DAVID MODEL SENIOR SECONDARY SCHOOL

HOLIDAY HOMEWORK

CLASS : XII (Science Stream)

Dear Student,

In this pandemic time the measures on educational objectives and learning outcomes has become a positive approach towards e-learning.

Wishing you all the well-being of your siblings, parents and other family members.

Importance of Summer Vacation:

1. Summer Vacation brings unique opportunities to learn and develop social skills.
2.. It benefits more by focusing on themselves during summer vacation by working on personal projects and simply relaxing.
3.. Helps to recover physical and mental energy.
4. Above all it is a reality check and self assessment moment.

Usefulness of Holiday Homework:

1. It is an idea of personal creativity and independence is stilled in the minds of the students.
2. It also teaches Time Management.
3. It nurtures the inner creativity of a child and helps to establish themselves as a good writer or a presenter.
4. Finally we can say it helps to practice, prepare and participate.

Do's and Don'ts At Home During Pandemic:

1. Wash your hands frequently and properly.
2. Do not touch your face again and again.
3. Do stay in touch with your friends and family. Talk to each other or message or video chat. Spread positivity.
4. If suffering from fever, cold or cough cover your face with mask and avoid coming in contact with persons at home till you recover.
5. Above all **Don't Step Out** when not needed. Stay Home Stay Safe Stay Healthy.

ENGLISH (CORE)

Solve the following questions:

1. While reading about new places and searching for them online has its merits, the advantages of actually travelling to various destinations far exceed them. Write a speech in 120-150 words for the magazine Travel Times, evaluating both these options. You are Amrit/Amrita.

2. You are Mukul / Mahima of Alps Public School. Your school has organized a debate on "Fake News On Social Media and Its Effects". Prepare your views against or in favour of the motion. (150-200 words).

3. You are Suyash, Head Boy of Shanti Public School. Write a notice in not more than 50 words urging the students to lend a helping hand in more and more numbers to the less privileged during Covid-19 crisis.

4. You have lost your class XII Physics book in the playground while playing football. Draft a notice in not more than 50 words for your school notice board informing the students about it. You are Chetan/Chetna of Nav Public School, Indore.

5. You are Vinit/Vinita of 34, Model Town, Lucknow. Write a letter to the editor of a local newspaper in 120-150 words expressing your concern over the increasing cases of Covid-19 and the need to spread more and more awareness among the people to keep themselves safe in this pandemic situation.

PHYSICS

Q.1. Calculate the electric field strength required to just support a water drop of mass 10^{-3} kg and having charge 1.6×10^{-19} C.

[6.125×10^{16} NC^{-1}]

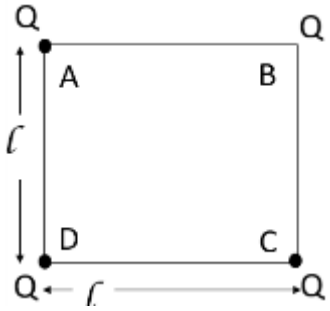
Q.2. How many electrons should be removed from a coin of mass 1.0 g, so that it may just float in an electric field of intensity 10^{9} NC^{-1} directed upward?

[9.8×10^{7}]

Q.3. A pendulum of mass m carrying charge ‘q’ is at rest in horizontal uniform electric field ‘E’. Find the tension in the thread of pendulum and angle makes it with vertical.

Q.4. An electron fall through a distance ‘d’ in a uniform electric field ‘E’. The direction of field is reversed keeping its magnitude same and a proton falls through same distance. Which one of them reach first?

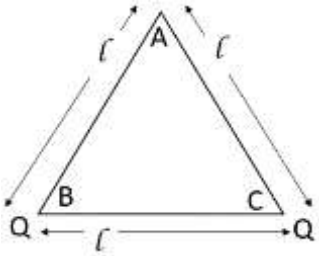
Q.5.



Find the net electric field due to the charge configuration at a point A on the square.

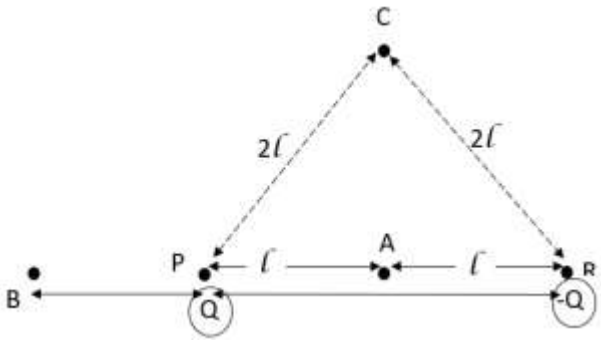
$[\frac{1}{4\pi\epsilon_0}\frac{Q}{l^2}(\sqrt{2}+\frac{1}{2})$ along $\overrightarrow{DB}]$

Q.6.



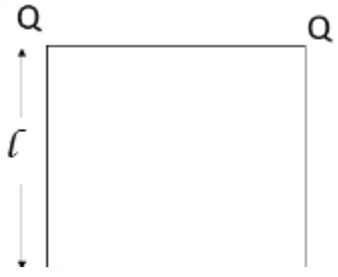
Find net electric field due to this charge configuration at a point A on this equilateral triangle. $[\sqrt{3}\frac{1}{4\pi\epsilon_0}\frac{Q}{l^2}$]

Q.7.



Find net electric field at a point A, B and C due to this charge configuration which are placed at P and R.

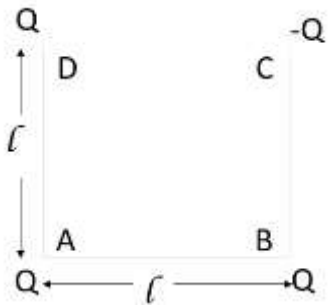
Q.8.



Find the net electric field at the centre of square of side 'ℓ' due to this charge configuration.

(zero)

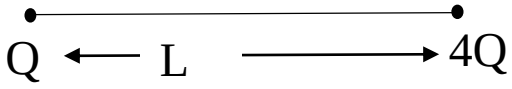
Q.9.



Find the net electric field at the centre of square side 'l' due to this charge of configuration.

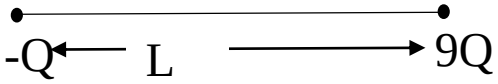
[$\frac{4}{4\pi\epsilon_0}\frac{Q}{l^2}$ along $\overrightarrow{AC}$]

Q.10.



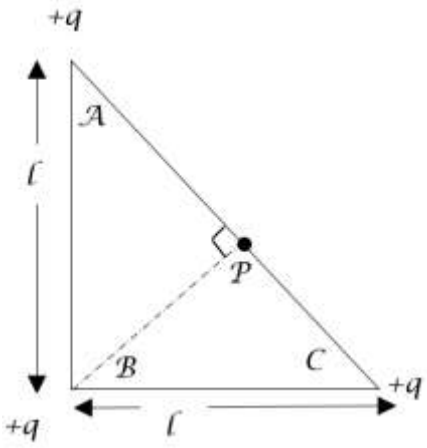
Find the point on the line joining two charges where the net electric field is zero.

Q.11.



Find the point on the line joining two charges where the net electric field is zero.

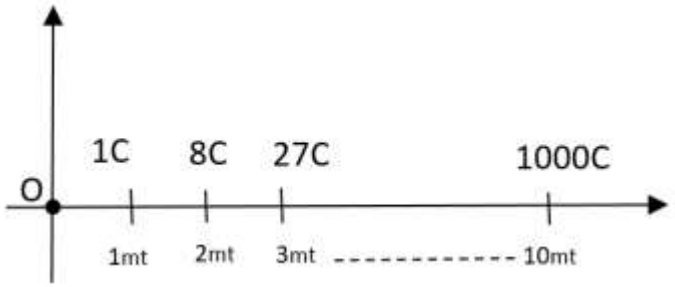
Q.12.



Find the magnitude and direction of net electric field at point P.

[E = $\frac{1}{4\pi\epsilon_0}\frac{2q}{l^2}$ along $\overrightarrow{BP}$]

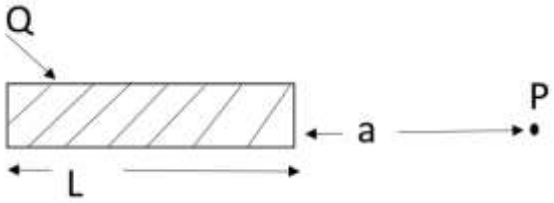
Q.13.



Find the net electric field at origin due to this charge configuration.

[$\frac{55}{4\pi\epsilon_0}$]

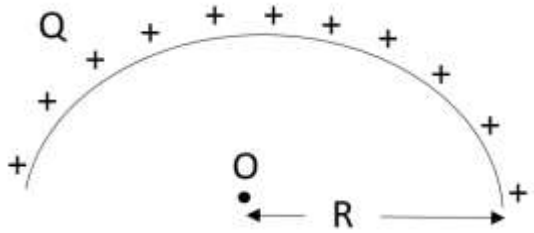
Q.14.



Charge 'Q' is uniformly distributed on the road of length 'L'. Find the net electric field due to this rod at point P which is 'a' distance away from one end.

[$\frac{Q}{4\pi\epsilon_0\, a(a+L)}$]

Q.15.



Charge 'Q' is uniformly distributed over semi-circular ring of radius R. Find the magnitude and direction of electric field intensity at the centre of ring.

Q.16. How much positive and negative charge is there in 250 gm water in a cup.

Q.17. A particle of mass 'm' and carrying charge –Q1 is moving around another charge +Q2 along a circular path of radius 'r'. Calculate the time period of revolution.

$$\mathbf{T} = \sqrt{\frac{16\pi^3\epsilon_o m r^3}{Q_1 Q_2}}$$

Q.18. A free pith ball A of 8gm carries a positive charge of 5×10^{-8} C. What must be the nature and magnitude of charge that should be given to second ball. B fixed 5 cm below it so that upper ball is stationary.

(4.36×10^{-7} C)

Q.19. Two particles, each having a mass of 5gm and charge 1×10^{-7} C, stay in limiting equilibrium on a horizontal table with a separation of 10cm between them. Find the coefficient of friction between table and particle.

($\mu = 0.18$)

Q.20. Two similarly equally charged identical metal spheres A and B repel each other with a force of 2×10^{-5} N. A third identical uncharged sphere C is touched to A, then placed at mid point between A and B. Calculate the net force on C.

2×10^{-5} N along BC

Q.21. Two identical charges Q each are kept at a distance ℓ from each other. A third charge q is placed on the line joining the above two charges such that all the three charges are in equilibrium. What is the magnitude, location and polarity of third charge?

Q.22. A charge Q is to be divided in two parts. What should be the values of two charges so that force between them is maximum?

[$\frac{Q}{2}$] each

Q.23. Two small spheres each having mass 'm' and charge 'q' are suspended from a point by insulating threads each 'ℓ' mt. If Q is the angle, each thread moves with vertical when equilibrium attain.
Show that q2 = (4 mg$\ell^2 \sin^2\theta \tan\theta$)T14$\in_0$

Q.24. Two identical metallic spheres A and B, each carrying a charge 'Q', repel each other with a force 'F'. A third metallic sphere C of same size but uncharged is successively made to touch the spheres And B, then removed away. What is the force of repulsion between A and B?

[3F/8]

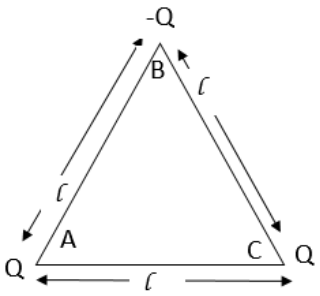
Q.25. Two point electric charges of values q and 2q are kept at a distance 'd' apart from each other in air. A third charge 'Q' is to be kept along the same line in such a way that net force acting on 'q' and '2q' is zero. Calculate the position of 'Q' in terms of q and d.

($\sqrt{2}$-1)d from q

Q.26. An infinite number of charges each equal to $4\mu C$ are placed along x axis at x = 1m, 2m, 4m and so on. Find the net force on charge of 1C placed at origin.

(4.8 x 10^4 N)

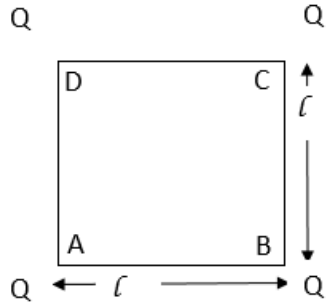
Q.27.



Find net force on charge at B.

($\sqrt{3}\,\frac{Q^2}{4\pi\epsilon_0 l^2}$)

Q.28.



Find net force on charge placed at 'C'.

[$(2\sqrt{2}+1)\,\frac{KQ^2}{2l^2}$)]

[K = $\frac{1}{4\pi\epsilon_0}$]

Q.29. Four charges +Q, +Q, -Q and –Q are placed at four corners A, B, C and D respectively of square with side 'l'. Calculate the net force on a charge 'q' placed at centre of square.

[$\frac{1}{4\pi\epsilon_0}\,\frac{4\sqrt{2}Qq}{Q^2}$ parallel to AD or BC]

Q.30. A particle of mass 'm' and charge 'q' is located midway between two fixed charged particles having each charge 'Q' at a distance 2L part. If the middle charge is slightly displaced by 'x' (x<<<<l) then calculate the time period of oscillations.

[$2\sqrt{\frac{m\pi\epsilon_0 l^3}{Qq}}$]

Q.31. A thin conducting ring of radius R has an electric charge +Q distributed uniformly along its length. What would be the increase in the tension of ring, if a point charge +q is placed at centre of ring?

CHEMISTRY

Q.1. Which of the following conditions favours the existence of a substance in the solid state?

(i) High temperature
(ii) Low temperature
(iii) High thermal energy
(iv) Weak cohesive forces

Q.2. Which of the following is not a characteristic of a crystalline solid?

(i) Definite and characteristic heat of fusion.
(ii) Isotropic nature.
(iii) A regular periodically repeated pattern of arrangement of constituent particles in the entire crystal.
(iv) A true solid

Q.3. Which of the following is an amorphous solid?

(i) Graphite (C)
(ii) Quartz glass (SiO_2)
(iii) Chrome alum
(iv) Silicon carbide (SiC)

Q.4. Which of the following is true about the value of refractive index of quartz glass?

(i) Same in all directions
(ii) Different in different directions
(iii) Cannot be measured
(iv) Always zero

Q.5. Which of the following statement is not true about amorphous solids?

(i) On heating they may become crystalline at certain temperature.
(ii) They may become crystalline on keeping for long time.
(iii) Amorphous solids can be moulded by heating.
(iv) They are anisotropic in nature.

Q.6. The sharp melting point of crystalline solids is due to _____.

(i) a regular arrangement of constituent particles observed over a short distance in the crystal lattice.
(ii) a regular arrangement of constituent particles observed over a long distance in the crystal lattice.
(iii) same arrangement of constituent particles in different directions.
(iv) different arrangement of constituent particles in different directions.

Q.7. Iodine molecules are held in the crystals lattice by _____.

(i) london forces
(ii) dipole-dipole interactions
(iii) covalent bonds
(iv) coulombic forces

Q.8. Which of the following is a network solid?

(i) SO_2 (Solid) (ii) I_2

(iii) Diamond (iv) H_2O (Ice)

Q.9. The lattice site in a pure crystal cannot be occupied by _____.

(i) molecule (ii) ion

(iii) electron (iv) atom

Q.10. Which of the following is not the characteristic of ionic solids?

(i) Very low value of electrical conductivity in the molten state.

(ii) Brittle nature.

(iii) Very strong forces of interactions.

(iv) Anisotropic nature.

Q.11. Graphite is a good conductor of electricity due to the presence of _____.

(i) lone pair of electrons (ii) free valence electrons

(iii) cations (iv) anions

Q.12. Assertion and Reason Type Questions

Note : In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

(i) Assertion and reason both are correct statements and reason is correct explanation for assertion.

(ii) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

(iii) Assertion is correct statement but reason is wrong statement.

(iv) Assertion is wrong statement but reason is correct statement.

1. **Assertion :** The total number of atoms present in a simple cubic unit cell is one.

   Reason : Simple cubic unit cell has atoms at its corners, each of which is shared between eight adjacent unit cells.

2. **Assertion :** Graphite is a good conductor of electricity however diamond belongs to the category of insulators.

   Reason : Graphite is soft in nature on the other hand diamond is very hard and brittle.

Q.13. Which of the following cannot be regarded as molecular solid?

(i) SiC (Silicon carbide) (ii) AlN

(iii) Diamond (iv) I_2

Q.14. Under which situations can an amorphous substance change to crystalline form?

Q.15. What is the number of atoms in a unit cell of a face-centred cubic crystal?

Q.16. Write a feature which will distinguish a metallic solid from an ionic solid.

Q.17. What type of interactions hold the molecules together in a polar molecular solid?

Q.18. 'Crystalline solids are anisotropic in nature.' What does this statement mean?

Q.19. How many atoms per unit cell (z) are present in bcc unit cell?

Q.20. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 1/3rd of tetrahedral voids?

Q.21. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 2/3rd of tetrahedral voids?

Q.22. Give an example each of a molecular solid and an ionic solid.

Q.23. A metallic element crystallises into a lattice having a ABC ABC … pattern and packing of spheres leaves out voids in the lattice. What type of structure is formed by this arrangement?

Q.24. Define the following terms in relation to crystalline solids:
(i) Unit cell (ii) Coordination number
Give one example in each case.

Q.25. Define the term voids.

Q.26. What type of stochiometric defect is shown by (i) ZnS and (ii) CsCI?

Q.27. If the formula of a compound is A2B, which sites would be occupied by A ions?

Q.28. What is the coordination number for (a) an octahedral void (b) a tetrahedral void.

Q.29. How many octahedral voids are there in 1 mole of a compound having cubic closed packed structure?

Q.30. What does the term „Coordination number" indicate

Q.31. Arrange simple cubic, bcc and fcc lattice in decreasing order of the fraction of the occupied space.

Q.32. What are Bravais lattices?

Q.33. Why are amorphous solids isotropic in nature?
Q.34. Why glass is regarded as an amorphous solid?
Q.35. Define the term 'crystal lattice."
Q.36. Name the crystal system for which all four types of unit cells are possible.
Q.37. What is the total number of atoms per unit cell in a foc crystal structure?
Q.38. What difference in behaviour between the glass and sodium chloride would you expect to observe, if you break off a piece of either cube?

BIOLOGY

General instructions

- Do this holiday homework in the fair notebook.
- Make neat, labelled and colourful diagrams wherever necessary.
- Try to attempt answers with the maximum help of diagrams or flowcharts instead of text theory in a creative way.

1. Revise and learn question answers from chapter 2.
2. Complete chapter 2 assignment in the fair notebook.
3. Make 20 MCQ from your NCERT textbook or very short answer type questions in the main notebook from the above chapter.
4. Prepare an assignment on COVID-19 - A pandemic under the following headings.
   - What is the virus called which causes the coronavirus disease?
   - How did the coronavirus disease start?
   - What are some of the common symptoms of the coronavirus disease?
   - What can I do to prevent the spread of the coronavirus disease?
   - How should you behave in school during the COVID-19 pandemic?
   - What can I do to prevent the coronavirus disease at home?
   - Discuss the long-term effects of COVID-19 on society (e.g. human interactions, education, career choices, tourism…)

Note: Prepare this assignment which should include the followings heads:

1. Preface	2. Index	3. Acknowledgement
4. Detailed Report of the topic	5. Bibliography	6. Teacher's Evaluation

5. (i) Why is zygote dominant for some time in fertilized ovules?
(ii) In fruits, what is formed from following parts :-
(a) Ovary wall (b) Outer integument (c) Inner integument
(d) zygote (e) primary endosperm (f) Ovary
(g) Nucellus

6. Trace the events that would take place in flowers from the time of Pollen grain of species fall on stigma up To completion of fertilization.

7. Explain the development of embryo in a dicotyledonous plant with neatly labeled diagrams.

8. Explain the formation of an embryo sac with diagrams.

9. Draw the embryo sac of a flowering plants and label :
(a) (i) Central Cell (ii) Chalazal end (iii) Synergids
(b) Name the cell that develops into embryo sac and explain how this cell leads to formation of embryo sac.
(c) Mention the role played by various cells of embryo sac.
(d) Give the role of filiform apparatus.

10. Differentiate between microsporogenesis and megasporogenesis. What type of cell division occurs during these events. Name the structure formed at the end of these two events.

11. Explain the structure of an anatropous ovule with a neat labeled diagram?

12. Give any three advantages of sexual incompatibility.

13. List any three differences between wind pollinated flowers & insects – pollinated flowers.

14. “Incompatibility is the natural barrier in fusion of gamete”. Justify this statement.

15. Make a List for one week for the food you eat daily and categorise them as food components like carbohydrates, proteins etc. Try to find which

vitamins and minerals you get from these foods or its significance in our body.

- Students have to be creative and design a poster on this year's theme: Innovating for the future.

OR

- In any topic on the current pandemic situations.

MATHEMATICS

Q1 to Q15 – Differentiate using product rule, quotient rule and chain rule.

1. $f(x) = \sin^2 x.\tan x$
2. $y = \sqrt{x\sec x}$
3. $g(x) = \sqrt{x^3} + 2\sqrt{x^2}$
4. $y = \frac{x+\sin x}{x\cos x}$
5. $y = \sin x.\sin 2x.\sin 3x$
6. $y = \frac{a\sec x + b\cos\sec x}{\sqrt{x}}$
7. $y = \sqrt{\sin(x^2)}$
8. $f(x) = \sqrt{\tan\sqrt{x}}$
9. $y = \frac{x^{100}}{100} + \frac{x^{99}}{99} + \frac{x^{98}}{98} + \ldots\ldots\ldots + \frac{x^2}{2} + x$
10. $y = \sqrt{\frac{x^2\sin x+5}{3\cos x}}$
11. $y = \tan\sqrt{x}\,.\,\cot\sqrt{x}$
12. $f(x) = \sin^m x\,.\,\cos^n x$
13. $f(x) = \frac{x^5\sin x + x.\sin x^5}{x^2\cos x^3}$
14. $f(x) = \frac{1}{x^5\tan^4 x}$
15. $f(x) = \sqrt{\cos\sqrt{\sin\sqrt{x}}}$

Q16 to Q19 – A^2-4A + 5I

16. $A = \begin{bmatrix} 1 & 2 & 3 \\ -2 & 0 & 2 \\ 1 & 4 & 2 \end{bmatrix}$
17. $A = \begin{bmatrix} 5 & 4 \\ -3 & 1 \end{bmatrix}$
18. $\begin{bmatrix} 7 & 4 \\ 0 & 3 \end{bmatrix}$
19. $A = \begin{bmatrix} 3 & 0 & 2 \\ 0 & 4 & 1 \\ 5 & 0 & -3 \end{bmatrix}$

Q20 to Q23 – Find matrix $A = [a_{ij}]_{2x3}$

20. $a_{ij} = \frac{2i+j}{2}$

21. $a_{ij} = \frac{i^2}{2j}$

22. $a_{ij} = \frac{2i+3j}{5}$

23. $a_{ij} = \sqrt{i \times j}$

Q24 to Q26 – Express following matrix as the sum of symmetric and skew symmetric matrices.

24. $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$

25. $A = \begin{bmatrix} 2 & 3 & 4 \\ -2 & 0 & -3 \\ -4 & 1 & -1 \end{bmatrix}$

26. $A = \begin{bmatrix} 5 & 7 & 9 \\ 1 & 3 & 5 \\ 3 & 5 & 7 \end{bmatrix}$

Q27 to Q30 – Evaluate following determinant along R_1 and then along C_2 and check if both expansion give same result.

27. $|A| = \begin{vmatrix} 2 & -3 & 4 \\ 1 & 2 & 1 \\ 3 & -4 & -2 \end{vmatrix}$

28. $|A| = \begin{vmatrix} 3 & 2 & -7 \\ 0 & -5 & 9 \\ 11 & 8 & 6 \end{vmatrix}$

29. $|A| = \begin{vmatrix} 11 & 13 & 18 \\ 1 & 2 & 3 \\ 2 & 0 & -1 \end{vmatrix}$

30. $|A| = \begin{vmatrix} 7 & 5 & 6 \\ 5 & 7 & 4 \\ 6 & 4 & 7 \end{vmatrix}$

PHYSICAL EDUCATION

- Learn Chapter no 1 physical education notes.
- Write the following practicals in your file .

  1. Any one game of your choice out of the list above.

  (Basketball, Football,Handball, Kho - Kho, Cricket , Kabaddi and Volleyball).

  - Introduction / History of game.
  - Labelled diagram of field.
  - Rules of Games.
  - Skills /technique of games
  - Equipment of Games.

- Trophies and Awards of games.
    a. Arjun Award
    b. Dronacharya Award
    c. Rajiv Gandhi Khel Ratan Award
- Sports Injuries.
- 5 major injuries of the game

2. Write the benefits of any two asanas. Procedure for asana, benefits and contraindication of asana .
3. Write the Procedures for administering senior citizen fitness tests. (Rikli & Jones ch no 6).

COMPUTER SCIENCE

Q1. Write a program that takes a number and checks whether the given number is even or odd.

Q2. Write a program to accept three integers and print the largest of the three.

Q3. Write a program to print table of a given number by user.

Q4. Write a program to calculate the factorial of the given number.

Q5. Write a program to input a number and test if it is a prime number or not.

Q6. Write a programs to print the following pattern :

a)	b)	c)
A	1	4 3 2 1
A B	1 2	3 2 1
A B C	1 2 3	2 1
A B C D	1 2 3 4	1
A B C D E		

Q7. Write a programs to find the sum of the following series :

a) $1/x + 1/x^2 + 1/x^3 + \ldots\ldots\ldots\ldots 1/x^n$
b) $1 + 1/2! + 1/3! + \ldots\ldots\ldots\ldots\ldots\ldots 1/n!$

c) 1 – 2 + 3 – 4 + 5 - ……. n

Q8. Write a program to input a number and check the given number is Armstrong number or not. (Only three digits of numbers)

Q9. Write a program to print a Fibonacci sequence of the n numbers.

Q10. Write a program to read a string and display it in reverse order.

Q11. Write a program to input a string and check if it is a palindrome string or not.

Q12. Write a program that reads a line and a character. It should display the number of occurrences of the given character in the line.

Q13. Write a program to input a string and print each individual word of it along with its length.

Q14. Write a program to input a string end converts all upper case letter to lower case later and lower case letter to upper case letter.

Q15. Write a program to display the maximum and minimum value from the list.

Q16. Write a program to input a number and a list and search the element from given list.

Q17. Define with suitable example:

a) Tokens
b) Data types
c) Operators
d) List
e) Dictionary

Q18. Difference between with example:

a) break and continue
b) while loop and for loop
c) Implicit type conversion and explicit type conversion
d) Global variable and local variable
e) Actual parameters and formal parameters

Q19. Write a program to accept a string from the user and display the following:
Number of words in the string

Number of uppercase characters, lower case characters, digits and special characters
percentage of character that are alpha numeric
example
input:
Python 3.7 is a Object Oriented Programming Language used in 2019
Output:
Number of Words: 11
Number of uppercase Characters: 5
Number of lowercase characters: 43
Number of digits: 6
Number of special characters: 11
percentage of character that are alpha numeric: 83%

Q20. Create a dictionary whose keys are month name and values is the number of days in the corresponding months:

a) Accept month name and number of days from the user.
b) Print key in alphabetic order.
c) Print months with 31 days.
d) Accept number of days from the user and display all the months having those many days

Q21. What will the output of the following code fragment?

```
fruit={}
Fruits=[“Apple”,”Banana”,”Grapes”,”Apple”,”Apple”,”Banana”,”apple”]
for index in Fruits:
   if index in fruit:
      fruit[index]+=1
   else:
     fruit[index]=1
print(fruit)
print(“Len of fruit”,len(fruit))
```

Q22. What will be the output of the following code and why?

```
team1 =["anjali", "anjali singh"]
team2 =["anjali singh", "Anjali"]
for player in team1:
   if player in team2:
      print("%s plays for team1 and team2." %(player))
```

STOP CORONAVIRUS SPREAD

PREVENTION FROM COVID-19

WEAR MASK

WASH HANDS

USE HAND SANITIZER

MAINTAIN SOCIAL DISTANCE