LITTLE FAIRY PUBLIC SCHOOL

Summer Holidays Homework CLASS-XI (2026-27) SCIENCE

This summer vacation the Holiday Homework is designed with the aim of activity based learning. It includes assignments and activities that will foster curiosity, develop creativity, enhance knowledge and instill the joy of learning and doing it in the right-spirit with enthusiasm will make it a great learning experience.

- Discover a new and better you who is enriched and confident and performs every action with utmost perfection.
- It's the perfect time for strengthening family bond, sharing festivities, joys and sorrows, having a good time together.
- Make sure to take some time to focus on interesting books and read as much as you can about the places and people.
- Take good care of your health and hygiene. In this scorching heat, keep yourself well hydrated and energetic.
- Engage yourselves in morning walks, yoga, exercise, meditation with your parents or grandparents.
- Revise all the work done in the class.
- Make sure that your work is neat, presentable, and original and conforms to the guidelines given homework as directed by the teachers

Holiday homework is an attempt to channelize the creative energy; it keeps you connected with the syllabus.

1. **ENGLISH:**

1. Collect 5 English newspaper articles on topics like education, environment, or youth issues. Paste them in a notebook. For each article, write a summary (100–120 words) and find 5 new vocabulary words with meanings.
2. Attempt the following Writing Skills:
   - Design a POSTER on "Save Environment" or "Say No to Plastic".
3. How would *The Portrait of a Lady* change if the story was set in today's modern world?
4. Do you think memories are more powerful than reality, as shown in *The Photograph*? Explain.
5. Was the narrator morally right in keeping the horse in *The Summer of the Beautiful White Horse*? Justify your answer.
6. Prepare a short speech on: **"Old Values vs Modern Lifestyle"**
"Technology Weakens Family Bonds"

PROJECT WORK : Instructions for Project File:

- The project must be handwritten and should be of 10-15 pages.
- It must include:

1.Cover Page	5. Introduction
2. Certificate	6. Content with headings
3. Acknowledgement	7. Conclusion
4. Index	8. Bibliography

- Use simple English and neat handwriting.
- Add examples, facts, and real-life references.
- Add pictures or newspaper cuttings.
- Work should be original.

TOPICS ARE AS FOLLOWS:

Roll No. 1–7	Topic: Importance of Reading Books
Roll No. 8–14	Topic: Role of Discipline in Student Life
Roll No. 15–21	Topic: Impact of Technology on Education
Roll No. 22–28	Topic: Value of Time Management
Roll No. 29–34	Topic: Importance of Moral Values
Roll No. 35–40	Topic: Clean India Mission (Swachh Bharat Abhiyan)
Roll No. 41onwards	Topic: Role of Communication Skills in Student Life.

2. PHYSICS :

WRITTEN ASSIGNMENT: Do the above assignment questions in your physics notebook.

****Revise NCERT chapter 1,2 and 3**

****Practice NCERT exercise questions and example questions**

Prepare science working model on the given topic:

Theme: Science and technology for sustainable future

Subtheme: (i) Water Conservation and Management (Roll no 1 to 6)
(ii) Emerging Technology (Roll 7 to 12)
(iii) Waste Management and Alternatives to Plastic (Roll no 13 to 18)
(iv) Green Energy (Roll no 19 to 24)
(v) Health and Hygiene (Roll no 25 to 30)
(vi) Sustainable Agriculture (Roll no 31 onwards)

Instructions for working model:-

1. The working model must be based on the applications of basic principles of Science and Technology.
2. Students must keep in mind that their work is innovative, original or having improvised modification in existing knowledge/ technology/craftsmanship etc. For the welfare of the larger section of a society.
3. The student should prepare a write up of their working model.
4. Use only eco-friendly material for preparing the working model.

3.CHEMISTRY

(I) PROJECT WORK : PREPARE A INVESTIGATORY PROJECT/ RESEARCH WORK ON ANY TOPIC RELATED TO CHEMISTRY

Example 1:. Waste to chemicals: Transforming wastes and residues to energy, fuels and other useful chemicals.

Example 2. Endangered elements: Managing and extraction, use, reuse and alternative development for elements in the chemical enterprise that are facing critical supply risks.

(II)WRTITTEN ASSIGNMENT:

Do practice of numericals and chapter wise MCQ, Assertion Reason and Case Study Based Questions of the given chapters in Chemistry Notebook.
Chapter 1: Some basic concept and Principles and
Chapter 2: Structure of Atom

Do the back exercise questions of NCERT in Chemistry Notebook.

4.BIOLOGY

(I)WRTITTEN ASSIGNMENT: Do the ASSIGNMENT questions in BIOLOGY Notebook

(II)BIOLOGY EXPERIMENTS

1. Study and describe a locally available common flowering plant, from any one family: Solanaceae or Liliaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams).
2. Study of distribution of stomata in the upper and lower surfaces of leaves.
3. Separation of plant pigments through paper chromatography.
4. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
5. Test for presence of sugar in urine.
6. Test for presence of albumin in urine.

#Note down all the above practicals in Biology File as given in Lab manual.

5. MATHEMATICS

(I) ACTIVITY FILE:

i Make a chart of the formulae, i.e FORMULAE SHEET chapterwise on A4 sheets.

ii Make FLASH CARDS of FUNCTIONS on A4 sheets

(II) CREATIVE WORK: Draw MIND MAPS on A4sheets chapterwise.

(III) PROJECT WORK:

i Make a maths working model on
Roll No. 1-5 : **"Vedic Maths in Daily life"/"Income Tax Calculation"**
Roll No. 6-10 **"Maths in Sports"/ "Probability and Statistics in Games"**
Roll No. 11-15 **"Maths in Music"/ "Prime Numbers and Encryption"**
Roll No. 16-20 **"Maths in Arts/ Archietecture"/ "Conic Sections in Archietecture"**
Roll No. 21-25 **"Maths in Nature"/ "Fibonacci Sequence in Nature"**
Roll No. 25-onwards **"Geometry Around Us"/ "Stock Market Analysis"**

ii The working model must be based on the applications of concepts of Mathematics

iii Model must be working, innovative, problem solving, original and economical .

iv The student should prepare a writeup of their working model

v Use only eco-friendly material for preparing the working model Thermocol is strictly not allowed.

(IV) WRITTEN ASSIGNMENT:

i Do NCERT textbook exercise based questions in MATHS Notebook,

ii Solve EXEMPLAR questions and ASSIGNMENTS Questions in your Practice Notebook.

(V) PRACTICAL WORK: Complete the follwoing Lab Activities in the Practical File.

i To find the number of subsets of a given set and verify that if a set has n number of elements, then the total number of subsets is 2^n .

ii To verify that for two sets A and B, n (A×B) = pq and the total number of relations from A to B is 2^{pq}, where n(A) = p and n(B) = q.

iii To find the values of sine and cosine functions in second, third and fourth quadrants using their given values in first quadrant.

iv To prepare a model to illustrate the values of sine function and cosine function for different angles which are multiples of π and $\pi/2$.

v To plot the graphs of sin x, sin 2x, 2sinx and sin x/2 , using same coordinate axes.

vi To inerpret geometrically the meaning of $i = \sqrt{-1}$ and its integral powers.

vii To obtain formula for the sum of squares of first n-natural numbers.

viii To establish the formula for the sum of the cubes of the first n natural numbers.

ix. To demonstrate that the Arithmetic mean of two different positive numbers is always greater than the Geometric mean.

6. <u>COMPUTER SCIENCE :</u> Do the given ASSIGNMENT in the C.S. Notebook and
MAKE A POWERPOINT PRESENTATION ON ONE OF THE FOLLOWING TOPIC .

1. Computer System Components
- Input, Processing, Storage, Output
- Use block diagrams and real-life device images

2. Types of Software
- System Software vs Application Software
- Include examples like Windows, Linux, MS Word, Photoshop

3. Memory Hierarchy in Computers
- Registers → Cache → RAM → HDD/SSD
- Include a pyramid or tier diagram

4. Input and Output Devices
- Categorize: Text, Pointing, Audio/Video Input; Visual, Print, Audio Output
- Use device images

5. Binary Number System
- Binary to Decimal conversion and vice versa
- Include examples with step-by-step conversions

6. Role of Operating System
- Functions like File Management, Memory Management, Task Scheduling
- Use icons and flowcharts

MAKE A CHART ON ONE THE FOLLOWING TOPIC

Chart 1: Block Diagram of a Computer System

- Show flow: Input → CPU → Memory → Output
- Color code each section

Chart 2: Types of Memory

- RAM, ROM, Cache, Secondary Storage
- Include key properties: speed, volatility, size

Chart 3: Software Types

- Table comparing System and Application software
- 2 columns: Features + Examples

Chart 4: Data Units in Computers

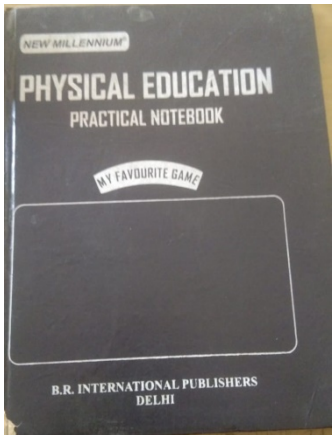
- Bit, Byte, KB, MB, GB, TB
- Show hierarchy in size

Chart 5: Input/Output Devices

- Divide into two halves: Input devices on left, Output devices on right
- Paste printed images or draw neatly

7.PHYSICAL EDUCATION

1. Prepare the Practical File (In the lab manual only)
2. Practical File will consist following three practicals in detail
3. **Practical- 1:** Fitness tests administration. (SAI Khelo-India Test). SAI Khelo-India Fitness Test Battery: (Test name, objective/purpose, equipment required, procedure, scoring method, standard norms and the picture/diagram)



4. A. For the age category of 5 to 8 years old:
    1. BMI
    2. Flamingo balance test
    3. Plate tapping test
5. B. For the age category of 9 to 18 years old:
    1. BMI
    2. Push-ups & Modified push-ups
    3. Curl-ups & Partial curl-ups
    4. 50mDash
    5. Sit and Reach test
    6. 600m Run/walk
6. **Practical- 2:** Procedure for asanas, benefits & contraindications for any two asanas for each lifestyle diseases: Obesity, Diabetes, Hypertension, Asthma, Arthritis & lower back pain. (Total 10 asanas will be there, picture/diagram is mandatory for all asanas)
7. **Practical- 3:** Anyone IOA recognized Sport/Game of choice. Labelled diagram of Field & Equipment. Mention the history, rules, terminologies, fundamental skills, scoring method, fouls, officials, International & Indian federation, and arjun awardee.
   (Ex:Volleyball/Basketball/Football/Handball/Hockey/Cricket/Kabaddi/Kho-Kho/Archery /Badminton/Boxing/Chess/Swimming)
   NOTE: Brown cover page, picture/diagram and index are mandatory.
    2. Complete the subject copy (till chapter-2).

ASSIGNMENT **ENGLISH**

Do the following questions in your English Notebook.

Q1). You have recently upgraded your laptop and now wish to sell the old one. Prepare an advertisement including brand, features, and contact details.

Q2) You have a furnished room available for students near a coaching centre. Prepare a “To Let” advertisement.

Q3) You are looking for a furnished single room near a metro station in Delhi. Draft an advertisement.

Q4) Your uncle wants to sell his fully furnished apartment in Gurgaon. Draft a suitable advertisement mentioning facilities.

ASSIGNMENT PHYSICS

1) Find the dimensions of (a/b) in the equation: $P = at^2/bx$ where P is pressure, x is distance and t is time.
2) Find an expression for viscous force F acting on a tiny steel ball of radius r moving in a viscous liquid of viscosity with a constant speed by the method of dimensional analysis.
3) If velocity of light C, Planck's constant h and gravitational constant G are taken as fundamental quantities then express mass in terms of dimensions of these quantities.
4) A radar signal is beamed towards a planet from the earth and its echo is received seven minutes later. Calculate the velocity of the signal, if the distance between the planet and the earth is $6.3x10^{10}$m?
5) Find the dimensions of latent heat, specific heat, universal constant of gravitation G and universal gas constant.
6) E, m, l and G denote energy, mass, angular momentum and gravitational constant respectively. Determine the dimensions of EL^2/m^5G^2.
7) Calculate the time taken by the light to pass through a nucleus of diameter $1.56 x10^{-16}$ m. (speed of light is $3x10^8$ m/s)
8) If velocity, time and force were chosen the basic quantities, find the dimensions of mass?
9) State the rules for finding the number of significant figures in a measurement.
10) Establish the relation Snth=u+a/2(2n-1), where the letters have their usual meanings.
11). Give an example of
    i) a physical quantity which has a unit but no dimension
    ii)a physical quantity which is neither unit nor dimensions
    iii) a constant which has a unit (iv) a constant which has no unit.
12) Force F acting on a particle of mass m moving along a circular pathbif radius r with a constant angular velocity w is given by $F= mrw^2$.Show that the equation is dimensionally correct.
13) The rotational kinetic energy of a body is given by $E= 1/2 I w^2$, where w is the angular velocity of the body. Use equation to obtain the dimensional formula for moment of inertia I. Also write its SI unit.
14) .Check the correctness of the relation v^2=was by the method of dimensions. The symbols have their usual meaning.
15) Name any three physical quantities having the same dimensions and also give the dimensions.
16) A particle is moving along a straight line and its position is given by the relation
    $x=(t^3-6t^2-15t+40)m$
    Find (a) The time at which velocity is zero.
    (b) Position and displacement of the particle at that point.
    (c) Acceleration of particle at the line.
17) The V-t graphs of two objects make angle 30° and 60° with the time axis. Find the ratio of their accelerations.
18) The displacement x of a particle varies with time as $x = 4t^2-15t + 25$. Find the position, velocity and acceleration of the particle at t = 0.
19) A ball thrown vertically upwards with a speed of 19.6 ms-1 from the top of a tower returns to the earth in 6s. Find the height of the tower ($g = 9.8 m/s^2$)
20) The displacement of a body is proportional to t^3, where t is time elapsed. What is the nature of acceleration- time graph of the body?
21) An object is in uniform motion along a straight line, what will be position time graph for the motion of the object if (i) x_0 = positive, v = lvlnegative is constant
(ii) both X_o and v are negative lvl is constantwhere X_o is position at t = 0
22) A railway train 400m long is going from New Delhi railway station to Kanpur. Can we consider railway train as a point object.
23) .Shipra went from her home to school 2.5km away. On finding her home closed she returned to her home immediately. What is her net displacement? What is the total distance covered by her?
24) .A balloon is ascending at the rate of 4.9m/s. A pocket is dropped from the balloon when situated at a height of 245m. How long does it take the packet to reach the ground? What is its final velocity?

25) .The displacement x of a particle moving in one dimension under the action of constant force is related to the time by the equation where x is in meters and t=√x-3 is in seconds. Find the velocity of the particle at: (i) t = 3s, (ii) t = 6s. (iii) A bullet bike moving on a straight road at a speed of 120 km/h is made to stop by a police officer within a 100m distance. Calculate the retardation of the bike (assumed uniform) and the time it takes for the bike to stop?
26) .Draw displacement time graph for a uniformly accelerated motion? What is its shape?
27) .On a 60km straight road, a bus travels the first 30 km with a uniform speed of 30 kmh^{-1}. How fast must the bus travel the next 30 km so as to have average speed of 40 kmh^{-1} for the entire trip?
28) A body covers 12 m in 2nd second and 20 m in 4th second. How much distance will it cover in 4 seconds after the 5th second.
29) .Derive the first, second and third equation of motion by the calculus method.
30) .What are positive and negative acceleration in straight line motion? Can a body have zero velocity and still be accelerating? If yes gives any situation.

ASSIGNMENT **BIOLOGY**

Q1) Multiple choice Questions:

(i) Living beings have been divided into there domains. What is true of archaea bacteria:
(a) Completely differ from prokaryotes.
(c) It has novel features absent in prokaryotes & eukaryotes
(b) Resemble eukaryotes in all respects.
(d) Completely differ from prokaryotes & eukaryotes.

(ii) Correct sequence in Linnaean hierarchy is:
(a) Species, genus, family, order, class (c) Class, family, species, genus, order
(b) Species, genus, phylum, family, class (d) Phylum, class, family, species, order

(iii) Lysosomes take part in:
(a) Intracellular digestion (b) Extracellular digestion
(c) Fat breakdown (d) Both (a) & (b)

(iv) Arrangement of ciliary microtubules is: (a) 9+9 (b) 9+3 (c) 9+4 (d) 9+2

Write such 10Mcq's of chapter - 1,5 & 8 in fair note Book.

Assertion & Reason based questions : Answer these questions selecting the appropriate option given below: (a) Both A & R are true & R is the correct explanation of A
(b) Both A & R are true & R is not the correct explanation of A
(c) A is true but R is false (d) A is false & R is true

(v) **Assertion:** Mitochondria & Chloroplasts have similar RNA sequence.
Reason: They show prokaryotic organization.

(vi) **Assertion:** National parks have been set up to protect wildlife.
Reason: Biosphere reserve has greater importance than the national parks.

(v) **Assertion:** A cell membrane shows fluid behavior.
Reason: A membrane is a mosaic or composite of diverse lipids & proteins.

Short Answer type Question :

Q2 Enlist four peculiar features of fluid mosaic model of plasma membrane. Write its significance also.

Q3 Differentiate between bacterial cell and Animal cell through labelled diagram. Who gave cell theory.

Q4 Write the rules and advantages of Binomial Nomenclature. Explain with the help of one example.

#Prepare 10 self made questions from each chapter - 1,5 & 8 i. e. from covered topics & note it down in fair notebook.

Case Based Questions :

Case Base- I (Read the para and choose correct answer.)

Adwita went to see the zoo in her town with her parents & saw many wild animals, their food habits, behavior etc. she saw that there was a wide variety of animal life in the zoo. But she was amazed to

see that the board placed in front of lion cage & monkey place which tells that both were mammals. However, she thought that they were totally different in appearance.

(i) Why lion & monkey are considered to be mammals?

(ii)Write the scientific name of lion & tiger?

(iii) Which is correct hierarchical sequence:

(a) Phylum, class, order, family (b) Phylum, division, family, class

(c) Genus, species, order, family (d) Division, order, class, genus

Case Base-II(Read the para and choose correct answer.)

Cytoplasm is one of the basic components of the cells. It is an amorphous, translucent & homogeneous colloidal ground substance present between the plasma membrane & the nucleus. It has two types of cytoplasmic structures: cell organelles & cell inclusions. Cell organelles include ER, Golgi body, Ribosomes, lysosome, mitochondria etc. each of these cell organelles is structurally adapted to perform its specific function. Answer the following questions with reference of cell organelles.

(iv) Which organelle is present in maximum number is secretory cells?

(v) Which of the cell organelles is associated with photorespiration?

ASSIGNMENT SUBJECT – MATHEMATICS, CH– 1: SETS

Choose the correct option:

1. For any set A, $(A')'$, is equal to: (a) A' (b) A (c) $\varnothing$ (d) none of these
2. Let S ={x;x is a positive multiple of 3 less than 100 }, P={x:x is a prime number less than 20}. Then n(S)+n(P) is: (a) 34 (b) 31 (c) 33 (d) 41
3. Given two finite sets such that n(A) =115; n(B) = 326; n(A−B) =47; n(A∪B) is
   (a) 373 (b) 165 (c) 370 (d) None of these.
4. Given two finite sets such that n(A) =3, n(B) =6. Then minimum numbers of elements in A∪B is:
   (a) 3 (b) 6 (c) 9 (d) 18
5. If a set A containing 6 elements, then number of non-empty subsets of A is:
   (a) 36 (b) 30 (c) 64 (d) 63
6. Let A= {(x, y): y = e^{2x}, $x \in R$} and B = {(x, y): y = e^{-2x}, $x \in R$ }then $A \cap B$ *is*:
   (a) Not a set (b) Singleton set (c) Empty Set (d) None of these
7. If $A = \{x : x = 4n + 1, \forall\ 2 \leq n \leq 6\}$, then the number of subsets of A are:
   (a) 2^2 (b) 2^3 (c) 2^5 (d) 2^6
8. Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. The values of m and n respectively are :
   (a)7, 6 (b) 5, 1 (c) 6, 3 (d) 8, 7
9. Let$A = \{x : x \in R, |x| < 2\}, B = \{x : x \in R, |x - 2| \geq 2\}$ *and* $A \cup B = R - C$ *then set C equals*:
   (a) $\{x: -2 < x \leq 2\}$ (b) $\{x: -2 < x \leq 4\}$ (c) $\{x: 2 < x \leq 4\}$ (d) None of these

Short Answer Type questions:

10. Write the following sets in the roaster form.
    A = {x| x is a positive integer less than 10 and $\mathbf{2^x - 1}$ is an odd number}.
11. Write the following in set builder form. A = {3, 9, 27, 81}
12. If the universal set U = {1,3,5,7,9,11,13,15,17} , B= 1,3,7,13,15then find B'.
13. Let A, B, and C be the sets such that A∪B = A∪C Then show that B=C.
14. For any sets A and B, Show that: P(A ∩B) =P(A) ∩ P(B).

Long Answer Type - I Questions:

16. In a survey of 400 students in a school, 100 were listed as taking apple juice. 150 as taking orange juice and 75 were listed as taking both appleas well as orange juice. Find how many students were taking neither apple juice nor orange juice.
17. There are 200 individuals with a skin disorder, 120 had been exposed to chemical C1, 50 to chemical C2, and 30 to both chemicals C1 and C2. Find the number of individuals exposed to:

(i)Chemical C1, but not chemical C2, (ii) Chemical C2 but not chemical C1,
(iii) Chemical C1 or chemical C2.

18. A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 men and only three men got medals in all the three sports, how many received medals in exactly two of the three sports?

20. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H & I, 11 read both H and T. 8 read both T & I, 3 read all three newspapers. Find: (i) The number of people who read at least one of the newspapers. (ii) The number of people who read exactly one newspaper.

21. From 50 students taking examinations in Mathematics, Physics and Chemistry, each of the student has passed in at least one of the subject, 37 passed Mathematics, 24 Physics and 43 Chemistry. At most 19 passed Mathematics and Physics, at most 29 Mathematics and Chemistry and at most 20 Physics and Chemistry. What is the largest possible number that could have passed all three examinations?

22. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked products A & B, 12 people liked products C & A, 14 people liked products B & C and 8 liked all the three products. Find how many liked product C only.

23. In a survey of 25 students, it was found that 15 had taken mathematics, 12 had taken physics and 11 had taken chemistry, 5 had taken mathematics and chemistry, 9 had taken mathematics and physics, 4 had taken physics and chemistry and 3 had taken all the 3 subjects. Find the number of students that had (i) only chemistry,(ii) physics and chemistry, but not mathematics, (iii) only one of the subjects, (iv) at least one of the three subjects, (v) none of the subjects.

24. In a town of 840 persons, 450 persons read Hindi, 300 readEnglish and 200 read both. Then find the number of persons who read neither Hindi nor English.

25. In a group of 65 peoples, 40 like cricket, 10 like both cricket and tennis. How many like tennis only but not cricket? How many like tennis?

ASSIGNMENT MATHEMATICS, CH – 2: RELATIONS AND FUNCTIONS

1. If A = {1, 2, 4}, B = {2, 4, 5}, C = {2, 5} then (A – B) × (B – C)

(a) {(1, 2), (1, 5), (2, 5)} (b) {1, 4} (c) {1, 4} (d) None of these.

2. If R is a relation on set A = {1, 2, 3, 4, 5, 6, 7, 8} given by xRy y = 3x, then R = ?

(a) {(3, 1), (6, 2), (8, 2), (9, 3)} (b) {(3, 1), (6, 2), (9, 3)}

(c) {(3, 1), (2, 6), (3, 9)} (d) None of these.

3. Let A = {1, 2, 3}, B = {4, 6, 9} if relation R from A to B defined byx is greater then y. the range of R is -

(a) {1, 4, 6, 9} (b) {4, 6, 9} (c) {1} (d) None of these.

5. If 2f(x) – 3 f(1/x) =x2 (x ≠ 0), then f(2) is equal to -

(a)-7/4 (b) 5/2 (c) –1 (d) None of these.

6. Range of the function f(x) = cos[x] where [x] is G.I.Function for– $\pi/2 < x < \pi/2$ is -

(a) {–1, 1, 0} (b) {cos1, cos2, 1} (c) {cos1, –cos1, 1} (d) (-1,1)

7. If f(x) =log (1+x)/(1-x)and g(x) =3x+x3 /1+3x2 then f{g(x)} is equal to -

(a) f(3x) (b) {f(x)}3 (c) 3f(x) (d) –(f(x).

8. If f(x) = cos(logx) then value of f(x).f(y) – ½ {f(x/y)+f(xy)} is -

(a) 1 (b) –1 (c) 0 (d) ±1.

9. Doman of f(x) = $\sqrt{4x - x^2}$ is -

(a) R – [0, 4] (b) R – (0, 4) (c) (0, 4) (d) [0, 4].

10. If A and B are finite sets such that n(A) = 5 and n(B) = 7, then find the number of functions from A to B.

11. If f(x) = $x^2 - 3x + 1$ find $x \in R$ such that f (2x) = f (x)

12 Let f and g be two real valued functions, defined by, f(x) = x, g(x) = |x|. Find:

(a) f +g(x) (b). f – g(x) (c). fg(x) (d) (f/g) (x)

Q.13 Find the domain of the function: $f(x) = \frac{x^2+3x+5}{x^2-5x+4}$

Q.14 Let A={9,10,11,12,13} and f : A → N be defined by f (x) = The highest prime factor of n. Find the range of f.

Q.15 Draw the graph of the function: f (x) = 1| − x | + 1| + x |, − 2 ≤ x ≤ 2.

Q 16. If f is a real function defined by $f(x) = \frac{x-1}{x+1}$ then prove that $f(2x) = \frac{3f(x)+1}{f(x)+3}$.

Q 17 If A = {4,9,16,25}, B = {1,2,3,4} and R is the relation "is square of" from A to B. Write down the set corresponding to R. Also find the domain and range of R.

Q.18 If R is a relation "is divisor of" from the set A = {1,2,3} to B = {4,10,15}, write down the set of ordered pairs corresponding to R.

Q.19 Let A = {1,2} and B = {3,4}. Find the number of relations from A to B.

Q.20 Let N → N be defines by f (x) = 3x . Show that f is not an onto function.

ASSIGNMENT MATHEMATICS, CH – 3: TRIGONOMETRIC FUNCTIONS

Q1. If in two circles, arcs of the same length subtend angles of 60 and 75 at the centre, find the ratio of their radii.

Q2. Find the angle between the minute hand and the hour hand of a clock when the time is 5:20.

Q3. Prove that : $tan\ 70^0 = tan\ 20^0 + 2\ tan\ 50^0$.

Q4. If $cot\ \theta = -12/5$ and 'θ' lies in the second quadrant, find the values of other five functions.

Q5. Find the principal solutions of the following: (a) tan x = 3 (b) 2 sec x = (c) cosec x = -6.

Q6. Prove that : $tan\ 9^0 - tan\ 27^0 - tan\ 63^0 + tan 81^0 = 4$.

Q7. Show that : $\sqrt{2 + \sqrt{2 + \sqrt{2 + 2cos8\theta}}} = 2cos\theta$.

Q8. Prove that: $sin^2\frac{\pi}{6} + cos^2\frac{\pi}{3} - tan^2\frac{\pi}{4} = \frac{-1}{2}$.

Q9. Prove that: $3\ cos^2\frac{\pi}{4} + \sec\frac{2\pi}{3} + 5\ tan^2\frac{\pi}{3} = \frac{29}{2}$.

Q 10. $sec^4 A - sec^2 A = tan^4 A + tan^2 A$

Q11. $tan^2 A - sin^2 A = tan^2 A.sin^2 A$

Q12. $\frac{cosec\ A}{cosec\ A-1} + \frac{cosec\ A}{cosec\ A+1} = 2\ sec^2 A$

ASSIGNMENT - COMPUTER SCIENCE Ch-Computer System Worksheet-1

Section A: Multiple Choice Questions

1. **Which component acts as the brain of the computer system?**
   A) RAM B) CPU C) Hard Disk D) ROM
2. **What type of memory is volatile and loses data when power is turned off?**
   A) ROM B) SSD C) RAM D) Flash Drive
3. **Which of the following is an example of system software?**
   A) MS Word B) Operating System C) Google Chrome D) VLC Player
4. **What is the smallest unit of digital memory?**
   A) Byte B) Bit C) Kilobyte D) Nibble
5. **Which CPU register holds the address of the next instruction to be fetched and executed?**
   A) Memory Address Register (MAR) B) Program Counter (PC)
   C) Accumulator (AC) D) Instruction Register (IR)
6. **A system uses 32-bit memory addresses. What is the maximum theoretical RAM capacity it can address directly without extensions?**
   A) 2 GB B) 4 GB C) 8 GB D) 16 GB
7. **Which software type acts as an intermediary layer, allowing different application programs to communicate and share data with each other?**
   A) Device Driver B) Middleware C) Utility Software D) Firmware
8. **If a computer system uses a 64-bit word size, what does this primarily indicate?**
   A) The data bus can transfer 64 bytes at a time.
   B) The CPU can process 64 bits of data in a single cycle.
   C) The storage disk reads data in 64-bit blocks.
   D) The RAM has 64 memory channels.
9. **Which of the following best describes the function of the Control Unit (CU) during the machine cycle?**
   A) It performs logical and relational operations on data.
   B) It fetches, decodes, and manages the execution of instructions.
   C) It permanently saves the state of applications.
   D) It allocates logical memory addresses to physical storage blocks.
10. **In a modern computer memory hierarchy, which memory level offers the fastest access time?**
    A) Level 3 (L3) Cache B) Primary RAM C) CPU Registers D) Solid State Drive (SSD)
11. **If an operating system uses a "GUI" layout, what software layer translates your mouse clicks into machine code?**
    A) Language Processor B) Device Driver C) Application Interface D) Operating System Kernel
12. **How many Kilobytes (KB) are there in exactly 1 Gigabyte (GB) when using binary memory calculation standards?**
    A) 1,000,000 KB B) 1,024 KB C) 1,048,576 KB D) 1,073,741,824 KB

Section B: Short Answer Questions

1. Define the primary functions of the Control Unit (CU) and the Arithmetic Logic Unit (ALU).
2. Differentiate between proprietary software and free and open-source software (FOSS).
3. Convert the following memory units: 4 GB into Megabytes (MB).
4. Explain the purpose of cache memory in a computer system.
5. Distinguish between the functions of **RAM** and **ROM** in terms of who writes the data to them and when it happens.

6. A smartphone specifications sheet lists a "System on a Chip (SoC)". How does an SoC differ from a traditional computer motherboard architecture?
7. Convert **8,388,608 Bits** into **Megabytes (MB)**. Show the step-by-step division process.
8. Explain how **Defragmentation utilities** improve the read/write performance of a mechanical Hard Disk Drive (HDD).

Section C: Long Answer Questions

1. Draw a neat block diagram of a functional computer system. Explain the role of the input, output, CPU, and storage units.
2. What is an operating system? Discuss its major functions regarding resource management and user interface.

Section D: High-Order Thinking Short Answer Questions

1. Contrast the operational differences between a **Compiler** and an **Interpreter** regarding execution speed and error debugging.
2. A user installs a brand new external graphics card, but the operating system fails to utilize its hardware acceleration features. Identify the missing system software component and explain its role.
3. Mathematically prove how many Terabytes (TB) are exactly equivalent to \(2^{40}\) Bytes.
4. Explain the concept of **von Neumann architecture** bottlenecks and how modern cache hierarchies mitigate this issue.

Section E: Complex Analytical Questions

1. Analyze the boot process (Bootstrapping) of a computer system. Detail the chronological role of ROM, BIOS, POST, and the Storage Drive in loading the Operating System into RAM.
2. Discuss the concept of **Cloud Computing**. Differentiate between its three major service delivery models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Give one practical example of each.
3. Analyze the role of **Language Processors** in computing. Compare and contrast an **Assembler**, a **Compiler**, and an **Interpreter** based on their input format, target output, and speed.
4. Differentiate between **System Utilities** and **Application Software**. Classify the following into their exact software categories with a brief justification for each:
   Disk Defragmenter Device Driver for a Printer Python IDLE
   Backup Software

ASSIGNMENT - COMPUTER SCIENCE Chapter - Introduction to Python Worksheet-2

Section A: Multiple Choice Questions

1. **Which of the following is an invalid identifier in Python?**
   A) my_var B) _init_ C) 2nd_value D) DataValue
2. **What will be the output of the Python expression print(13 // 4, 13 % 4)?**
   A) 3.25, 1 B) 3, 1 C) 3, 3 D) 3.0, 1.0
3. **Python is an interpreted language. What does this mean?**
   A) The code is compiled into an .exe file before execution.
   B) The source code is executed line-by-line.
   C) The code runs directly on hardware without any translation.
   D) It does not require any memory allocation.
4. **Which of the following statements best describes how Python allocates memory to variables?**
   A) It reserves a fixed memory space based on the variable's explicit type declaration.
   B) It creates a data object in memory first, then tags it with the variable name as a reference.
   C) It allocates memory blocks alphabetically based on the variable identifier's name.
   D) It maps all variables directly to physical CPU registers to speed up script processing.
5. **What is the fundamental purpose of a namespace in a Python environment?**
   A) To ensure that code runs faster by sorting variable names by size.

B) To act as a dictionary containing mapping structures that prevent naming conflicts.
C) To compress raw source code files into smaller binary files before execution.
D) To define which external libraries can be legally imported by the user.

6. **Why are Python keywords restricted from being used as variable identifiers?**
   A) Keywords require more storage bytes than user-defined names.
   B) Keywords are reserved by the interpreter to understand the structure and syntax of the program.
   C) Keywords can only contain uppercase characters, violating variable naming design patterns.
   D) Keywords are encrypted internally to prevent source code tampering
7. **What is the value of the Python expression -11 // 3?**
   A) -3 B) -3.66 C) -4 D) -4.0
8. **Which operator in Python has the highest precedence order during evaluation?**
   A) * B) + C) // D) **
9. **What will be the exact data type and value returned by the expression 16 // 4.0?**
   A) 4 (int) B) 4.0 (float) C) 4.0 (int) D) 4 (float)
10. **What is the output of the expression print(14 % -3)?**
    A) 2 B) -1 C) -2 D) 1

Section B: Short Answer Questions

1. Differentiate between interactive mode and script mode in Python.
2. What are tokens in Python? Name any three types of tokens with an example for each.
3. Explain the structural concept of **Operator Precedence** and **Associativity** in Python when evaluating complex expressions without parentheses.
4. State the features of Python.
5. What are the limitations of Python.