NEW ERA PUBLIC SCHOOL, PATNA

(Affiliated to CBSE, Delhi, Upto 10+2 Level)

Summer Vacation Homework (2024-25)

CLASS – XII Science

Subject	HOMEWORKS
Maths	Do complete Exercise -9A and 9B of chapter -9 (Continuity and Differentiability) with examples from RS Agarwal book.
English	1. Project (Flamingo) Write an article on the prevailing custom of Child Labour in our society on the basis of your understanding the chapter 'Lost Spring' in 200 words. 2. Project (Vistas) Write summary of the chapter 'The Enemy' , in your own language, in 200 words.

Std-12
Physics

1. If the radius of the Gaussian surface enclosing a charge is halved, how does the electric flux through the Gaussian surface change ?
2. Why do the electric field lines not form closed loops?
3. Two charges of magnitudes -3Q and + 2Q are located at points (a, 0) and (4a, 0) respectively. What is the electric flux due to these charges through a sphere of radius '5a' with its centre at the origin?
4. Why do the electric field lines never cross each other?
5. A spherical conducting shell of inner radius rx and outer radius r2 has a charge 'Q'. A charge 'q' is placed at the centre of the shell.
   (a) What is the surface charge density on the
   (i) inner surface,
   (ii) outer surface of the shell?
   (b) Write the expression for the electric field at a point $x > r_2$ from the centre of the shell.
6. Show that the electric field at the surface of a charged conductor is given by $E=\sigma/\varepsilon_0 n\hat{}$, where σ is the surface charge density and h is a unit vector normal to the surface in the outward direction.
7. A thin straight infinitely long conducting wire having charge density X is enclosed by a cylindrical surface of radius r and length l, its axis coinciding with the length of the wire. Find the expression for the electric flux through the surface of the cylinder.
8. A hollow cylindrical box of length 1m and area of cross-section 25 cm^2 is placed in a three dimensional coordinate system as shown in the figure. The electric field in the region is given by $E=50xi\hat{}$ where E is in NC^{-1} and x is in metres. Find

   (a) Net flux through the cylinder.

   (b) Charge enclosed by the cylinder

9. Define the term 'electric flux'. Write its S.I. units. What is the flux due to electric field $E=3\times10^3 i\hat{}$ N/C through a square of side 10 cm, when it is held normal to if?
10. State 'Gauss law' in electrostatics. Use this law to derive an expression for the electric field due to an infinitely long straight wire of linear charge density λ $cm^{-1.}$
11. Two charged spherical conductors of radii R_1 and R_2 when connected by a conducting wire acquire charges q_1 and q_2 respectively. Find the ratio of their surface charge densities in terms of their radii.
12. Two point charges + q and -2q are placed at the vertices 'B' and 'C' of an equilateral triangle ABC of side as given in the figure. Obtain the expression for (i) the magnitude and (ii) the direction of the resultant electric field at the vertex A due to these two charges.
13. A charge is distributed uniformly over a ring of radius 'a'. Obtain an expression for the electric intensity E at a point on the axis of the ring. Hence show that for points at large distances from the ring, it behaves like a point charge.

Complete the all exercise problem of NCERT chapter -1

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STD-12

CHEMISTRY

1. Give an example of 'liquid in solid' type solution.
2. Which of the following is a dimensionless quantity: molarity, molality ormole fraction?
3. 10 g glucose is dissolved in 400 g. of solution. Calculate percentageconcentration of the solution.
4. Under what condition molality and molarity of a solution are identical.
   Explain with suitable reason.
5. Addition of HgI_2 to KI (aq.) shows decrease in vapour pressure. Why?
6. What will happen to the boiling point of the solution formed on mixing two miscible liquids showing negative deviation from Raoult's law?
7. Liquid 'Y' has higher vapour pressure than liquid 'X', which of them will have higher boiling point?
8. When 50 mL of ethanol and 50 mL of water are mixed, predict whether the volume of the solution is equal to, greater than or less than 100 mL.Justify.
9. Which type of deviation is shown by the solution formed by mixing cyclohexane and ethanol?
10. A and B liquids on mixing produce a warm solution. Which type of deviationfrom Raoult's law is there?
11. Define cryoscopic constant (molal freezing point depression constant.)
12. Mention the unit of ebulioscopic constant (molal boiling point elevation constant.)
13. If k_f for water is 1.86 K kg mol^{-1}, what is the freezing point of 0.1 molal solution of a substance which undergoes no dissociation or association of solute?
14. What is reverse osmosis? Give one large scale use of it.
15. What is the maximum value of van't Hoff factor (i) for $Na_2SO_4 . 10H_2O$?
16. What is the value of van't Hoff factor (i) if solute molecules undergo dimerisation.
17. Under what condition is van't Hoff factor less than one?
18. The Phase Diagram for pure solvent and the solution containing nonvolatile solute are recorded below. The quantity indicated by 'X' in the figure is known as :
19. (a)What are ideal solutions? Write two examples.

    (b) Calculate the osmoic pressure in pascals exerted by a solution prepared by dissolving 1.0g of polymer of molar mass 185000 in450 mL of water at 37°C.
20. Describe a method of determining molar mass of a non-volatile solute from vapour pressure lowering.

Std--12
BIOLOGY

(1) Name the pollinating agent of flowers like salvia, sunflower. Give two favorable features of such a flower for pollination.

(2) Give characteristics of insect pollinated flowers.

(3) Name the pollinating agents of flowers like maize and wheat. Give any two characteristic features of such a flower.

(4) An anther with malfunctioning tapetum often fails to produce viable male gametophytes. Give any one reason.

(5) Explain pollen-pistil interaction.

(6) Difference between microsporogenesis and megasporogenesis.

(7) Explain 7celled 8 nucleate stage of mature embryo.

(8) Draw a well labelled diagram of male reproductive system and explain its function.

(9) Draw a well labelled diagram of female reproductive system and explain its function.

(10) Explain the process of gametogenesis.

PROJECT WORK

Prepare a investigatory project on any one of the topic
1.Infertility or IVF
2.Microbes in human welfare
3.Drug addiction and alcohol abuse
4.Biotechnology and its application .
5.Gametogenesis.

Prepare a art integrated project/Chart/Model on topic :
1. Emasculation and Bagging. 2.Draw a well labelled diagram on following topic in A4 size sheet paper.
Sexual Reproduction in flowering plant 1.Microsporogenesis, 2.Structure of Mature Ovule
Human reproduction 1.Male reproductive system
2. Female reproductive system.
3. Event of menstrual cycle.

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HOLIDAY HOME-WORK NOTICE
SESSION - (2024-25)

1. Do all the homework in Homework copy.
2. Write in cursive handwriting only.
3. Holiday Homework contains 5 Marks for each subject.
4. Summer Vacation will be between 20/05/2024(Monday) to 17/06/2024(Monday). School will re-open on 18/06/2024(Tuesday).
5. You can also get Holiday Homework fromSchool App. and Website:- www.newerapublicschool.org