HOLIDAY HOMEWORK

CLASS :- XII (SCIENCE)

Let's Pen The Pandemic : Covid - 19

"The capacity to learn is a gift; the ability to learn is a skill; the willingness to learn is a choice."

GENERAL INSTRUCTIONS TO BE FOLLOWED WHILE DOING HOLIDAY HOMEWORK:

- It is compulsory to attempt each subject.

- Summer vacations are going to be started from June 10 to 25, 2020.

- Submit your assignments to Subject teachers as the school reopens.

- Holiday homework should be done as per the given instructions

- Label properly the name, class roll no and subject.

- The work will be assessed for the neat handwriting, presentation, creativity and submission of the work on time.
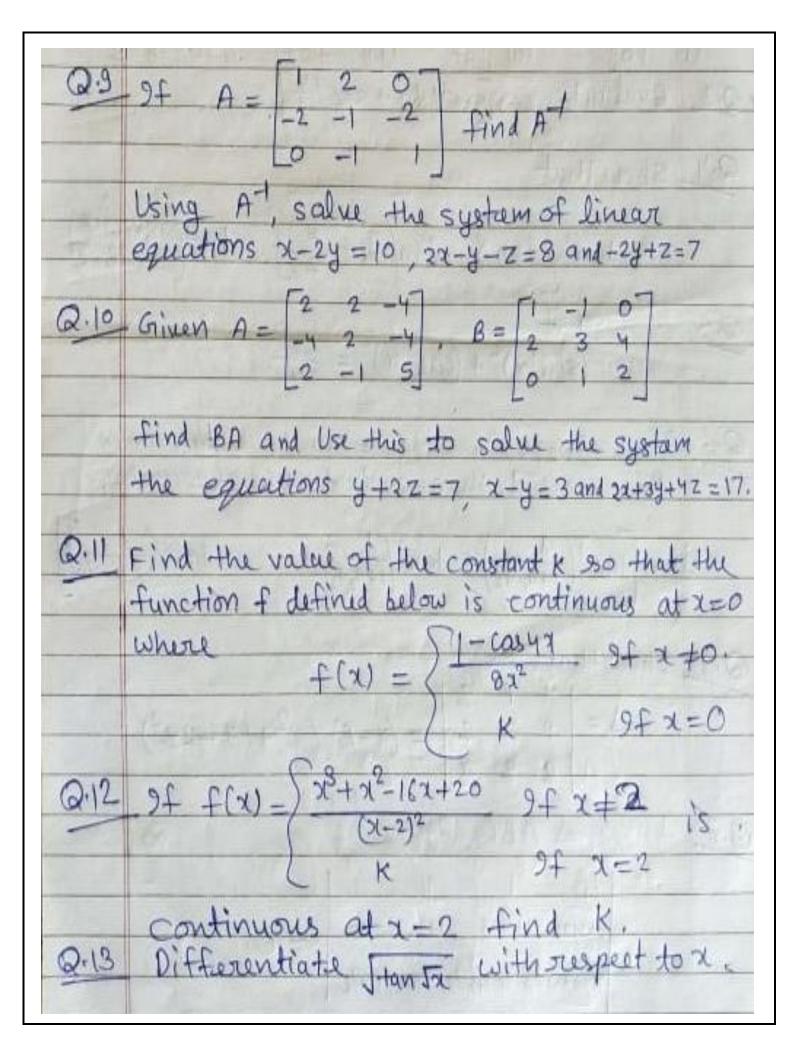
ENGLISH

Q1 : Collect invitation cards written in English. Now cut and paste them in your notebooks.

Q2 : Collect 1/2 'Advertisement' from newspaper of each heading and paste them in your notebooks.

a)   Situation vacant

b)   Situation wanted

c)   For sale

d)   For purchase

e)   Lost and found

f)   Matrimonial

g)   To let

h)   For rent

i)   Educational and vocational

j)   Travels and tours

Q3 : Prepare flowcharts of all the taught chapters . (Flowchart should cover whole summary of the chapter) .

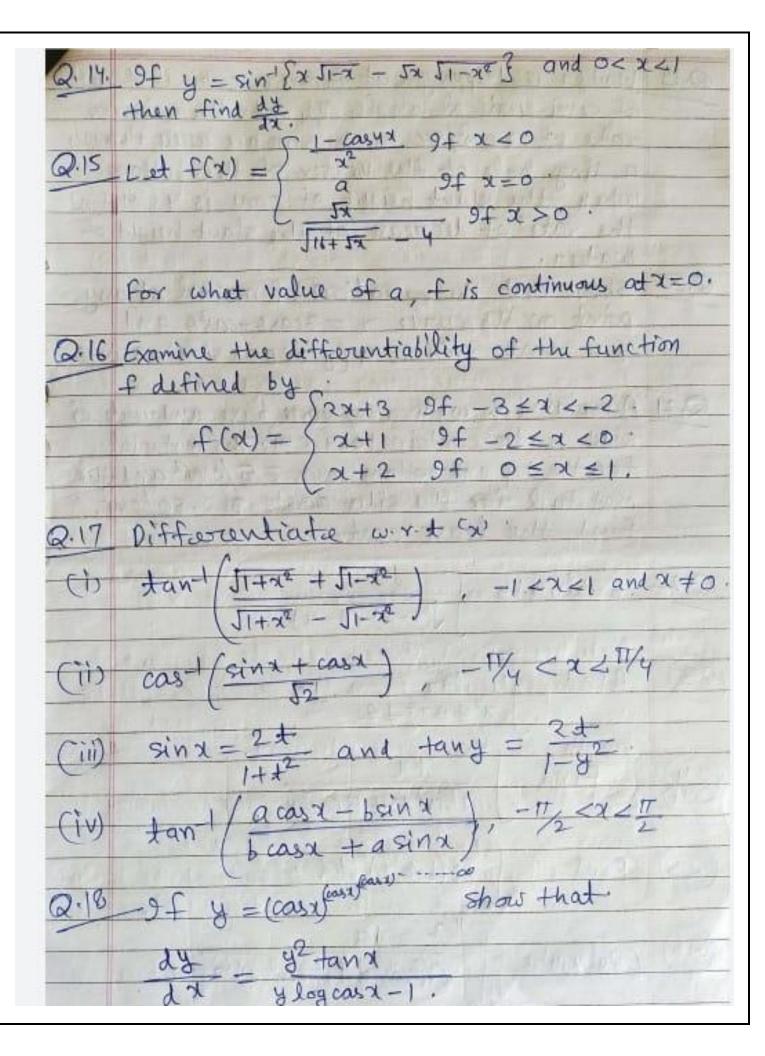Q4 : listen your favourite English song and write the lyrics of the same in your notebook.

हिंदी

कोरोना (कोविड -19) पर एक परियोजना (प्रोजेक्ट) फाइल तैयार करते हुए एक स्वरचित कविता भी लिखिए।

MATHEMATICS

① Let $A = \{1, 2, 3, \ldots 9\}$ and R be the relation in $A \times A$ defined by $(a, b) R (c, d)$ if $a + d = b + c$ for (a, b), (c, d) in $A \times A$. Prove that R is an equivalence relation and also obtain the equivalent class $[(2, 5)]$.

Q.2 Functions $f, g : R \to R$ are defined, respectively by
$f(x) = x^2 + 3x + 1$, $g(x) = 2x - 3$ find
(i) fog (ii) gof (iii) fof (iv) gog.

2.3 Evaluate $\cos\left[\sin^{-1}\left(\frac{1}{4}\right) + \sec^{-1}\frac{4}{3}\right]$.

Q.4 Show that

$$2 \tan^{-1}\left\{\tan \frac{\alpha}{2} \cdot \tan\left(\frac{\pi}{4} - \frac{\beta}{2}\right)\right\} = \tan^{-1}\left(\frac{\sin\alpha \cdot \cos\beta}{\cos\alpha + \sin\beta}\right)$$

2.5 Show that
$$(\sin^{-1}x)^2 + (\cos^{-1}x)^2 = \frac{5\pi^2}{4}.$$

2.6 If $a_1, a_2, a_3, a_4 \ldots a_n$ is an AP with common difference d, then evaluate the expression.

$$\tan\left[\tan^{-1}\left(\frac{d}{1 + a_1 a_2}\right) + \tan^{-1}\left(\frac{d}{1 + a_2 a_3}\right) + \cdots + \tan^{-1}\left(\frac{d}{1 + a_{n-1} a_n}\right)\right]$$

Q.7 Show that
$$\Delta = \begin{vmatrix} x & p & 2 \\ p & x & 2 \\ 2 & 2 & x \end{vmatrix} = (x - p)(x^2 + px - 2z^2)$$

Q.8 In a $\triangle ABC$, if

$$\begin{vmatrix} 1 & 1 & 1 \\ 1+\sin A & 1+\sin B & 1+\sin C \\ \sin A + \sin^2 A & \sin B + \sin^2 B & \sin C + \sin^2 C \end{vmatrix} = 0$$

then prove that $\triangle ABC$ is an isosceles triangle.

Q.9 If $A = \begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{bmatrix}$ find A^{-1}

Using A^{-1}, solve the system of linear equations $x - 2y = 10$, $2x - y - z = 8$ and $-2y + z = 7$

Q.10 Given $A = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$

find BA and Use this to solve the system the equations $y + 2z = 7$, $x - y = 3$ and $2x + 3y + 4z = 17$.

Q.11 Find the value of the constant k so that the function f defined below is continuous at $x = 0$ where

$$f(x) = \begin{cases} \dfrac{1 - \cos 4x}{8x^2} & \text{if } x \neq 0. \\ k & \text{if } x = 0 \end{cases}$$

Q.12 If $f(x) = \begin{cases} \dfrac{x^3 + x^2 - 16x + 20}{(x-2)^2} & \text{if } x \neq 2 \\ k & \text{if } x = 2 \end{cases}$ is

continuous at $x = 2$ find k.

Q.13 Differentiate $\sqrt{\tan\sqrt{x}}$ with respect to x.

Q.14. If $y = \sin^{-1}\{x\sqrt{1-x} - \sqrt{x}\sqrt{1-x^2}\}$ and $0 < x < 1$
then find $\frac{dy}{dx}$.

Q.15 Let $f(x) = \begin{cases} \dfrac{1-\cos 4x}{x^2} & \text{if } x < 0 \\ a & \text{if } x = 0 \\ \dfrac{\sqrt{x}}{\sqrt{16+\sqrt{x}} - 4} & \text{if } x > 0 \end{cases}$

For what value of a, f is continuous at $x = 0$.

Q.16 Examine the differentiability of the function
f defined by

$$f(x) = \begin{cases} 2x+3 & \text{if } -3 \le x < -2 \\ x+1 & \text{if } -2 \le x < 0 \\ x+2 & \text{if } 0 \le x \le 1. \end{cases}$$

Q.17 Differentiate w.r.t (x)

(i) $\tan^{-1}\left(\dfrac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}}\right)$, $-1 < x < 1$ and $x \ne 0$.

(ii) $\cos^{-1}\left(\dfrac{\sin x + \cos x}{\sqrt{2}}\right)$, $-\frac{\pi}{4} < x < \frac{\pi}{4}$

(iii) $\sin x = \dfrac{2t}{1+t^2}$ and $\tan y = \dfrac{2t}{1-y^2}$

(iv) $\tan^{-1}\left(\dfrac{a\cos x - b\sin x}{b\cos x + a\sin x}\right)$, $-\frac{\pi}{2} < x < \frac{\pi}{2}$

Q.18 If $y = (\cos x)^{(\cos x)^{(\cos x)^{\cdots \infty}}}$ show that
$$\frac{dy}{dx} = \frac{y^2 \tan x}{y \log \cos x - 1}.$$

Q.19 Water is dripping out from a conical funnel of semi-vertical angle $\pi/4$, at the uniform rate of $2 \, cm^2/sec$ in the surface area, through a tiny hole at the vertex of the bottom. When the slant height of cone is $4 \, cm$. find the rate of decrease of the slant height of water.

Q.20 Show that the equation of normal at any point on the curve $x = 3\cos\theta - \cos^3\theta$ and $y = 3\sin\theta - \sin^3\theta$ is $4(y\cos^3\theta - x\sin^3\theta) = 3\sin 4\theta$.

Q.21 A metal box with a square base and vertical side is to contain $1024 \, cm^3$. The material for the top and bottom casts ₹ $5/cm^2$ and the material for the sides costs ₹ $2.50/cm^2$. Find the least cast.

Physics

Make project file with colourful page(maximam 10 to 12 pages).

Topic

1.Moving coil Roll no 1,26&51 galvanometer

2. Meter bridge(2&27)

3. Potentiometer(3&28

4. Capacitor(4&29

5. Wheat stone bridge(5&30)

6. Conversion gelvanometre into ammeter& voltmeter(6&31)

7. Cyclotron(7&32)

CHEMISTRY

To make a project file (for board chemistry practical) in which you have to write 12 to 15 pages. Topics are given below. You can also use coloured pen.

No.	Name	Topic
01	Ajay Gangwar	Colligative Properties
02	Aman Kumar	Refining of metals
03	Arisha Fatime	Corrosion
04	Arun Gangwar	Adsorption
05	Deeksha	Colloids
06	Deepak Kumar	Catalysis
07	Deepek Restogi	Carbohydrates
08	Deependra Kumar	Proteins
09	Divyanshi Gangwar	Vitamins
10	Divyansha Sharma	Classification of polymers
11	Drashya Saxena	Food Preservatives
12	Gaganprit Kaur	Cleansing Agents
13	Gaurav Rathore	Classification of Crystalline solids
14	Gurjeet Kaur	Colligative Properties
15	Harsh Gangwar	Refining of metals
16	Himani	Corrosion
17	Mohd. Faisal	Adsorption
18	Mohd Sameer	Colloids
19	Mohd. Fardeen	Catalysis
20	Monika Gangwar	Carbohydrates
21	Naina Pandey	Proteins
22	Nikhil	Vitamins
23	Pankaj Gangwar	Classification of Polymers
24	Pankaj Gangwar	Food Preservatives
25	Paras Maheshwari	Cleansing Agents
26	Paras Pandey	Classification of Crystalline solids
27	Pawandeep Kaur	Colligative Properties

28. Pinkey Aanpur → Refining of metals
29. Pradeep Patel → Corrosion
30. Prajjwal Pandey → Adsorption
31. Renu Maurya → Colloids
32. Rishabh Pandey → Catalysis
33. Rishi Kumar → Carbohydrates
34. Ritika Chitranshi → Proteins
35. Rohit Singh → Vitamins
36. Sachin Kumar → Classification of Polymers
37. Sanchit Aanpur → Food Preservatives
38. Saniya Malik → Cleansing Agents
39. Saurabh Aanpur → Classification of Crystalline Solid
40. Shapun Pandey → Colligative Properties
41. Shivam Aanpur → Refining of metals
42. Shivank Pandey → Corrosion
43. Shubham Aanpur → Adsorption
44. Snehil → Colloids
45. Sudhanshu Nandan → Catalysis
46. Syed Mohib Naqvi → Carbohydrates
47. Tanya Aanpur → Proteins
48. Vimal Goswami → Vitamins
49. Vipin Aanpur → Classification of Polymers
50. Yash Goswami → Food Preservatives
51. Yogendra Kumar → Cleansing Agents.

Biology

Make project file by using colourful pages at least 12 pages

Topics are according to roll no.

1. Human reproduction Roll no 1 and 7
2. Principle of inheritance Roll no 3 and 9
3. Double Helical D model Roll no 2and 8.
4. DNA replication Roll no 4 and 6
5. Evolution Roll no 5 and 10.
6. Human health and diseases Roll no 11 and 19.
7. Cancer Roll no 12 and 18.
8. Dairy farm management Roll no 13 and 17
9. Biotechnology Roll no 14 and 16
10. Syndrome Roll no 15.

Physical Education

• Procedure for administering the Senior Citizen Fitness Test for 2 elderly family members.

• Anyone game of your choice out of the list (Basketball, Football, Kabaddi, Kho-Kho, Volleyball, Handball, Hockey, Cricket). Labelled diagram of field & equipment (Rules, Terminologies & Skills).

• Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease with proper diagrams.

Work out

Students will take two bowls and hang them in the balcony of their house. Everyday.

They need to fill them with grains and water respectively to feed the birds.

Note : This activity will help the students to connect to the nature and they will develop a sense of compassion. Visual and Performing Arts

DP