TECNIA INTERNATIONAL SCHOOL
(AN ENGLISH MEDIUM SR. SEC. SCHOOL AFFILIATED TO CBSE)
F-19, SEC-8, ROHINI
NEW DELHI-85
HOLIDAY HOMEWORK
2018-19
Class-XII A

ENGLISH

I. Attempt all questions.

Q1. You want to sell your house at 15 Rajendra Nagar, New Delhi. Draft an advertisement in not more than 50 words, giving the necessary details, to be published in the classified columns of 'The New India Express.' You are Krishna/Alka.

Q2. You are Anuj, a social activist. Design a poster to observe 'Wildlife Protection Week' in your city, in 50 words.

Q3. G.L. Institute recently organised a 'No Tobacco' Workshop. Write a report on the same to be published in the newspaper in 150-200 words.

Q4. Spurt of violence previously unknown in Indian schools makes it incumbent on the educationists to introduce value education effectively in schools. Write an article in 150-200 words expressing your views on the need of value education. You are Anu/Aditya.

Q5. 'Brain Drain is not a bane for a country like India.' Write a debate in 150-200 words either for or against the motion.

CHEMISTRY

1. Complete the practical file.

2. Prepare a scientific investigations based project involving laboratory testing and collecting information from other sources.

3. Do the given question bank of Ch-1, Ch-2 and Ch-10 in chemistry notebook.

QUESTION BANK

Chapter 1: The Solid State

Q.1. Differentiate between schottky defect and frenkel defect?

Q.2. The unit cell of an element of atomic mass 108 and density 10.5 g/cm^3 is a cube with edge length 409 pm. Find the structure of the crystal lattice.

Q.3. What is the distance between K$^+$ and F$^-$ in KF, if the density of KF is 2.48 g/cm^3?

Q.4. Differentiate between stoichiometric and non-stoichiometric defect.

Q.5. Differentiate between ferromagnetism, anti-ferromagnetism and ferrimagnetism.

Q.6. What are octahedral and tetrahedral void?

Q.7. The length of unit cell edge of BCC metal crystal is 352 pm. Calculate the radius of an atom of the metal.

Q.8. Why do solids have high density and low compressibility?

Q.9. Why melting point of crystalline solid is sharp whereas amorphous solid is not?

Q.10. Why do ionic solids have high melting and boiling points?

Q.11. Why does electrical conductivity of most metals decrease with increase in temperature?

Q.12. The nearest neighbour Ag atoms in the silver crystal are 2.5×10^{-8} cm. Presuming fcc structure of the crystal, what will be density of silver? [At. Wt. of Ag = 108 g mol^{-1}]

Q.13. Give differences between isotropic and anisotropic substance.

Q.14. (i) Calculate the packing efficiency in fcc crystal.
       (ii) How many octahedral voids are present in fcc crystal?

Q.15. Explain the following giving example:

       (i) Intrinsic semiconductor   (ii) 12-16compounds
       (iii) Ferromagnetic substance.

Chapter 2: Solutions

Q.1. The freezing point of pure nitrobenzene is 278.8K. When 2.5 g of unknown substance is dissolved in 100 g of nitrobenzene, the freezing point of solution is found to be 276.8K.If the freezing point depression constant of nitrobenzene is 6 K g mol^{-1}. What is the molar mass of unknown substance?

Q.2. A solution containing 12.5 g of non-electrolyte substance in 175 g of water gave a boiling point elevation of 0.70K. Calculate the molar mass of the substance. [K_b= 0.52 kg/mol]

Q.3. Calculate the amount KCl which must be added to 1kg of water so that the freezing point is depressed by 3 K. (K_f =1.86 K kg/mol).

Q.4. Which has highest freezing point?

(i)   1Mglucose   (ii)   1MCaCl$_2$ (iii)   1MAIF$_3$ (iv)   1M NaCl

Q.5. Define the terms –

(i)   Ebullioscopic constant   (ii)   Cryoscopic constant
(iii)   Raoult's Law   (iv)   Van't Hoff factor.

Q.6. Calculate the mole fraction of water in a mixture of 12g water, 108g acetic acid and 92 g ethyl alcohol.

Q.7. Calculate the molality of 1 molar solution of sodium nitrate the density of solution 1.25 g/cm^3.

Q.8. What is meant by ideal solution?

Q.9. Define colligative property.

Q.10. A solution containing 12.5 g of non-electrolyte substance in 175 g of water gave a boiling point elevation 0.70K. Calculate molar mass of solute.

Q.11. A decimolar solution of K$_4$[Fe(CN)$_6$] is 50% dissociated at 300 K. Calculate the osmotic pressure of the solution. [R = 0.0 821 L atm K^{-1}mol^{-1}]

Q.12. With the help of suitable diagrams explain positive and negative deviations from Raoult's Law.

Q.13. Define osmotic pressure. How does it vary with concentration and temperature?

Q.14. At 298 K, the vapour pressure of pure water is 23.75 mm Hg, calculate vapour pressure of solution over10% aqueous solute on the urea (Molecular weight = 60 g mol^{-1}) and also calculate the osmotic pressure at 298K.

Q.15. Phenol associates in benzene to certain extent to form dimer. A solution contains 20×10^{-3} kg of phenol in1kgof benzene has its freezing point decreased by 0.61K. Calculate the fraction of phenol that has dimerised. [K$_f$ for benzene = 5.12 K/m]

Chapter 10: Haloalkanes and Haloarenes

Q.1. Give one chemical test to distinguish between C$_2$H$_5$Br and C$_6$H$_5$Br.

Q.2. Write the IUPAC name of D.D.T.

Q.3. Why ring substitution in chlorobenzene occurs preferably at ortho and para positions?

Q.4. Write a short note on Sandmeyer's reaction.

Q.5. How would you convert methyl bromide into:

(i)   Methanoic acid   (ii)   Methylamine.

Q.6. Explain why:
(i) Chlorobutane has higher B.P. than 2-chloro butane.
(ii) Alkyl halides undergo nucleophilic substitution reactions.
(iii) Alkyl halides are insoluble in water though they have C-X polar bond.

Q.7. Arrange each set of compounds in order of increasing B.P.
(i) CH_3Cl, CH_3Br, C_2H_5Br
(ii) CH_3Br, CH_2Br_2, $CHBr_3$
(iii) $CH_3CH_2CH_3$, CH_3CH_2-CH_2Br, CH_3–$CH(Br)$–CH_3

Q.8. Primary alkyl halide (A) C_4H_9Br reacted with alc KOH to give compound (B) compound (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) was reacted with sodium metal it gave a compound (D) C_8H_{18} that was different than the compound when n-Butyl bromide was reacted with sodium. Give the structural formula of (A) and write the equations for all the reactions.

Q.9. Arrange the following in increasing order of boiling point:
(i) Bromomethane, bromoform, chloromethane, dibromomethane
(ii) Propane, 1-chloropropane, isopropyl chloride, 1-chlorobutane

Q.10. What happens when: (Give chemical reactions)
(i) Cyclohexanol is treated with thionyl chloride?
(ii) p-Hydroxybenzyl alcohol is heated with HCl?
(iii) Ethyl bromide is refluxed with NaI in acetone?
(iv) Ethyl bromide is treated with mercurous fluoride?

Q.11. Convert:
(i) Acetylene to Pent -2-yne   (ii)Tert-butyl bromide to Isobutyl bromide
(iii) Butan -1-ol to But-1-ene

Q.12. Convert:
(i) Chlorobenzene to p-nitrophenol
(ii) Benzene to aniline
(iii) 2, 4, 6-Trinitrochlorobenzene to Benzene.

Q.13. Write short notes on
(i) Wurtz reaction (ii) Carbylamine reaction   (iii) Wurtz-Fitting reaction

Q.14. How will you distinguish between:
(i) Chlorobenzene and Benzyl chloride?
(ii) Methanol and Ethanol?
(iii) Ethylamine and Diethylamine?

Q.15. What is meant by S_N1 and S_N2 mechanism? Illustrate with the help of example and discuss the stereochemistry involved.

BIOLOGY

- **Prepare your investigatory project in summer vacation.**

- **Complete your practical file in summer vacation**

- **Do the given question bank in biology notebook.**

Q1. Differentiate between chasmogamous and cleistogamous flowers.

Q2. Why wind and water pollinated flowers are not very colourful?

Q3. Which type of pollination is best in your opinion and why?

Q4. Draw the diagrams of monocot and dicot embryo. Explain their structures.

Q5. What is polyembryony? How it occurs?

Q6. What is role of scrotum in male reproductive system?

Q7. Name male sex accessory glands. Write their functions also.

Q8. How uterus prepare itself for embryo development?

Q9. Explain process of Parturition.

Q10. Explain structure and function of mammary glands in human being.

Q11. Unicellular organisms are immortal where as multicellular organisms are not. Justify.

Q12. Where are fimbriae present in a human female reproductive system? Give their function.

Q13. Mention the role of gonadotropin in menstrual cycle. On what day of the menstrual cycle do the gonadtopin reach a peak?

Q14. State the difference between meiocyte and gamete with respect to chromosome number.

Q15. Why do corn cobs have long tassels?

Q16. Differentiate parthenogenesis from parthenocarpy and perisperm from pericarp.

Q17. How is it possible in Oxalis and Viola plants to produce assured seed sets even in the absence of pollinators?

Q18. Write the cellular contents carried by the pollen tube. How does the pollen tube gain its entry into the embryo sac?

Q19. How is the milk production regulated by hormones in human female? Explain.

Q20. Name the hormones produced only during pregnancy in a human female. Mention their source organs.

COMPUTER SCIENCE

Q1. Give two examples of PAN and LAN types of network.

Q2. Differentiate between Message switching and packet switching.

Q3. Expand GSM, CDMA and GPRS. Explain them.

Q4. Write one characteristic feature of 2G, 3G and 4G Mobile Technologies.

Q5. (a) Which protocol is used to transfer hyper text documents on the internet?

(b) Which transmission medium should be used to transfer data across two continents at very high speed?

(c) Two neighbourhood schools, at a distance of 120 metres from each other, decide to join their LANs using UTP cable so that they can share their e-learning resources. But after joining their LANs, they are not able to share the resources due to loss of signal in-between. Which device should they use to establish proper connectivity?

(d) Which of the following softwares are Open Source:
    Linux, MS Windows 7, Photoshop, MySql

(e) Distinguish between Open Source software and Proprietary software with reference to customizability of the software.

(f) Name any four Indian scripts included in Unicode.

(g) Sabhyata says that the following numbers indicate an address:
                208.77.188.166

What is the above address called? To which object/device is it assigned?

(h) Tarun Nathani wants to upload and download files from/to a remote internet server. Write the name of the relevant communication protocol which will let her do the same.

(i) Two doctors in the same room have connected their Palmtops using Bluetooth for working on a group presentation. Out of the following, what kind of Network they have formed?

LAN, MAN. PAN, WAN

(j) Arrange the following communication channels in ascending order of their data transmission rates.

Ethernet Cable, Optical Fiber, Telephone Cable, Co -axial Cable

(k) Which of the following is not a characteristic of Open Source Software?
• Its source code is available for modification
• It is owned by a company or an individual
• It can be downloaded from internet

(l) Jatin Khanna is confused between the terms Domain Name and URL. Explain the difference with the help of appropriate examples of each.

Q6. Define any two threats to Network Security.

Q7. Differentiate between Star and Bus Topologies of networks.

INFORMATICS PRACTICES

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Q2. Define any two threats to Network Security.

Q3. Differentiate between Star and Bus Topologies of networks.

PHYSICAL EDUCATION

Complete the Record File

Record File shall include:

Practical-1:
Modified AAHPER administration for all items.

Practical-2:
Conduct Barrow 3 Item Test on 10 students.

Practical-3:
Procedure for Asanas, Benefits & Contraindication for any two Asanas each lifestyle disease.

Practical-4:
Procedure for administering Senior Citizen Fitness Test for 5 elderly family members.

Practical-5:

Any one game of your choice out of the list above. Labelled diagram of field & equipment Rules, Terminologies & Skills.

PAINTING

Prepare 20 sheets of painting (Landscape and Human Full Figure)

PHYSICS

Complete the practical file.

MATHEMATICS

Relations & Functions

Q.1. Show that the relation R in the set A = $\{1,2,3,4,5\}$ given by R=$\{(a,b):|a-b| \text{ is even}\}$, is an equivalence relation.

Q.2. Show that the relation R in R defined by R=$\{(a,b):a \leq b\}$, is reflexive and transitive but not symmetric.

Q.3. Let A= R −$\{3\}$ and B = R−$\{1\}$, Consider the function f: A → B defined by $f(x) = \frac{x-2}{x-3}$. Show that f is one–one and onto

Q.4. If f: R → R be given by $f(x) = (3-x^3)^{\frac{1}{3}}$, find the value of $fof(x)$

Q.5. Consider f : R → R given by f(x) = 4x+3, show that f is invertible. Find the inverse of f.

Q.6. Show that binary operation a * b = $\frac{a+b}{2}$ ∀ a,b ∫ N is commutative but not associative.

Q.7. Show that f: N →N defined by $f(x) = \begin{cases} \frac{n+1}{2}, \text{if n is odd} \\ \frac{n}{2}, \text{if n is even} \end{cases}$

is many-one onto function.

Q.8. Show that f : R −$\{0\}$ →R−$\{0\}$ given by $f(x) = 3/x$ is invertible and it is inverse of itself.

Q.9. On the set $M = A(x) = \left\{ \begin{bmatrix} x & x \\ x & x \end{bmatrix} : x \in R \right\}$ of 2×2 matrices, find the identity element for the multiplication of matrices as a binary operation. Also, find the inverse of an element of M.

Q.10. Let $f(x) = [x]$ and $g(x) = |x|$ find $gof(-5/3) - fog(-5/3)$

Q.11. Show that the function $f: R \to R$ defined by $f(x) = 3x^3 + 5$ for $x \in R$ is a bijection.

Q.12. Show that the relation R on the set R of all real numbers, defined as $R = \{ (a, b): a \le b^2 \}$ is neither reflexive nor symmetric nor transitive.

Matrices

Q.1. Construct a 3×4 matrix, whose elements are given by $a_{ij} = \frac{1}{2}|-3i + j|$

Q.2. If $A = \begin{bmatrix} 8 & 0 \\ 4 & -2 \\ 3 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -2 \\ 4 & 2 \\ -5 & 1 \end{bmatrix}$, then find the matrix X, such that $2A + 3X = 5B$.

Q.3. If $A = \begin{bmatrix} 0 & -\tan \alpha/2 \\ \tan \alpha/2 & 0 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then show that $I + A = (I - A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$

Q.4. Express the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as the sum of symmetric & skew-symmetric matrix.

Q.5. Obtain the inverse of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ using elementary transformations.

Q.6. If $f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$ Prove that $f(x).\ f(y) = f(x + y)$

Q.7. If A and B are invertible matrices of the same order, then prove that $(AB)^{-1} = B^{-1}A^{-1}$

Q.8. Let $f(x) = x^2 - 5x + 6$. Find $f(A)$ If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$

Q.9. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ Show that $A^2 - 5A + 7I = 0$, Use this to find A^4.

Q.10. Find the values of x, y, z if the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfy the equation $A'A = I_3$.

Q.11. Prove that the product of matrices

$\begin{bmatrix} \cos^2\theta & \cos\theta.\sin\theta \\ \cos\theta.\sin\theta & \sin^2\theta \end{bmatrix}$ and $\begin{bmatrix} \cos^2\phi & \cos\phi.\sin\phi \\ \cos\phi.\sin\phi & \sin^2\phi \end{bmatrix}$

is the null matrix, when θ and ϕ differ by an odd multiple of $\dfrac{\pi}{2}$.

Q.12. Show that the following system of equations is consistent $2x - y + 3z = 5$, $3x + 2y - z = 7$, $4x + 5y - 5z = 9$, Also, find the solution.

Determinants

Q.1. Prove that : $\begin{vmatrix} 1 & x & x^2 \\ x^2 & 1 & x \\ x & x^2 & 1 \end{vmatrix} = (1 - x^3)^2$

Q.2. Find the equation of the line joining A(1,3) and B(0,0) using determinants and find if D (K, 0) is a point such that area of a triangle ABD is 3 square units.

Q.3. If $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ Verify that $A^3 - 6A^2 + 9A - 4I = 0$ and hence find A^{-1}

Q.4. Prove that : $\begin{vmatrix} a+bx & c+dx & p+qx \\ ax+b & cx+d & px+q \\ u & v & \omega \end{vmatrix} = (1 - x^2) \begin{vmatrix} a & c & p \\ b & d & q \\ u & v & \omega \end{vmatrix}$

Q.5. Solve by Matrix method:

$$2x + y + z = 1$$
$$x - 2y - z = 3/2$$
$$3y - 5z = 9$$

Q.6. Prove that :

$\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$

Q.7. Prove that : $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc + bc + ca + ab$.

Q.8. Solve :
$$\begin{vmatrix} x-2 & 2x-3 & 3x-4 \\ x-4 & 2x-9 & 3x-16 \\ x-8 & 2x-27 & 3x-64 \end{vmatrix} = 0$$

Q.9. Using determinants, find the area of the triangle whose vertices are (1, 4), (2, 3), (-5, 3). Are the given points collinear?

Q.10. If the points (a_1, b_1), (a_2, b_2) and $(a_1 + a_2, b_1 + b_2)$ are collinear, Show that $a_1 b_2 = a_2 b_1$.