do you observe the weather changes?

45. Do you have a separate room for Geography in your school?

46. Do you get training in direct learning from nature?

47. Do you get satisfactory answers to your questions from your Geography teacher?

48. Are you satisfied with your Geography class?

49. Do you consider Geography as an interesting subject?

50. Do you feel that Geography is a useful subject for future life?

51. Are you satisfied with the way of teaching Geography in your class?

52. Do you think that your parents show adequate interest in your studies?

53. Do you have a healthy atmosphere in your home for study?

54. Do you get adequate facilities in your home for proper study?

55. Do your parents meet your teachers regularly?

56. Do you share your problems in studies with your parents?

57. Do you get help in your studies from your elder brothers and sisters?

58. If your parents are not educated do they contact their educated neighbours?

59. Do you get support from home to participate in extra curricular activities?

60. Will you get permission to go on study tours?

61. Do you get tuition facilities for the subject you are weak?

62. Do you get encouragement from parents to participate in science fairs?

63. Do your parents buy journals or extra reading materials?

64. Do you get guidance from your parents for systematic study habits?

65. Do you have a separate room in your house for your study?

66. Do you get encouragement from home when you get high marks?
67. Are you interested in visiting the landscape near your house?
68. Do you have the habit of observing day to day changes in nature?
69. Do you discuss with your friends the daily events broadcast on TV or published in the newspapers?
70. Do you note down important events that occur in the world around us?
71. Do you have the habit of doing your homework punctually?
72. Do you get absent from class without serious reasons?
73. Do you have good friends in your study matters?
74. Do you get enough help from your friends in your studies?
75. Do you share your materials with your friends?
76. Do you spend your free time properly?
77. Do you have ambition to reach at higher level in future?
78. Do you get enough training in forming good character?
79. Is the training from school adequate for successful future life?
80. Do you have the habit of writing personal diary?
School of Pedagogical Science
Mahatma Gandhi University, Kottayam
Geography Learning Environment Questionnaire

Appendix O

1. Would you visit the school for the purpose of
   learning
2. Would you visit the school for the purpose of
   social interaction
3. Would you visit the school for the purpose of
   professional development
4. Would you visit the school for the purpose of
   recreational activities
5. Would you visit the school for the purpose of
   research
6. Would you visit the school for the purpose of
   community service
7. Would you visit the school for the purpose of
   cultural events
8. Would you visit the school for the purpose of
   leisure activities

9. Would you recommend the school to your
   friends
10. Would you recommend the school to your
    family
11. Would you recommend the school to your
    colleagues
12. Would you recommend the school to your
    employers
13. Would you recommend the school to your
    students

N. C. C., Scout, Guide
School of Pedagogical Science
Mahatma Gandhi University, Kottayam
Geography Learning Environment Questionnaire
Response Sheet

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Appendix Q

School of Pedagogical Sciences
Mahatma Gandhi University, Kottayam
Socio Economic Status Scale (SESS)
Response Sheet

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Explanation:
- TWG: Total Economically Weaker Groups
- TEPG: Total Economically Poor Groups

General Socioeconomic Status Scale (SESS)

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
LIST OF EXPERTS

1. Dr. Anil Kumar R.
   Lecturer in Geography
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4. Prof. Kalyana Raman
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   Thiruvananthapuram

6. Sr. Meletia (Retd.)
   Principal, Alphonsa College, Pala.

7. Sr. Sylvetta A.C. (Retd.)
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   Mutholy

9. Sr. Thresiamma Thomas
   Teacher in Charge, Standard IX
   St. Mary’s H.S. Kuravilangadu

10. Dr. Theres Kuttiyani
    Consultant, ADART, Pala.