

**THE ASIAN SCHOOL, DEHRADUN**  
**HOMEWORK FOR WINTER VACATION 2022 CLASS XI**

**ENGLISH : Instructions:**

**General Instructions –**

- The assignment must be hand written.
- Use A-4 size sheets and a file cover
- Assignment is to be submitted positively to the teacher on the first day the school reopens after the Winter break..

**1. Read the passage carefully.**

How can you best improve your English depends on how much you are into it. If you hear English spoken every day and mix freely with English speaking people it's an advantage. Watching, Listening, reading, speaking, and writing in that order; step-by-step process is the best.

Reading English books is also a good idea. To read a lot is essential – not just text books but also novels and story books. Read for pleasure and not as a duty. Do not choose difficult books simply to learn new words but rather read books that interest you. Look for meaning of new words in the dictionary. Look for words now & then in any reading material and try guessing meanings from the context. Extensive reading and not intensive reading improve your English. As you read you will become familiar with words and sentence patterns and your understanding will improve.

Some people feel that we cannot learn a language through watching English news, documentaries, films, and serials etc. But this is a wrong notion. Actually, there is a lot common between the reading, watching and hearing English, it all helps in learning the language. Learning vocabulary of the written form we also learn its spoken form. Therefore, we are learning a language in its totality.

**(1). (a) On the basis of your reading of the passage make notes on it,** using recognizable abbreviations wherever necessary – minimum four). Use a format you consider suitable. Also supply a suitable title. **(b) Write the summary of the passage in 80 words.**

**(2). Draft the following Advertisements. You may use the given cues:**

i). You are the manager of Super Software Solutions Ltd. Draft an advertisement for your company for the post of a Chief Programmer (Solutions) giving details as per your requirement.

*(Use heading - Situation Wanted, Name of employee with address, no. of posts vacant, age limit, minimum qualification, pay scale, parks, mode of applying and whom to apply, deadline, contact)*

ii). Your aunt, emigrating to Canada wants to put up a classified advertisement to dispose off her flat before she leaves. Draft a suitable advertisement putting her flat on sale.

*(Begin with For Sale or Available, mention the type of house, details - no. of rooms, size of floor etc, use adjectives like - airy, well ventilated etc, expected price, contact)*

iii). You have a cat named Katty, is missing since 12 June, 20xx. Draft an advertisement to be published in the 'Missing' column of the local daily.

*(Begin with - Missing, give physical description, name, breed, colour of fur, any distinct feature, missing since when and from where, reward - if any, contact.)*

iv). Your uncle has just established a Tour and Travel Company and needs a classified advertisement to popularize it. Draft an advertisement giving necessary details.

*(Begin with Tours and Travels, name of company, mention tours/ cruises/ sightseeing etc, duration and dates, packages and discounts, Visa requirements - if any, booking period, contact)*

v). While travelling in a bus you found some certificates, a wallet, and some jewellery in a bag. You found no contact details of the owner in the bag. Draft an advertisement to be published in the local newspaper.

*(Begin with - Found, description as name of object, brand, colour, size, condition etc. found when and where, reward if any, keep strategic details undisclosed for authenticity and verification of the claimant, contact)*

**(3). Use the correct forms of the words given in brackets to complete the passage given below.**

We often (i) ..... (go) for a morning walk. Yesterday, my younger brother also (ii) ..... (accompany) us. He got up early in the morning and (iii) ..... (knock) at my door. I (iv) ..... (wake up) with a start and (v) ..... (gets)

ready for the walk. While I (vi) ..... (come) out of the room I saw my grandmother coming out of her room. She (vii) ..... (tell) us it was just three o'clock. My brother (viii) ..... (lose) count of time in excitement.

**(4). Rearrange the following words into meaningful sentences:**

- 1) the biggest /the /golden /in/ eagle /the /all eagles / and /United States / fastest/ of /is
- 2) altitudes /it can/ to/ of/ can/ 13,000 feet/ / fly
- 3) diving speed /200 miles/ nears /it has /per hour/ a/ that/nears
- 4) this /can /a/ bird / wingspan/with a / is a/ eight feet/reach/ formidable/that
- 5) plains of/ from the/ Mexico / tundra of/to the /Alaska, golden eagles / in high nests/ homes /make / their

**(5). Answer the following questions briefly.**

1. Why did Jonathan called the narrator the best daddy and captain in the world? ("WE ARE NOT AFRAID TO DIE... IF WE CAN ALL BE TOGETHER")
2. Who was King Tut and why has there been such widespread speculation about him in modern times? (DISCOVERING TUT: THE SAGA CONTINUES)
3. What feelings did Andrew experience when the baby was still born? (BIRTH)
4. What did Rajendra Deshpande mean when he says, you neither travelled to the past nor the future. You were in the present experiencing a different world. (THE ADVENTURE)
5. "I was in a room I knew and did not know," says the narrator in the story 'The Address'. What prompted her to make this observation? ('THE ADDRESS')
6. Tsetan's support to the author during the journey. Elaborate.(SILK ROAD)
7. Which issues are raised by this play and how are they resolved? Answer with reference to Mother's Day. (MOTHER'S DAY)

- HINDI:**
1. आपके जीवन में प्रेरणा देने वाले किसी एक व्यक्ति का साक्षात्कार कीजिए एवं उसे लिखिए।
  2. आपके जीवन की किसी महत्वपूर्ण यात्रा का वर्णन 300 शब्दों में कीजिए।
  3. किसान अपने व्यवसाय से पलायन कर रहे हैं। इस विषय पर एक संक्षिप्त निबन्ध लिखिए।
  4. जामुन का पेड़ कहानी का बिन्दुवार सारांश अपने शब्दों में लिखिए।
  5. किन्हीं दो समाचार पत्रों का संपादकीय लिखिए।
  6. फेरी वाले हमारे दिन प्रतिदिन की बहुत सी जरूरतों को आसान बना देते हैं, फेरीवालों के योगदान व समस्याओं पर एक संपादकीय लेख तैयार कीजिए।
  7. पानी का संकट वर्तमान स्थिति में बहुत गहराया हुआ है। इसी तरह के पर्यावरण से सम्बन्ध अन्य किसी एक संकट के बारे में लगभग 150 शब्दों में आलेख लिखिए।

**MATHEMATICS :**

**(A) WORKSHEETS (TO BE SOLVED IN THE MATHS HOMEWORK NOTEBOOKS)**

**CHAPTER-7 PERMUTATION AND COMBINATIONS**

- Q1. Find the 3-digit numbers that can be formed from the given digits: 1, 2, 3, 4 and 5 assuming that  
a) digits can be repeated. b) digits are not allowed to be repeated.
- Q2. A coin is tossed 6 times, and the outcomes are noted. How many possible outcomes can be there?
- Q3: How many words, with or without meaning, can be formed using all the letters of the word EQUATION, using each letter Exactly once?
- Q4: How many words can be formed each of 2 vowels and 3 consonants from the letters of the given word – DAUGHTER?
- Q5: It is needed to seat 5 boys and 4 girls in a row so that the girl gets the even places. How many are such arrangements possible?
- Q6: Find the number of 6 digit numbers that can be formed by using the digits 0, 1, 3, 5, 7, and 9. These digits shall be divisible by 10, and no digit shall be repeated?
- Q7. Calculate how many numbers are there between 99 and 1000 having at least one of their digits 7?
- Q8. A boy has 3 library tickets and 8 books of his interest in the library. Of these 8, he does not want to borrow Mathematics Part II, unless Mathematics Part I is also borrowed. In how many ways can he choose the three books to be borrowed?
- Q9. Determine the number of permutations of the letters of the word ALLAHABAD.
- Q10. How many automobile license plates can be made, if each plate contains two different letters followed by three different digits?

**Chapter9 : SEQUENCE AND SERIES**

1. If  $p^{\text{th}}$ ,  $q^{\text{th}}$  and  $r^{\text{th}}$  terms of an A.P. are  $a$ ,  $b$ ,  $c$  respectively, then show that:  $a(q-r) + b(r-p) + c(p-q) = 0$
2. Which term of the sequence is 72, 70, 68, 66, ..... is 40?
3. Find the number of terms common to the two A.P.'s 3, 7, 11, ..., 407 and 2, 9, 16, ..., 709.
4. Divide 32 into four parts which are in A.P. such that the product of extremes is to the product of extremes is to the product of means is 7 : 15.
5. The first, second and the last terms of an A.P. are  $a$ ,  $b$ ,  $c$  respectively. Prove that the sum is  $\frac{(a+c)(b+c-2a)}{2(b-a)}$
6. The  $p^{\text{th}}$  term of an A.P. is  $a$  and  $q^{\text{th}}$  term is  $b$ . Prove that the sum of its  $(p+q)$  terms is  $\frac{p+q}{2} \left\{ a+b + \frac{a-b}{p-q} \right\}$ .

7. The sums of  $n$  terms of three arithmetical progressions are  $S_1, S_2, S_3$ . The first term of each is unity and the common differences are 1, 2 and 3 respectively. Prove that  $S_1 + S_3 = 2S_2$ .
8. The ratio of the sum of  $n$  terms of two A.P.'s is  $(7n + 1) : (4n + 27)$ . Find the ratio of their  $m^{\text{th}}$  terms.
9. Between 1 and 31 are inserted  $m$  arithmetic means so that the ratio of the 7<sup>th</sup> and  $(m-1)$ th mean is 5:9. Find the value of  $m$ .
10. Find three numbers in G.P. whose sum is 13 and the sum of whose squares is 91.
11. Find the sum of the following series:  $0.7 + 0.77 + 0.777 + \dots$  to  $n$  terms
12. If  $S_1, S_2$  and  $S_3$  be respectively the sum of  $n, 2n$  and  $3n$  terms of a G.P. prove that  $S_1(S_3 - S_2) = (S_2 - S_1)^2$ .
13. The arithmetic mean between two numbers is 10 and their geometric mean is 8. Find the numbers.
14. The first term of a G.P. is 2 and the sum to infinity is 6. Find the common ratio.
15. The digits of a positive integer having three digits are in A.P. and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

#### Chapter 10 : STRAIGHT LINES

1. Find the slope of the lines which makes the angle  $2\pi/3$  with the positive direction of  $x$  axis.
2. Find the equation of the line with slope -1 and cutting off an intercept of 4 units on negative direction of  $y$ -axis.
3. Find the ratio in which the line segment joining the points (2, 3) and (4, 1) divides the line segment joining the points (1, 2) and (4,3).
4. Find the equation of the straight line which is at a distance of  $3\sqrt{2}$  units from the origin and the perpendicular from the origin makes an angle of  $75^\circ$  with the positive direction of  $x$  axis.
5. Transform the following equations of the line to
  - (i) slope intercept form and find its slope and  $y$  intercept
  - (ii) intercept form and find intercepts on the coordinate axes
  - (iii) normal form and find the inclination and length of the perpendicular: a)  $\sqrt{3}x + y - 8 = 0$
6. Find the equation of the straight line passing through the point (2, -3) and the point of intersection of the lines  $x + y + 4 = 0$  and  $3x - y - 8 = 0$ .
7. Find the equation of straight line whose intercepts on the axes are thrice as long as those made by  $2x + 11y = 6$ .
8. Find the equation of straight lines which are perpendicular to the line  $12x + 5y = 17$  and at a distance of 2 units from the point (-4,1).
9. The points A(2,3) B(4,-1) & C(-1,2) are the vertices of a triangle. Find the length of perpendicular from A to BC and hence the area of ABC.
10. Find the equation of the straight line which passes through (3,-2) and cuts off positive intercepts on the  $x$  axis and  $y$  axis which are in the ratio 4:3.
11. Reduce the equation  $3x - 2y + 4 = 0$  to intercept form. Hence find the length of the segment intercepted between the axes.
12. Find the image of the point (1, 2) in the line  $x - 3y + 4 = 0$ .
13. If the image of the point (2, 1) in a line is (4,3). Find the equation of the line.
14. Find the equation of a line passing through the point (-3, 7) and the point of intersection of the lines  $2x - 3y + 5 = 0$  and  $4x + 9y = 7$ .
15. If A (1, 4), B(2, -3) and C(-1, -2) are the vertices of a triangle ABC. find
  - a) The equation of the median through A
  - b) The equation of the altitude through A
  - c) The right bisector of side BC
16. If the slopes of the two lines are  $\frac{1}{2}$  and 3, then find the angle between the two lines.
17. Find the angle between the  $x$ -axis and the line joining the points (3, -1) and (4, -2).
18. Find the equations to the line parallel to the axes and passing through the point (-3, 5).
19. Find the equation of the line which is passing through the point (-2, -4) and perpendicular to the line  $3x - y + 5 = 0$ .
20. Find the equation of the line which passes through the point (3,4) and the sum of whose intercepts on the axes is 14.
21. Find the distance of the point (-1,1) from the line  $12(x+6) = 5(y-2)$
22. Find the point of intersection of the lines  $5a + 7b = 3$  and  $2a - 3b = 7$ .
23. At what point is the origin be shifted, if the coordinates of the point (5) become (3,7)?
24. Find the area of the triangle formed by the lines  $y - x = 0$ ,  $x + y = 0$  and  $x - c = 0$ .
25. Find the intercepts cut off by the line  $2a - b + 16 = 0$

#### Chapter 12: INTRODUCTION TO 3D GEOMETRY

1. Name the octant in which each of the following points lies.
 

|                |                  |                   |                     |
|----------------|------------------|-------------------|---------------------|
| (i) (1, 2, 3), | (ii) (4, -2, 3), | (iii) (4, -2, -5) | (iv) (4, 2, -5)     |
| (v) (-4, 2, 5) | (vi) (-3, -1, 6) | (vii) (2, -4, -7) | (viii) (-4, 2, -5). |
2. Find the third vertex of triangle whose centroid is (7, -2, 5) and whose other 2 vertices are (2, 6, -4) and (4, -2, 3).
3. Find the point in XY-plane which is equidistant from three points A(2,0,3), B(0,3,2) and C(0,0,1) through A.
4. Find lengths of the medians of the triangle with vertices A(0,0,6), B(0,4,0) and C(6,0,0)
5. Find the ratio in which the line joining the points (1,2,3) and (-3,4,-5) is divided by the XY-plane. Also, find the co-ordinates of the point of division.
6. If the points A (1, 0, -6), B (-3, p, q) and C (-5, 9, 6) are collinear, find the values of  $p$  and  $q$ .

7. Find the co-ordinates of the point which divides the line segment joining the points  $(-2, 3, 5)$  and  $(1, -4, -6)$  in the ratio  $(2:3)$  internally (ii)  $2:3$  externally
8. Find the coordinates of the points which trisect the line segment AB, given A  $(2, 1, -3)$  and B  $(5, -8, 3)$ .
9. Find the ratio in which the line segment joining the points  $(2, 4, 5)$  and  $(3, 5, -4)$  is divided by the YZ plane. Also find the co-ordinate of the point of division.
10. Find the centroid of a triangle, the mid-point of whose sides are D  $(1, 2, -3)$ , E  $(3, 0, 1)$  and F  $(-1, 1, -4)$ .

**(B):-THE STUDENTS HAVE TO PREPARE MATHS ACTIVITY FILE , FOR THE INTERNAL ASSESSMENTS IN MATHEMATICS, AS PER THE GUIDELINES ISSUED BY CBSE.**

**GUIDELINES AND INSTRUCTIONS FOR PREPARING THE ACTIVITY FILE:**

- The activities should be done in a loose ruled project sheets and fixed in a stick file.
- It should contain the following in the order
  - INDEX
  - ACKNOWLEDGEMENT
  - The figures should be drawn with pencil.
  - The headings should be written in black in and the content in blue ink.
  - Use the graph sheets wherever required.
  - Color pencil and pen can be used.
  - Mention NAME OF THE SCHOOL, your NAME, CLASS AND SECTION, SUBJECT and SESSION in the activity file.
  - Prepare a neat and clean creative activity file.

**NOTE: THE PDF OF THE ACTIVITIES TO BE COMPLETED WIL BE SHARED IN THE CLASS WHATASPP GROUPS BY THE SUBJECT TEACHER.**

**(C) :- SOLVE THE UT-2 PAPER IN THE MATHS H.W NOTEBOOK.**

**THE HOLIDAY HOMEWORK HAS TO BE SUBMITTED AFTER THE WINTER VACATIONS.**

**PHYSICS :**

**1- Homework is to be done neatly in Physics Homework Notebook.**

**2- There are 25 questions. Students have to write all 25 questions and their answers in the notebook.**

Q1-The radius of the earth is 6400 km and  $g = 10 \text{ m/s}^2$ . In order that a body of 5 kg weighs zero at the equator, the angular speed of the earth is.

Q2-A body is projected vertically from the surface of the earth of radius R with velocity equal to half of the escape velocity. The maximum height reached by the body is.

Q3-The masses of two planets are in the ratio 1 : 2. Their radii are in the ratio 1 : 2. The acceleration due to gravity on the planets are in the ratio.

Q4-Who among the following first gave the experimental velocity of G?

- (a) Cavendish (b) Copernicus (c) Brook Taylor (d) none of these

Q5-The angular momentum of a particle relative to certain I points Ovaries with time as  $L = a + bt^2$  where a and b are constant vectors with  $a \perp b$ . Find the force moment  $\tau$  relative to the point O acting on the particle when the angle between the vectors  $\tau$  and L equal  $45^\circ$ .

Q6-Three particles of masses 1g, 2g and 3g have their centre of mass at the point  $(2,2,2)$ . What must be the position of the fourth particle of mass 4g so that the combined centre of mass may be at the point  $(O, O, O)$ .

Q7-Two balls of masses 3m and m are separated by a distance of l.

(a) Find the position of the C.M.

(b) If these two balls are attached to a vertical axis by means of two threads whose combined length is l and rotated in a horizontal plane with uniform angular velocity  $\omega$  about an axis of rotation passing through C.M. Prove that the tensions in the two strings will become equal.

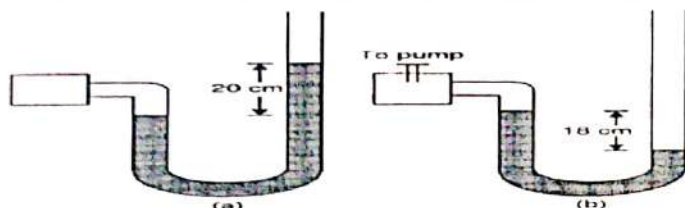
Q8-A cord is wound around the circumference of a wheel of diameter 0.3m. The axis of the wheel is horizontal. A mass of 0.5kg is attached at the end of the cord and it is allowed to fall from rest. If the weight falls 1.5m in 4s, what is the angular acceleration of the wheel? Also, find out the M.I. of the wheel.

Q9-Two strips of metal are riveted together at their ends by four rivets, each of diameter 6.0 mm. What is the maximum tension that can be exerted by the riveted strip if the shearing stress on the rivet is not to exceed  $6.9 \times 10^7 \text{ Pa}$ ? Assume that each rivet is to carry one-quarter of the load.

Q10-A mild steel wire of length 1.0 m and cross-sectional area  $0.50 \times 10^{-2} \text{ cm}^2$  is stretched, well within its elastic limit, horizontally between two pillars. A mass of 100g is suspended from the mid-point of the wire. Calculate the depression at the mid-point.

Q11-Determine the volume contraction of a solid copper cube, 10 cm on an edge, when subjected to a hydraulic pressure of  $7.0 \times 10^6 \text{ Pa}$ .

- Q12-A rigid bar of mass 15 kg is supported symmetrically by three wires each 2.0 m long. Those at each end are of copper and the middle one is of iron. Determine the ratios of their diameters if each is to have the same tension.
- Q13-A glass plate of length 20 cm, breadth 4 cm, and thickness 0.4 cm weighs 40 g in air. If it is held vertically with the long side horizontal and the plate half breadth immersed in water, what will be its apparent weight, the surface tension of water =  $70 \text{ dyne cm}^{-1}$
- Q14-The two thigh bones (femurs) each of cross-section area  $10 \text{ cm}^2$  support the upper part of a human body of mass 40 Kg. Estimate the pressure sustained by the femurs.
- Q15-A copper cube of mass 0.50 kg is weighed in water ( $\rho = 10^3 \text{ kg m}^{-3}$ ). The mass comes out to be 0.40 kg. Is the cube hollow or solid? Given density of copper =  $8.96 \times 10^3 \text{ kg m}^{-3}$ .
- Q16- A manometer reads the pressure of a gas in an enclosure as shown in Fig. (a) When a pump removes some of the gas, the manometer reads as in Fig. (b). The liquid used in the manometers is mercury and the atmospheric pressure is 76 cm of mercury.
- (a) Give the absolute and gauge pressure of the gas in the enclosure for cases (a) and (b), in units of cm of mercury.
- (b) How would the levels change in case (b) if 13.6 cm of water (immiscible with mercury) is poured into the right limb of 1 the manometer? Ignore the small change in the volume of the gas.



- Q17-During blood transfusion, the needle is inserted in a vein where the gauge pressure is 2000 Pa. At what height must the blood container be placed so that blood may just enter the vein? Given: density of whole blood =  $1.06 \times 10^3 \text{ kg m}^{-3}$ .
- Q18-(a) What is the largest average velocity of blood flow in an artery of radius  $2 \times 10^{-3} \text{ m}$  if the flow must remain laminar?
- (b) What is the corresponding flow rate? Take viscosity of blood to be  $2.084 \times 10^{-3} \text{ Pa-s}$ . Density of blood is  $1.06 \times 10^3 \text{ kg/m}^3$ .
- Q19- A mass of 5 kg is hung from a copper wire of 1 mm diameter and 2 m in length. Calculate the extension produced. What should be the minimum diameter of the wire so that its elastic limit is not exceeded? Elastic limit for copper =  $1.5 \times 10^9 \text{ dyne cm}^{-2}$ ,  $Y$  for copper =  $1.1 \times 10^{12} \text{ dyne cm}^{-2}$ .
- Q20-A cube of aluminium of each side 4 cm is subjected to a tangential (shearing) force. The top of the cube is sheared through 0.012 cm w.r.t. the bottom face.
- Find (a) shearing strain, (b) shearing stress, (c) shearing force. Given  $\eta = 2.08 \times 10^{11} \text{ dyne cm}^{-2}$ .
- Q21-The fact that the triple point of a substance is unique is used in modern thermometry. How?
- Q22-Is it possible for a body to have a negative temperature on the Kelvin scale? Why?
- Q23-Why do telephone wires become tight in winter?
- Q24-On what factors does the amount of heat flowing from the hot face to the cold face depend? How?
- Q25-State Newton's law of cooling and define the cooling curve. What is its importance?

## CHEMISTRY:

### INSTRUCTIONS:

- 1- Homework is to be done neatly in Chemistry Homework Notebook.
  - 2- There are 25 questions. Students have to write all 25 questions and their answers in the notebook.
- Q1. From a thermodynamic point of view, to which system the animals and plants belong?
- Q2. Under what conditions,  $\Delta H$  of a process is equal to  $\Delta U$ ?
- Q3. Which of the following is a state function?
- (i) height of a hill (ii) distance travelled in climbing the hill (iii) energy consumed in climbing the hill.
- Q4. Find the value of the equilibrium constant for the following conversion reaction at 298 K.



$$\Delta_r G^\circ = -13.6 \text{ kJ mol}^{-1}.$$

- Q5. How does the sign of  $G$  help in predicting the spontaneity/non-spontaneity of a process?
- Q6. Calculate the standard entropy change for the reaction  $X \rightarrow Y$  if the value of  $\Delta H^\circ = 28.40 \text{ kJ}$  and equilibrium constant is  $1.8 \times 10^{-7}$  at 298 K and  $\Delta_r G^\circ = 38.484 \text{ kJ}$ .

- Q7. Calculate the enthalpy of formation of methane, given that the enthalpies of combustion of methane, graphite, and hydrogen are 890.2 kJ, 393.4 kJ, and 285.7 kJ mol<sup>-1</sup> respectively.
- Given (i)  $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O}; \Delta H = -890.2 \text{ kJ mol}^{-1}$   
 (ii)  $\text{C} + \text{O}_2 \longrightarrow \text{CO}_2; \Delta H = -393.4 \text{ kJ mol}^{-1}$   
 (iii)  $\text{H}_2 + \frac{1}{2}\text{O}_2 \longrightarrow \text{H}_2\text{O}; \Delta H = -285.7 \text{ kJ mol}^{-1}$
- Q8. Two moles of an ideal gas initially at 27°C and one atm pressure are compressed isothermally and reversibly till the final pressure of the gas is 10 atm. Calculate q, w, and ΔU for the process.
- Q9. When 0.532 g of benzene (C<sub>6</sub>H<sub>6</sub>) with boiling point 353 K is burnt with an excess of O<sub>2</sub> in a calorimeter, 22.3 kJ of heat is given out. Calculate ΔH for the combustion process (R = 8.31 JK<sup>-1</sup> mol<sup>-1</sup>)
- Q10. Enthalpy and entropy changes of a reaction are 40.63 kJ mol<sup>-1</sup> and 108.8 JK<sup>-1</sup> mol<sup>-1</sup> respectively. Predict the feasibility of the reaction at 27°C.
- Q11. Find out the value of the equilibrium constant for the following reaction at 298 K. Standard Gibbs energy change, Δ<sub>r</sub>G° at the given temperature is -13.6 kJ mol<sup>-1</sup>.
- Q12. How does dilution with water affect the pH of a buffer solution?
- Q13. The equilibrium constant for the reaction  
 $\text{H}_2\text{O} + \text{CO} \rightleftharpoons \text{H}_2 + \text{CO}_2$  is 0.44 at 1260 K. What will be the value of the equilibrium constant for the reaction:  
 $2\text{H}_2(\text{g}) + 2\text{CO}(\text{g}) \rightleftharpoons 2\text{CO}(\text{g}) + 2\text{H}_2(\text{g})$  at 1260 K.
- Q14. Write the conjugate acids for the following Bronsted bases: NH<sub>2</sub>, NH<sub>3</sub>, HCOO<sup>-</sup>
- Q15. The degree of dissociation of N<sub>2</sub>O<sub>4</sub>(g)  $\rightleftharpoons$  2NO<sub>2</sub>(g), at temperature T and total pressure is αα. Find the expression for the equilibrium constant of this reaction at this temperature and pressure?
- Q16. A solution gives the following colors with different indicators. Methyl orange – yellow, methyl red – yellow, and bromothymol blue – Orange. What is the pH of the solution?
- Q17. Name the three groups into which chemical equilibrium can be classified.
- Q18. BF<sub>3</sub> does not have a proton but still acts as an acid and reacts with NH<sub>3</sub>. Why is it so? What type of bond is formed between the two?
- Q19. Arrange the following in increasing order of pH.  
 KN<sub>3</sub>(aq), CH<sub>3</sub>COONa(aq), NH<sub>4</sub>Cl(aq), C<sub>6</sub>H<sub>5</sub>COONH<sub>4</sub>(aq)
- Q20. 2HI(g)  $\rightleftharpoons$  H<sub>2</sub>(g) + I<sub>2</sub>(g) is 1 × 10<sup>-4</sup>. At a given time, the composition of reaction mixture is [HI] = 2 × 10<sup>-5</sup> mol, [H<sub>2</sub>] = 1 × 10<sup>-5</sup> mol and [I<sub>2</sub>] = 1 × 10<sup>-5</sup> mol. In which direction will the reaction proceed?
- Q21. A reaction between ammonia and boron trifluoride is given below:  
 $\text{NH}_3 + \text{BF}_3 \rightarrow \text{H}_3\text{N} : \text{BF}_3$   
 Identify the acid and base in this reaction. Which theory explains it? What is the hybridization of B and N in the reactants?
- Q22. Consider the reaction:  $2\text{HBr} + \text{Cl}_2 \rightarrow 2\text{HCl} + \text{Br}_2$   
 Identify the substance:  
 i) Getting reduced ii) getting oxidized iii) acting as reducing agent iv) acting as oxidizing agent
- Q23. Calculate the oxidation number of underlined atom in the following:  
 i) NaAuCl<sub>4</sub> ii) QF<sub>2</sub> iii) Ca(ClO<sub>2</sub>)<sub>2</sub> iv) NH<sub>2</sub>OH v) SeO<sub>3</sub><sup>2-</sup>
- Q24. A copper wire is dipped in silver nitrate solution in beaker A and a silver wire is dipped in a solution of copper sulphate kept in beaker B. If the standard electrode potential for:  
 $\text{Cu} + 2\text{e}^- \rightarrow \text{Cu}$  is +0.34 and for  
 $\text{Ag} + \text{e}^- \rightarrow \text{Ag}$  is +0.80V.  
 Given E°(Ni<sup>2+</sup>/Ni) = -0.25V and E°(Cu<sup>2+</sup>/Cu) = 0.34V  
 Predict in which beaker the ions present will get reduced?
- Q25. How many milliliters of 0.125 MK<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> are required to react completely with 25.0 mL of 0.250 M FeSO<sub>4</sub> solution in acidic medium?

#### Bio : INSTRUCTIONS:

- 1- Homework is to be done neatly in Biology Homework Notebook.
  - 2- There are 25 questions. Students have to write all 25 questions and their answers in the notebook.
- Q1. What do you mean by plasmids? What role do they play in bacteria?
- Q2. Mention the similarity and differences between mitochondria and chloroplasts?
- Q3. Describe the fluid mosaic model of the plasma membrane.
- Q4. What is a cell envelope? Describe its chemical nature.
- Q5. Why do fats release more energy than carbohydrates on oxidation?
- Q6. How are amino acids linked to form a peptide chain?
- Q7. What is meant by the tertiary structure of proteins?
- Q8. Describe the structure and function of ATP.
- Q9. List the differences between DNA and RNA.
- Q10. Give reasons for following:
- a) Salts dissolve in water but oil does not
  - b) Amino acid can be basic
  - c) Phospholipids form a thin layer on the surface of an aqueous medium.

- Q11. Illustrate lock and key hypothesis of enzyme action?
- Q12. Why is meiosis necessary in sexually reproducing organisms?
- Q13. Describe the changes that take place during the prophase and metaphase of mitosis.
- Q14. Describe the changes that take place during the prophase and metaphase of mitosis.
- Q15. Give the overall general chemical equation of photosynthesis?
- Q16. Write two differences between cyclic and non-cyclic photophosphorylation?
- Q17. Describe the process of photorespiration.
- Q18. Describe the process of glycolysis and where it occurs.
- Q19. Why does anaerobic respiration produce less energy than aerobic respiration?
- Q20. Calculate the efficiency of respiration in the living system.
- Q21. Illustrate the mechanism of the Electron transport system.
- Q22. Explain Bolting.
- Q23. List a hormone that:
- Is in nature, gaseous.
  - Is in charge of phototropism.
  - Influences femaleness in cucumber flowers.
  - Is utilized to kill weeds (dicots).
  - In long-day plants, induces flowering.
- Q24. List five main groups of natural plant growth regulators. Write a note on the discovery, physiological functions, and agricultural/horticultural applications of any two of them.
- Q25. Why is Absciscic acid also known as a stress hormone?

#### COMPUTER SCIENCE:

- Q1. Write a program to accept ten numbers in a list and print the count of prime nos. from it.
- Q2. Write a program to accept ten numbers in a list and replace every odd number by its square and every even number by its cube.
- Q3. Write a program to accept ten words in a list and print all the words ending with a vowel
- Q4. Write a program to accept five numbers in a list and replace every number by its reverse  
For e.g. if the list has elements : 12 , 20, 45, 67, 89 output would be : 21, 02, 54, 76, 98
- Q5. Write a program to accept a string and replace every character by it's consecutive character.  
For e.g. if the accepted string is "alpha" , then output must be "bmqib"
- Q6. Write a program to accept ten words in a list and display longest word and length of longest word.
- Q7. Write a program to count repeated characters in a string. Sample : "hello world python"  
h : 2 , o : 3 , l : 3, spaces : 2.
- Q8. Write a program to convert a list of multiple integers into a single integer.  
Sample : [11,33,50]  
Expected output : 113350
- Q9. Write a program to accept five values in a list. Use random module function to generate a random number between 0 to 4 in a variable called "index". Display the value from the list at the index number : "index".
- Q10. Write a program to accept 10 values in a tuple "t1" and print all the values having 5 in it's unit place

#### HISTORY: All students are required to do a project on ANY TOPIC OF SYLLABUS 2022-23.

Following essentials are required to be fulfilled for its preparation and submission-

- The total length of the project report will not be more than 8-10 written pages of A-4 size paper).
- The project report will be handwritten and credit will be awarded to original drawings, illustrations, photographs, artworks, good layout and creative use of materials.
- The project report will be presented in a neatly bound simple project file.
- The project report will be developed and presented in this order**
  - Cover page showing project title, student information, school and year.
  - List of contents with page numbers.
  - Certificate.
  - Acknowledgement.
  - Chapters with relevant headings.
  - Summary and conclusions.
  - Bibliography

#### POLITICAL SCIENCE :

All students are required to do a project on ANY TOPIC FROM SYLLABUS 2022-23.

Following essentials are required to be fulfilled for its preparation and submission-

- The total length of the project report will not be more than 8-10 written pages of A-4 size paper).

2. The project report will be handwritten and credit will be awarded to original drawings, illustrations, photographs, artworks, good layout and creative use of materials.
3. The project report will be presented in a neatly bound simple project file.
4. **The project report will be developed and presented in this order**

- Cover page showing project title, student information, school and year.
- List of contents with page numbers.
- Certificate.
- Acknowledgement.
- Chapters with relevant headings.
- Summary and conclusions.
- Bibliography

#### **GEOGRAPHY :**

All students are required to do a project on EROSIONAL AND DEPOSITIONAL FEATURES of any one of the following agent of erosion:-

- **Running Water**
- **Ground Water**
- **Waves**

Following essentials are required to be fulfilled for its preparation and submission-

1. The total length of the project report will not be more than 8-10 written pages of A-4 size paper).
2. The project report will be handwritten and credit will be awarded to original drawings, illustrations, photographs, artworks, good layout and creative use of materials.
3. The project report will be presented in a neatly bound simple project file.

**The project report will be developed and presented in this order** • Cover page showing project title, student information, school and year.

- List of contents with page numbers.
- Certificate.
- Acknowledgement.
- Chapters with relevant headings.
- Summary and conclusions.
- Bibliography

#### **ECONOMICS :**

Prepare a project on any one topic given below :

1. Human Development Index-2022
2. India's Foreign Trade
3. India's Health Infrastructure- Impact Of Covid 19.
4. Alternative Fuels
5. Farm Bills – Pro Or Anti Farmers
6. Role Of Rbi In Control Of Money Supply
7. Us-China Trade Wars
8. Organic Farming- Back To The Nature
9. Impact Of Covid 19 On The World Economy
10. Digital India
11. Start-Up India
12. Make In India
13. Effect on PPC due to various government policies
14. Opportunity Cost as an Economic Tool (taking real life situations)
15. Effect of Price Change on a Substitute Good (taking prices from real life visiting local market)
16. Effect on equilibrium Prices in Local Market (taking real life situation or recent news)
17. Effect of Price Change on a Complementary Good (taking prices from real life visiting local market)
18. Solar Energy, a Cost Effective Comparison with Conventional Energy Sources
19. Bumper Production- Boon or Bane for the Farmer
20. measures of central tendency

Expected Checklist:

- Introduction of topic/title
- Identifying the causes, consequences and/or remedies
- Various stakeholders and effect on each of them

- Advantages and disadvantages of situations or issues identified
- Short-term and long-term implications of economic strategies suggested in the course of research
- Validity, reliability, appropriateness and relevance of data used for research work and for presentation in the project file
- Presentation and writing that is succinct and coherent in project file
- Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.

#### GENERAL INSTRUCTIONS :

- The total length of the project report should not be more than the 15 written pages or 700 words of A-4 size sheet.
- The project work should be hand written and credit will be given to original drawing.
- It should be presented in a neatly bound simple project file. The project should be developed and presented in the following order
  - Cover page showing project title, student information, school and year.
  - List of contents with page number.
  - Certificate page
  - Acknowledgement
  - Summary and Conclusion
  - Bibliography

**ACCOUNTS :** Comprehensive project of any sole proprietorship business. This may state with journal entries and their ledgering, preparation of Trial balance.

**Problem :** The following balances appeared in the books of Vishal Stores on 1<sup>st</sup> April 2020.

Assets : Cash Rs 15,000, Bank Balance Rs 5,000; Stock Rs 40,000; Furniture Rs 3,600; Debtors Rs 24,000 (X Rs 6,000; Y Rs 8,000 and Z Rs 10,000).

Liabilities : Bank Loan Rs 10,000; Creditors Rs 12,500 (Ajay Rs 5,000, Vijay Rs 7,500).

Following transactions took place during April 2020:

|          |                                                                                                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------------|
| April 2  | Bought goods from Kailash for Rs 20,000 at a trade discount of 10% and cash discount of Rs 2%. Paid 60% amount immediately. |
| April 4  | Sold goods to X for Rs 9,000.                                                                                               |
| April 5  | Received Rs 14,800 from X in full settlement of his account.                                                                |
| April 6  | Cash deposited into bank Rs 10,000.                                                                                         |
| April 8  | Cheque received from Y for Rs 7,850 in full settlement of his account. This cheque was immediately deposited into bank.     |
| April 10 | Received a cheque from Z Rs 2,000                                                                                           |
| April 12 | Cheque received from Z into bank.                                                                                           |
| April 15 | Cheque received from Y dishonoured.                                                                                         |
| April 16 | Cash sales Rs 15,000; out of this amount Rs 12,000 deposited into bank.                                                     |
| April 16 | Amount due to Ajay paid by cheque.                                                                                          |
| April 18 | Old newspapers sold Rs 50.<br>Old furniture sold Rs 750                                                                     |
| April 20 | Z became insolvent and 40 paise in a rupee could be received from his estate by cheque which is deposited into bank.        |
| April 22 | Purchased goods from Gopal and paid by cheque Rs 8,000                                                                      |
| April 24 | Sold half of the above goods to Chanderkant at a profit of 30% on cost.                                                     |
| April 25 | Proprietor withdrew for private use Rs 2,000 from office and Rs 3,000 from bank.                                            |
| April 30 | Paid salary to Motilal by cheque Rs 2,000.                                                                                  |
| April 30 | Paid Rent by cheque Rs 1,5000.                                                                                              |
| April 30 | Paid trade expenses Rs 500.                                                                                                 |

#### PSYCHOLOGY :

- Students conduct your familiar words and unfamiliar words test on one subject.

Attempt all these questions on your homework notebook.

- Draw the stage model of memory.
- Explain all types of interference.
- Explain the forgetting theory.
- What are the ways to enhance memory? Explain all the methods.
- Define sensation.
- What are the theories of selective attention ? explain it.
- Explain all types of illusions.
- What are perceptual constancies? explain all types of perceptual constancy.

#### PHYSICAL EDUCATION :

- Body Mass Index (BMI)

Introduction, Chart and calculate BMI of 10 people and give them suggestion according to their body condition.

- Prepare a Standard Athletic Track field of 400m with proper labeling.

3. Prepare a file on any one game related to class 11 syllabus:

- a) History
- b) Fundamental skills
- c) Terminologies
- d) Dimension of play field
- e) Rules and regulation
- f) Important tournament
- g) Famous Personality

## BUSINESS STUDIES

### I. Project One: Field Visit

The objective of introducing this project among the students is to give a first-hand experience to them regarding the different types of business units operating in their surroundings, to observe their features and activities and relate them to the theoretical knowledge given in their text books. The students should select a place of field visit from the following: – (Add more as per local area availability.)

The following points should be kept in mind while preparing this visit.

- 1. Select a suitable day free from rush/crowd with lean business hours.
- 2. Visit to be discussed with the students in advance. They should be encouraged to prepare a worksheet containing points of observation and reporting.
- 3. Students may carry their cameras (at their own risk) with prior permission for collecting evidence of their observations.

#### Topics :

1. Visit to a Departmental store- The students are required to observe the following:

- a) Different departments and their lay out.
- b) Nature of products offered for sale.
- c) Display of fresh arrivals.
- d) Promotional campaigns.
- e) Spaces and advertisements.
- f) Assistance by Sales Personnel.
- g) Billing counter at store – Cash, Credit Card/ Debit Card, swipe facility. Added attractions and facilities at the counter.
- h) Additional facilities offered to customers
- i) Any other relevant aspect.

2. Visit to a Mall. The students are required to observe the following:

- a) Number of floors, shops occupied and unoccupied.
- b) Nature of shops, their ownership status
- c) Nature of goods dealt in: local brands, international brands,
- d) Service business shops- Spas, gym, saloons etc.
- e) Rented spaces, owned spaces
- f) Different types of promotional schemes.
- g) Most visited shops.
- h) Special attractions of the Mall- Food court, Gaming zone or Cinema etc.
- i) Innovative facilities.
- j) Parking facilities.

### II. Project Two: Case Study on a Product

Take a product having seasonal growth and regular demand with which students can relate. For example,

- Apples from Himachal Pradesh, Kashmir.
- Oranges from Nagpur.
- Mangoes from Maharashtra/U.P./Bihar/Andhra Pradesh etc.
- Strawberries from Panchgani.
- Aloe vera from Rajasthan.
- Walnuts/almonds from Kashmir.
- Jackfruit from South, • Guavas from Allahabad.
- Pineapples from North East India.
- Tea from Assam.
- Orchids from Sikkim and Meghalaya.
- Pottery of Manipur.
- Fishes from coastal areas.

Students may develop a Case Study on the following lines:

- (i) Research for change in price of the product. For example, apples in Himachal Pradesh during plucking and non-plucking season.
- (ii) Effect on prices in the absence of effective transport system.
- (iii) Effect on prices in the absence of suitable warehouse facilities.
- (iv) Duties performed by the warehouses.
- (v) Demand and supply situation of the product during harvesting season, prices near the place of origin and away.

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**MUSIC (TABLA)**

Project Work :

1. Definitions of following : Laya, Sangeet, Kala
2. Write down the Thah, Dugun & Chaugun- Teentaal, Jhaptaal, Ektaal.
3. Brief note on – Banaras Gharana.
4. Kaida in Teentaal.
5. Kaida- Rela in Teentaal.
6. Three Tukdas in Teentaal.
7. Life Sketch : Pt. Kudau Singh, Pt. Nana Panse

**Note : Homework to be done in Project File Only.**

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**MUSIC (VOCAL)**

1. Define the following terms – Nada, Saptak, Raga, Jaati, Laya, Taal.
2. Give the description of Raga Bihag, Bharavi and Bhimpalasi with one Chhota Khayal along with Notation (One Chhota Khayal in any one Raga)
3. Write about the history of Dhrupad, Khayal and Tarana.
4. Elaborate Raga Bhairavi in not more than 50 swaras.
5. Write down the Thah, Dugun and Chaugun layakari of Teentaal, Ektaal and Chautaal.

**Note : Homework to be done in Project File Only.**

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**PAINTING :**

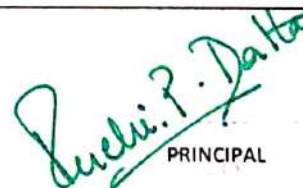
- Make 4 Geometrical Designs.
- Make 4 Still Life in Pen and Ink.

**Note : Size- A3**

**Sheet- Cartridge Sheet (Drawing sheet)**

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HEAD SENIOR SCHOOL

  
PRINCIPAL