

# केन्द्रीय विद्यालय क्र.-1

अर्मापुर, कानपुर

## KENDRIYA VIDYALAYA No.1

### ARMAPUR, KANPUR



# Autumn Break

# Holiday Homework

# CLASS-XII

## शरद कालीन गृहकार्य

दिनांक : 03/10/22 से 12/10/22

कक्षा : XA (हिंदी)

प्रथम समूह - शुद्ध लेखन (प्रतिदिन एक पेज का श्रुति लेखन)  
- सुन्दर लेखन

बहुविकल्पीय प्रश्न उत्तर सहित - उषा (कविता)

## प्रथम और द्वितीय समूह

रचनात्मक लेखन

- आजादी का अमृत महोत्सव : स्वर्णिम 75 साल

समाचार लेखन की शैली

अभिव्यक्ति और माध्यम

क. कहानी का नाट्य रूपांतरण (एक कथानी का)

ख. फीचर (एक विषय पर)

## कक्षा XA हिंदी

प्रथम समूह : शुद्ध लेखन (प्रतिदिन एक पेज का श्रुति लेखन)  
सुन्दर लेखन

(उषा के साथ दार्ढ्य साज पाठ पाँच बहुविकल्पीय प्रश्न-उत्तर)

प्रथम + द्वितीय समूह : अभिव्यक्ति और माध्यम

रचनात्मक लेखन - आत्म निर्ररि आरत

पत्र लेखन - गंदी और गंदे पानी संबंधित पत्र

स्वच्छता लेखन

डावरी लेखन -

KENDRIYA VIDYALAYA No.1 ARMAPUR, KANPUR  
CLASS XII B & XII D  
SUBJECT: ENGLISH  
ASSIGNMENT FOR AUTUMN BREAK -2022-23

1. Design a formal invitation on your parents' behalf on the occasion of the birthday celebration of your brother, using not more than 50 words.
2. You are Mr. Ravi Sharma. You have received an invitation on the occasion of the birthday celebration of your friend's son. Send your acceptance of the invitation, using not more than 50 words.
3. You are Ankit/Amrita, staying at Nehru Nagar, Kanpur. You have come across an advertisement in The Times of India for recruitment of computer engineer trainees by Kesko Software, Kanpur. Apply in response to this advertisement, giving your detailed bio-data (curriculum vitae). Invent all necessary details.
4. Learn questions and answers of the chapters taught up to 30-09-2022.  
(Write at least 2 questions and their answers from each chapter.)

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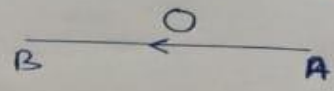
# HOLIDAY HOME WORK FOR AUTUMN BREAK 2022

## CLASS XII


### SUBJECT PHYSICS

1. Solve the sample question paper given by CBSE 2022-23
2. Solve the CCT and CA questions from question bank given by KVS.
3. Practice reason assertion question.
4. Practice MCQ type of questions.

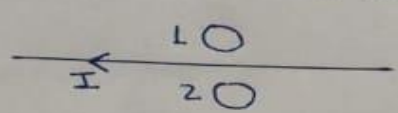
① The electric current flowing in a wire in the direction from A to B decreasing. Find out the direction of the induced current in the metallic loop kept the wire as shown in the figure.



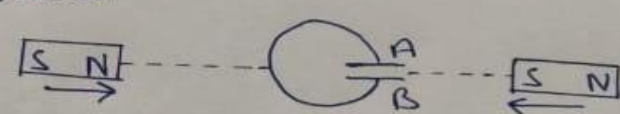
② In the given figure, a bar magnet is quickly moved towards a conducting loop having a capacitor. Predict the polarity of the plates A and B of the capacitor.



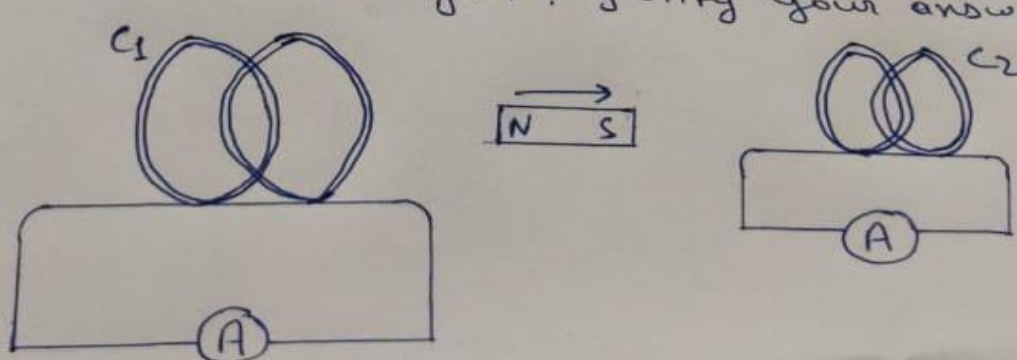
③ Predict the direction of induced current in metal ring when current  $I$  in the wire is steadily decreasing.



④ Predict the polarity of the capacitor in the situation described below:-



⑤ A magnet is quickly moved in the direction indicated by arrow between two coils  $C_1$  and  $C_2$  as shown in figure. Will be the direction of induced current in each coil seen from the magnet? Justify your answer.



Concept based questions 12 Phys

Q1 - A charge of  $2C$  moves between two points maintained at a potential difference of  $1$  volt. What is the energy acquired by the charge?

Q2 - In a conductor, a point  $P$  is at a higher potential than another point  $Q$ . In which direction do the electrons move?

Q3 - What is the value of angle between the vectors  $\vec{p}$  and  $\vec{E}$  for which the potential energy of an electric dipole moment  $\vec{p}$ , kept in an external electric field  $\vec{E}$ , has maximum value?

Q4 - A parallel plate capacitor with air b/w the plate has a capacitance of  $8\text{ pF}$ . What will be the capacitance if distance b/w the plates be reduced by half and the space b/w them is filled with a substance of dielectric constant  $k=6$ ?

Q5 - What is the amount of work done in moving a charge  $q$  around a circular arc of radius  $r$  at the centre of which another point charge  $Q$  is located?

Q6 - Is the force acting b/w two point electric charges kept at some distance in air, attractive or repulsive?  
(i)  $q_1 q_2 > 0$  (ii)  $q_1 q_2 < 0$ ?

Q7 - Two fixed point charges  $+4e$  and  $+e$  units are separated by a distance 'a'. Where should a third charge  $q$  be placed for it to be in equilibrium?

Q8 - Two point charges  $q_1$  and  $q_2$  placed a distance 'd' apart such that there is no point where the field vanishes. What can be concluded from this?

Q9 - A proton is displaced in a uniform electric field along the positive  $x$ -axis. In which direction will it tend to move?

Q10 - How does the electric flux due to a point charge enclosed by a spherical Gaussian surface get affected when its radius is increased?

Q11 - How much resistance of an air-gap?

## ELECTROMAGNETIC WAVES

1. Which of the four Maxwell's equations shows that magnetic lines of force cannot start from a point nor end at a point?
2. A capacitor is connected to an a.c. source. Is the conduction current in connecting wires equal to the displacement current in a conductor the capacitor.
3. A capacitor has been charged by a d.c. source. What are the magnitude of conduction and displacement currents, when it is fully charged?
4. Name the electromagnetic radiation used in eye surgery or to kill germs in water purifiers. Write the frequency range.
5. A plane electromagnetic wave travels in vacuum along x-direction. What can you say about the direction of electric and magnetic field vectors?

## RAY OPTIC

- 1) For what angle of incidence, the lateral shift produced by a parallel sides glass slab is maximum?
- 2) Where should an object be placed from a convex lens to form an image of the same size? Can it happen in case of concave lens?
- 3) A converging lens is kept coaxially in contact with a diverging lens - both the lenses being of equal focal length. What is the focal length of the combination.
- 4) How does the angle of minimum deviation of a glass prism of refractive index 1.5 change, if it is immersed in a liquid of refractive index 1.3?
- 5) A double convex lens made from a material of refractive index  $\mu_1$ , is immersed in a liquid of refractive index  $\mu_2$ , where  $\mu_2 > \mu_1$ . What change, if any, would occur in the nature of the lens?

- Q12 A  $4\ \Omega$  non-insulated resistance wire is bent  $180^\circ$  in the middle and the two halves are twisted together. What will be its new resistance?
- Q13 The applied p.d. across given resistance is altered so that heat produced per second increases by a factor of 9. By what factor does the applied p.d. change?
- Q14 Two bulbs P & Q have their resistances in the ratio 1:2. They are connected in series across a battery. Find the ratio of the power dissipation in these bulbs.
- Q15 How does the mobility of  $e^-$  in a conductor change, if the potential difference applied across the conductor is doubled, keeping the length and temperature of the conductor constant?
- Q16 A proton and an  $e^-$  travelling along parallel paths enter a region of uniform magnetic field, acting  $\perp$  to their paths. Which of them will move in a circular path with higher frequency?
- Q17 In which orientation is the force experienced by a current-carrying conductor placed in a magnetic field maximum?
- Q18 An  $e^-$  is moving with a velocity  $v$ , along the axis of a long straight solenoid, carrying a current  $I$ . What will be the force acting on the  $e^-$  due to the magnetic field of the solenoid?

# **Holiday Home Work class 12 CHEMISTRY**

## **Common HW to all groups (A,B,C)**

- 1) To complete practical copy
- 2) To complete and prepare investigatory project
- 3) To complete notes , intext questions , examples and exercises upto Alcohol, Phenol and Ethers
- 4) 30 IUPAC names from organic compound

## **Specific home work for group A**

learn and prepare following topics so that if any questions is being asked after break you must be able to answer

- a) Ideal and non ideal solutions
- b) Uses of osmosis and osmotic pressure
- c) Numericals on Nernst equation (atleast 5 from NCERT/ADDITIONAL BOOK)
- d) Unit of rate constant for 1<sup>st</sup> , 2<sup>nd</sup> ,zero order reaction
- e) 5 numericals based on first order reaction
- f) Preparation and chemical properties of  $K_2Cr_2O_7$ (potassium dichromate),  $KMnO_4$ (potassium permanganate)
- g) IUPAC names of coordination compound (20 from additional book/NCERT)
- h) Mechanism of  $Sn_1$  and  $Sn_2$  reaction

## **Specific home work for group B**

Home work of group a students + completely prepare D Block elements and coordination compounds

(must be able to gain 100% marks after break from these two chapters after break)

## **Specific home wrok for group c**

1)To practice CCT based material - chapters already done in class from shared file in what's app group(lucknow region)

2)Prepare 10 CCT based questions/ high order thinking skills questions with answers from syllabus already covered



**AUTUMN BREAK\_HOME WORK**  
**CLASS – XII**  
**MATHS**  
**(FOR GROUP-B STUDENTS)**

**Relations and Functions:**

1. If  $f: R \rightarrow R$  is a function, defined as  $f(x) = \frac{3x-2}{5}$ , show that  $f$  is bijective.
2. If the function  $f: R \rightarrow R$  is given by  $f(x) = \frac{x+3}{2}$  and  $g: R \rightarrow R$  is given by  $g(x) = 2x - 3$ , show that both the functions are bijective.
3. Consider  $f: R_+ \rightarrow [-9, \infty)$  given by  $f(x) = 5x^2 + 6x - 9$ . Prove that  $f$  is one-one and onto.
4. Let  $A=R-\{2\}$  and  $B=R-\{1\}$ . If  $f: A \rightarrow B$  is a function defined by  $f(x) = \frac{x-1}{x-2}$ , show that  $f$  is one-one and onto.
5. Let  $N$  be the set of all natural numbers and  $R$  be the relation on  $N \times N$  defined by  $(a, b)R(c, d)$  if  $a + d = b + c$  for all  $(a, b), (c, d) \in N \times N$ . Prove that  $R$  is an equivalence relation and also obtain the equivalence class  $[(2,6)]$ .
6. Let  $N$  be the set of all natural numbers and  $R$  be the relation on  $N \times N$  defined by  $(a, b)R(c, d)$  if  $ad(b + c) = bc(a + d)$  for all  $(a, b), (c, d) \in N \times N$ . Check whether  $R$  is an equivalence relation.

**Inverse Trigonometric Functions:**

**NCERT QUESTIONS:**

EXERCISE 2.1 – (Complete)

EXERCISE 2.2 – 1, 2, 5 to 11, 16 to 21

MISC. EXERCISE – 1, 2, 9, 10, 11, 15, 16

**Matrices:**

**NCERT QUESTIONS:**

EXERCISE 3.1 – 6 to 10

EXERCISE 3.2 – 7 to 12, 15 to 22

EXERCISE 3.3 – 3, 4, 5, 10

MISC. EXERCISE – 4 to 11

EXAMPLES – 8 to 11, 18, 19, 21, 22, 28

## Determinants:

1. Using matrix method, solve the following system of equations :

$$x + 2y - 3z = -4, \quad 2x + 3y + 2z = 2, \quad 3x - 3y - 4z = 11$$

2. Solve the following system of equations, using matrices :

$$\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4, \quad \frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1, \quad \frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$$

3. Find  $A^{-1}$ , where  $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$ , Hence, solve the system of linear equations :

$$x - 2y = 10, \quad 2x + y + 3z = 8, \quad -2y + z = 7.$$

4. Given that  $A = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ , find  $AB$  and use it to solve the

system

of equations :  $x - y + z = 4, x - 2y - 2z = 9, 2x + y + 3z = 1.$

5. If  $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$  and  $C = \begin{bmatrix} 7 & 2 & -6 \\ -2 & 1 & -3 \\ -4 & 2 & 5 \end{bmatrix}$ . Find  $AC$  and hence solve the

Equations  $x - 2y = 10, 2x + y + 3z = 8, -2y + z = 7.$

6. The perimeter of a triangle is 90 cm. The longest side exceeds the shortest side by 16 cm and the sum of the lengths of the longest and shortest side is twice the length of the other side. Use the matrix method to find the sides of the triangle.
7. The sum of three numbers is 6. If 3<sup>rd</sup> number is multiplied by 2 and first number is added, we get 7 and by adding second and third number to 3 times the first number we get 12. Use matrix method to find the numbers.
8. A school wants to award its students for the values of Honesty, Regularity and Hardwork with a total cash award of Rs. 6,000. Three times the award money for Hardwork added to that given for Honesty amounts to Rs. 11,000. The award money given for Honesty and Hardwork together is double the one given for Regularity. Represent the above situation algebraically and find the award money for each value, using matrix method.

9. If

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

Verify that  $A^2 - 4A - 5I = 0$ . Hence find  $A^{-1}$ .

10. If

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$$

Verify that  $A^3 - 6A^2 + 7A + 2I = 0$ . Hence find  $A^{-1}$ .

11. The management committee of a residential colony decided to award some of its members (say x) for honesty, some (say y) for helping others and some (say z) for supervising the workers to keep the colony neat and clean. The sum of all the awardees is 12. Three times the number of awardees for cooperation and supervision added to two times the number of awardees for honesty is 33. If the sum of the number of awardees for honesty and supervision is twice the number of awardees for helping others, using matrix method, find the number of awardees of each category. Apart from these values suggest one more value the management must include for award.

12. The schools P and Q want to award their selected students on the value of Discipline, Politeness and Punctuality. The school wants to award Rs. x each, Rs. y each and Rs. z each for the three respectively values to its 3, 2 and 1 students with total award money of Rs 1000. School Q wants to spend Rs 1500 to award its 4, 1 and 3 students on the respective values (by giving the same award money for three values as before). If the total amount of awards for one prize on each value is Rs 600, using matrices, find the award money for each value. Apart from these values suggest one more value for awards.

13. If  $A^{-1} = \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ , find  $(AB)^{-1}$ .

**NCERT QUESTIONS:**

EXERCISE 4.1 – 3, 4, 7, 8

EXERCISE 4.3 – (Complete)

EXERCISE 4.4 – 12 to 20

**Continuity:**

Find the unknown constant if the functions are continuous

(1) $f(x) = \begin{cases} kx^2, & x \leq 2 \\ 3, & x > 2 \end{cases}$	2. $f(x) = \begin{cases} 2x-1, & \text{if } x < 2 \\ a, & \text{if } x = 2 \\ x+1, & \text{if } x > 2 \end{cases}$
(3) $f(x) = \begin{cases} 2x+1, & \text{if } x < 2 \\ k, & \text{if } x = 2 \\ 3x-1, & \text{if } x > 2 \end{cases}$	(4) $f(x) = \begin{cases} 3ax+b, & \text{if } x > 1 \\ 11, & \text{if } x = 1 \\ 5ax-2b, & \text{if } x < 1 \end{cases}$
(5) $f(x) = \begin{cases} 5, & x \leq 2 \\ ax+b, & 2 < x < 10 \\ 21, & x > 10 \end{cases}$	(6) $f(x) = \begin{cases} kx+1, & x \leq \pi \\ \cos x, & \text{if } x > \pi \end{cases}$
(7) $f(x) = \begin{cases} k(x^2+2), & \text{if } x \leq 0 \\ 3x+1, & \text{if } x > 0 \end{cases}$	(8) $f(x) = \begin{cases} \lambda(x^2-2x), & \text{if } x \leq 0 \\ 4x+1, & \text{if } x > 0 \end{cases}$

9. Find the relation between a and b so that

$$f(x) = \begin{cases} ax+1, & x \leq 3 \\ bx+3, & x > 3 \end{cases} \text{ is continuous at } x = 3.$$

10. The function  $f(x)$  is defined as follows:

$$f(x) = \begin{cases} x^2 + ax + b, & 0 \leq x < 2 \\ 3x + 2, & 2 \leq x \leq 4 \\ 2ax + 5b, & 4 < x \leq 8 \end{cases}$$

If  $f$  is continuous on  $[0,8]$  find the values of a and b.

## Differentiation

### NCERT QUESTIONS:

EXERCISE 5.3: (Complete)

EXERCISE 5.5: 7 to 15

EXERCISE 5.6: 5 to 11

EXERCISE 5.7: 12 to 17

MISC. EXERCISE: 14, 15, 16, 17, 23.

EXAMPLE: 33, 39, 40, 41, 45

## Increasing & decreasing functions:

1. Find the intervals in which the function  $f(x) = 2x^3 - 9x^2 + 12x + 15$  is increasing and decreasing.
2. Find the intervals in which the function  $f(x) = 2x^3 + 9x^2 + 12x + 20$  is increasing and decreasing.
3. Find the intervals in which the function  $f(x) = 2x^3 - 15x^2 + 36x + 17$  is increasing and decreasing.
4. Find the intervals in which the function  $f(x) = x^3 - 12x^2 + 36x + 17$  is increasing and decreasing.
5. Find the intervals in which the function  $f(x) = 20 - 9x + 6x^2 - x^3$  is increasing and decreasing.
6. Find the intervals in which the function  $f(x) = (x-1)^3(x-2)^2$  is increasing and decreasing.
7. Find the intervals in which the function  $f(x) = x^3 + \frac{1}{x^3}$  is increasing and decreasing.
8. Find the intervals in which the function  $f(x) = \sin x - \cos x, 0 \leq x \leq 2\pi$  is increasing and decreasing
9. Prove that  $y = \frac{4 \sin \theta}{2 + \cos \theta} - \theta$  is an increasing function in  $[0, \frac{\pi}{2}]$
10. Show that  $y = \log(1+x) - \frac{2x}{2+x}, x > -1$  is an increasing function of  $x$ , throughout its domain.
11. Find intervals in which the function given by  $f(x) = \sin 3x, x \in [0, \frac{\pi}{2}]$  is (a) increasing (b) decreasing.

## Maxima and Minima:

1. Show that the semi-vertical angle of the cone of maximum volume and of given slant height is  $\tan^{-1} \sqrt{2}$ .
2. Show that the right circular cone of least curved surface and given volume has altitude equal to  $\sqrt{2}$  times the radius of the base.
3. Show that the height of a closed right circular cylinder of given surface and maximum volume is equal to the diameter of its base.
4. A wire of length 28 m is to be cut into pieces. One of the pieces is to be made into a circle and the other into a square. Where the wire should be cut so that combined area is the minimum?
5. Show that the height of the cylinder of maximum volume that can be inscribed in a sphere of radius R is  $2R/\sqrt{3}$ .
6. Show that the volume of the largest cone that can be inscribed in a sphere is  $8/27$  of the volume of the sphere.
7. A window is in the form of a rectangle surmounted by a semi-circular opening. The total perimeter of the window is 10 m. find the dimensions of the window so as to admit maximum light through the whole opening.
8. Show that of all the rectangles of given area, the square has the smallest perimeter.
9. Show that the rectangle of maximum perimeter which can be inscribed in a circle of radius r is the square of side  $r\sqrt{2}$ .
10. If the sum of the lengths of the hypotenuse and a side of a right angled triangle is given, show that the area of the triangle is maximum when the angle between them is  $\pi/3$ .

## INTEGRATION:

1. Evaluate:  $\int \frac{x^2 dx}{1+x^3}$
2. If  $\int (e^{ax} + bx) dx = \frac{e^{4x}}{4} + \frac{3x^2}{2}$ , find the values of 'a' and 'b'
3. Evaluate:  $\int \sin 4x \cos 7x dx$
4. Evaluate:  $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$
5. Evaluate:  $\int \frac{5dx}{\sqrt{x+3} - \sqrt{x-2}}$
6. Evaluate:  $\int \frac{x^3 - x^2 + x - 1}{x-1} dx$
7. Evaluate:  $\int_0^1 \frac{2x}{1+x^2} dx$

8. Evaluate:  $\int_0^{\frac{\pi}{2}} \frac{\sin x}{1 + \cos^2 x} dx$

9. Evaluate using properties of definite integrals:  $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cot x}}{\sqrt{\cot x} + \sqrt{\tan x}} dx$

10. Evaluate using properties of definite integrals:  $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} x^3 \cos 2x dx$

11. Evaluate:  $\int x \log(1+x) dx$

12. Evaluate:  $\int \frac{dx}{\sqrt{3-x+x^2}}$

13. Evaluate:  $\int \frac{x^2+1}{x^4+x^2+1} dx$

14. Evaluate:  $\int e^x [\tan x + \log \sec x] dx$

15. Evaluate:  $\int \sqrt{\tan x} dx$

16. Evaluate:  $\int \cos^4 x dx$

17. Evaluate:  $\int \frac{dx}{(x-1)^2(x-2)}$

18. Evaluate:  $\int_0^{\pi} |\cos x| dx$

19. Prove that:  $\int_0^a f(x) dx = \int_0^a f(a-x) dx$ . Use it to evaluate:  $\int_0^2 x\sqrt{2-x} dx$

20. Evaluate:  $\int_0^{\frac{\pi}{2}} \frac{x}{\sin x + \cos x} dx$

### Area of Bounded Region:

- Find the area enclosed by  $x = 4y - 2$  and parabola  $x^2 = 4y$
- Find the area enclosed by  $y^2 = 4x$ ,  $x^2 + y^2 = 8x$ .
- Find the area of triangle with vertices (4, 1), (6, 6) and (8, 4).
- Find the area of triangle with sides  $y = 2x + 1$ ,  $y = 3x + 1$  and  $x = 4$ .
- Area of circle  $x^2 + y^2 = 16$  in the exterior of parabola  $y^2 = 6x$
- Find the area of the smaller region bounded by the ellipse  $\frac{x^2}{9} + \frac{y^2}{4} = 1$  and line  $\frac{x}{3} + \frac{y}{2} = 1$ .
- Find the area enclosed between the parabola  $y^2 = x$  and line  $y + x = 2$ .
- Find the area of the region  $\{(x, y) : x^2 + y^2 \leq 1 \leq x + y\}$
- Using integration find the area of the region given by:  
 $\{(x, y) : 0 \leq y \leq x^2, 0 \leq y \leq x+1, 0 \leq x \leq 2\}$

10. Using integration, find the area of the triangular region whose vertices are (1,0), (2,2) and (3,1)

11. Using integration, find the area bounded by the lines:

$$x + 2y = 2, y - x = 1 \text{ and } 2x + y = 7.$$

## **DIFFERENTIAL EQUATIONS :**

1. Solve:  $\frac{dy}{dx} + 2y = 2x$

2. Solve:  $\frac{dy}{dx} + y \cot x = \sec x.$

3. Solve:  $(1 + y^2)dx + x dy = 0$  given that  $y(1) = 1.$

4. Solve:  $\frac{dy}{dx} = y^2 \tan 2x$  given that  $y(0) = 2.$

5. Solve:  $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$

6. Solve:  $(x - 1) \frac{dy}{dx} = 2xy,$  given that  $y(2) = 1.$

7. Solve:  $\frac{dy}{dx} - y = x e^x$

8. Solve:  $(x - xy)dy = y dx.$

9. Show that  $y = e^{-x} + ax + b$  is a solution of the differential equation:  $e^{xy_2} = 1$

10. Show that  $y = A \cos x - B \sin x$  is a solution of the differential equation  $y_2 + y = 0$

11. Show that  $y = x \sin 3x$  is the solution of the differential equation:  $y_2 + 9y - 6 \cos 3x = 0$

12. Solve:  $x^2y dx - (x^3 + y^3)dy = 0.$

13. Solve:  $y^2 dx + (x^2 - xy) dy = 0.$

14. Solve:  $x y_1 = y - \sqrt{x^2 + y^2}$

15. Solve:  $\frac{dy}{dx} = (y/x) + \tan(y/x)$

16.  $x\sqrt{1-y^2} dx + y\sqrt{1-x^2} dy = 0.$

17. Determine the order and degree of the equation.

$$\left(\frac{ds}{dt}\right)^2 + 3s\left(\frac{d^2s}{dt^2}\right)^2 = 0$$

18. Solve  $(y + xy)dx + (x - xy^2)dy = 0$

## VECTOR ALGEBRA:

1. If  $\vec{a}$  is a unit vector and  $(\vec{x} + \vec{a}) \cdot (\vec{x} - \vec{a}) = 15$ , find  $|\vec{x}|$
2. Given  $\vec{AB} = 3\hat{i} - \hat{j} - 5\hat{k}$  and coordinate of the terminal point are (0, 1, 3). Find the coordinate of the initial point.
3. If the sum of the two unit vector is a unit vector, prove that the magnitude of their difference is  $\sqrt{3}$ .
4. If  $|\vec{a}| = 2$ ,  $|\vec{b}| = 5$  and  $|\vec{a} \times \vec{b}| = 8$ , find the value of  $\vec{a} \cdot \vec{b}$ .
5. If  $\vec{PO} + \vec{OQ} = \vec{QO} + \vec{OR}$ , show that the points P, Q, R are collinear.
6. If  $\vec{a} = \hat{i} + 2\hat{j} - \hat{k}$  and  $\vec{b} = 3\hat{i} + \hat{j} - 5\hat{k}$  find a unit vector in the direction of  $\vec{a} - \vec{b}$
7. If the position vectors of the points A and B are  $2\hat{i} + 3\hat{j} - \hat{k}$  and  $3\hat{i} + 2\hat{j} + \hat{k}$  then find the vector of magnitude 6 units in the direction of  $\vec{AB}$
8. If P(1, 5, 4) and Q(4, 1, -2), find the direction ratios and direction cosines of  $\vec{PQ}$
9. If the angle between two vectors  $\vec{a}$  and  $\vec{b}$  of equal magnitude is  $30^\circ$  and their scalar product is  $2\sqrt{3}$ , find their magnitudes.
10. Find the value of  $\lambda$  so that the vectors  $3\hat{i} - \hat{j} - 5\hat{k}$  and  $2\hat{i} + 3\hat{j} - \lambda\hat{k}$  are parallel
11. Find the value of  $\lambda$  so that the vectors  $3\hat{i} - \hat{j} - 5\hat{k}$  and  $2\hat{i} + 3\hat{j} - \lambda\hat{k}$  are perpendicular
12. If  $\vec{a} = 4\hat{i} + 2\hat{j} - \hat{k}$  and  $\vec{b} = 5\hat{i} + 2\hat{j} - 3\hat{k}$  find the angle between  $\vec{a} + \vec{b}$  and  $\vec{a} - \vec{b}$
13. Find the value of  $\lambda$  when the scalar projection of  $\vec{a} = \lambda\hat{i} + \hat{j} + 4\hat{k}$  on  $\vec{b} = 2\hat{i} + 6\hat{j} + 3\hat{k}$  is 4 units.
14. Show that the vectors  $\vec{a} = 3\hat{i} - 2\hat{j} + \hat{k}$ ,  $\vec{b} = \hat{i} - 3\hat{j} + 5\hat{k}$  and  $\vec{c} = 2\hat{i} + \hat{j} - 4\hat{k}$  form a right angled triangle.
15. If  $\vec{a}$ ,  $\vec{b}$  and  $\vec{c}$  are three vectors such that  $\vec{a} + \vec{b} + \vec{c} = 0$  and  $|\vec{a}| = 3$ ,  $|\vec{b}| = 5$ ,  $|\vec{c}| = 7$ , find the angle between  $\vec{a}$  and  $\vec{b}$ .
16. Find the position vector of a point R which divided the line segment joining the points P and Q with position vectors  $\hat{i} + 2\hat{j} - \hat{k}$  and  $-\hat{i} + \hat{j} + \hat{k}$  respectively in the ration 2 : 1 i) internally ii) externally.
17. Show that the points A(2, 6, 3), B(1, 2, 7) and C(3, 10, -1) are collinear.
18. If the points  $(\alpha, -1)$ , (2, 1) and (4, 5) are collinear, find  $\alpha$  by vector method.
19. Three vertices of a triangle are A(0, -1, -2), B(3, 1, 4) and C(5, 7, 1). Show that it is a right angled triangle. Also find the other two angles.
20. For the points A(1, 1, 1), B(2, 5, 0), C(3, 2, -3) and D(1, -6, -1) find the angle between  $\vec{AB}$  and  $\vec{CD}$ .
21. If  $\vec{a}$ ,  $\vec{b}$  and  $\vec{c}$  are three vectors such that  $\vec{a} + \vec{b} + \vec{c} = 0$ , prove that  $\vec{a} \times \vec{b} = \vec{b} \times \vec{c} = \vec{c} \times \vec{a}$ .
22. Find the area of the parallelogram with diagonals  $3\hat{i} + \hat{j} - 2\hat{k}$  and  $\hat{i} - 3\hat{j} + 4\hat{k}$ .
23. The scalar product of the vector  $\hat{i} + \hat{j} + \hat{k}$  with the unit vector along the sum of vectors  $2\hat{i} + 4\hat{j} - 5\hat{k}$  and  $\lambda\hat{i} + 2\hat{j} + 3\hat{k}$  is equal to 1. Find the value of  $\lambda$ .



**AUTUMN BREAK\_HOME WORK**  
**CLASS – XII**  
**MATHS**  
**(FOR GROUP-A STUDENTS)**

**Relations and Functions:**

1. If  $f: R \rightarrow R$  is a function, defined as  $f(x) = \frac{3x-2}{5}$ , show that  $f$  is bijective.
2. If the function  $f: R \rightarrow R$  is given by  $f(x) = \frac{x+3}{2}$  and  $g: R \rightarrow R$  is given by  $g(x) = 2x - 3$ , show that both the functions are bijective.
3. Consider  $f: R_+ \rightarrow [-9, \infty)$  given by  $f(x) = 5x^2 + 6x - 9$ . Prove that  $f$  is one-one and onto.
4. Let  $A=R-\{2\}$  and  $B=R-\{1\}$ . If  $f: A \rightarrow B$  is a function defined by  $f(x) = \frac{x-1}{x-2}$ , show that  $f$  is one-one and onto.
5. Let  $N$  be the set of all natural numbers and  $R$  be the relation on  $N \times N$  defined by  $(a, b)R(c, d)$  if  $a + d = b + c$  for all  $(a, b), (c, d) \in N \times N$ . Prove that  $R$  is an equivalence relation and also obtain the equivalence class  $[(2,6)]$ .
6. Let  $R$  is a relation in the set  $A=\{0,1,2,3,4,5\}$  given by  $R = \{(a, b): 2 \text{ divides } (a - b)\}$ . Show that  $R$  is an equivalence relation

**Inverse Trigonometric Functions:**

**NCERT QUESTIONS:**

EXERCISE 2.1 – (Complete)

EXERCISE 2.2 – 1, 2, 5 to 11, 16 to 21

MISC. EXERCISE – 1, 2, 9, 10, 11, 15, 16

**Matrices:**

**NCERT QUESTIONS:**

EXERCISE 3.1 – 6 to 10

EXERCISE 3.2 – 7 to 12, 15 to 22

EXERCISE 3.3 – 3, 4, 5, 10

MISC. EXERCISE – 4 to 11

EXAMPLES – 8 to 11, 18, 19, 21, 22, 28

**Determinants:**

1. Using matrix method, solve the following system of equations :  
 $x + 2y - 3z = -4$  ,  $2x + 3y + 2z = 2$  ,  $3x - 3y - 4z = 11$

2. Solve the following system of equations, using matrices :  
 $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$ ,  $\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$ ,  $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$

3. Find  $A^{-1}$ , where  $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$ , Hence, solve the system of linear equations :

$$x - 2y = 10, 2x + y + 3z = 8, -2y + z = 7.$$

4. Given that  $A = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ , find  $AB$  and use it to solve the

system

$$\text{of equations : } x - y + z = 4, x - 2y - 2z = 9, 2x + y + 3z = 1.$$

5. If  $A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$  and  $C = \begin{bmatrix} 7 & 2 & -6 \\ -2 & 1 & -3 \\ -4 & 2 & 5 \end{bmatrix}$ . Find  $AC$  and hence solve the

$$\text{Equations } x - 2y = 10, 2x + y + 3z = 8, -2y + z = 7.$$

6. The perimeter of a triangle is 90 cm. The longest side exceeds the shortest side by 16 cm and the sum of the lengths of the longest and shortest side is twice the length of the other side. Use the matrix method to find the sides of the triangle.
7. The sum of three numbers is 6. If 3<sup>rd</sup> number is multiplied by 2 and first number is added, we get 7 and by adding second and third number to 3 times the first number we get 12. Use matrix method to find the numbers.
8. A school wants to award its students for the values of Honesty, Regularity and Hardwork with a total cash award of Rs. 6,000. Three times the award money for Hardwork added to that given for Honesty amounts to Rs. 11,000. The award money given for Honesty and Hardwork together is double the one given for Regularity. Represent the above situation algebraically and find the award money for each value, using matrix method.

9. If

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

Verify that  $A^2 - 4A - 5I = O$ . Hence find  $A^{-1}$ .

10. If

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$$

Verify that  $A^3 - 6A^2 + 7A + 2I = O$ . Hence find  $A^{-1}$ .

### NCERT QUESTIONS:

EXERCISE 4.1 – 3, 4, 7, 8

EXERCISE 4.3 – (Complete)

EXERCISE 4.4 – 12 to 20

## Continuity:

Find the unknown constant if the functions are continuous

(1) $f(x) = \begin{cases} kx^2, & x \leq 2 \\ 3, & x > 2 \end{cases}$	2. $f(x) = \begin{cases} 2x-1, & \text{if } x < 2 \\ a, & \text{if } x = 2 \\ x+1, & \text{if } x > 2 \end{cases}$
(3) $f(x) = \begin{cases} 2x+1, & \text{if } x < 2 \\ k, & \text{if } x = 2 \\ 3x-1, & \text{if } x > 2 \end{cases}$	(4) $f(x) = \begin{cases} 3ax+b, & \text{if } x > 1 \\ 11, & \text{if } x = 1 \\ 5ax-2b, & \text{if } x < 1 \end{cases}$
(5) $f(x) = \begin{cases} 5, & x \leq 2 \\ ax+b, & 2 < x < 10 \\ 21, & x > 10 \end{cases}$	(6) $f(x) = \begin{cases} kx+1, & x \leq \pi \\ \cos x, & \text{if } x > \pi \end{cases}$
(7) $f(x) = \begin{cases} k(x^2+2), & \text{if } x \leq 0 \\ 3x+1, & \text{if } x > 0 \end{cases}$	(8) $f(x) = \begin{cases} \lambda(x^2-2x), & \text{if } x \leq 0 \\ 4x+1, & \text{if } x > 0 \end{cases}$
9. Find the relation between a and b so that $f(x) = \begin{cases} ax+1, & x \leq 3 \\ bx+3, & x > 3 \end{cases}$ is continuous at $x = 3$ .	10. The function $f(x)$ is defined as follows: $f(x) = \begin{cases} x^2 + ax + b, & 0 \leq x < 2 \\ 3x + 2, & 2 \leq x \leq 4 \\ 2ax + 5b, & 4 < x \leq 8 \end{cases}$ If $f$ is continuous on $[0,8]$ find the values of a and b.

## Differentiation

### NCERT QUESTIONS:

EXERCISE 5.3: (Complete)

EXERCISE 5.5: 7 to 15

EXERCISE 5.6: 5 to 11

EXERCISE 5.7: 12 to 17

MISC. EXERCISE: 14, 15, 16, 17, 23.

EXAMPLE: 33, 39, 40, 41, 45

## Increasing & decreasing functions:

1. Find the intervals in which the function  $f(x) = 2x^3 - 9x^2 + 12x + 15$  is increasing and decreasing.
2. Find the intervals in which the function  $f(x) = 2x^3 + 9x^2 + 12x + 20$  is increasing and decreasing.
3. Find the intervals in which the function  $f(x) = 2x^3 - 15x^2 + 36x + 17$  is increasing and decreasing.
4. Find the intervals in which the function  $f(x) = x^3 - 12x^2 + 36x + 17$  is increasing and decreasing.
5. Find the intervals in which the function  $f(x) = 20 - 9x + 6x^2 - x^3$  is increasing and decreasing.

6. Find the intervals in which the function  $f(x) = (x - 1)^3 (x - 2)^2$  is increasing and decreasing.
7. Find the intervals in which the function  $f(x) = x^3 + \frac{1}{x^3}$  is increasing and decreasing.
8. Find the intervals in which the function  $f(x) = \sin x - \cos x, 0 \leq x \leq 2\pi$  is increasing and decreasing.
9. Prove that  $y = \frac{4 \sin \theta}{2 + \cos \theta} - \theta$  is an increasing function in  $[0, \frac{\pi}{2}]$ .
10. Show that  $y = \log(1+x) - \frac{2x}{2+x}, x > -1$  is an increasing function of  $x$ , throughout its domain.
11. Find intervals in which the function given by  $f(x) = \sin 3x, x \in [0, \frac{\pi}{2}]$  is (a) increasing (b) decreasing.

### **Maxima and Minima:**

1. Show that the semi-vertical angle of the cone of maximum volume and of given slant height is  $\tan^{-1} \sqrt{2}$ .
2. Show that the right circular cone of least curved surface and given volume has altitude equal to  $\sqrt{2}$  times the radius of the base.
3. Show that the height of a closed right circular cylinder of given surface and maximum volume is equal to the diameter of its base.
4. A wire of length 28 m is to be cut into pieces. One of the pieces is to be made into a circle and the other into a square. Where the wire should be cut so that combined area is the minimum?
5. Show that the height of the cylinder of maximum volume that can be inscribed in a sphere of radius  $R$  is  $2R/\sqrt{3}$ .
6. Show that the volume of the largest cone that can be inscribed in a sphere is  $8/27$  of the volume of the sphere.
7. A window is in the form of a rectangle surmounted by a semi-circular opening. The total perimeter of the window is 10 m. find the dimensions of the window so as to admit maximum light through the whole opening.
8. Show that of all the rectangles of given area, the square has the smallest perimeter.
9. Show that the rectangle of maximum perimeter which can be inscribed in a circle of radius  $r$  is the square of side  $r\sqrt{2}$ .
10. If the sum of the lengths of the hypotenuse and a side of a right angled triangle is given, show that the area of the triangle is maximum when the angle between them is  $\pi/3$ .

## INTEGRATION:

1. Evaluate:  $\int \frac{x^2 dx}{1+x^3}$
2. If  $\int (e^{ax} + bx) dx = \frac{e^{4x}}{4} + \frac{3x^2}{2}$ , find the values of 'a' and 'b'
3. Evaluate:  $\int \sin 4x \cos 7x dx$
4. Evaluate:  $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$
5. Evaluate:  $\int \frac{5 dx}{\sqrt{x+3} - \sqrt{x-2}}$
6. Evaluate:  $\int \frac{x^3 - x^2 + x - 1}{x-1} dx$
7. Evaluate:  $\int_0^1 \frac{2x}{1+x^2} dx$
8. Evaluate:  $\int_0^{\frac{\pi}{2}} \frac{\sin x}{1+\cos^2 x} dx$
9. Evaluate using properties of definite integrals:  $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cot x}}{\sqrt{\cot x} + \sqrt{\tan x}} dx$
10. Evaluate using properties of definite integrals:  $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} x^3 \cos 2x dx$
11. Evaluate:  $\int x \log(1+x) dx$
12. Evaluate:  $\int \frac{dx}{\sqrt{3-x+x^2}}$
13. Evaluate:  $\int e^x [\tan x + \log \sec x] dx$
14. Evaluate:  $\int \cos^4 x dx$
15. Evaluate:  $\int \frac{dx}{(x-1)^2(x-2)}$
16. Evaluate:  $\int_0^{\pi} |\cos x| dx$
17. Prove that:  $\int_0^a f(x) dx = \int_0^a f(a-x) dx$ . Use it to evaluate:  $\int_0^2 x\sqrt{2-x} dx$
18. Evaluate:  $\int_0^{\frac{\pi}{2}} \frac{x}{\sin x + \cos x} dx$

## Area of Bounded Region:

1. Find the area enclosed by  $x = 4y - 2$  and parabola  $x^2 = 4y$
2. Find the area of triangle with vertices (4, 1), (6, 6) and (8, 4).

3. Find the area of triangle with sides  $y = 2x + 1$ ,  $y = 3x + 1$  and  $x = 4$ .
4. Area of circle  $x^2 + y^2 = 16$  in the exterior of parabola  $y^2 = 6x$
5. Find the area of the smaller region bounded by the ellipse  $\frac{x^2}{9} + \frac{y^2}{4} = 1$  and line  $\frac{x}{3} + \frac{y}{2} = 1$ .
6. Find the area enclosed between the parabola  $y^2 = x$  and line  $y + x = 2$ .
7. Find the area of the region  $\{ (x, y) : x^2 + y^2 \leq 1 \leq x + y \}$
8. Using integration find the area of the region given by:  
 $\{(x, y) : 0 \leq y \leq x^2, 0 \leq y \leq x + 1, 0 \leq x \leq 2\}$
9. Using integration, find the area of the triangular region whose vertices are (1,0), (2,2) and (3,1)
10. Using integration, find the area bounded by the lines:  
 $x + 2y = 2$ ,  $y - x = 1$  and  $2x + y = 7$ .

### **DIFFERENTIAL EQUATIONS :**

1. Solve:  $\frac{dy}{dx} + 2y = 2x$
2. Solve:  $\frac{dy}{dx} + y \cot x = \sec x$ .
3. Solve:  $(1 + y^2)dx + x dy = 0$  given that  $y(1) = 1$ .
4. Solve:  $\frac{dy}{dx} = y^2 \tan 2x$  given that  $y(0) = 2$ .
5. Solve:  $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$
6. Solve:  $(x - 1) \frac{dy}{dx} = 2xy$ , given that  $y(2) = 1$ .
7. Solve:  $\frac{dy}{dx} - y = x e^x$
8. Solve:  $(x - xy)dy = y dx$ .
9. Show that  $y = e^{-x} + ax + b$  is a solution of the differential equation:  $e^x y_2 = 1$
10. Show that  $y = A \cos x - B \sin x$  is a solution of the differential equation  $y_2 + y = 0$
11. Show that  $y = x \sin 3x$  is the solution of the differential equation:  $y_2 + 9y - 6 \cos 3x = 0$
12. Solve:  $x^2 y dx - (x^3 + y^3) dy = 0$ .
13. Solve:  $y^2 dx + (x^2 - xy) dy = 0$ .
14. Solve:  $x y_1 = y - \sqrt{x^2 + y^2}$
15. Solve:  $\frac{dy}{dx} = (y/x) + \tan(y/x)$
16.  $x \sqrt{1-y^2} dx + y \sqrt{1-x^2} dy = 0$ .

17. Determine the order and degree of the equation.

$$\left(\frac{ds}{dt}\right)^2 + 3s\left(\frac{d^2s}{dt^2}\right)^2 = 0$$

18. Solve  $(y + xy)dx + (x - xy^2)dy = 0$

### VECTOR ALGEBRA:

1. If  $\vec{a}$  is a unit vector and  $(\vec{x} + \vec{a}) \cdot (\vec{x} - \vec{a}) = 15$ , find  $|\vec{x}|$
2. Given  $\vec{AB} = 3\hat{i} - \hat{j} - 5\hat{k}$  and coordinate of the terminal point are  $(0, 1, 3)$ . Find the coordinate of the initial point.
3. If  $|\vec{a}| = 2$ ,  $|\vec{b}| = 5$  and  $|\vec{a} \times \vec{b}| = 8$ , find the value of  $\vec{a} \cdot \vec{b}$ .
4. If  $\vec{a} = \hat{i} + 2\hat{j} - \hat{k}$  and  $\vec{b} = 3\hat{i} + \hat{j} - 5\hat{k}$  find a unit vector in the direction of  $\vec{a} - \vec{b}$
5. If the position vectors of the points A and B are  $2\hat{i} + 3\hat{j} - \hat{k}$  and  $3\hat{i} + 2\hat{j} + \hat{k}$  then find the vector of magnitude 6 units in the direction of  $\vec{AB}$
6. If P(1, 5, 4) and Q(4, 1, -2), find the direction ratios and direction cosines of  $\vec{PQ}$
7. If the angle between two vectors  $\vec{a}$  and  $\vec{b}$  of equal magnitude is  $30^\circ$  and their scalar product is  $2\sqrt{3}$ , find their magnitudes.
8. Find the value of  $\lambda$  so that the vectors  $3\hat{i} - \hat{j} - 5\hat{k}$  and  $2\hat{i} + 3\hat{j} - \lambda\hat{k}$  are parallel
9. Find the value of  $\lambda$  so that the vectors  $3\hat{i} - \hat{j} - 5\hat{k}$  and  $2\hat{i} + 3\hat{j} - \lambda\hat{k}$  are perpendicular
10. If  $\vec{a} = 4\hat{i} + 2\hat{j} - \hat{k}$  and  $\vec{b} = 5\hat{i} + 2\hat{j} - 3\hat{k}$  find the angle between  $\vec{a} + \vec{b}$  and  $\vec{a} - \vec{b}$
11. Find the value of  $\lambda$  when the scalar projection of  $\vec{a} = \lambda\hat{i} + \hat{j} + 4\hat{k}$  on  $\vec{b} = 2\hat{i} + 6\hat{j} + 3\hat{k}$  is 4 units.
12. Show that the vectors  $\vec{a} = 3\hat{i} - 2\hat{j} + \hat{k}$ ,  $\vec{b} = \hat{i} - 3\hat{j} + 5\hat{k}$  and  $\vec{c} = 2\hat{i} + \hat{j} - 4\hat{k}$  form a right angled triangle.
13. If  $\vec{a}$ ,  $\vec{b}$  and  $\vec{c}$  are three vectors such that  $\vec{a} + \vec{b} + \vec{c} = 0$  and  $|\vec{a}| = 3$ ,  $|\vec{b}| = 5$ ,  $|\vec{c}| = 7$ , find the angle between  $\vec{a}$  and  $\vec{b}$ .
14. Find the position vector of a point R which divided the line segment joining the points P and Q with position vectors  $\hat{i} + 2\hat{j} - \hat{k}$  and  $-\hat{i} + \hat{j} + \hat{k}$  respectively in the ratio 2 : 1 i) internally ii) externally.
15. Show that the points A(2, 6, 3), B(1, 2, 7) and C(3, 10, -1) are collinear.
16. Three vertices of a triangle are A(0, -1, -2), B(3, 1, 4) and C(5, 7, 1). Show that it is a right angled triangle. Also find the other two angles.
17. For the points A(1, 1, 1), B(2, 5, 0), C(3, 2, -3) and D(1, -6, -1) find the angle between  $\vec{AB}$  and  $\vec{CD}$ .
18. If  $\vec{a}$ ,  $\vec{b}$  and  $\vec{c}$  are three vectors such that  $\vec{a} + \vec{b} + \vec{c} = 0$ , prove that  $\vec{a} \times \vec{b} = \vec{b} \times \vec{c} = \vec{c} \times \vec{a}$ .
19. Find the area of the parallelogram with diagonals  $3\hat{i} + \hat{j} - 2\hat{k}$  and  $\hat{i} - 3\hat{j} + 4\hat{k}$ .
20. The scalar product of the vector  $\hat{i} + \hat{j} + \hat{k}$  with the unit vector along the sum of vectors  $2\hat{i} + 4\hat{j} - 5\hat{k}$  and  $\lambda\hat{i} + 2\hat{j} + 3\hat{k}$  is equal to 1. Find the value of  $\lambda$ .

Chap-1. Relations and functions

Q.1. Example 5 on page - 03

Q.2. Example 6 on page - 4

Q.3 Let  $f: \mathbb{N} \rightarrow \mathbb{R}$  be a function defined as  $f(x) = 4x^2 + 12x + 15$ . Prove that  $f: \mathbb{N} \rightarrow S$ , where  $S$  is the range of  $f$ , is one-one onto functionQ.4 Consider  $f: \mathbb{R}_+ \rightarrow [-5, \infty)$  given by  $f(x) = 9x^2 + 6x - 5$ . Show that  $f$  is one-one onto function.Q.5. Show that the relation  $R$  in the set  $\mathbb{Z}$  of integers given by  $R = \{(a, b) : 2 \text{ divides } |a-b|\}$  is an equivalence relation. Also find equivalence class of 2.Chap-2 Inverse Trigonometric functions

1. Find the principal values of the following

(a)  $\sin^{-1}(-\frac{1}{2}) + \tan^{-1}(-\sqrt{3}) + 2 \cos^{-1}(-\frac{1}{2})$

(b)  $\tan^{-1}(\sqrt{3}) - \sec^{-1}(-2) + 2 \sin^{-1}(\frac{\sqrt{3}}{2})$

2. Draw the graph of  $\sec^{-1}x$  and find domain and range of it.3. Simplify  $\tan^{-1}\left(\frac{\sqrt{1+x} - \sqrt{1-x}}{\sqrt{1+x} + \sqrt{1-x}}\right)$ ,  $-\frac{1}{\sqrt{2}} \leq x \leq 1$ Chap-3. Matrices

1. Ex 3.2 Q. No. 16, 18 and 20.

2. Miscellaneous Ex. - Q. No. 3, 7, 9, and 10, 11.



## Chap. 4. Determinants.

1. Ex. 4.3, Q. No. 2.
2. Example 26. on page - 131.
3. Ex 4.5, Q. No. 15 and 16.
4. Ex. 4.6 Q. No 15, and 16.
5. Example 33. on page - 139.

6. If  $A^{-1} = \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ , find  $(AB)^{-1}$

## Chap. 5. Continuity and differentiability.

1. Show that  $f(x) = |1-x+|x||$ ,  $x \in \mathbb{R}$ , is a continuous function
2. Find the value of  $p$  and  $q$ , for which

$$f(x) = \begin{cases} \frac{1 - \sin^3 x}{3 \cos^2 x} & \text{if } x < \frac{\pi}{2} \\ p & \text{if } x = \frac{\pi}{2} \\ \frac{q(1 - \sin x)}{(\pi - 2x)^2} & \text{if } x > \frac{\pi}{2} \end{cases} \text{ is cont. at } x = \frac{\pi}{2}.$$

3. If  $y = (\cos x)^{\cos x} (\sec x)^{\sec x}$ , then show that

$$\frac{dy}{dx} = \frac{y^2 \tan x}{y \log \cos x - 1}.$$

4. If  $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$ , then show that

$$\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{1-x^2}.$$

5. If  $x = a(\cos t + t \sin t)$  and  $y = a(\sin t - t \cos t)$ ,  $0 < t < \frac{\pi}{2}$ ,

$$\text{Find } \frac{d^2x}{dt^2}, \frac{d^2y}{dt^2}, \frac{d^2y}{dx^2} \text{ at } t = \frac{\pi}{4}.$$

6. If  $y = (x + \sqrt{1+x^2})^h$ , then show that

$$(1+x^2) \frac{d^2y}{dx^2} + x \frac{dy}{dx} = h^2 y.$$

7. Ex 7.7. Q No. 5 and 7.
8. Write and ~~learn~~ <sup>understand</sup> Properties of Definite Integrals.
9. Ex 7.11. Q No 15, 16.
10. Example 43. and 44 on page. 351.
11. Miscellaneous ex. Q No. 10, 20, 28, 30 and 7.

### Chap-8 Application of Integrals:-

1. Example - 4. and 5.
2. Ex. 8.1 Q No. 3, 8, 9.
3. Example 7. and 10.
4. Miscellaneous ex. Q No. 12 and 15.

### Chap-9. Differential Equations.

1. Ex 9.4. Q No. 11, 19, 21. and 22
2. Example 15 on page-399.
3. Ex 9.5, Q No. 9, 10, 11, 13 and 15.
4. Example - 21 and 22 on page 411 and Example 23 on page -412
5. Ex 9.6. Q No - 11, 15, 17.
6. Example 28 on page -418.
7. Miscellaneous ex. Q No. 3, 4, 7, and 11 and 15.

### Chap-9. Vector Algebra

1. Ex 10.2, Q No. 14 and 17.
2. Ex 10.3 Q No. 13, 15, 16.
3. Ex 10.4. Q No. 3, 5, and 8, 10.
4. Example - 28, 30.
5. Miscellaneous ex. Q No. 9, 12, 13, 14.

7. Ex 5.1 Q. No. 24, and 34.
8. Ex 5.2 Q. No. 10
9. Ex 5.5. Q. No. 11, 15, 16.
10. Ex 5.6. Q. No. 7. and 11
11. Miscellaneous ex. Q. 14, 15 and 23.

### Chap-6 Application of Derivatives.

1. Ex. 6.1 Q. No. 5, 13, 14.
2. Example 12. on page 203.
3. Example 13 on page 204.
4. Ex. 6.2 Q. No. 7, and 9, Q. No. 15.
5. Example 38 on page - 227
6. Ex. 6.5, Q. No. 23, 24, 25, 26.
7. Example 48 on page-239.
8. Miscellaneous ex. Q. No. 6, 7, 15, 17, 18.

### Chap 7 Integrals.

1. Ex 7.2 Q. No. 34, and 37
2. Ex 7.3 Q. No. 21 and 22
3. Example 10. on page 313.
4. Ex. 7.4, Q. No. 12, and 22.
4. Ex 7.5 Q. No. 15, 16, 20, 21,
5. Example 22 on page. 327,
6. Learn <sup>(understand)</sup> and write & standard integral formulae

~~i)  $\int \frac{1}{\sqrt{x^2 - a^2}} dx$ , (ii)  $\int \frac{1}{\sqrt{x^2 + a^2}}$~~

i)  $\int \frac{1}{x^2 + a^2} dx$

ii)  $\int \frac{1}{a^2 - x^2} dx$

iii)  $\int \sqrt{x^2 + a^2} dx$

iv)  $\int \sqrt{a^2 - x^2} dx$

v)  $\int \frac{1}{\sqrt{x^2 - a^2}} dx$

vi)  $\int \frac{1}{\sqrt{a^2 - x^2}} dx$ .

# HOLIDAY HOME WORK FOR AUTUMN BREAK 2022

## Class XII

### Subject-Biology

1. Solve the sample question paper given by CBSE 2022-23
2. Solve the CCT and CA questions from question bank given by KVS.
3. Practice reason and assertion type question.
4. Practice MCQ type of questions.
5. Practice diagram-based questions.
6. Complete the biology practical record file.

**Autumn break homework**  
**Session: 2022 -2023**  
**Class 12th**  
**Subject: Biotechnology**  
**Date: 1 /10/2022**

- 1. Prepare and complete the project file on the topics already allotted in the month of June.**
- 2. Prepare your practical file with all work completed and with proper cover.**
- 3. Solve the CBSE sample paper 2022 in the notebook and learn it.**
- 4. Solve these following question in the notebook daywise. ( Do not copy any questions just write the answer with proper serial number.)**

**Day 1**

1. A biotechnologist wants to develop a variety of rice, which can survive in high salinity. How can he do so?
2. Both PCR and M-13 bacteriophage can amplify DNA with respect to the DNA fragment obtained. What is the basic difference between the two?
3. Differentiate between finite and continuous cell lines.
4. Analysis of m-RNA in a given cell doesn't provide a direct reflection of its protein content. Give two reasons to support the statement.
5. Downstream processing becomes difficult and costly, if eukaryotic proteins are produced in prokaryotes. Give two reasons.

*freedom is  
defeat it  
with all  
your might*

6. How is the blue-white selection method used to screen transformed host cells?
7. Differentiate between primary and secondary metabolites in plants.
8. What are the main areas of consideration for safety aspects specific to Microbial Culture ? (Any three)

## Day 2

1. a. Why do we need different kinds of cloning vectors?  
b. What will you observe if you use a YAC vector prepared without Autonomously Replicating Sequence (ARS) a vector?  
c. In order to produce a foreign protein in the host, what is the suitable vector? State one special feature of these type of vectors.
2. Name 2 databases commonly used in bioinformatics. What all information do they respectively store?  
Name any one database retrieval tool and give its application.
3. Why do cereals and legumes have a limited nutritional quality? Write two genetic engineering approaches that have been used to improve the seed protein quality.
4. a. What are Epitopes?  
b. Differentiate between monoclonal and polyclonal antibodies.
5. Detergents now-a-days are provided with 'biologically active

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to defend it  
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our might*

enzymes'.

(a) Name the enzyme commonly used.

(b) Why is this enzyme inactivated in the presence of bleach ?

(c) How is the engineered enzyme different from its natural form ?

### Day 3

1. (a) Why are fermentors provided with baffles ?

(b) Foaming of (in) medium can hinder microbial growth. Why ?

(c) Microbial strains are usually exposed to chemicals like NTG (Nitrosoguanidine). Why ?

2. (a) What is a 'gene knockout' ?

(b) Why are mouse models prepared using gene knockouts useful ?

3. Who developed the technique to grow Human Embryonic Stem Cells (hESCs) in culture and what is the source of these cells ?

4. Define the terms : RefSeq, Homologues and Paralogs.

5. What is BLAST ? Write the principles that underlie BLAST search. Draw a labelled diagram showing the technique which can be used to identify and locate a specific sequence in a DNA gel using a probe.

6. Draw a diagram to show and compare the features of pBR 322 and YEp .

7. Why is YEp called a shuttle vector ?

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Send it  
with all  
our might*

## Day 4

1. (a) What are stem cells ?  
(b) Differentiate between pluripotent and multipotent stem cells. Which of these act as repair system for the body and how ?  
(c) Give three applications of stem cells in the field of medicine.
2. (a) How are edible vaccines produced ?  
(b) Edible vaccines have advantages over recombinant vaccines produced by bacteria. List any three advantages.
3. (a) What are nutraceutical proteins ?  
(b) Curd has been used as a pro-biotic. Why ?
4. (a) Whey protein can treat a spectrum of diseases. Explain.  
(b) In which food system is the water binding property of whey protein used ?
5. (a) Why is sickle cell anaemia called a molecular disease?  
(b) Describe the technique used to identify this disease in the laboratory.  
(c) Who developed this technique?
6. Explain with suitable diagram, the steps and principle involved in Sanger's method of DNA sequencing.

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Defend it  
with all  
our might*



## Day 5

1.. Justify the statements, giving reasons:

(a) Golden rice is nutritionally superior to normal rice.

(b) Edible vaccines are better than conventional vaccines.

(c) Plants are cheap chemical factories to produce thousands of chemical molecules.

2. Describe the important parts of a mass spectrometer with diagram. Describe its use in study of proteins.

3. With the help of suitable diagram, describe major steps in making of a 'recombinant plasmid'.

4. (a) Describe how hybridoma technology is used for producing monoclonal antibody.

(b) Enlist two therapeutic mAb, with their application.

5. Germplasm conservation through the conventional methods has many limitations. Name any four.

6. Properties of proteins decide its purification scheme. Enlist any two such properties.

7. What are expression vectors ? What kind of promoter should be used in such vectors?

8. What is a metagenome? How is metagenomics used to screen for novel microbial products?

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and it  
to all  
or might*

**PRACTICAL SYLLABUS & LIST OF PRACTICALS**

**COMPUTER SCIENCE - XII**

**SESSION 2022-23**

S.No	Unit Name	Marks (Total=30)
1	<b>Lab Test:</b>  1. Python program (60% logic + 20% documentation + 20% code quality)	8
	2. A stub program with Python SQL connectivity must be provided with blanks (4 blanks) to be filled by the student with the desired SQL query.	4
2	<b>Report file:</b> <ul style="list-style-type: none"><li>• Minimum 15 Python programs.</li><li>• SQL Queries – Minimum 5 sets using one table / two tables.</li><li>• Minimum 4 programs based on Python - SQL connectivity</li></ul>	7
3	Project (using concepts learnt in Classes 11 and 12)	8
4	Viva voce	3

**Python Programming**

1. Write a python program to search an element in a list and display the frequency of elements present in the list and their location using Linear search by using a user defined function. [List and search element should be entered by user]
2. Write a python program to search an element in a list and display the frequency of elements present in the list and their location using binary search by using a user defined function. [List and search element should be entered by user]
3. Write a python program to pass a list to a function and double the odd values and half

even values of a list and display list elements after changing.

4. Write a Python program input n numbers in tuple and pass it to function to count how many even and odd numbers are entered.

5. Write a Python program to function with key and value, and update value at that key in the dictionary entered by the user.

6. Write a Python program to pass a string to a function and count how many vowels present in the string.

7. Write a Python program to generate (Random Number) that generates random numbers between 1 and 6 (simulates a dice) using a user defined function.

8. Write a **menu driven** python program to implement **10** python mathematical functions.

9. Write a python program to implement python string functions. **(all listed in Sumita Arora book)**

10. Write a menu driven program in python to delete the name of a student from the dictionary and to search phone no of a student by student name. Create menu as below:

MENU

1. Delete from Dictionary

2. Search Phone number using name from Dictionary

3. Exit

11. Write a python program to read and display file content line by line with each word separated by #.

12. Write a python program Read a text file and display the number of vowels, consonants, uppercase, lowercase characters in the file.

13. Write a Menu driven program in python to count spaces, digits, words and lines from text file TOY.txt

14. Write a python program to remove all the lines that contain the character „a” in a file and write it to another file.

15. Write a python program to create a binary file with name and roll number. Search for a given roll number and display name, if not found display appropriate message.

16. Write a python program to create a dictionary with roll number, name and marks. Accept 5 records from the user and write them into a binary file. You may use dictionary as student={1:(“Asmita”,89.7),2:(“Swati”,87.5)}

17.\* Write a python program to create a CSV file by entering user-id and password, read and search the password for given user-id.

18. Write a menu driven python program to create a CSV file by entering dept-id, name and city, read and search the record for given dept-id.

## MENU

1. Create csv file

2. Search record as per dept no

3.Exit

19. Write a Python program to implement a stack using list (PUSH & POP Operation on Stack).

20. Write a python program using the function PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error messages.

21. Write a python program using function POP(Arr), where Arr is a stack implemented by a list of numbers. The function returns the value deleted from the stack.

## Database Management

22. Create a school Database and then create a student table in the school database and insert data. Implement the following SQL commands on the student table:

ALTER table to add new attributes / modify data type / drop attribute

UPDATE table to modify data

ORDER By to display data in ascending / descending order

DELETE to remove tuple(s)

GROUP BY and find the min, max, sum, count and average

23. Integrate SQL with Python by importing the MySQL module record of employees and displaying the record.

24. Integrate SQL with Python by importing the MySQL module to search an employee using empno and if present in table display the record, if not display appropriate method.24. Integrate SQL with Python by importing the MySQL module to search a student using rollno, update the record.

25. Integrate SQL with Python by importing the MySQL module to search a student using rollno, delete the record.

### Project :

Final coding + Viva voce

### Project (using concepts learnt in Classes 11 and 12)

(Student has to make Project Based on the concept File Handling or Python/Database connectivity)

Project Title Example:

- v BANK MANAGEMENT SYSTEM,
- v BOOK SHOP MANAGEMENT SYSTEM
- v COMPUTER SALES AND SERVICE SYSTEM,
- v DAILY TRAVEL BOOKING SYSTEM,
- v EMPLOYEE MANAGEMENT SYSTEM,
- v HOSPITAL MANAGEMENT SYSTEM,
- v LIBRARY MANAGEMENT SYSTEM,
- v QUIZ PROJECT etc.

Project

The aim of the class project is to create something that is tangible and useful using Python file handling/Python-SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world

problem that is worthwhile to solve. Students are encouraged to visit local businesses and ask them about the problems that they are facing.

For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts for the GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, of course to do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves. The students should be sensitized to avoid plagiarism and violations of copyright issues while working on

Projects. Teachers should take necessary measures for this.

**VIVA Voce :**

Click on following link for Viva questions

<https://www.tutorialaicsip.com/cs-xii/computer-science-class-12-viva-voce/>

**KENDRIYA VIDYALAYA NO. 1**

**Holiday Homework (2022-23)**

**BUSINESS STUDIES**

**CLASS- XII**

- 1 What is meant by “Effectiveness in Management”?
- 2 What are the organizational objectives of management?
- 3 Give any two points of the features of Art.
- 4 “The management principles can be applied to all types of activities.” Which characteristic of management is highlighted by this statement?
- 5 ITC contributes Rs. 1 on the sale of every four classmate notebooks to its rural development initiative that supports, among other projects, primary education in villages. It uses eco-friendly and chlorine free paper for the production of its notebooks.  
Identify the management objective which ITC is trying to achieve.
- 6 Volvo Ltd’s target is to produce 10,000 shirts per month at a cost of Rs. 100 per shirt. The production manager achieved this target at a cost of Rs. 90 per shirt. Do you think the ‘Production manager’ is effective? Give one reason in support of your answer.
- 7 “In an organisation, the employees are happy and satisfied, there is no chaos and the effect of management is noticeable.” Which characteristic of management is highlighted by this statement?
- 8 Anmol, the sales manager of PQR Ltd., is given the responsibility of selling 2,000 LEDs in a month. This target could be achieved if he has a sales team of 10 people. Presently, only 8 persons are working under him. He was not allowed to hire more persons by his superiors. As a result, he fails to meet the target. Which principle of management is being violated here?
- 9 Mr. Ram started a small business with limited investment, he hired labour at very less wages. Over the time with broad vision of Ram and hard work of his employees, the business started earning very good revenue. But, with increase in earning capacity of company also Ram did not increase the wages and salary of his employees, they were not able to maintain a reasonable standard of living. Identify the principle of management, overlooked by Mr. Ram.
- 10 What do you mean by principle of management?

- 11** Explain the followings:
- (i) Principle of Scalar Chain
  - (ii) Unity of Command
- 12** Management has evolved like a discipline. There are number of books on management. Students are learning various principles and theories of management from these books. But all students of MBA do not become successful only by learning these principles. The success depends upon creative application of these principles. Today many companies have started giving importance to corporate social responsibility and Business Ethics.
- In the above para one feature of Science, Art and Profession each are given. Identify each one of them by quoting lines.
- 13** XYZ Power Ltd. set up a factory for manufacturing solar lanterns in a remote village as there was no reliable supply of electricity in rural areas. The revenue earned by the company was sufficient day by day, so the company decided to increase production to generate higher sales. For this they decided to employ people from the nearby villages as very few job opportunities were available in that area. The company also decided to open schools and crèches for the children of its employees
- Identify and explain the objectives of management discussed above.
- 14** Management is a series of continuous interrelated functions. Comment.
- 15** Ashutosh Goenka was working in 'AxeLtd.', a company manufacturing air purifiers. He found that the profits had started declining from last six months. Profit has an implication for the survival of the firm, so he analysed the business environment to find out the reasons for this decline.
- (i) Identify the level of management at which Ashutosh Goenka was working.
  - (ii) Explain three functions being performed by Ashutosh Goenka.
- 16** Explain any five features of Management Principles.
- 17** Company X is facing a lot of problems these days. It manufactures white goods like washing machines, microwave ovens, refrigerators and air conditioners. The company's margins are under pressure and the profits and market share are declining. The production department blames marketing for not meeting sales targets and marketing blames production department for producing goods, which are not of good quality meeting customers expectations. The finance department blames both production and marketing for declining return on investment and bad marketing.
- What quality of management do you think the company is lacking? Explain it and also explain the importance of it?



K.V.No.1 Armapur  
**Accountancy Homework**  
**Class XII**

- 1 Ritesh and Hitesh are childhood friends. Ritesh is a consultant whereas Hitesh is an architect. They contributed equal amounts and purchased a building for ₹ 2 crores. After a year, they sold it for ₹ 3 crores and shared the profits equally. Are they doing the business in partnership? Give reason in support of your answer.
- 2 What is meant by Fixed Capital of partners?
- 3 What is meant by Partnership Deed?
- 4 Give the average period in months for charging interest on drawings for the same amount withdrawn at the beginning of each quarter.
- 5 What share of profits would a “sleeping partner”, who has contributed 75% of the total capital, get in the absence of a deed?
- 6 Mohit and Rohit were partners in a firm with capitals of ₹ 80,000 and ₹ 40,000 respectively. The firm earned a profit of ₹ 30,000 during the year. Mohit’s share in the profit will be:  
(i) ₹ 20,000    (ii) ₹ 10,000    (iii) ₹ 15,000    (iv) ₹ 18,000
- 7 The interest on Partner’s Capital accounts is to be credited to.....  
(i) Profit & Loss A/c    (ii) Interest A/c  
(iii) Partner’s Capital A/c    (iv) None of these
- 8 X has given a loan of ₹ 50,000 to the firm. He claims 10% p.a. interest. Is his claim valid in case partnership deed is silent in his matter?
- 9 Which one of the following items cannot be recorded in the profit and loss appropriation account?  
(i) Interest on Capital    (ii) Interest on Drawings  
(iii) Rent paid to Partners    (iv) Partner’s Salary
- 10 Net profit of a firm is ₹ 79,800. Manager is entitled to a commission of 5% of profits after charging his commission. Manager’s commission will be:

(i) ₹ 4,200    (ii) ₹ 380    (iii) ₹ 3,990    (iv) ₹ 3,800

- 11** On 1-4-2021, Jay and Vijay, entered into partnership for supplying laboratory equipments to government schools situated in remote and backwards areas. They contributed capitals of ₹ 80,000 and ₹ 50,000 respectively and agreed to share the profits in the ratio of 3:2. The partnership deed provided that interest on capital shall be allowed at 9% p.a. During the year, the firm earned a profit of ₹ 7,800.  
Showing your calculations clearly, prepare 'Profit and Loss Appropriation Account' of Jay and Vijay for the year ended 31-3-2022.
- 12** Zee and Vee are partners in a firm. Their capital accounts showed the balance on 1<sup>st</sup> April, 2017 as ₹ 20,000 and ₹ 15,000 respectively. During the year 2017-18, Zee introduced additional capital of ₹ 10,000 on August 1, 2017 and Vee introduced ₹ 15,000 on 1<sup>st</sup> October, 2017. Interest on capital is allowed @ 6% p.a. on the capital. Calculate interest on capital of each partner.
- 13** A, B and C are partners sharing profits in the ratio of 5:4:1. C is given a guarantee that his share of profits in any given year would be ₹ 5,000. Deficiency if any, would be borne by A and B equally. The profit for the year ended 31<sup>st</sup> March, 2016 amounted to ₹ 40,000. Pass necessary entries in the books of the firm.
- 14** The partners of a firm, Alia, Bhanu and Chandu distributed the profits for the year ended 31<sup>st</sup> March, 2017, ₹ 80,000 in the ratio of 3:3:2 without providing for the following adjustments:
- (i) Alia and Chandu were entitled to a salary of ₹ 1,500 each p.m.
  - (ii) Bhanu was entitled for a salary of ₹ 4,000 p.a.
- Pass the necessary Journal entry for the above adjustments in the books of the firm.
- 15** Moli, Bhola and Raj were partners in a firm sharing profits and losses in the ratio of 3:3:4. Their partnership deed provided for the following;
- (i) Interest on capital @ 5% p.a.
  - (ii) Interest on Drawing @ 12% p.a.
  - (iii) Interest on partner's loan @ 6% p.a.
  - (iv) Moli was allowed an annual salary of ₹ 4,000; Bhola was allowed a commission of 10% of net profit as shown by Profit and Loss Account and Raj was guaranteed a profit of ₹ 1,50,000 after making all the adjustments as provided in the partnership agreement.
  - (v) Their fixed capitals were Moli: ₹ 5,00,000; Bhola: ₹ 8,00,000 and

Raj: ₹ 4,00,000. On 1<sup>st</sup> April, 2016 Bhola extended a loan of ₹ 1,00,000 to the firm. The net profit of the firm for the year ended 31<sup>st</sup> March, 2017 before interest on Bhola's loan was ₹ 3,06,000.

Prepare Profit and Loss Appropriation account of Moli, Bhola and Raj for the year ended 31<sup>st</sup> March, 2017 and their Current Accounts assuming that Bhola withdrew ₹ 5,000 at the end of each month. Moli withdrew ₹ 10,000 at the end of each quarter and Raj withdrew ₹ 40,000 at the end of each half year.

- 16** On March 31<sup>st</sup>, 2014, the balances in the capitals accounts of Ekta, Ankit and Chahat after making adjustments for profits and drawings were ₹ 1,50,000; ₹ 2,10,000 and ₹ 2,70,000 respectively. Subsequently, it was discovered that the interest on capital and drawings had been omitted.
- (i) The profit for the year ended 31<sup>st</sup> March, 2014 was ₹ 1,20,000.
  - (ii) During the year Ekta withdrew ₹ 24,000 and Ankit and Chahat each withdrew a sum of ₹ 24,000 in equal instalments in the middle of each quarter.
  - (iii) The interest on drawing is to be charged @ 5% p.a. and interest on capital is to be allowed @ 10% p.a.
  - (iv) The profit sharing ratio among the partners was 1:2:3.
  - (v) Showing your working notes clearly, pass the necessary rectifying entry.

# AUTUMN BREAK HOLIDAY ASSIGNMENT

## CLASS XII

### SUBJECT -ECONOMICS

Solve and Revise Macro Economics CBSE Examination Papers( Given in Book )

#CBSE sample papers MCQs solve and revise 2017 2018 2019 2020 2021 2022

Learn Macro Economics Chapter : #concept and component aggregate demand and aggregate supply

# determination of income and Employment

# concept of short run equilibrium, output and investment multiplier

# deficit demand Excess demand and its corrective measures (7,8,9,10)

(# Test will be conducted of these chapters after opening the school)

#### **Project work Topics-**

#concept of liquidity.

#GST

#Demonetisation in India

# Multiplier and its Application in the Indian economy

#Problem of unemployment in India.

#Digital India Movement in India.

#The Central Bank and its Functions

#Development of Indian Economy

# New Economic policy of India 1991

# Human capital formation.

# Green Revolution in India .

#Skill India mission .

**Mode of presentation/submission of the Project:**

At the end of the stipulated term, each learner will present the research work in the Project File to the External and Internal examiner. **The questions should be asked from the Research Work/ Project File of the learner. The Internal Examiner should ensure that the study submitted by the learner is his/her own original work.** In case of any doubt, authenticity should be checked and verified.

**Marking Scheme :**

Marks are suggested to be given as –

S. No.	Heading	Marks Allotted
1.	Relevance of the topic	3
2.	Knowledge Content/Research Work	6
3.	Presentation Technique	3
4.	Viva-voce	8
	Total	20 Marks

**Suggestive List of Projects:**

Class XI	
• Effect on PPC due to various government policies	• Invisible Hand (Adam Smith)
• Opportunity Cost as an Economic Tool (taking real life situations)	• Effect of Price Change on a Substitute Good (taking prices from real life visiting local market)
• Effect on equilibrium Prices in Local Market (taking real life situation or recent news)	• Effect of Price Change on a Complementary Good (taking prices from real life visiting local market)
• Solar Energy, a Cost Effective Comparison with Conventional Energy Sources	• Bumper Production- Boon or Bane for the Farmer
• Any other newspaper article and its evaluation on basis of economic principles	• <b>Any other topic</b>

Class XII	
• Micro and Small Scale Industries	• Food Supply Channel in India
• Contemporary Employment situation in India	• Disinvestment policy of the government
• Goods and Services Tax Act and its Impact on GDP	• Health Expenditure (of any state)
• Human Development Index	• Inclusive Growth Strategy
• Self-help group	• Trends in Credit availability in India
• Monetary policy committee and its functions	• Role of RBI in Control of Credit
• Government Budget & its Components	• Trends in budgetary condition of India
• Exchange Rate determination – Methods and Techniques	• Currency War – reasons and repercussions
• Livestock – Backbone of Rural India	• Alternate fuel – types and importance
• Sarwa Siksha Abhiyan – Cost Ratio Benefits	• Golden Quadrilateral- Cost ratio benefit
• Minimum Support Prices	• Relation between Stock Price Index and Economic Health of Nation
• Waste Management in India – Need of the hour	• Minimum Wage Rate – approach and Application
• Digital India- Step towards the future	• Rain Water Harvesting – a solution to water crises
• Vertical Farming – an alternate way	• Silk Route- Revival of the past
• Make in India – The way ahead	• Bumper Production- Boon or Bane for the farmer
• Rise of Concrete Jungle- Trend Analysis	• Organic Farming – Back to the Nature
• Any other newspaper article and its evaluation on basis of economic principles	• <b>Any other topic</b>