KALKA PUBLIC SCHOOL
SUMMER HOLIDAY HOMEWORK - 2020-21
CLASS - XI (SCIENCE)

ENGLISH:

Q1 COVID19 PROJECT TOPIC-– **Tip of the iceberg – Is our destruction of Nature responsible for COVID19?**

Instructions
a) Prepare digital PROJECT – videos, interviews, clippings – minimum 15 slides.
b) Be original and creative.
c) Preserve the hardcopy for submission later.
d) Mention your Name, Class, Section, School, Subject, and Topic

 Q **2 –ART INTEGRATED PROJECT-**

Film Making – Write a script for a film, performing in and shooting your own film. (Family members can be the cast of your film)

Q3-Design a creative POSTER on SELF RELIANT INDIA or VOCAL FOR LOCAL

"Life isn't about waiting for the storm to pass. It's about learning how to dance in the rain."

PHYSICS:

Question 1
The air bubble formed by explosion inside water perform oscillations with time period T which depends on pressure (p), density (ρ) and on energy due to explosion (E). Establish relation between T, p, E and ρ.

Question 2
The velocity v of a particle depends upon the time 't' according to the equation

$$v = \sqrt{ab} + bt + \frac{c}{d+t}$$

Determine the units of a, b, c and d. What physical quantities they represent. All have SI units.

Question 3
Mass of the Sun is 2.0×10^30 Kg and radius of sun is 7.0×10^8 m. Express the density of sun in significant figures.

Question 4
A physical quantity X is connected from X= AB^2/C. Calculate the percentage error in X, when % error in A, B, C are 4, 2, and 3 respectively.

Question 5
Percentage error in the measurement of height and radius of cylinder are x and y respectively. Find the percentage error in the measurement of volume. Which of the two measurements height or radius needs more attention?

Question 6
A physical quantity X is related to four measurable quantities a, b, c and d as follows:
$X = a^2 b^3 c^{5/2} d^{-2}$.
The percentage error in the measurement of a, b, c and d are 1%, 2%, 3% and 4%, respectively. What is the percentage error in quantity X ? If the value of X calculated on the basis of the above relation is 2.763, to what value should you round off the result.

Question 7
An artificial satellite is revolving around a planet of mass M and radius R, in a cir cular orbit of radius r. From Kepler's Third law about the period of a satellite around a common central body, square of the period of revolution T is proportional to the cube of the radius of the orbit r. Show using dimensional analysis, that

$$T = \frac{k}{R}\sqrt{\frac{r^3}{g}},$$

where k is a dimensionless constant and g is acceleration due to gravity.

Question 8
If velocity of light c, Planck's constant h and gravitational constant G are taken as fundamental quantities then express mass, length and time in terms of dimensions of these quantities.

Question 9
In the expression $P = E\, l^2 m^{-5} G^{-2}$, E, m, l and G denote energy, mass, angular momentum and gravitational constant, respectively. Show that P is a dimensionless quantity.
Question 10
Two specific heat capacities of a gas are measured as Cp =(12.28±0.2) units and CV=(3.97±0.3) units. Find the value of gas constant R.(cp-cv=R)

Question 11
Define error. What are different sources of errors?

Question 12
How can we minimize errors?

Question 13
What are the different ways of expressing an error?

Question 14
What is Absolute Error? Define the term accuracy.

Question 15
What do you mean by precision? According to you are instrument of high precision accurate?

Question 16
What is relative error or percentage error?

Question 17 Show that the expression v=u+at is dimensionally correct, where v and u represent velocities and a is acceleration and t represents time.

Question 18 The period 'T' of a simple pendulum is measured in time units and is described by T=2π√l/g Where l is the length of the pendulum and 'g' is the free fall acceleration in units of length divided by square of time. Show that this equation is dimensionally correct.

Question 19 Estimate the average mass density of a sodium atom assuming its size to be about 2.5 Å. (Use the known values of Avogadro's number and the atomic mass of sodium). Compare it with the density of sodium in its crystalline phase: 970 kg m^-3. Are the two densities of the same order of magnitude? If so, why?

20. Project work :-
    Make a working or non working model on any topic related to physics which anyhow helpful against covid-19 pandemic. Which makes the thing technical and easier . Also prepare the project file on the same model
        Guidelines for the Project:-
        ● Project Report must have a Title page, Acknowledgement page, Index page and Bibliography page.
        ● Project Report should be prepared in any Word processor (MS Word) software or handwritten.
        ● Project Report must have a Header and Footer. Name of the Project topic should reflect in the Header and Page number should be in the footer.
        ● Project Report must have 12 – 15 pages.
21. Complete the assignment and revised which float on whatsapp group

CHEMISTRY:

1. How many number of atoms are present in 52 u of He?
2. How many significant figure are present in (i) 0.0025 (ii) 600.0?
3. Vitamin C is known to contain 1.29×10^{24} hydrogen atoms. Calculate the number of moles of hydrogen atoms.
4. Calculate the percentage of nitrogen in NH_3. (Atomic mass of N = 14, H = 1 amu)
5. Calculate molecular mass of glucose ($C_6H_{12}O_6$) molecule.
6. Round off the following figures upto three significant figures.
   (i)   34.216   (ii) 10.4107   (iii) 0.04597   (iv) 2808
7. Calculate the number of He atom in (i) 52 u, (ii) 52 g, (iii) 52 moles of He.
   Atomic wt. of He is 4 u.

8. How many electrons are present in 16 g of CH_4?

9. Boron occurs in nature in the form of two isotopes, $^{11}_5B$ and $^{10}_5B$, in ratio of 81% and 19% respectivly. Calculate its average atomic mass.
10. If 2 litres of N_2 is mixed with 2 litres of H_2 at a constant temperature and pressure, then what will be the volum of NH_3 formed?
11. How many atoms are present in 1 ml of NH_3 at STP?
12. Which of these weights most?
    (i)   32 g of oxygen,   (ii) 2 g atom of hydrogen,
    (iii) 0.5 mole of Fe,   (iv) 3.01×10^{23} atom of carbon

13. Calculate the number of moles of NaOH in 27 cm^3 of 0.15 M NaOH solution.
14. If 66.023×10^{23} molecules of N_2 react completely with H_2 according to the equation:
$$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g),$$

    then calculate the number of molecules of NH_3 formed.

15. Calculate the mass of ferric oxide that will be obtained by complete oxidation of 2 g of Fe.
    [Atomic weights of Fe = 56 u, O = 16 U]

PROJECT WORK ON COVID

SUSTAINABLE APPLICATION OF CHEMISTRY IN FIGHT AGAINST CORONAVIRUS OUTBRAKE.

MATHEMATICS:

MULTIPLE CHOICE QUESTIONS:

1.   If the sum of n terms of an A.P. is given by $S_n = 3n + 2n^2$, then the common

difference of the A.P. is

(A) 3   (B) 2   (C) 6   (D)4 .

2.   If 9 times the 9th term of an A.P. is equal to 13 times the 13th terms, then 22th term of the A.P. is

(A) 0   (B) 22   ()C) 220   (D) 198.

3.   If t_n denotes the nth term of the series 2+3+6+11+18+…. Then t_{50} is

(A) $49^2 - 1$ (B) 49^2 (C)$50^2+ 1$ (D) $49^2+ 2$

4.   The minimum value of $4^x + 4^{1-x}$, x ∈ R, is

(A) 2   (B) 4   (C) 1   (D) 0

5.   The third term of G.P. is 4. The product of its first 5 terms is

(A) 4^3 (B) 4^4 (C) 4^5 (D) None of these

6.   The lengths of three unequal edges of a rectangular solid block are in G.P. The volume of the block is 216 cm^3 and the total surface area is 252 cm^3. The length of the longest edge is

(A) 12 cm   (B) 6 cm   (C) 18cm   (D) 3 cm

7.   If x, 2y, 3z are in A.P, where the distinct numbers x, y, z are in G.P then the common ratio of the G.P is

(A) (a) 3   (B) 1/3   (C) 2   (D) ½

8.   The two geometric mean between the numbers 1 and 64 are

(a) 1 and 64   (B) 4 and 16   (C) 2 and 64   (D) 8 and 16

9.   The nth term of a G.P. is 128 and the sum of its n terms is 225. If its common ratio is 2 , then its first   term is

(A) 1   (B) 3   (C) 8   (D) none of these.

10.   Sum of n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \cdots$ … … … … … … … ..

(A) $\frac{n(n+1)}{2}$ (B) 2n(n+1)   (C) $\frac{n(n+1)}{\sqrt{2}}$ (D) 1

VERY SHORT QUESTIONS

11.   Find the sum of the series to n terms :- 1x2 + 2x3 + 3x4 + 4x5 + 5x6 +……….

12.   Find the minimum value of the expression $3^x + 3^{1-x}$, x ∈ R

13. The 6th term and the 17 th term of an A.P. are 19 and 41 respectively , find the 40th term.

14. Write the first 4 terms of a sequence :- $a_1 = 1$, $a_n = a_{n-1} +2$, $n>1$

15. The angles of a quadrilateral are in A.P. , whose common difference is 10^0 find the angles

16. Find the sum to n terms of the sequence given by $a_n = 5- 6n$, $n\epsilon N$. Find the sum of odd integer from 1 to 2001.

17. Insert five numbers between 8 and 26 such that the resulting sequence is an A.P.

18. If m^{th} term of an A.P. is n and n^{th} term is m, then write the pth term.

19. The sum of three numbers in A.P. is -3 and their product is 8, find the numbers.

20. If the 4th and 9th terms of a G.P. be 54 and 13122 respectively, find the G.P.

SHORT QUESTIONS

21. Find the sum of first 24 terms of the A.P. a_1 , a_2, a_3, a_4, a_5,……. If it is known that $a_1 + a_3 + a_{10} + a_{15} + a_{24} = 225$

22. Find the sum to n terms of the series 5 + 7 + 13 + 31 + 85 + …………..

23. If the 4th, 10 th and 16th terms of a G.P. are x, y, x respectively . Prove that x, y, z are in G.P.

24. If a, b, c are in A.P. and x, y, z are G.P. ,then show that $x^{b-c} . y^{c-a} . z^{a-b} = 1$

25. Prove that the sum of n terms of the series 11 + 103 + 1005 + …. is
$\frac{10}{9} (10^n - 1) + n^2$.

26. Find the sum of 0.7 +0.77 +0.777 + 0.7777 + ……… to n terms.

27. The sum of three numbers in G.P. is 21 and the sum of their squares is 189. Find the numbers.

28. Show that $(x^2 + xy + y^2)$, $(z^2 + xz + x^2)$ and $(y^2 + yz+ z^2)$ are consecutive terms of an A.P.,   if x, y, z are in A.P.

29. In a cricket tournament 16 school teams participated. A sum of Rs 8000 is to be awarded among themselves as prize money. If the last placed team is awarded Rs275 in prize money and the award increases by same amount for successive finishing places, how much   amount will the first team receive?

30. The product of first three terms of a G.P. is 1000. If 6 is added to its second term and 7

added to its third term, the terms become in A.P. Find the G.P.

31. A person has 2 parents, 4 grandparents, 8 great grand parents, and so on, Find the number of his ancestors during the ten generations preceding his own.

32. If a and b are the roots of $x^2 - 3x + p = 0$ and c, d are the roots $x^2 - 12x + q$, where a, b, c, d form a G.P. prove that $(q + p) : (q - p) = 17 : 15$.

32. If a,b,c are in G.P.,then prove that $\frac{1}{a^2 - b^2} = \frac{1}{b^2 - c^2} - \frac{1}{b^2}$

33. solve: $1 + 6 + 11 + 16 + \dots + x = 148$

34. The ratio of the sum of n terms of two A.P.' is $(7n - 1) : (3n + 11)$, findthe ratio of their 10th terms.

35. How many numbers are there between 200 and 500, which leaves remainder 7,when divided by 9

36. The number of terms of an A.P. is even; the sum of odd terms is 24,of the even terms is

30, and the last term exceeds the first by $10\frac{1}{2}$, find the number of terms and the series.

37. Find the fourth term from the end of the G.P $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots \dots \frac{1}{4374}$.

38. Find three numbers in G.p whose product is 729 and the sum of their product in pair is 819.

39. Evaluate the value of $\sum_{k=1}^{n}(2^k + 3^{k-1})$

40. write the sum of 20 terms of the series : $1 + \frac{1}{2}(1 + 2) + \frac{1}{3}(1 + 2 + 3) + \dots \dots$

LONG QUESTIONS

41. If $\theta_1, \theta_2, \theta_3, \theta_4 \dots \dots \theta_n$ are in A.P , whose common difference is d, show that sec

$\theta_1.\sec\theta_2 + \sec\theta_2.\sec\theta_3 + \dots \dots \sec\theta_{n-1}. \sec\theta_n = \frac{\tan \theta n - \tan \theta 1}{sind}$

42. The sum of n terms of two arithmetic progressions are in the ratio $(3n + 8) : (7n + 15)$. Find the ratio of their 12 th terms

43. If the pth and qth terms of a G.P. are q and p respectively, show that (p+q) th term is

$\left(\frac{q^p}{p^q}\right)^{1/p-q}$

44. Find the modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$

45. Find the square roots of the following :

(i) 7 – 24i   (ii) 5 + 12i

46. Write following complex number in the polar form

(i) $\frac{1+2i}{1-3i}$ (ii)) $\frac{i-1}{\cos\left(\frac{\pi}{3}\right)+i\sin\left(\frac{\pi}{3}\right)}$

47. If the sum of three numbers in G.P. is 56. If we subtract 1, 7, 21 from these numbers in that order, we obtain an arithmetic progression. Find the numbers.

48. If a, b,c are in G.P. and x,y are the arithmetic means of a,b and b,c respectively, then prove that $\frac{a}{x}+\frac{c}{y}=2$ and $\frac{1}{x}+\frac{1}{y}=\frac{2}{b}$

49. Find the value of n so that $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ may be the geometric mean between a and b.

50. If S_1, S_2 , S_3 are the sum of first n natural numbers, their squares ,their cubes respectively, show that $9S^2_2 = S_3(1 + 8S_1)$.

Art integrated project:

Wood carving is an ancient art form of Sikkim. Wood carving is done on a range of product like carved table, square table, wooden masks, decorative screen etc. The main raw material used in this craft is wood, which cut into a desire geometrical shape. Then assemble together and are ready for coat of two of either colorful paint or polish

Note- Students will make similar design on sheet and applying different colors into it.

The dimension of the sheet is 12cm by12cm

Give the answer of the following questions

1. Identify the geometrical shapes used in the figure.

2. How many concentric circles are there in the figure?

3.Find the equation of the circle whose centre is lies at the origin.

4. Find the area of the remaining portion of the design.

COVID-19 PROJECT

Mathematically analyze the impact of COVID-19 on the different sectors of Indian Economy.

BIOLOGY:

1.students are Asked to complete a detailed research based project on various aspects of covid 19 and coronavirus
2.you are also asked to make a herbarium of the local plants of your locality. At least 25 specimens to be included. .

COMPUTER SCIENCE:

Q1.Project Work
Do the case study of the project on a given topic: **A Journey 'FROM BASIC TO PYTHON'**
It should include the following:
- Updation taking place in:
- Hardware
- Software
- Operating System
- People Behind for the updations
- Advantages and Disadvantages

Guidelines for the Project:-
- Project Report must have a Title page, Acknowledgement page, Index page and Bibliography page.
- Project Report should be prepared in any Word processor (MS Word) software.
- Project Report must have a Header and Footer. Name of the Project topic should reflect in Header and Page number should be in the footer.
- Project Report must have 12 – 15 pages.

Q2. Develop a **research project or an innovation project** designed for use of Information Technology to deal with COVID19 CORONA VIRUS. **(Note: Only for those who have been assigned the COVID project for Comp. Sc.)**

TOPIC: Use of urban technology to monitor, track Covid19 in rural areas.

Guidelines for a research project or an innovation project:
1) The duration of the video is 3 to 4 minutes.

2) **Technology/Software/App use:** Animated videos using any animation

software/app

3) All entries should be submitted on an individual basis.

4) No shared work is allowed.

Q3: Do the following questions in your notebook

COMPUTER SYSTEM

1. "Hardware is of no use without software and software cannot be used hardware."Explain.

2. How can software be classified? Name at least one software in each of the categories.

3. What is an operating system? Write the names of any two popular operating systems.

4. Specify the measuring units of memory.

5. What do you understand by RAM and ROM?

6. What is the major difference between CD and DVD?

7. Explain the statement," Functioning of a computer is similar to the way the human brain functions."

8. How does an output unit work? Give examples controller of a computer?

9. Compare volatile memory and non-volatile memory.

10. Define primary storage devices. List their types.

CYBER SAFETY

1. How can we safely browse the internet?

2. What do you mean by the confidentiality of information?

3. What do you understand by cybercrime?

4. Robin searched the net to purchase a write watch and a football. Now, whenever he goes online, he gets an advertisement for sports item and wristwatches.
   A) Why does this happen?
   B) How could Robin avoid this?
   C) How can Robin get rid of this?

5. How will you identify from a URL whether the website you are visiting is safe or not?

SOCIOLOGY:

Q1.My culture and socialization :a self. reflexive activity

● major characteristics of my family culture

● Culture components that affects me:

non material culture of my family - folkways, festival celebrations, values, family rituals, laws etc.

Material culture - mode of transportation, technological gadgets, buildings,

Economic sources etc.

● **Socialization** - changes in my behavioural pattern and attitude

● **Cultural lag-** different aspects in which I'm unable to match with some of the above

family culture .

Note -

Present the biography in a story book form approx. 10 A4 size pages maximum.

The story book must include required illustrations and pictures.

Q2. Do write about **any one** of the following Indian sociologist biosketch and their contribution in

the field of sociology :

A. M N Srinivas

B. G. S Ghurye

C. S K varma

D. M.S.A Rao

E. A K Desai

Note- the Question will be done in the sociology notebook (part-B)

Q3 SOCIOLOGY PROJECT WORK

● SELECT **ANY ONE** PROJECT FOR FINAL INTERNAL PRACTICAL EVALUATION **.**

● EACH ONE OF YOU WILL SELECT ONE TOPIC AND IT SHOULD NOT BE REPEATED BY

OTHER SO **SELECT TOPIC AND WITH YOUR NAME SEND IT ON MY PERSONAL WINDOW.**

POINTS TO REMEMBER:-

YOUR PROJECT SHOULD HAVE THE FOLLOWING CONTENTS:

1.COVER PAGE

2.CERTIFICATE

3.ACKNOWLEDGEMENT

4.WELL FRAMED RESEARCH QUESTION

5.STATEMENT OF PURPOSE OR RATIONALE (WELL WRITTEN)

6.RESEARCH SITE

7. METHODOLOGY (SURVEY ,INTERVIEW ITS ADVANTAGES AND DISADVANTAGES) EXPECTED OUTCOMES

8.LIMITATIONS

9. QUESTIONNAIRE (20 QUESTIONS For SURVEY AND 15 QUESTIONS FOR INTERVIEW SCHEDULE)

10. 2 CASE STUDIES

11. DATA ANALYSIS OF (50 SAMPLES OF SURVEY TO BE FILLED BY PEOPLE IN YOUR LOCATIY)

12 .NEWSPAPER OR MAGAZINE CLIPPINGS

13. CONCLUSION

14. BIBLIOGRAPHY

Project topics-

- Caste and politics
- Gender issues
- Life of transgenders
- Inter caste marriage and society
- Changing food habits
- Changing educational system
- Health epidemic and poverty
- Health epidemic and unemployment
- Advertisement : Bane or boon
- Teenage depression
- Role of social media
- Impact of globalization on youth

- Right to privacy v/s Right to freedom of expression

- Cyber crime

- Movements and mob lynching

- Working women and non working women: comparative study

- Film industry and glamour

- The relationship between poverty and education

- The sociology of consumerism

- Life of disabled people in India

- Religion,Sprituality and superstition

- Domestic violence

- Class as a structured inequality

- Popular youth culture in 2020's

- Peer pressure on teenagers

- Career in sports

- Metro as a lifeline of transport in cities

- Literacy and education policies in Delhi

- Joint family system in urban areas

- Human interventions in Environment

NOTE:- THE ENTIRE PROJECT SHOULD BE HAND WRITTEN TO BE DONE IN A SEPARATE FILE.