1. Early Childhood Education

Answer all the questions briefly.

1. Looking at the picture given below, what do you think is the meaning of the statement, *'It is through play that children make sense of the world around them'?* (Answer in about 150 words).

2. Why is early years education important? (Answer in about 150 words).

3. Imagine that you are a teacher in a preschool. There are about 4-5-years old children in your classroom. List three things/activities that you could organize to engage them meaningfully. You can assume the classroom setting and materials available for your use. Give reasons for your choice of the activities. (Answer in about 250 words).

2. Language (write any ONE– either English, Hindi or Kannada)

English (answer all the questions)

A. ***Reading Comprehension*** - From "The Leopard" by Ruskin Bond

As I crossed the stream and began climbing the hill, the grunting and chattering increased, as though the langurs were trying to warn me of some hidden **danger. I looked** up, and saw a great orange-gold leopard, sleek and spotted, poised on a rock about twenty feet away from me. The leopard looked at me once, briefly and with an air of disdain, and then sprang into a dense thicket, making absolutely no sound as it melted into the shadows.

I had disturbed the leopard in his quest for food. But a little later I heard the quickening cry of a barking deer as it fled through the forest.

After that encounter I did not see the leopard again, although I was often made aware of its presence by certain movements.

Sometimes I thought I was being followed; and once, when I was late getting home and darkness closed in on the forest, I saw two bright eyes staring at me from a thicket. I stood still, my heart thudding against my ribs. Then the eyes danced away, and I realized that they were only fireflies.

One evening, near the stream, I found the remains of a barking deer which had only been partly eaten. I wondered why the leopard had not hidden the remains of its meal, and decided that it had been disturbed while eating. Climbing the hill, I met a party of shikaris resting beneath the pine trees. They asked me if I had seen a leopard. I said I had not. They said they knew there was a leopard in the forest. Leopard skins were selling in Delhi at a thousand rupees each, they told me. I walked on.

But the hunters had seen the carcass of the deer, and they had seen the leopard's pug marks, and they had kept coming to the forest. Almost every evening I heard their guns banging away.

'There's a leopard about,' they always told me. 'You should carry a gun.'

'I don't have one,' I said.

The birds were seldom to be seen, and even the langurs had moved on. The red fox did not show itself; and the pine martens, who had become quite bold, now dashed into hiding at my approach. The smell of one human is like the smell of any other.

And then, of course, the inevitable happened.

The men were coming up the hill, shouting and singing. They had a long bamboo pole across their shoulders, and slung from the pole, feet up, head down, was the lifeless body of the leopard. It had been shot in the neck and in the head.

'We told you there was a leopard!' they shouted, in great good humour. 'Isn't it a fine specimen?'

'It was a fine leopard,' I said.
I walked home through the silent forest. It was very silent, almost as though the birds and animals knew that their trust had been violated.

Questions

1. Identify three words or phrases in the first paragraph that tell us what the leopard was like:

a.

b.

c.

2. In the paragraph beginning, “Sometimes I thought...” In your own words, explain how the author creates suspense. (About 50 words)

3. How does the narrator feel about the leopard? Describe, giving evidence, in about 50 words.

B. Writing Task

Write a letter to a friend imagining a walk through a forest. (200 words)

C. Beliefs about Language Teaching and Learning

Vignette 1:

Mr. Iranna teaches a multi-grade (Grades 1-3) class in a rural area in Karnataka. Iranna places a lot of emphasis on copywriting, and makes his students copy correctly and neatly in their workbooks. When he is busy with other commitments, students are encouraged to keep working on their workbooks, copying letters and words. He also spends time teaching his students how to read aksharas, words and sentences accurately. A younger colleague once asked Iranna to explain why he teaches in the way he does. He explained that children learn to read best by focusing on sounds and copywriting in Grades 1-3; they can learn to understand what they read and to express themselves in writing in the higher grades.

1. Select ONE number from i-iv, indicating your agreement with the statement below.

Children should be first taught to read words and copy them neatly, and only later should teachers focus on understanding and compositional writing.

i	ii	iii	iv
Completely disagree	Somewhat disagree	Somewhat agree	Completely agree

2. Why did you give this rating? Explain briefly (about 50 words).

3.Mathematics

Answer all the questions.

I. Multiple choice questions

1. Select the polynomial(s), for which $(x + 2)$ is **not** a factor?

   a. $x^2 + 4x + 4$
   b. $x^3 + 2x^2 - 8x$
   c. $-x^3 + 2x^2 + 8x$
   d. $x^3 - 2x^2 - 8x$

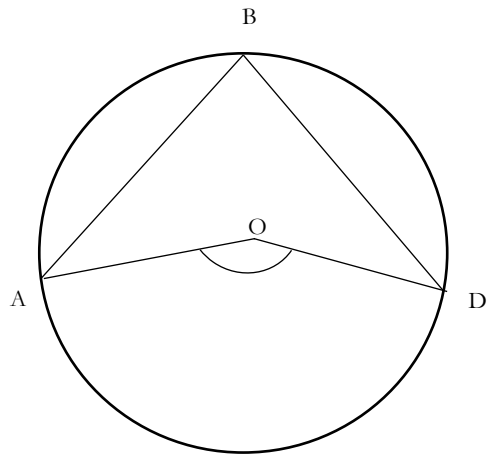
2. In the given figure, O is the centre of the circle, and ∠ODB = 40°, AB = BD. Answer the following questions

   A. What is the measure of ∠ABD?

   a. 40°
   b. 80°
   c. 90°
   d. Insufficient information

   B. What is the measure of ∠AOD in the segment AD?

   a. 180°
   b. 160°
   c. 270°
   d. Insufficient information



3. What are the roots of the equation $2x^2 - 9 = 0$

   a. $+\frac{3}{\sqrt{2}}, -\frac{3}{\sqrt{2}}$

   b. $+\frac{3}{2}, -\frac{3}{2}$

   c. $+\frac{2}{3}, -\frac{2}{3}$

   d. $+\frac{2}{3}, +\frac{3}{2}$

4. The perimeter of a rectangle is 98 cm. The ratio of length (L) to breadth (B) is 3:4. What could be the length of the sides of the rectangle?

   a. L = 21, B = 28*
   b. L = 42, B = 56
   c. L = 40, B = 58
   d. L = 45, B = 60

5. Which of the answer and its justification is correct for 5÷ 0?

   a. 0, because, anything divided by zero is zero
   b. Greater than 5, because 5 ÷ 5 = 1, 5 ÷ 4 = 112, 5 ÷ 1 = 5
   c. 0, because 0 divided by any number is 0
   d. Undefined, because sum of any number of zeroes will not lead to 5*

6. Which of the following expressions has numerical value 10?

   a. $2 \times 8 - 6 \div 6 - 2 + 3$
   b. $15 \div 5 + 4 \times 6 - 4 \div 2$
   c. $-3 \times 4 + 5 \times 4 - 8 + 2 \times 5$ *
   d. $-7 + 3 \times 8 \div (-8)$

7. There are line segments of the following lengths: 2, 3, 4, 5, 6. Which combination of line segments <u>will not</u> make a triangle?

   a. 2, 3, 5*
   b. 2, 5, 6
   c. 3, 4, 5
   d. 3, 5, 6

II. Solve the problem $1\frac{3}{4} \div \frac{1}{2}$. Students generalize that when a number (the dividend) is divided by another number (the divisor), the quotient is always smaller than the dividend. Is the students' generalization correct? Why/ why not? Give examples to support your answer.

III. Here are two views on learning mathematics: One view is that if you have students practice a lot of sums using algorithms and shortcuts, they eventually start understanding how the algorithm works and may get a sense of why it works. […] The other view is that learning Mathematics is about developing an understanding of how the subject is constructed, its basic elements and working out the logical steps that lead to the algorithm and short-cuts in some areas. The child here is expected to be able to develop multiple strategies for problems and also use the algorithms if she finds it appropriate.

(H.K. Dewan, Pedagogy of mathematics, in The Learning Curve, 2010)

Which of these two views would you prefer for learning mathematics? Why? Explain your answer taking examples from your own learning or your family and friends.

4. Science

Answer all the questions

1. One feature which is **similar** among plant and animal cells is the presence of:

    a. cell wall
    b. chloroplasts
    c. mitochondria
    d. large vacuoles

2. Which of the following is **not** required for the formation of a blood clot?

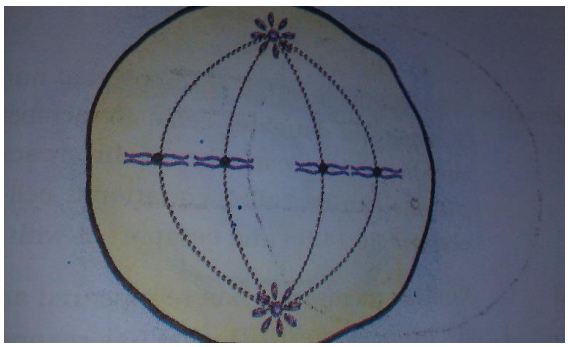
    a. Platelets
    b. Clotting factors
    c. Antibodies
    d. Fibrinogen

3. During a field trip to a desert ecosystem, a student makes the following observations: Hawk eats a snake.
   Lizard eats a fly.
   Tortoise eats small patches of grass.
   Snake eats a mouse.

   Based on these observations of how each of the organisms obtains energy, she came up with different conclusions. Which of the following is the best conclusion?
    a. The lizard and the snake are secondary consumers.
    b. The hawk is a primary consumer.
    c. The grass and the desert tortoise are both primary consumers.
    d. The lizard is a tertiary consumer.

4. A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers, with short pea plants bearing white flowers. All the progeny bore violet flowers, but almost half of them were short. This suggests that the genetic makeup of the tall parent can be depicted as:
    a. TTWW
    b. TTww
    c. TtWW
    d. TtWw

5. Which phase of the cell in a mitotic division does the diagram below represent?



   a. Anaphase
   b. Telophase
   c. Prophase
   d. Metaphase

6. Which of the following statements is **not** true about the nucleus?

   a. It contains chromosomes
   b. It contains nucleolus
   c. It is well-organized in all kind of cells
   d. It controls inheritance and activities of cell

7. In order to help children understand the differences between monocot and dicot plants, you are showing them different parts of both the plants, as well as cross-sections of stems. Children make the following observations regarding these plants such as:
   i. Flowers with trimerous symmetry
   ii. Leaves with reticulate venation
   iii. Vascular bundles scattered in ground tissue
   iv. Plants with tap root system

   Of the above observations, which are the characters exhibited by monocotyledons alone?

   a. i. and ii. only
   b. iii. and iv. only
   c. ii. and iv. Only
   d. i. and iii. only

8. An offspring of two parents had an extra chromosome in its karyotype. The most likely cause of this condition would have been:

   a. A point mutation
   b. Nondisjunction
   c. Translocation
   d. A nonsense mutation

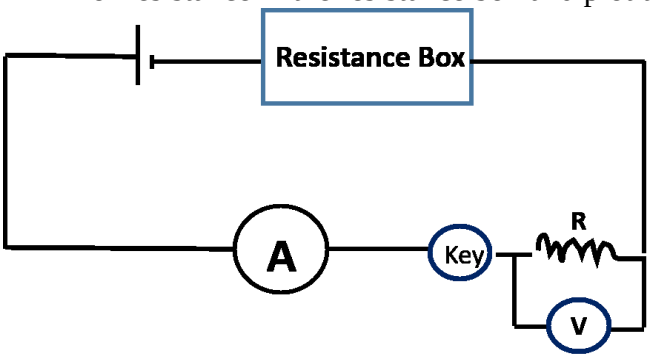
9. If the density of the earth is doubled without any change in its radius, **g** on earth will:

    a. remain the same
    b. double
    c. triple
    d. reduce by half

10. The momentum of a body is increased by 10%. The percentage increase in its kinetic energy will be:

    a. 21
    b. 10
    c. 1.21
    d. 121

11. In a Practical Physics session on current and electricity at the senior high school level, students were asked to verify Ohm's law. Therefore, they were asked to record voltage and current for different values of resistance in the resistance box and plot the data.



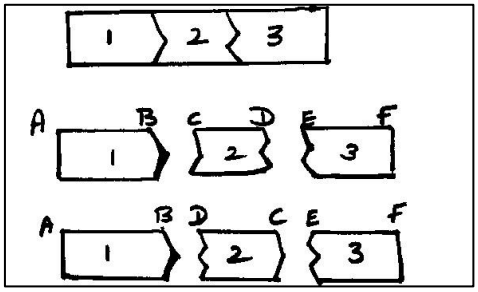
    Which of the following plots would be the correct step to verify Ohm's Law?

    a. Voltage drop across the resistor along X axis vs resistance in the resistance box in Y axis
    b. Voltage drop across the resistor along Y axis vs current along X axis
    c. Current along Y axis vs resistance in the resistance box along X axis
    d. Voltage drop across the resistor along X axis vs current along Y axis

12. Jamal says that he does not like sitting on metal chairs in the room because "they are colder than the plastic ones." As Jamal's teacher, how would you respond to his inference?

    a. They are colder because metal is naturally colder than plastic
    b. They are not colder; the metal ones just feel colder because they are heavier
    c. They are not colder because they are at the same temperature
    d. They are colder because metal has less heat to lose than plastic

13. As shown in the figure, a magnet is broken into three pieces and the middle piece is reversed. Which of the following statements is true?



a. 1 & 2 attract each other but 2 & 3 repel each other
b. 1 & 2 repel each other but 2 & 3 attract each other
c. All three repel each other
d. All three attract each other

14. Which of the following statements is true for the given 'distance-time' table of an object in motion?

Time in seconds	Distance in meters
0	0
1	1
2	8
3	27
4	64
5	125
6	216
7	343

a. It has non-uniform motion and the acceleration is increasing
b. It has constant acceleration in uniform motion
c. It has non-uniform motion and the acceleration is decreasing
d. It has decreasing acceleration since velocity is increasing

15. For the statement: "a metal which can be obtained by the electrolysis of the aqueous solution of its salts", which one of the following would you choose as the correct option?

a. Na
b. Al
c. Cu
d. Mg

16. An elimination reaction in organic compounds generally involves loss of atoms or groups from adjacent carbon atoms which results in the formation of a pi bond between these carbon atoms. Which of these is an example of an elimination reaction?

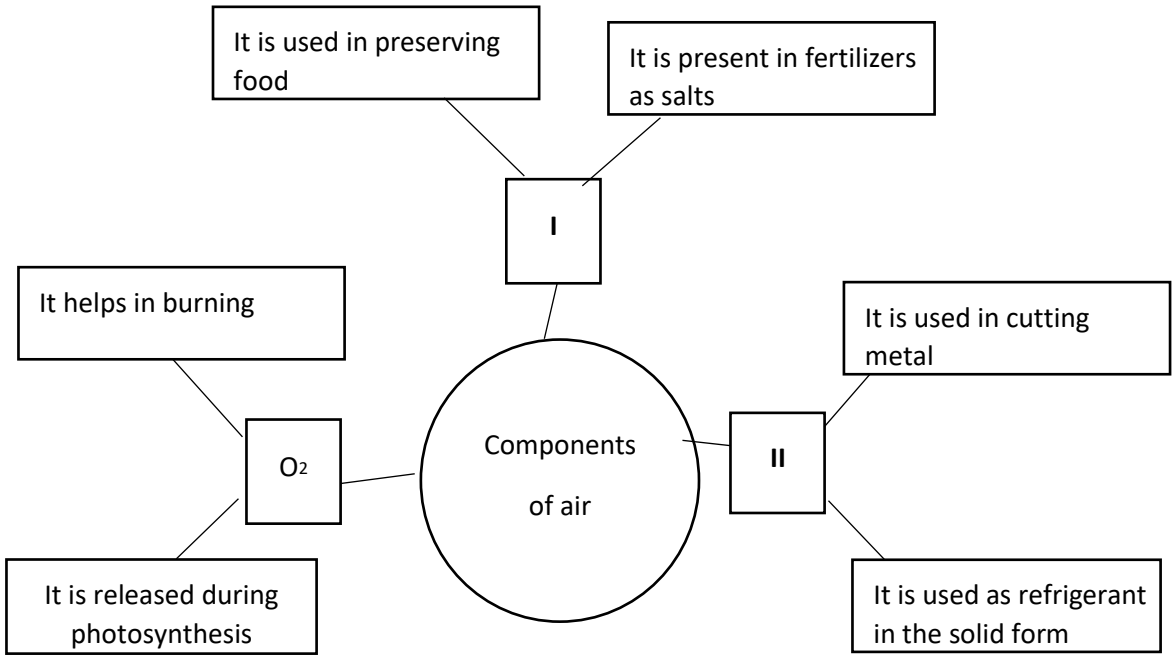
a. Chlorination of methane

b. Dehydration of alcohol
c. Nitration of benzene
d. Hydroxylation of ethylene

17. On a mission to a newly discovered planet, an astronaut finds chlorine abundances of 13.85% for ^{35}Cl and 86.15% for ^{37}Cl. What is the average atomic mass of chlorine for this location? The mass of ^{35}Cl is 34.97 amu. The mass of ^{37}Cl is 36.97 amu.

a. 36.69 amu
b. 36.99 amu
c. 37.12 amu
d. 37.51 amu

18. Complete the flow chart below by filling in box I and box II:



a. I → Ar, II→ CO2
b. I → N2, II→ H2O
c. I → CO2, II→ N2
d. I → N2, II→ CO2

19. The following observations were made by students when they rubbed a solution of baking soda on dry litmus paper. The teacher observed that due to individual as well as experimental errors, the observations varied among students as given in the table below:

Student	Effect on dry red litmus paper	Effect on dry blue litmus paper
Javed	Colour changed to blue	No change

Rajni	No change	Colour changed to red
John	Colour changed to blue	Colour changed to red
Gurbhej	No change	No change

Who do you think is correct?

a. Javed
b. Rajni
c. John
d. Gurbhej

20. The half-life of Carbon -14 is 6000 years. How old is a skeleton that contains only 12.5% of its original Carbon-14?

a. 6000 years
b. 3000 years
c. 12,000 years
d. 18,000 years

5. Social Studies

Instructions: All the questions are based on Chapter 1 from Geography book of grade 10, published by NCERT. The question paper has 3 parts. In Part 1, please answer one question from the two questions provided. All the questions in part 2, and 3 are compulsory.

Part 1

Answer in about 300 words:

Instruction: Answer only one question out of the two questions provided.

1. The chapter states the following: The use of land is determined both by physical factors as well as human factors. The physical and human factors mentioned in the chapter are as follows:

topography, culture and traditions, population density, climate, soil types, technological capability.

Q: Can you identify from the list which are physical factors and which are human factors?
Please explain one physical and one human factor mentioned above with one relevant example for each.

OR

2. The chapter states the following: "There are many regions in our country that are rich in resources, but these are included in economically backward regions. On the contrary there are some regions which have a poor resource base but they are economically developed."

Q: Name one economically backward region, and one resource poor but economically developed region, and mention possible reasons behind such situation as explained in the chapter?

Part 2

Objective-type Questions:

Instruction: All questions are compulsory in Part 2.

3. Write your answer in the space provided.

a. The soil which is suitable for cotton cultivation, rich in soil nutrients, such as calcium carbonate, magnesium, potash and lime is known as _____

b. On the basis of exhaustibility, resources can be divided into two types renewable and non-renewable. Identify the following resources as renewable and non-renewable.

Fossil fuel _____ _____
Wildlife _____
Minerals _____ _____

c. Identify two among these human activities that have contributed significantly to land degradation: Air pollution, over grazing, animal slaughter, deforestation, rock climbing, mining and quarrying.

_____

4. There are six types of soils described in the chapter. Identify the type of soil as per the given description:

a. This soil has adequate proportion of potash, phosphoric acid and lime which are ideal for the growth of sugarcane, paddy, wheat and other cereal and pulse crops. _____

b. The soil is red to brown in colour, generally sandy in texture and saline in nature. _____

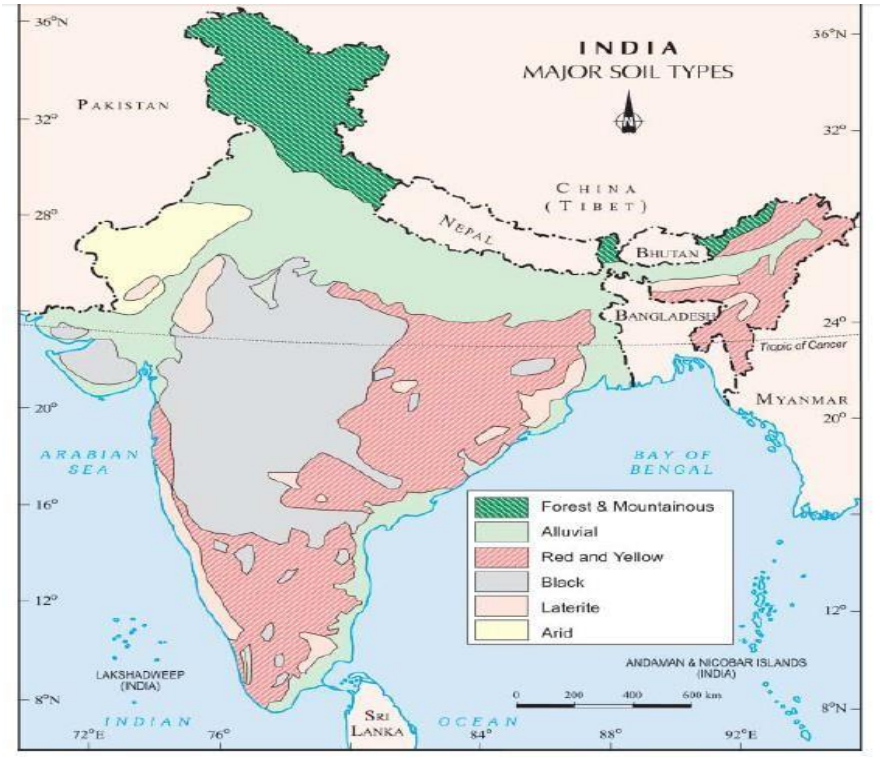
c. This soil develops in areas with high temperature and heavy rainfall, humus content is low. _____

d. This soil develops on crystalline igneous rocks in areas of low rainfall in the eastern and southern parts of the Deccan plateau. _____

Part 3

Map Reading:

Instruction: All questions are compulsory in Part 3.



5. Look at the map provided and answer the following questions:

a. Mention four states where laterite soil is found as indicated in the map

b. Mention three states where black soil is found.