



# **S.B.P. D.A.V. Centenary Public School, Fatehabad.**



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**Holidays' Assignments for Summer Vacations (2024-25) for Class XI NON-MEDICAL**

## **General Instructions:**

1. *Get up early in the morning and go out for a walk daily. Do yoga daily for healthy living.*
2. *Make a Bird feeder and add seeds (wheat & rice) for birds daily and also place water for them.*
3. *Raise a small kitchen garden by planting seeds of vegetables.*
4. *The summer break for classes IX-XII will be from 28.05.2024 to 30.06.2024 (Both days inclusive). School will reopen on 01.07.2024.*
5. *Revise the syllabus of all subjects done before summer vacations for Unit Tests to be started from 02.07.2024.*
6. *Do assignments in holidays homework notebook and activities/projects on A4 sheets for each subject and make a portfolio & submit it for assessment to your class teacher on July 10, 2024. There will be assessment of these portfolios and marks will be awarded in half yearly/annual exams.*
7. ***Register & Participate in 1<sup>st</sup> stage of 10<sup>th</sup> Online International Humanity Olympiad by accessing through web portal – <http://www.humanityolympiad.org> or Android App - Awake Humanity (play store). Every individual passing the exam (i.e. scoring minimum 40%) will get an e-certificate through e-mail immediately on their emails. School code is : FATE100. This certificate and certificates of courses earned by you during holidays should be part of your portfolio.***

## **Revise syllabus for U.T.**

Unseen passages for comprehension

Grammar: Tenses, Narration, Clauses, Preposition

## **Hornbill :**

1-The Portrait Of A Lady

2.We're Not Afraid to Die if We Can All be Together

A Photograph(Poem)

## **Snapshot:**

1.The Summer of The Beautiful White Horse

2.The Address

## **Do worksheets from Insight in neat and clean handwriting (Use pencil only)**

Worksheet 1to 5(Reading Comprehensions)

Do worksheets of Tenses, Narration

## **Project Work-(Use A4 Sheets only)**

- 1.You have read the lesson ‘The Portrait of a Lady’ by Khushwant Singh. Relating to the topic, share your real life experience about the bond that you share with your grandparents .What would be that one skill you would like to teach them and how ?Your answer should be penned in 150 words.
- 2.On the occasion of Father's Day, take an interview of your father,in which he is sharing his childhood memories.
- 3.Compose a poem on the time gone by when you were young. Mention all that you miss of the yesteryears keeping in mind the poem-'A Photograph'(Represent with images and photographs)
- 4.Government has decided to introduce regional language in Educational Curriculum. Do you think it is regressive or retrograde. Express your opinion in favour or against the topic.
- 5.During this break, download following app to improve your speaking skills.

### English Conversation Practise

### Subject - Physics

Task No.	Task Details												
1	<p>List all Nobel laureates of Physics, Chemistry and Medical science from last 10 years and their topic of research in tabular form.</p> <p>List all Indian Nobel laureates of Physics, Chemistry and Medical science and their topic of research in tabular form.</p> <p>Tabular form can be something like this:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">YEAR : 2023</th> </tr> </thead> <tbody> <tr> <td style="width: 33%;">Physics</td> <td style="width: 33%;">Names of laureate</td> <td style="width: 33%;">Topic of Research</td> </tr> <tr> <td>Chemistry</td> <td>Names of laureate</td> <td>Topic of Research</td> </tr> <tr> <td>Medical Science</td> <td>Names of laureate</td> <td>Topic of Research</td> </tr> </tbody> </table>	YEAR : 2023			Physics	Names of laureate	Topic of Research	Chemistry	Names of laureate	Topic of Research	Medical Science	Names of laureate	Topic of Research
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Physics	Names of laureate	Topic of Research											
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Medical Science	Names of laureate	Topic of Research											
2	<p>Climate change refers to long-term shifts in temperatures and weather patterns. These climate changes are causing adverse effects humanity.</p> <p>Write a research paper on the topic of : Climate Change , Its adverse effects to Humanity and ways to improve upon the situation.</p>												
3	<p>Revise Following Chapters for unit test:</p> <p>(1) Units and Dimensions            (2) Motion in One Dimension            (3) Motion in a Plane</p>												
4	<p>Solve question of all the chapters covered so far from following sources:</p> <p>(1) NCERT            (2) NCERT Exemplar</p>												
5	<p>Solve worksheet provided with homework.</p>												

### Worksheet (Unit and Dimensions)

1. The dimensional formula for latent heat is:  
 a.  $M^0L^2T^{-2}$                       b.  $ML^2T^{-2}$                       c.  $MLT^{-2}$                       d.  $ML^2T^{-1}$
2. Which of the following is not a unit of energy?  
 a. W-s                      b. Kg-m/s                      c. N-m                      d. Joule
3. The energy radiated per unit area per second by a black body at temperature 'T' is given by  $E = \sigma T^4$ , Where  $\sigma$  is the Stefan's constant. The dimensions of  $\sigma$  are:  
 a.  $MT^2K^{-2}$                       b.  $MT^{-3}K^{-4}$                       c.  $MT^{+3}K^{-4}$                       d.  $ML^4T^{-3}K^{-4}$
4. The dimensions of  $\frac{1}{\sqrt{\epsilon_0 \mu_0}}$  are those of:  
 a. Velocity                      b. time                      c. capacitance                      d. Distance
5. In the following list, the only pair, the two members of which have different dimensions is:  
 a. Linear momentum and moment of a force                      b. Plank's constant and angular momentum  
 c. Pressure and modulus of elasticity                      d. Work and Torque
6. In the Vander walls equation,  $\left(P + \frac{a}{V^2}\right)(V-b) = \text{constant}$ , the unit of 'a' is,  
 a. dyne cm                      b. dyne  $cm^4$                       c. dyne/ $cm^3$                       d. dyne/ $cm^2$
7. The dimensional formula  $ML^{-1}T^{-2}$  corresponds to:  
 a. modulus of elasticity                      b. viscosity  
 c. moment of a force                      d. thrust
8. A force f varies with time t as  $f = at + bt^2$ . The dimensions of a and b are, respectively:  
 a.  $MLT^{-3}$  and  $ML^2T^{-4}$                       b.  $MLT^{-3}$  and  $MLT^{-4}$   
 c.  $MLT^{-1}$  and  $MLT^0$                       d.  $MLT^{-4}$  and  $MLT^{-1}$
9. Which of the following is a dimensionless quantity?  
 a. momentum/ acceleration                      b. volume / area  
 c. energy / work                      d. force / power
10. A gas bubble from an explosion under water oscillates with a period T proportional to  $P^a d^b E^c$  where P is the static pressure, d is the density of water and E is the total energy of the explosion. The values of a, b and c are:  
 a.  $-\frac{1}{2}, \frac{1}{2}, -\frac{1}{3}$                       b.  $-\frac{5}{6}, \frac{1}{2}, \frac{1}{3}$                       c.  $\frac{5}{6}, -\frac{1}{2}, -\frac{1}{3}$                       d.  $-\frac{5}{6}, -\frac{1}{2}, \frac{1}{3}$
11. Which of the following quantities has not been expressed in proper units?  
 a. young's modulus =  $N/m^2$                       b. Surface Tension =  $N/m$   
 c. pressure =  $N/m^2$                       d. Energy =  $kg\ m/s$
12. The dimensional formula for Planck's constant h is:  
 a.  $ML^2T^{-2}$                       b.  $ML^2T^{-1}$                       c.  $M^{-1}L^2T^{-2}$                       d.  $ML^2T^{+1}$
13. Which of the following is a derived quantity?  
 a. mass                      b. velocity                      c. length                      d. time
14. If  $x = at + bt^2$ , where x is in meters and t in hours, then unit of a is:  
 a. m                      b. m/hr                      c. mhr                      d.  $m^2/hr$

15. The dimensional formula for root mean square velocity is:  
 a.  $[M^0L^1T^{-1}]$       b.  $[M^0L^0T^{-2}]$       c.  $[M^0L^0T^{-1}]$       d.  $[MLT^{-3}]$
16. The dimensional formula for angular frequency is:  
 a.  $[T^{-2}]$       b.  $[T^{-1}]$       c.  $[T]$       d.  $[T^2]$
17. Energy per unit volume represents:  
 a. Pressure      b. Force      c. Thrust      d. Work
18. When 9.525 are rounded off to give three significant figures then it is equal to:  
 a. 9.53      b. 9.52      c. 10      d. 9.5250
19. The value of  $0.99 - 0.989$  is:  
 a. 0.001      b.  $0.010 \times 10^{-1}$       c.  $0.01 \times 10^{-1}$       d.  $0.1 \times 10^{-3}$
20. Two quantities A and B have different dimensions. Which mathematical operation given below is physically meaningful?  
 a.  $\frac{A}{B}$       b.  $A + B$       c.  $A - B$       d.  $A = B$
21. The surface tension of a liquid is  $70 \text{ dyne cm}^{-1}$ . It may be expressed in international system as:  
 a.  $7 \times 10^{-2} \text{ Nm}^{-1}$       b.  $7 \times 10^2 \text{ Nm}^{-1}$       c.  $70 \text{ Nm}^{-1}$       d.  $7 \times 10^3 \text{ Nm}^{-1}$
22. Given:  $y = a \cos (t/p - qx)$ , where t represents time in second, and x represents distance in metre. Which of the following statements is true?  
 a. The unit x is same as that of q.  
 b. The unit x is same as that of p.  
 c. The unit t is same as that of q.  
 d. The unit t is same as that of p.
23. If e is charge on an electron, c is velocity of light and h is Planck's constant, then the quantity,  $\frac{e^2}{\epsilon_0 ch}$  has the dimensional formula:  
 a.  $[M^0L^0T^0]$       b.  $[M^0L^0T^{-1}]$       c.  $[MLT]$       d.  $[M^{-1}L^{-1}T^{-1}]$
24. The frequency of vibration n of a stretched string of length l under tension T is given by:  

$$n = \frac{p}{2l} \sqrt{\frac{T}{m}}$$
 The dimensional formula for m is:  
 a.  $[ML^{-1}T^{-1}]$       b.  $[ML^0T^0]$       c.  $[ML^{-1}T^0]$       d.  $[ML^{-2}T^0]$

### Kinematics

- A Body moves 6 m north. 8 m east and 10m vertically upwards, what is its resultant displacement from initial position  
 (a)  $10\sqrt{2}m$       (b)  $10m$   
 (c)  $\frac{10}{\sqrt{2}}m$       (d)  $10 \times 2m$
- An athlete completes one round of a circular track of radius R in 40 sec. What will be his displacement at the end of 2 min. 20 sec  
 (a) Zero      (b) 2R  
 (c)  $2\pi R$       (d)  $7\pi R$
- A person travels along a straight road for half the distance with velocity  $v_1$  and the remaining half distance with velocity  $v_2$  The average velocity is given by

- (a)  $v_1 v_2$                       (b)  $\frac{v_2^2}{v_1^2}$
- (c)  $\frac{v_1 + v_2}{2}$                       (d)  $\frac{2v_1 v_2}{v_1 + v_2}$
4. A car travels from  $A$  to  $B$  at a speed of  $20 \text{ km/hr}$  and returns at a speed of  $30 \text{ km/hr}$ . The average speed of the car for the whole journey is
- (a)  $25 \text{ km/hr}$                       (b)  $24 \text{ km/hr}$
- (c)  $50 \text{ km/hr}$                       (d)  $5 \text{ km/hr}$
5. A particle experiences a constant acceleration for 20 sec after starting from rest. If it travels a distance  $s_1$  in the first 10 sec and a distance  $s_2$  in the next 10 sec, then
- (a)  $s_1 = s_2$                       (b)  $s_1 = s_2 / 3$
- (c)  $s_1 = s_2 / 2$                       (d)  $s_1 = s_2 / 4$
6. A body starts from the origin and moves along the X-axis such that the velocity at any instant is given by  $(4t^3 - 2t)$ , where  $t$  is in sec and velocity in  $m/s$ . What is the acceleration of the particle, when it is  $2 \text{ m}$  from the origin
- (a)  $28 \text{ m/s}^2$                       (b)  $22 \text{ m/s}^2$
- (c)  $12 \text{ m/s}^2$                       (d)  $10 \text{ m/s}^2$
7. The initial velocity of the particle is  $10 \text{ m/sec}$  and its retardation is  $2 \text{ m/sec}^2$ . The distance moved by the particle in  $5^{\text{th}}$  second of its motion is
- (a)  $1 \text{ m}$                       (b)  $19 \text{ m}$
- (c)  $50 \text{ m}$                       (d)  $75 \text{ m}$
8. The motion of a particle is described by the equation  $x = a + bt^2$  where  $a = 15 \text{ cm}$  and  $b = 3 \text{ cm/s}^2$ . Its instantaneous velocity at time  $3 \text{ sec}$  will be
- (a)  $36 \text{ cm/sec}$                       (b)  $18 \text{ cm/sec}$
- (c)  $16 \text{ cm/sec}$                       (d)  $32 \text{ cm/sec}$
9. A particle moves along a straight line such that its displacement at any time  $t$  is given by  $S = t^3 - 6t^2 + 3t + 4 \text{ metres}$   
The velocity when the acceleration is zero is
- (a)  $3 \text{ ms}^{-1}$                       (b)  $-12 \text{ ms}^{-1}$
- (c)  $42 \text{ ms}^{-1}$                       (d)  $-9 \text{ ms}^{-1}$
10. If a car at rest accelerates uniformly to a speed of  $144 \text{ km/h}$  in  $20 \text{ s}$ . Then it covers a distance of
- (a)  $20 \text{ m}$                       (b)  $400 \text{ m}$
- (c)  $1440 \text{ m}$                       (d)  $2880 \text{ m}$
11. Acceleration of a particle changes when
- (a) Direction of velocity changes
- (b) Magnitude of velocity changes
- (c) Both of above
- (d) Speed changes
12. The velocity of a bullet is reduced from  $200 \text{ m/s}$  to  $100 \text{ m/s}$  while travelling through a wooden block of thickness  $10 \text{ cm}$ . The retardation, assuming it to be uniform, will be

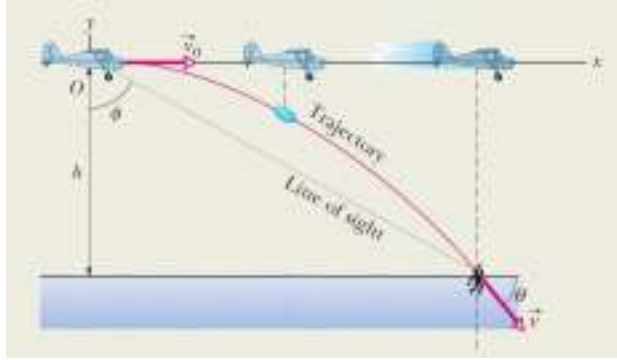
- (a)  $10 \times 10^4 \text{ m/s}^2$       (b)  $12 \times 10^4 \text{ m/s}^2$   
 (c)  $13.5 \times 10^4 \text{ m/s}^2$       (d)  $15 \times 10^4 \text{ m/s}^2$
13. A 210 meter long train is moving due North at a of  $25 \text{ m/s}$ . A small bird is flying due South a little above the train with speed  $5 \text{ m/s}$ . The time taken by the bird to cross the train is  
 (a)  $6 \text{ s}$       (b)  $7 \text{ s}$   
 (c)  $9 \text{ s}$       (d)  $10 \text{ s}$
14. A stone falls from a balloon that is descending at a uniform rate of  $12 \text{ m/s}$ . The displacement of the stone from the point of release after  $10 \text{ sec}$  is  
 (a)  $490 \text{ m}$       (b)  $510 \text{ m}$   
 (c)  $610 \text{ m}$       (d)  $725 \text{ m}$
15. A body  $A$  is projected upwards with a velocity of  $98 \text{ m/s}$ . The second body  $B$  is projected upwards with the same initial velocity but after  $4 \text{ sec}$ . Both the bodies will meet after  
 (a)  $6 \text{ sec}$       (b)  $8 \text{ sec}$   
 (c)  $10 \text{ sec}$       (d)  $12 \text{ sec}$
16. Two bodies of different masses  $m_a$  and  $m_b$  are dropped from two different heights  $a$  and  $b$ . The ratio of the time taken by the two to cover these distances are  
 (a)  $a : b$       (b)  $b : a$   
 (c)  $\sqrt{a} : \sqrt{b}$       (d)  $a^2 : b^2$
17. A rocket is fired upward from the earth's surface such that it creates an acceleration of  $19.6 \text{ m/sec}^2$ . If after  $5 \text{ sec}$  its engine is switched off, the maximum height of the rocket from earth's surface would be  
 (a)  $245 \text{ m}$       (b)  $490 \text{ m}$   
 (c)  $980 \text{ m}$       (d)  $735 \text{ m}$
18. A stone is shot straight upward with a speed of  $20 \text{ m/sec}$  from a tower  $200 \text{ m}$  high. The speed with which it strikes the ground is approximately  
 (a)  $60 \text{ m/sec}$       (b)  $65 \text{ m/sec}$   
 (c)  $70 \text{ m/sec}$       (d)  $75 \text{ m/sec}$
19. A body freely falling from the rest has a velocity ' $v$ ' after it falls through a height ' $h$ '. The distance it has to fall down for its velocity to become double, is  
 (a)  $2h$       (b)  $4h$   
 (c)  $6h$       (d)  $8h$
20. The effective acceleration of a body, when thrown upwards with acceleration  $a$  will be  
 (a)  $\sqrt{a-g^2}$       (b)  $\sqrt{a^2+g^2}$   
 (c)  $(a-g)$       (d)  $(a+g)$

#### Additional Questions

Q.1	You are standing on the sidewalk, watching a train coast eastward at constant velocity. Your friend is riding in that train. In her inertial frame of reference, the sweater in her lap is motionless. Describe the sweater's motion in <i>your</i> inertial frame of reference.
Q.2	A fly ball is hit to the outfield. During its flight (ignore the effects of the air), what happens to its (a) horizontal and (b) vertical components of velocity? What are the (c) horizontal and (d) vertical components of its acceleration

during ascent, during descent, and at the topmost point of its flight?

- Q.3 In Fig.1, a rescue plane flies at 198 km/h (" 55.0 m/s) an constant height h " 500 m toward a point directly over a victim, where a rescue capsule is to land. (a) What should be the angle  $\phi$  of the pilot's line of sight to the victim when the capsule release is made? (b) As the capsule reaches the water, what is its velocity?

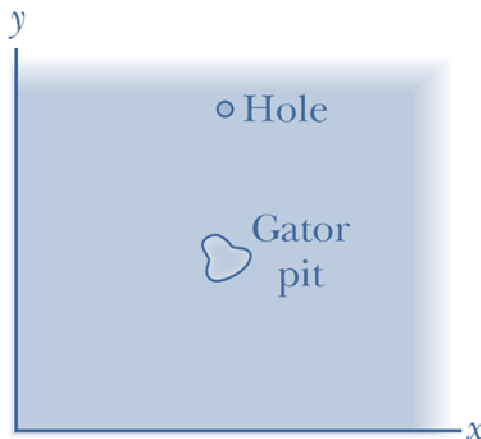


- Q.4 (a) If you toss a ball straight up, what is the sign of the ball's displacement for the ascent, from the release point to the highest point? (b) What is it for the descent, from the highest point back to the release point? (c) What is the ball's acceleration at its highest point?

- Q.5 Being part of the "Gators," the University of Florida golfing team must play on a putting green with an alligator pit. Figure below shows an overhead view of one putting challenge of the team; an x-y coordinate system is superimposed. Team members must putt from the origin to the hole, which is at x-y coordinates (8 m, 12 m), but they can putt the golf ball using only one or more of the following displacements, one or more times:

$$\vec{d}_1 = (8 \text{ m})\hat{i} + (6 \text{ m})\hat{j}, \quad \vec{d}_2 = (6 \text{ m})\hat{j}, \quad \vec{d}_3 = (8 \text{ m})\hat{i}.$$

The pit is at coordinates (8 m, 6 m). If a team member putts the ball into or through the pit, the member is automatically transferred to Florida State University, the arch rival. What sequence of displacements should a team member use to avoid the pit and the school transfer?



## Chemistry

- **REVISE syllabus for U.T**
  - Investigatory Project Report to be made on the topics allotted in class.
  - Do following assignment in your holidays' homework notebook.
  - Do all the NCERT Exemplar questions of chapters completed in class.
- 1) Which is better method molarity or molality?
- 2) How much  $\text{CO}_2$  is produced when 6 gm of Carbon is burnt in excess Oxygen?
- 3) **Assertion (A)** : Significant figures for 0.200 is 3 whereas for 200 it is  
**Reason (R)** : Zero at the end or right of a number are significant provided they are not on the right side of the decimal point.
- (i) Both A and R are true and R is correct explanation of A.
  - (ii) Both A and R are true but R is not a correct explanation of A
  - (iii) A is true but R is false.
  - (iv) Both A and R are false.
- 4) **Assertion (A)** : Combustion of 16 g of methane gives 18 g of water.  
**Reason (R)** : In the combustion of methane, water is one of the products.
- (i) Both A and R are true but R is not the correct explanation of A.
  - (ii) A is true but R is false.
  - (iii) A is false but R is true.
  - (iv) Both A and R are false.
- 5) **Assertion (A)** : All isotopes of a given element show the same type of chemical behaviour.  
**Reason (R)** : The chemical properties of an atom are controlled by the number of electrons in the atom.
- i) Both A and R are true but R is not the correct explanation of A.
  - ii) A is true but R is false.
  - iii) A is false but R is true.
  - iv) Both A and R are false.
- 6) **Assertion (A)** : Black body is an ideal body that emits and absorbs radiations of all frequencies.  
**Reason (R)** : The frequency of radiation emitted by a body goes from a lower frequency to higher frequency with an increase in temperature.
- i) Both A and R are true but R is not the correct explanation of A.
  - ii) A is true but R is false.
  - iii) A is false but R is true.
  - iv) Both A and R are false.
- 7) **Assertion (A)** : It is impossible to determine the exact position and exact momentum of an electron simultaneously.  
**Reason (R)** : The path of an electron in an atom is clearly defined.
- i) Both A and R are true but R is not the correct explanation of A.
  - ii) A is true but R is false.



iii) A is false but R is true.

iv) Both A and R are false

**8. Assertion (A) :** Generally, ionisation enthalpy increases from left to right in a period.

**Reason (R) :** When successive electrons are added to the orbitals in the same principal quantum level, the shielding effect of inner core of electrons does not increase very much to compensate for the increased attraction of the electron to the nucleus.

(i) Assertion is correct statement and reason is wrong statement.

(ii) Assertion and reason both are correct statements and reason is correct explanation of assertion.

(iii) Assertion and reason both are wrong statements.

(iv) Assertion is wrong statement and reason is correct statement.

**9.** Determine the molecular formula of an oxide of iron if the mass % of iron and oxygen are 69.9% and 30.1% resp. Molar mass of compound is 170 gm/mol.

**10.** The density of 3 M solution of NaCl is 1.25gm/ml. Calculate the molality of the solution.

**11.** 10 L of a welding gas weighs 11.6 gm at STP. Calculate the molar mass of this gas.

**12.** Calculate the number of atoms in (a) 5 L oxygen gas at STP (b) 4.4 gm of CO<sub>2</sub>(c) 52 a.mu of He

**13.** Calculate the number of moles in (a) 5 L of 0.75 M Na<sub>2</sub>CO<sub>3</sub> (b) 7.85 gm iron (c) 34.2 gm of sucrose

**14.** A compound contains 4.07% hydrogen, 24.27% carbon and rest chlorine. Its molar mass is 98.96 gm. Determine its empirical and molecular formula.

**15.** What are the main points and limitations of Dalton's atomic theory?

**16.** 50 kg of N<sub>2</sub> and 10 kg of hydrogen gas are mixed to produce ammonia gas. Calculate mass of ammonia gas formed. Identify limiting reagent in the production of NH<sub>3</sub> in this solution.

**17.** 3.0 g of H<sub>2</sub> react with 29.0 g O<sub>2</sub> to yield H<sub>2</sub>O.

i. What is the limiting reactant?

ii. Calculate the maximum amount of water that can be formed.

iii. Calculate the amount of one of the reactants which remains unreacted.

**18.** Chlorine has two isotopes of atomic mass units 34.97u and 36.97u .the relative abundances of these two isotopes are 0.735 and 0.245 respectively. Find out average atomic mass of chlorine.

**19.** Prepare at least two conversions for each:

a) m<sup>3</sup> to litre b) m<sup>3</sup> to cm<sup>3</sup> c) atm to barr d) Kelvin to °F e) cm<sup>2</sup> to nm<sup>2</sup>

**20.** A metal forms two oxides. One contains 46.67% of the metal and another 63.94% of the metal. Show that these results are in accordance with law of multiple proportions.

**21.** An organic liquid having Carbon , hydrogen, oxygen and nitrogen contains

C=41.37%, H=5.75%, N=16.09% and rest is oxygen. Calculate the molecular formula of liquid if its V.D. is 43.

**22.** Define black body and black body radiations.

**23.** Write the electronic configuration of Cu and Cr.

**24.** An ion with mass number 56 contains 3 units of positive charge and 30.4% more neutrons than electrons .assign symbol to the ions.

**25.** Show that the circumference of the Bohr orbit for the hydrogen atom is integral multiple of the de Broglie wavelength associated with the electron revolving around the orbit.

26. What is the lowest value of  $n$  which allows 'g' orbital to exist.
27. What transition in a hydrogen spectrum would have the same wavelength as in the Balmer transition  $n = 4$  to  $n = 2$  of  $\text{He}^+$  spectrum?
28. Write postulates of Bohr's model of atom
29. Write postulates of Bohr's model of atom.
30. Define Heisenberg's uncertainty principle.
31. Difference between orbit and orbital.
32. Explain Aufbau's principle
33. Write complete electronic configuration of elements from 1 to 40.
34. What is ionization energy? How it varies from left to right and top to bottom in a periodic table?
35. What is electronegativity? Arrange the given elements in increasing order of electronegativity: Nitrogen, Oxygen, Carbon, Hydrogen, Bromine, Chlorine, Fluorine, Sulphur, phosphorus, Iodine
36. Why atomic masses are the average values? Explain by giving example.
37. Why is molality preferred over molarity in expressing concentration of solution?
38. In combustion of methane, which is limiting reagent and why?
39. A sample of gaseous substance weighing 0.5 g occupies a volume 1.12 litres under N.T.P conditions. Calculate the molar mass of the substance.
40. In Rutherford's experiment, generally thin foils of heavy atoms like gold, platinum etc. is used in bombardment of alpha particles. If thin films of light atoms like aluminium etc. are used, what difference would be observed?
41. Define Quantum numbers. Show that how different quantum numbers are related with each other.
42. State and explain de- Broglie relation.
43. How many no. of nodes are present in 3P orbital?
44. Why Heisenberg uncertainty principle has no significance in our daily life?
45. What are the advantages of long form of periodic table?
46. What are the limitations of mendleev's periodic table?
47. What are the general characteristics of s and p block elements?
48. What are the factors affecting Ionization energy?
49. The first ionization energy of Carbon atom is greater than that of Boron, whereas reverse is true for second ionization enthalpy. Explain.

Complete the practical file and do all the NCERT questions of above chapter.

### **XI –Elective Maths**

#### **Sets**

1. If  $A = \{x : x \in \mathbb{N}, x \leq 6\}$  and  $B = \{x : x \in \mathbb{N}, 2 < x^2 < 26\}$ , then  $A \cap B$  is equal to :
 

[a] {3,4,5,6}	[b] {3,4,5}	[c] {2,3,4,5}	[d] {4,5,6,7}
---------------	-------------	---------------	---------------
2. The set builder form of  $A = \{2,7,12,17,22\}$ 

[a] $A = \{5n-3, n \in \mathbb{N}, n \leq 5\}$	[b] $A = \{27-5n, n \in \mathbb{N}, n < 5\}$
[c] $A = \{5n-3, n \in \mathbb{N}, n < 5\}$	[d] $A = \{27-5n, n \in \mathbb{N}, n \geq 5\}$

3. Let  $A = \{2,3,4,5,7,8\}$ ,  $B = \{4,5,6,7,8\}$  and  $C = \{1,3,5,6,7,8,9\}$ , then  $\{(A \cap C) \cup B\}$  equals to  
 [a]  $\{3,4,5,6,7,8,9\}$  [b]  $\{3,4,5,6,7,8\}$  [c]  $\{2,3,4,5,6,7\}$  [d]  $\{3,4,6,7,8,9\}$
4. Let  $U = \{1,2,3,4,5,6,7,8\}$ ,  $A = \{1,2,3,5,6\}$ ,  $B = \{2,3,4,7,8\}$  then the value of  $(A' \cup B)$  is equal to  
 [a]  $\{1,2,3,4,5\}$  [b]  $\{2,3,4,7,8\}$  [c]  $\{1,2,4,7,8\}$  [d]  $\{2,3,5,6,8\}$
5. In a school, there are 20 teachers who teach Mathematics or Physics. Of these 12 teachers teach Mathematics and 4 teach Mathematics and Physics. How many teach Physics?  
 [a] 10 [b] 11 [c] 8 [d] 12

- [a] A is false and R is true.  
 [b] A is true and R is false.  
 [c] Both A and R are true and R is the correct explanation of A.  
 [d] Both A and R are true but R is not the correct explanation of A.
6. Assertion : the number of non-empty subsets of the set  $\{a,b,c,d,e,f\}$  is 63.  
 Reason : The number of proper subsets of the set A when  $n(A) = 2^k - 1$ .
7. Assertion : The collection of ten most talented writers of India form a set.  
 Reason : A set is a collection of well defined of distinct objects.

### Relations & Functions

1. The value of a and b if  $(5a, 4)$  and  $(b, -1)$  belong to the set  $\{(x, y) : x - 11y = 16\}$   
 [a]  $a=11, b=4$  [b]  $a=12, b=11$  [c]  $a=12, b=5$  [d]  $a=12, b=11$
2. If  $f(x) = 2x^2 - 7x + 8$ , then the value of  $f\{f(2)\}$  is  
 [a] 4 [b] 2 [c] 7 [d] 3
3. Find the domain of :  $f(x) = 7x / (x^2 - 8x - 20)$   
 [a]  $\{-2, 10\}$  [b]  $R - \{-2, 10\}$  [c]  $R - (-2, 10)$  [d]  $R - \{-2, 10\}$
4. If  $A = \{x : x^2 - 10x + 21 = 0\}$  ; ,  $B = \{6, 12\}$  ;  $C = \{7, 12\}$  then  $A \times (B \cap C)$   
 [a]  $(10, 3), (12, 7)$  [b]  $(6, 12), (2, 12)$  [c]  $(7, 12), (3, 12)$  [d]  $(2, 12), (2, 12)$
5. Let  $A = \{2, 3, 8\}$ ,  $B = \{2, 3, 5\}$ ,  $C = \{2, 5, 8, 9\}$  then  $(A - B) \times (B - C)$  is  
 [a]  $\{(1, 2), (1, 5), (2, 5)\}$  [b]  $\{(1, 4)\}$  [c]  $\{(4, 5)\}$  [d]  $\{8, 3\}$
6. Find the range of :  $y = (4x + 3) / (5x + 4)$   
 [a]  $R - \{5/4\}$  [b]  $R - \{4/5\}$  [c]  $R - \{-5/4\}$  [d]  $R - \{-4/5\}$
- [a] A is false and R is true.  
 [b] A is true and R is false.  
 [c] Both A and R are true and R is the correct explanation of A.  
 [d] Both A and R are true but R is not the correct explanation of A.
9. Assertion : If  $(2x + 1, x + 5y - 2) = (9, 18)$ , then  $x = 5$  and  $y = 3$ .  
 Reason : Two ordered pairs are equal if their corresponding elements are equal.
10. Assertion : A relation  $R = \{(1, 3), (2, 2), (3, 1)\}$  defined on the set  $A = \{1, 2, 3\}$  is a function.  
 Reason : A relation from set A to set B is a function if every element of A is related to a unique element of B.

### Complex Numbers

1. The value of  $(4i^6 + 14i^{11} + 14i^{12} + 16i^{17})$

[a]  $10 + 6i$       [b]  $10 - 6i$       [c]  $10 + 2i$       [d]  $10 - 2i$

2. The value of  $(2+8i) / (1+i)$

[a]  $(3+4i)$       [b]  $(5+3i)$       [c]  $(5-6i)$       [d]  $(3-2i)$

3. The number  $\frac{(1+i)^3}{1-i^5}$  is equal to :

[a]  $i$       [b]  $-i$       [c]  $-1$       [d]  $-2$

4. If  $x + iy = \frac{(2+i)(1-3i)}{(1+2i)(3+i)}$ , then the value of  $x$  and  $y$  :

[a]  $x=3/5, y=4/5$       [b]  $y=-3/5, x=-4/5$       [c]  $x=-3/5, y=-4/5$       [d]  $y=3/5, x=4/5$

5. If  $(4x + 1) + (6y - 8)i = (-7 - 2i)^2$  then the value of  $x$  and  $y$  :

[a]  $x = 11, y = -6$       [b]  $x = 11, y = 6$       [c]  $x = -11, y = 6$       [d]  $x = -11, y = -6$

[a] A is false and R is true.

[b] A is true and R is false.

[c] Both A and R are true and R is the correct explanation of A.

[d] Both A and R are true but R is not the correct explanation of A.

6. Assertion : If  $4x + i(3x + 4y) = 15 + 11i$ , then  $x = 15/4$  and  $y = 1/16$ .

Reason : Two complex numbers are equal if their corresponding real and imaginary parts are equal.

7. Assertion : If  $Z = \frac{1}{5+12i}$ , then  $|Z| = \frac{1}{17}$

Reason : If  $Z = a+ib$  then  $|Z| = \sqrt{a^2 + b^2}$

## Trigonometry

1. The value of  $\cos(1680^\circ) + \sin(1290^\circ)$

[a]  $2$       [b]  $-1$       [c]  $0$       [d]  $1$

2. If  $\cos A = -20/29$ , A lies in second quadrant, then the value of  $(1 + \operatorname{cosec} A)$

[a]  $49/20$       [b]  $-5/2$       [c]  $50/21$       [d]  $-50/21$

3. If  $x \sin 135^\circ \cos^2 120^\circ = \frac{\tan^2 120^\circ \operatorname{cosec} 150^\circ}{\cot^2 30^\circ \sec^2 135^\circ}$ , then  $x$  is :

[a]  $2$       [b]  $4$       [c]  $8$       [d]  $16$

4. Evaluate :  $\cos A + \sin(270^\circ + A) - \sin(270^\circ - A) + \cos(180^\circ + A)$

[a]  $-1$       [b]  $0$       [c]  $1$       [d] none of these

5.  $\tan A \sin\left(\frac{\pi}{2} + A\right) \cos\left(\frac{\pi}{2} - A\right)$  is equal to

[a]  $1$       [b]  $0$       [c]  $\frac{1}{\sqrt{2}}$       [d] none of these

6. The value of  $\left(3 \cos \frac{\pi}{3} \operatorname{cosec} \frac{\pi}{6} - 4 \sin \frac{5\pi}{6} \tan \frac{\pi}{4}\right) \cos 2\pi$

[a]  $0$       [b]  $-1$       [c]  $1$       [d]  $\frac{1}{2}$

7. If  $x = \sec A - \tan A$  and  $y = \operatorname{cosec} A + \cot A$ , then the value of  $x - y + 1 + xy$  is

[a]  $2$       [b]  $0$       [c]  $1$       [d]  $-1$

8. If  $\cos(a+b) = 4/5$ , and  $\sin(a-b) = 5/13$ , then the value of  $\tan(2a)$  is

[a] 24/25      [b] 33/56      [c] 56/33      [d] 25/24

9. If  $\sin A = 1/2$ , then the value of  $\sin 3A$  is :

[a]  $1/2$       [b]  $1/3$       [c] 0      [d] 1

[a] A is false and R is true.

[b] A is true and R is false.

[c] Both A and R are true and R is the correct explanation of A.

[d] Both A and R are true but R is not the correct explanation of A.

10. Assertion :  $\tan 8A - \tan 6A + \tan 2A = \tan 8A \tan 6A \tan 2A$

Reason :  $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

11. Assertion : If two equal arcs of different circles subtend angles of  $36^\circ$  and  $45^\circ$  at the centre respectively, then the ratio of their radii is 5 : 4.

Reason : In a circle of radius  $r$ , an arc of length  $m$  subtends an angle of  $m/r$  radians at the centre.

### Case Study

1. In a survey of 25 students, it was found that 21 had taken Mathematics, 26 had taken Physics and 29 had taken Chemistry, 14 had taken Mathematics and Physics, 12 had taken Mathematics and Chemistry, 14 had taken Physics and Chemistry and 8 had taken all the three subjects. Based on the above information, answer the following questions.

[i] The number of students who had taken only Mathematics is

[a] 8      [b] 3      [c] 4      [d] 5

[ii] The number of students who had taken at least one of the three subjects is

[a] 45      [b] 48      [c] 44      [d] 50

[iii] The number of students who had taken only one of the subjects is

[a] 20      [b] 19      [c] 15      [d] 25

[iv] The number of students who had taken Mathematics and Physics but not Chemistry is

[a] 8      [b] 9      [c] 6      [d] 11

[v] The number of students who had taken Chemistry and Physics but not Mathematics is

[a] 4      [b] 3      [c] 8      [d] 6

2. The mathematics teacher was teaching the students of class XI the following concepts of trigonometric equations. An equation involving trigonometric functions of an unknown angle or angles is called a trigonometric equation. The solution in the interval  $[0, 2\pi]$  is called the principal solution of the given equation.

Based on the above information, answer the following questions.

[i] If  $\tan x = \frac{-1}{2}$  and  $\operatorname{cosec} x = \frac{3}{2}$  then in which quadrant they lie.

[a] I      [b] II      [c] III      [d] IV

[ii] The value of  $2\sin^2 x$  is equal to :

[a]  $(1 - \cos x)$       [b]  $(1 + \cos x)$       [c]  $(1 + \cos 2x)$       [d]  $(1 - \cos 2x)$

[iii] If  $\cot x = -1/\sqrt{3}$  and  $x$  lies in 2<sup>nd</sup> quadrant the value of  $(1 + \sec x)$

[a] 1      [b] 3      [c] -1      [d] 0

[iv] The degree measures of  $\left(\frac{8\pi}{9}\right)^\circ$  is :

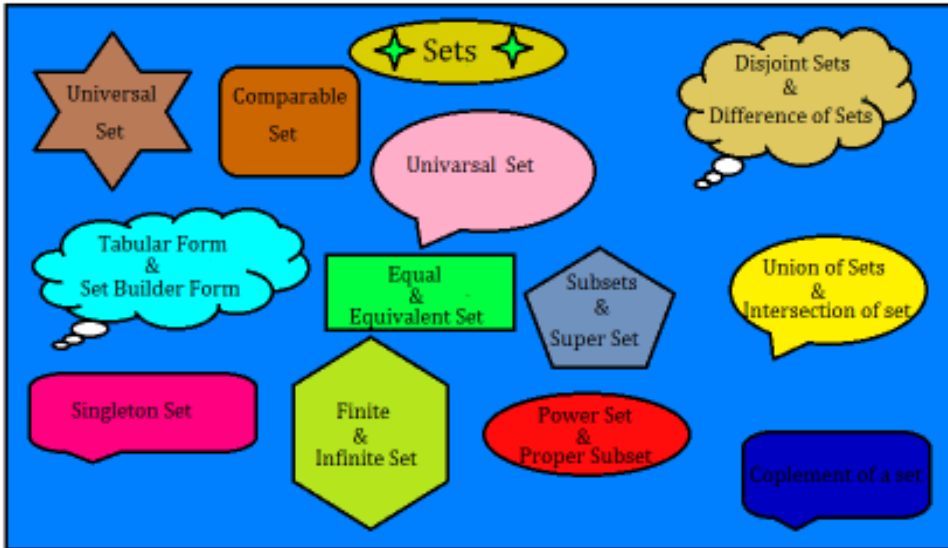
[a]  $320^\circ$       [b]  $340^\circ$       [c]  $280^\circ$       [d]  $160^\circ$

[v] The value of  $\cot 75^\circ$

[a]  $3 + \sqrt{2}$       [b]  $2 + \sqrt{3}$       [c]  $2 - \sqrt{3}$       [d]  $3 - \sqrt{2}$

## Activities

1. Draw the graph of the function  $f(x) = \begin{cases} 3 - x, & \text{if } x > 1 \\ 1, & \text{if } x = 1 \\ 2x, & \text{if } x < 1 \end{cases}$
2. Represent the given complex number on Arganda plane :  $\frac{2+i}{(1+i)(1-2i)}$
3. Write the definition of the following given below in practical file.  
(Note : Students may integrate different forms of art in the project work)



## COMPUTER SCIENCE

1. Prepare a Project on the topic- Contribution of Boolean Algebra in Digital Electronics. Students must research on the above topic and prepare a typed document. Circuit diagrams and pictures must be included to make the document relevant and attractive. The project must be submitted in a channel file.
  2. Complete NCERT exercise of chapter 2(Data Representation) in the holiday homework notebook.
- Prepare for the unit test to be held after summer break. Syllabus for Unit test is as follows -**
- Basic computer organisation: Introduction to Computer System, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (bit, byte, KB, MB, GB, TB, PB)
  - Types of software: System software (Operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler, and interpreter), application software
  - Operating System(OS): functions of the operating system, OS user interface
  - Boolean logic: NOT, AND, OR, NAND, NOR, XOR, NOT, truth tables and De Morgan's laws, Logic circuits
  - Number System: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems
  - Encoding Schemes: ASCII, ISCII, and Unicode (UTF8, UTF32)