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BHARTI HR. SEC. SCHOOL,
KIRODIMAL NAGAR
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SCHOOL CODE - 16039
SUMMER VACATION
HOLIDAY HOME WORK
SESSION – 2025- 26
CLASS - IX***



SUBJECT - ENGLISH

SUMMER VACATION ASSIGNMENT (ENGLISH)

1. Write an article (100- 120 words) on any of the topics.

- 1. Environmental issues**
- 2. Technological developments**
- 3. Women Centric Issues**

Paste or draw pictures related to the topic.

2. Select 2 poems from the main course book BEEHIVE and highlight the importance of poetic devices.

Explain the poetic devices and give suitable examples.

Use the following devices.

Simile

Metaphor

Personification

Alliteration

Repetition

Irony

Assonance

Anaphora

INSTRUCTIONS

The project/assignment is to be done in colorful bordered project paper (lining page).

***Cover Page*: Handmade Cover (using chart paper/ craft papers)**

Include your name, class, subject and key points of the project.

Make a well decorated file to the best of your creativity.

SUBJECT – MATHEMATICS

Note:- (1) Assignment should be written on your notecopy.

(2) Completion of notecopy.

CHAPTER - POLYNOMIALS

MULTIPLE CHOICE QUESTIONS

1. The zero polynomial has:
(a) One zero (b) two zeroes (c) infinite zeroes (d) No zero
2. If the polynomial $3x^4 + 4x^3 - 3x - 1$ is divided by $x - 1$, then the remainder is:
(a) 1 (b) 3 (c) 5 (d) -5
3. The coefficient of x in the expansion of $(x + 3)^3$ is:
(a) 1 (b) 9 (c) 18 (d) 27
4. If $p(x) = x^3 - x^2 + x + 1$, the value of $\frac{p(-1) + p(1)}{2}$ is:
(a) $\frac{1}{4}$ (b) 4 (c) 0 (d) -2
5. If $p(x) = 2x^3 - 3x^2 + 4x - 2$, then $p(-1)$ is:
(a) -2 (b) -11 (c) 0 (d) 1
6. If $x^{\frac{1}{3}} + y^{\frac{1}{3}} + z^{\frac{1}{3}} = 0$, then which one of the following expression is correct:
(a) $x^3 + y^3 + z^3 = 0$ (b) $x + y + z = 3x^{\frac{1}{3}} \cdot y^{\frac{1}{3}} \cdot z^{\frac{1}{3}}$
(c) $x + y + z = 3xyz$ (d) $x^3 + y^3 + z^3 = 3xyz$
7. If $(x - 1)$ is a factor of $p(x) = x^2 + x + k$, then the value of k is:
(a) 3 (b) 2 (c) -2 (d) 1
8. The degree of polynomial $4x^2 - \sqrt{3}x + \frac{5}{2}x^3$ is :
(a) 4 (b) 2 (c) 3 (d) $\frac{1}{2}$
9. Degree of zero polynomial is :
(a) 0 (b) 1 (c) any natural number
(d) not defined
10. If degree of polynomial $p(y)$ is 'a', then maximum number of zeroes of $p(y)$ would be:
(a) $a + 1$ (b) $a - 1$ (c) a (d) $2a$
11. The coefficient of x^2 in the polynomial $5 - 3x^2 + 5x$ is :
(a) 3 (b) 5 (c) -3 (d) 0
12. Which one of the following is binomial in y ?
(a) $y^2 + \sqrt{2}$ (b) $y + \frac{1}{y} + 2$ (c) $\sqrt{y} + \sqrt{2}y$ (d) $\sqrt{y} + 1$
13. The coefficient of x^2 in $(2 - 3x^2)(x^2 - 5)$ is :
(a) -17 (b) -10 (c) -3 (d) 17

14. Which one of the following has -3 as a zero?
(a) $(x - 3)$ (b) $(x^2 - 9)$ (c) $(x^2 - 3x)$ (d) $(x^2 + 3)$
15. The value of k for which $(x - 1)$ is a factor of the polynomial $4x^3 + 3x^2 - 4x + k$ is :
(a) 3 (b) 0 (c) 1 (d) -3
16. The degree of the polynomial $p(x) = (x - 7)^3 - x^3$ is :
(a) 3 (b) 2 (c) 1 (d) 0
17. One of the factors of the polynomial $p(x) = 4x^4 + 2x^3 + 5x^2 + 3x - 2$ is :
(a) $(x - 1)$ (b) $(x + 1)$ (c) $(x - 2)$ (d) $(x + 2)$
18. One of the factors of the polynomial $x^3 - 8$ is :
(a) $x + 2$ (b) $x - 2$ (c) $x + 8$ (d) $x - 8$

EXERCISE 2.2

- Find the value of the polynomial $2x^3 - 3x^2 + 4x - 1$ at
(i) $x=0$ (ii) $x=1$ (iii) $x=2$
- Find $P(0)$, $P(3)$ and $P(-2)$ for the polynomial $P(x) = 5 - 4x + 2x^2$.
- Find $P(0)$, $P(1)$ and $P(2)$ for the polynomial $P(z) = (z+1)(z-1)$.
- Find $P(0)$, $P(2)$ and $P(\pi)$ for the polynomial $P(x) = 2x - \pi$.
- Find the value of the polynomial $3x^3 - 4x^2 - 7x - 5$, when $x=3$ and also when $x=-3$.
- If $P(y) = \frac{y}{2} - 5$, then find the value of $P(2)$ and $P\left(\frac{2}{5}\right)$.
- If $P(t) = t^3 + 2t^2 + t$, then find the value of $P(3)$, $P(-3)$ and $P(4)$.
- Find the zero of the polynomial:
(i) $P(x) = x + 3$ (ii) $P(x) = 2t - 3$ (iii) $g(x) = 5x - 1$
(iv) $f(x) = 2 - 3x$ (v) $P(x) = bx$ (vi) $q(x) = dx + c, d \neq 0$
(vii) $P(x) = 4x$ (viii) $P(x) = 3x^2 - 1$ (ix) $P(x) = x^2 + 3x + 2$
(x) $P(x) = x^2 - 2x$.
- Verify that:
(i) 4 is a zero of the polynomial $P(x) = x - 4$
(ii) -2 is a zero of the polynomial $P(x) = x + 2$
(iii) $\frac{1}{5}$ is a zero of the polynomial $P(x) = x - 5$
(iv) $\frac{3}{4}$ is zero of the polynomial $P(x) = 3x - 4$.
(v) -3 is a zero of $(x - 3)$ (vi) $-\frac{1}{3}$ is a zero of $(3x + 1)$
(vii) $-\frac{4}{5}$ is a zero of $(4 - 5y)$ (viii) 0 and 2 are the zeros of $t^2 - 2t$
(ix) -3 is zero of $y^2 + y - 6$
- Verify whether the indicated numbers are zero of the polynomial or not?
(i) $P(x) = 5x - \pi, x = \frac{4}{5}$ (ii) $P(x) = 2x + 1, x = -\frac{1}{2}$
(iii) $P(x) = x^2 - 1, x = -1, 1$ (iv) $P(x) = 5x^2 - 1, x = \frac{1}{\sqrt{5}}, -\frac{1}{\sqrt{5}}$
(v) $q(x) = (x+2)(x-3), x = -2, 3$ (vi) $P(x) = ax + c, x = -\frac{c}{a}$
- Verify whether 4 and 0 are zeros of the polynomial $P(x) = x^2 - 4x$.



Do You Know?

If the leading coefficient of a univariate polynomial is 1, then it is called *monic*.

EXERCISE 2.1

1. Which of the following expressions are polynomials in one variable and which are not? Give reasons for your answer.

(i) $3x^2 + 4x + 15$ (ii) $5x^3 - 4x^2 + 6x - 3$ (iii) $5 + 8x^{3/2} + 4x^2$ (iv) $4\sqrt{y} + \sqrt{2}y$
 (v) $y^2 - \frac{1}{y^2}$ (vi) $\sqrt{x} + 6$ (vii) $x^2 + \frac{3}{x^2} + 4$ (viii) $\frac{1}{x}$
 (ix) $x^2 + xy + 3$ (x) $x^{15} + y^{10} + z^9$ (xi) 8
 (xii) $\sqrt{3}x^2 - 2x$ (xiii) $1 - \sqrt{5}x$ (xiv) $\frac{1}{5x^{-2}} + 5x + 7$

(xv) $\frac{(x-2)(x-4)}{x}$ (xvi) $\frac{1}{x+1}$ (xvii) $\frac{1}{7}a^3 - \frac{2}{\sqrt{3}}a^2 + 4a - 7$

(xviii) $\frac{1}{2x}$

(NCERT Exemplar)

2. Classify the following as polynomials in one variable, two variables etc.

(i) $x^2 + x + 1$ (ii) $y^3 - 5y$ ✓
 (iii) $xy + yz + zx$ (iv) $x^2 - 2xy + y^2 + 1$ ✓

3. Write the degree of each of the following polynomials:

(i) $5x + 3$ (ii) $3x^2 + x + 5$ (iii) $5x^3 + 7x^2 + 3x + 2$
 (iv) $7x^2 + 6x^4 + 5x + 8x^3 + 8$ (v) 0 (vi) 6
 (vii) $4 - 3x^2 + 5x^3 + 7x^8 - x^{25}$ (viii) $1 - \sqrt{2}x + x^2$ (ix) $\sqrt{5}x^3 + 2$
 (x) $2x - 1$ (xi) -10 (xii) $x^3 - 9x + 3x^5$
 (xiii) $y^3(1 - y^4)$

4. Write the coefficient of x^2 in each of the following:

(i) $x^2 + 4x + 3$ (ii) $5 + 3x + 2x^2$ (iii) $x^3 - 3x^2 + 2x + 3$
 (iv) $-5x^2 + x^4 + 2x^5$ (v) $(x-7)^2$ (vi) $(2x-1)^2$ (vii) $(x-3)^3$
 (viii) $\frac{\pi}{6}x + x^2 - 1$ (ix) $3x - 5$ (x) $(x-1)(3x-4)$

(xi) $(2x-5)(2x^2-3x+1)$ (xii) $(x^2-x+1)^2 + (x^2+x+1)^2$

5. Classify the following as linear, quadratic and cubic polynomials:

(i) $x + 2$ (ii) x^2 (iii) $4y$ (iv) $3x^2 + 3x$
 (v) $x^3 + 2x^2 + 4$ (vi) $(x+3)^3 - x^3$ (vii) $(2-x)^2 - x^2$ (viii) $2 - x^2 + x^3$
 (ix) $3x^3$ (x) $5t - \sqrt{7}$ (xi) $4 - 5y^2$ (xii) 3
 (xiii) $2 + x$ (xiv) $y^3 - y$ (xv) $1 + x + x^2$ (xvi) t^2
 (xvii) $\sqrt{2}x - 1$

(NCERT Exemplar)

6. Give an example of a polynomial, which is:

- (i) monomial of degree 1
 (ii) binomial of degree 20
 (iii) trinomial of degree 2

CHAPTER NAME-NUMBER SYSTEM

Multiple Choice Questions

- The product of any two irrational numbers is:
(A) always an irrational number
(B) always a rational number
(C) always an integer
(D) sometimes rational, sometimes irrational
- The value of $1.999\dots$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is:
(A) $\frac{19}{10}$ (B) $\frac{1999}{1000}$ (C) 2 (D) $\frac{1}{9}$
- $2\sqrt{3} \times \sqrt{3} + 1$ is equal to :
(A) $2\sqrt{9}$ (B) 6 (C) 7 (D) $4\sqrt{6}$
- Between two rational numbers:
(A) there is no rational number
(B) there is exactly one rational number
(C) there are infinitely many rational numbers
(D) there are only rational numbers and no irrational numbers
- which of the following is equal to x ?
(A) $x^{\frac{12}{7}} - x^{\frac{3}{7}}$ (B) $^{12}\sqrt{(x^4)^{\frac{1}{2}}}$ (C) $(\sqrt{x^3})^{\frac{2}{3}}$ (D) $x^{\frac{12}{7}} \times x^{\frac{7}{12}}$

Short Answer Type Questions

- Find the three rational numbers between:
(i) -1 and -2 (ii) 0.1 and 0.11 (iii) $\frac{5}{7}$ and $\frac{6}{7}$ (iv) $\frac{1}{4}$ and $\frac{1}{5}$
- Represent geometrically the following numbers on the number line:
(i) $\sqrt{4.5}$ (ii) $\sqrt{5.6}$ (iii) $\sqrt{8.1}$ (iv) $\sqrt{2.3}$
- Simplify $16^{\frac{-1}{4}} \times \sqrt[4]{16}$
- Find the value of x in $3 + 2^x = (64)^{\frac{1}{2}} + (27)^{\frac{1}{3}}$.
- If $a = -2$, $b = -1$, then find $a^{-b} - b^a$.

Long Answer Type Questions

- If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $x^2 + y^2 + xy$.

12. If $x = \frac{2-\sqrt{5}}{2+\sqrt{5}}$ and $y = \frac{2+\sqrt{5}}{2-\sqrt{5}}$, find the value of $x^2 - y^2$.

13. Determine rational numbers p and q if

$$\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = p - 7\sqrt{5}q.$$

14. Simplify: $\frac{6}{2\sqrt{3}-\sqrt{6}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$.

15. Simplify: $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} + \frac{2\sqrt{3}}{\sqrt{6}+2} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$.

16. Show that: $\frac{1}{3-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$.

17. If: $x = \frac{\sqrt{p+q} + \sqrt{p-q}}{\sqrt{p+q} - \sqrt{p-q}}$, then find the value of $qx^2 - 2px + q$.

18. Show that: $\frac{x^{-1} + y^{-1}}{x^{-1}} + \frac{x^{-1} - y^{-1}}{x^{-1}} = \frac{x^2 + y^2}{xy}$.

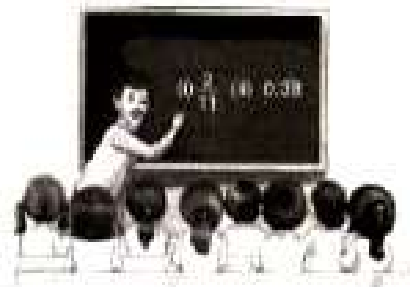
19. If $x = 2 + 3\sqrt{2}$, then find the value of $\left(x + \frac{14}{x}\right)$.

20. Find the value of a and b in the following:

(i) $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a - b\sqrt{3}$

(ii) $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} = a + b\sqrt{6}$

21. To judge the preparation of student's class IX on topic "Number System" Mathematics teachers write two numbers on black board (as shown in figure), and asks some questions about the members, which are following, then answer the question:



- (i) Write the decimal form of $2/11$
- (ii) Write the p/q form of 0.38.
Write the decimal expansion of $2/11$.
- (iii) If p/q form of 0.38 is m/n, then find the value of (m+n)

SUBJECT - SCIENCE

Chapter: Motion

Instructions for Students:

- Complete all Notes and NCERT Exercise Questions of the chapter Motion in your Classwork Copy.
- Complete the following Assignment in a separate file/folder.
- Write neatly and organize your work properly.
- Label all diagrams carefully.

Part A - Notes to be Completed in Classwork Copy

Write short notes on:

- Distance and Displacement
- Speed, Velocity and Uniform Motion
- Non-uniform Motion
- Acceleration
- Graphical Representation of Motion (Distance-Time graph and Velocity-Time graph)
- Equations of Motion (Derivations using graphs)
- Uniform Circular Motion

Diagrams to be drawn:

- Distance-Time graph for uniform and non-uniform motion
- Velocity-Time graph for uniformly accelerated motion

Part B - NCERT Exercise Questions

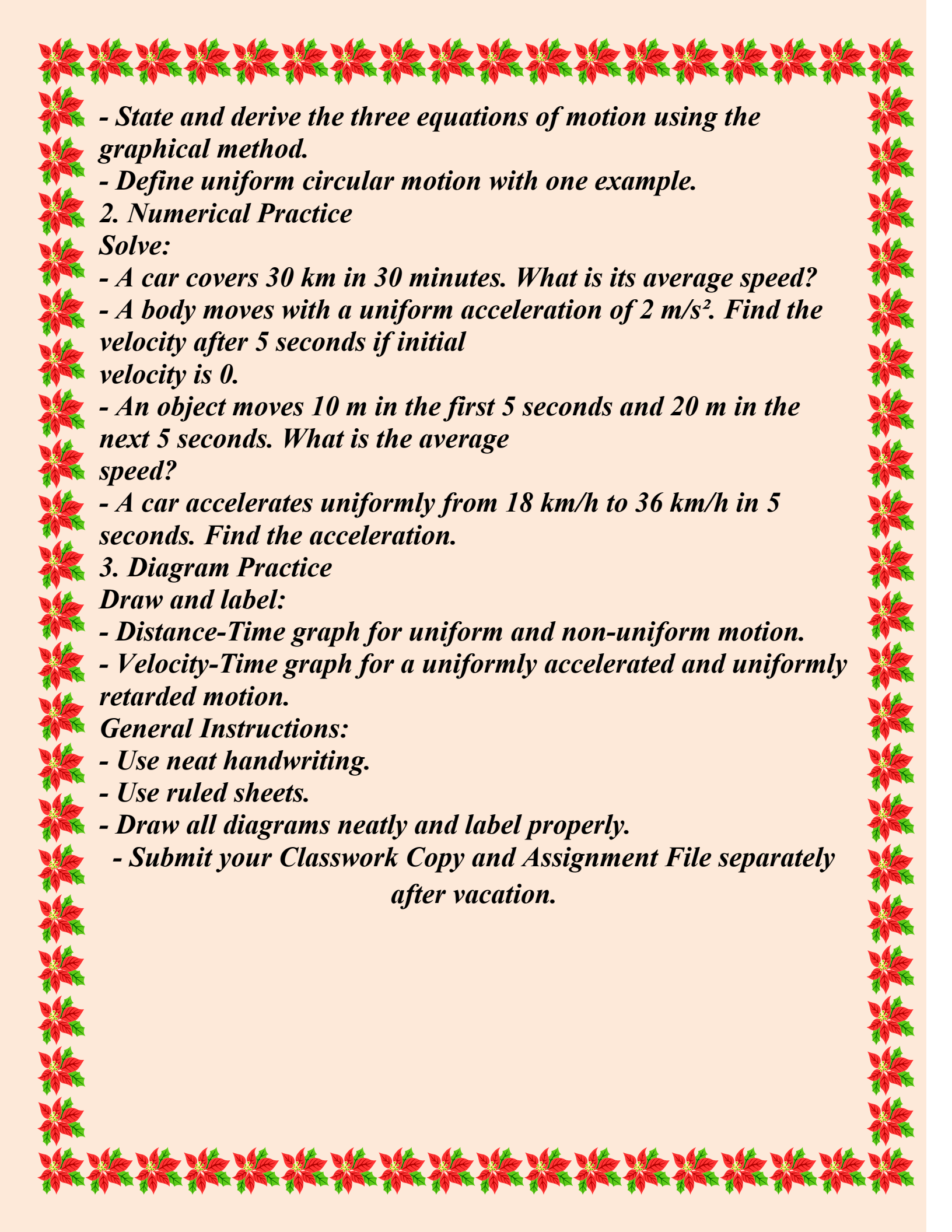
Solve all NCERT textbook exercise questions (In-Text and End of Chapter Questions) of the chapter Motion in your Classwork Copy.

Part C - Assignment (Separate File/Folder)

1. Concept-Based Questions

Answer briefly:

- Define distance and displacement. Give one example of each.
- Differentiate between speed and velocity.
- What is acceleration? Write its SI unit.



- State and derive the three equations of motion using the graphical method.

- Define uniform circular motion with one example.

2. Numerical Practice

Solve:

- A car covers 30 km in 30 minutes. What is its average speed?

- A body moves with a uniform acceleration of 2 m/s^2 . Find the velocity after 5 seconds if initial velocity is 0.

- An object moves 10 m in the first 5 seconds and 20 m in the next 5 seconds. What is the average speed?

- A car accelerates uniformly from 18 km/h to 36 km/h in 5 seconds. Find the acceleration.

3. Diagram Practice

Draw and label:

- Distance-Time graph for uniform and non-uniform motion.

- Velocity-Time graph for a uniformly accelerated and uniformly retarded motion.

General Instructions:

- Use neat handwriting.

- Use ruled sheets.

- Draw all diagrams neatly and label properly.

- Submit your Classwork Copy and Assignment File separately after vacation.



SUBJECT - SOCIAL SCIENCE

Students are required to research on the topic allotted to them. They also need to Gather information and other data related to their project. Kindly refer to the details mentioned below :-

Enrichment Activity/Project guidelines-

It is a mandatory for all.

Each student has to take any 4 project.

Project can be submit in handmade file.

Number of pages expected in the project: 20 pages

☐ **Cover page (Topic, Name, Class, Section and Roll No.)**

☐ **Index**

☐ **Acknowledgement**

☐ **Introduction**

☐ **Causes**

☐ **Effects**

☐ **Mitigation strategies**

☐ **Case study**

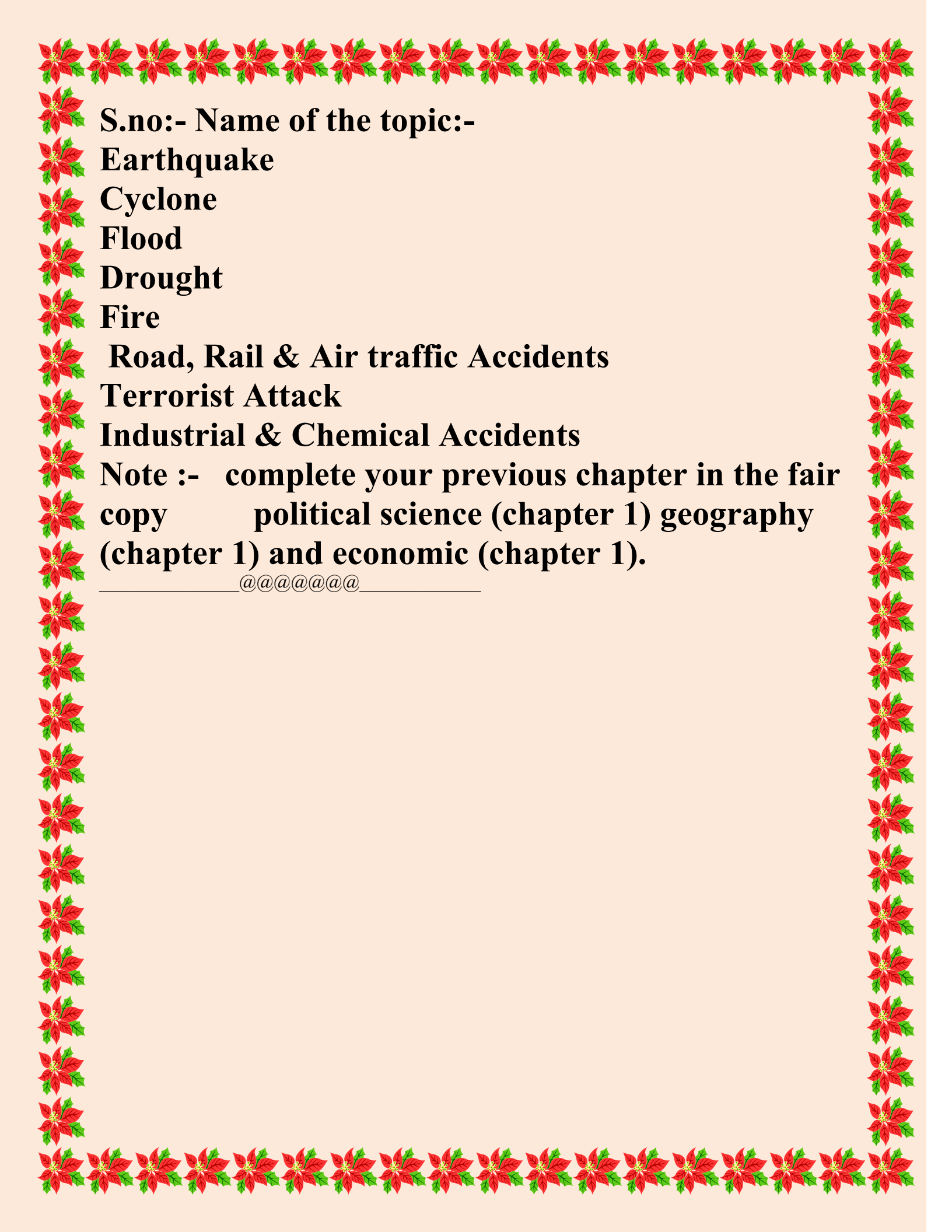
☐ **Conclusion**

☐ **Bibliography**

☐ **Glossary (Optional)**

Support your project with suitably labelled pictures, maps, graphs,

Interesting facts, interviews conducted, questionnaire etc.



S.no:- Name of the topic:-

Earthquake

Cyclone

Flood

Drought

Fire

Road, Rail & Air traffic Accidents

Terrorist Attack

Industrial & Chemical Accidents

**Note :- complete your previous chapter in the fair
copy political science (chapter 1) geography
(chapter 1) and economic (chapter 1).**

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SUBJECT - INFORMATION TECHNOLOGY

Instruction : This assignment question should be prepared in project file pages and attached in stick file.

- 1. Research and write a short paragraph about different type of internet connection (like WiFi, broadband) explain their advantages and disadvantage.*
- 2. Explain the steps to properly shutdown a computer.*
- 3. Write a short essay on how computer is used in everyday life.*
- 4. Give the examples of different areas where computer is used.*
- 5. What is the importance of email? Write a short paragraph about how email can used for the communication*
- 6. Write the functions of all function key available in keyboard.*
- 7. What is some way to protect your personal information online?*
- 8. Think a problem you have faced while using technology. Write a short paragraph about how you solved it or how you would solve in the future.*
- 9. Design presentation slides (10 to 15 slides approx.)*

Generation of computers & its features



a) Various computer programming language & its feature.

b) Importance of various social media application

c) Introduction of artificial intelligence (AI)

d) Python programming and its features.

e) Cyber threats and security.

f) Emerging technology

g) Various storage devices

h) About Information Technology (IT) Act.

i) Internet services

j) History of internet

k) Various input and output devices