DAVID MODEL SENIOR SECONDARY SCHOOL

Main Road Tukmirpur

SUMMER HOLIDAYS HOMEWORK (2024-2025)
Class : XI (Science)

General Instruction: Follow the subject wise given instructions and submit the given task the very first day when the school reopens.

ENGLISH

- **Read Newspaper daily.**
- **Watch any Sci-fi movie of your choice and write the review.**

How to do: The review is to be written in 250-300 words keeping in mind the given aspects:

- Introduction
- Review
- Favourite character
- Analysis

Where to do: A4 Size sheets

Parameters for Assessment Content, language and accuracy.

- **Read the Chapters of Hornbill and Snapshots.**
- **Revise all the "Class notes".**
- **Go for a morning walk daily, observe nature and your surroundings.**
- **Compose 'a Poem' or write 'an Article' on topic of your choice.**

PHYSICS

Write answer of the given questions on A4 sheets.

Q1. If density ρ, acceleration due to gravity g and frequency v are the basic quantites, find the dimensions of force.

Q2. In the expression $P = El^2\, m^{-5} G^{-2}$; E, m, l and G denote energy, mass angular momentum and gravitational constant, respectively. Show that P is a dimensional quantity.

Q3. Show that angular momentum has the same physical unit as the Planck's constant h which is given by the relation $E = hv$.

Q4. The frequency $'\mathrm{v}'$ of vibration of a stretched string depends upon:
(i) its length l, (ii) its mass per unit length $'m'$ and (iii) the tension T in the string
Obtain dimensionally an expression for frequency v.

Q5. The velocity of sound waves $'v'$ through a medium may be assumed to depend on:
(i) the density of medium $'d'$ and (ii) the modulus of elasticity $'E'$.
Deduce by the method of dimensions the formula for the velocity of sound. Take dimensional constant $K = 1$.

Q6. The critical angular velocity ω_c of a cylinder inside another cylinder containing a liquid at which its turbulence occurs depends on viscosity η, density ρ and the distance d between the walls of the cylinder. Find the expression for ω_c.

Q7. The frequency ν of an oscillating drop may depend upon radius r of the drop, density ρ of the liquid and surface tension S of the liquid. Establish an expression for ν dimensionally.

Q8. Check by the method of dimensions whether the following equations are correct:

(i) $E = mc^2$ (ii) $T = 2\pi\sqrt{\frac{l}{g}}$

(iii) $v = \sqrt{\frac{P}{\rho}}$, where v = velocity of sound, P = pressure and ρ = density of medium.

(iv) $\nu = \frac{1}{2l}\sqrt{\frac{T}{m}}$, where ν = frequency of vibration, l = length of the string and m = mass per unit length.

Q9. The Vander Wall's equation for a gas is $\left(P + \frac{a}{V^2}\right)(V - b) = RT$

Determine the dimension of a and b. Hence write the SI units of a and b.

Q10. When white light travels through glass, the refractive index of glass (μ = velocity of light in air/velocity of light in glass) is found to vary with wavelength as $\mu = A + \frac{B}{\lambda^2}$. Using the principle of homogeneity of dimension, find the SI units in which the constants A and B must be expressed.

Q11. On a 60 km track, a train travels the first 30 km with a uniform speed of 30 kmh^{-1}. How fast must the train travel next 30 km so as to average 40 kmh^{-1} for the entire trip?

Q12. A body covers one third of its journey with speed $'u'$, next one third with speed $'v'$ and the last one-third with speed $'w'$. Calculate the average speed of the body during the entire journey.

Q13. A body travelling along a straight line traversed one-half of the total distance with a velocity v_0.The remaining part of the distance was covered with a velocity v_1, for half the time and with velocity v_2 for the other half of time. Find the mean velocity averaged over the whole time of motion.

Q14. The position of an object moving along x-axis is given by $x = a + bt^2$ where $a = 8.5\ m, b = 2.5\ ms^{-2}$ and t is measured in seconds. What is its velocity at $t = 0$ s and $t = 2.0$ s. What is the average velocity between $t = 2.0$ s and $t = 4.0$ s?

Q15. The acceleration of a particle in ms^{-2} is given by $a = 3t^2 + 2t + 2$, where time t is in second. If the particle starts with a velocity $v = 2\ ms^{-1}$ at $t = 0$, then find the velocity at the end of 2 s.

Q16. A burglar's car had a start with an acceleration of 2 ms^{-2}. A police vigilant party comes after 5 seconds and continued to chase the burglar's car with a uniform velocity of 20 ms^{-1}. Find the time in which the police van overtakes the burglar's car.

Q17. A body starting from rest accelerates uniformly at the rate of 10 cms^{-2} and retards uniformly at the rate of 20 cms^{-2} .Find the least time in which it can complete the journey of 5 km if the maximum velocity attained by the body is 72 kmh^{-1} .

Q18. A stone falls from a cliff and travels 24.5m in the last second before it reaches the ground at the foot of the cliff. Find the height of the cliff.

Q19. A body is dropped from rest at a height of 150m, and simultaneously, another body is dropped from rest from a point 100m above the ground. What is their difference in height after they have fallen (i) 2s (ii) 3s? How does the difference in height vary with time?

Q20. A parachutist bails out from an aeroplane and after dropping a distance of 40m, he opens the parachute and decelerates at $2ms^{-2}$. If he reaches the ground with a speed of $2ms^{-1}$, how long is he in the air? At what height did he bail out from the plane?

Q21. You drive a car at a speed of 70 km/h in a straight road for 8.4 km, and then the car runs out of petrol. You walk for 30 minute to reach a petrol pump at a distance of 2 km. The average velocity from the beginning of your drive till you reach the petrol pump is

(a) 16.8 km/h (b) 35 km/h (c) 64 km/h (d) 18.6 km/h

Q22. The acceleration experienced by a moving motorboat, after its engine is cut-off, is given by $\frac{dv}{dt} = -kv^3$ where k is constant. If v_0 is the magnitude of velocity at cut-off, the magnitude of the velocity at a time t after the cut off is

(a) $v_0/2$ (b) v_0 (c) $\frac{v_0}{\sqrt{2v_0^2kt+1}}$ (d) v_0e^{-kt}

Q23. A train started from rest from a station and accelerated at $2\ ms^{-2}$ for 10 s. Then, it ran at constant speed for 30 s and thereafter it decelerated at $4\ ms^{-2}$ until it stopped at the next station. The distance between two station is

(a) 650 m (b) 700 m (c) 750 m (d) 800 m

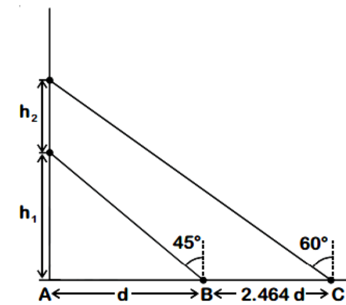
Q24. A ball is dropped from a high rise platform at t = 0 starting from rest. After 6 s another ball is thrown downwards from the same platform with a speed v. The two balls meet at t = 18 s. What is the value of? (Take $g = 10\ ms^{-2}$)

(a) 74 ms^{-1} (b) 64 ms^{-1} (c) 84 ms^{-1} (d) 94 ms^{-1}

Q25. The water drop falls at regular intervals from a tap 5 m above the ground. The third drop is leaving the tap at instant the first drop touches the ground. How far above the ground is the second drop at that instant?

(a) 3.75 m (b) 4.00 m (c) 1.25 m (d) 2.50 m

Q26. A balloon is moving up in air vertically above a point A on the ground. When it is at a height h, a girl standing at a distance d (point B) from A (see figure) sees it at an angle $45°$ with respect to the vertical. When the balloon climbs up a further height h_2, it is seen at an angle $60°$ with respect to the vertical if the girl moves further by a distance $2.464\ d$ (point C). Then the height h, is (given $\sin 30° = 0.5774$)

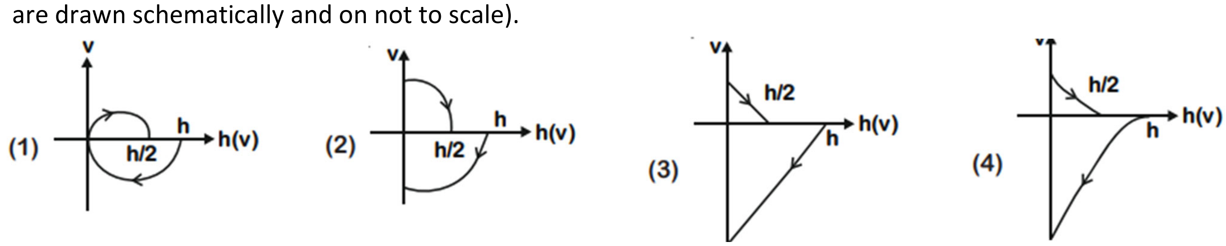


(a) d (b) $0.732\ d$ (c) $1.464\ d$ (d) $0.464\ d$

Q27. A helicopter rises from rest on the ground vertically upwards with a constant acceleration g. A food packet is dropped from the helicopter when it is at a height h. The time taken by the packet to reach the ground is close to [g is the acceleration due to gravity]

(a) $t = 3.4\sqrt{\left(\frac{h}{g}\right)}$ (b) $t = 1.8\sqrt{\frac{h}{g}}$ (c) $t = \sqrt{\frac{2h}{3g}}$ (d) $t = \frac{2}{3}\sqrt{\frac{h}{g}}$

Q28. A tennis ball is released from a height h and after freely falling on a wooden floor it rebounds and reaches height $h/2$. The velocity versus height of the ball during its motion may be represented graphically by (graph are drawn schematically and on not to scale).

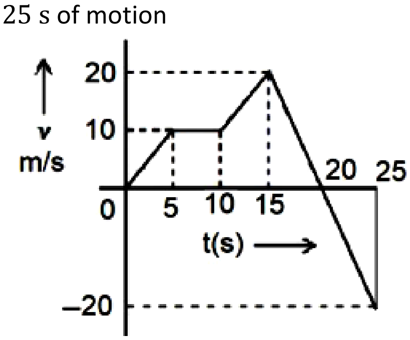


Q29. A ball is dropped form the top of a 100 m high tower on a planet. In the last $1/2\ s$ before hitting the ground, it covers a distance of $19\ m$. Acceleration due to gravity (in ms^{-2}) near the surface on that planet is __________.

Q30. From the $v - t$ graph shown. The ratio of distance to displacement in 25 s of motion

(a) $\frac{3}{5}$ (b) $\frac{1}{2}$

(c) $\frac{5}{3}$ (d) 1



CHEMISTRY

Write answer of the given questions on A4 sheets.

Chapter-1 Ncert Questions 1 to 34 exercise

Chapter-1 solved examples

Chapter-2 (i) write down configuration of atomic number 1 to 36

(Ii) Draw shapes of 3d orbitals

(Iii) Determine total electron in

(a) n=3, l=1. (b) n=4 , l= 0
© n= 4, ms= ½

(iv) Define the following - Hunds rule, Pauli exclusion principle, Aufbau principle, photoelectric effect, Heisenberg uncertainty principle

Chapter 2 Exercise questions no 2.5, 2.7,2.9,2.10,2.11,2.12,2.13,2.152.20,2.21,2.30,2.31.2.32,2.33,2.41,2.42, 2.43, 2.62, 2.63, 2.64,

- Chart of electronic configuration 1to 30
- Draw shapes of s, p and d orbitals

BIOLOGY

Write answer of the given questions on A4 sheets.

Q1. Answer these questions in A4 sheets.

- What do you mean by Taxonomy? Contributions of different scientists in the field of taxonomy.
- Collect information about the Red data Book. Prepare a list of at least 20 endangered species. Also write the different conservation methods to save them.
- Write any one branch of Biology in detail.
- Make a synopsis on any one organism belonging to 5 different kingdoms along with an A4 size clear picture.

Q2. Make a chart on any one of the following topics or the topic given individually in class. Use standard sized hard textured chart paper of black or white colour and then paste it on thermocol sheet and cellophane cover.

- Alimentary Canal of Frog.
- Parts of a Brain.
- Plant Cell vs Animal cell.
- Human Heart
- Human Evolution
- Embryonic development in human
- Evidences of evolution
- List of Indian endangered species
- Biomolecules
- Different types of viruses
- Different types of bacteria
- Morphology of plants
- Human endocrine system
- Different types of seeds, embryos and fruits in plants.
- Any one scientist who made contributions in the field of Biology.

- Any one labelled diagram related to Human physiology.
- List of Nobel Prize winners in medicine.
- Collage of different technological advancements in the field of medical field.

Q3. Do write the lab experiment of Animal Specimens in lab manual.

MATHEMATICS

Write answer of the given questions on A4 sheets.

Q1. Do examples of Ch-1, 2 & 3.

Q2. Draw the graph of following functions: -

(i) $f(x) = \frac{1}{x2}$	(ii) $f(x) = \sqrt{9 + x^2}$	(iii) $f(x) = \sqrt{x^2 - 9}$
(iv) $f(x) = x^2 - 6x + 5$	(v) $f(x) = \sqrt{x^2 + x - 6}$	(vi) $f(x) = \lvert x - 3 \rvert$
(vii) $f(x) = \lvert x - 1 \rvert + \lvert x - 3 \rvert$	(viii) $f(x) = [x] + 2$	(ix) $f(x) = \frac{1}{x-3}$
(x) $f(x) = x + \frac{1}{x}$	(xi) $f(x) = \log x + 1$	(xii) $f(x) = e^{x+1}$
(xiii) $f(x) = [\ \lvert x - 2 \rvert\ ]$	(xiv) $f(x) = \lvert x^2 + 4x + 3 \rvert$	(xv) $f(x) = [\ \lvert x \rvert - 2\ ]$

Q3. Do one project on the given topic.

a) About 5 Indian mathematicians. (Roll no. 1 to 12)
b) About 5 Foreign mathematicians (Roll no. 13 to 24)
c) Fibonaaci sequence, golden ratio (Roll no. 25 to 36)
d) Application of trigonometry (roll no. 37 to 48)
e) Application of probability (Roll no. 49 to 58)

COMPUTER SCIENCE

Write answer of the given questions on A4 sheets.

Q1. Draw a diagram of the functional component of a computer system.

Q2. Define the following:

- Input & Output Devices
- Hardware & Software
- Memory and it's Unit
- Operating System
- Language Processors

Q3. Define the role of ISCII, ASCII and Unicode.

Q4. Write at least one conversation for all types of numbers i.e. binary, decimal, octal decimal & hexadecimal number.

Q5. Define the logic circuit: and, or, not, nand & nor with their logic diagram & truth table.

Q6. Prove all the boolean laws & properties using truth table and also verified algebraically.

Q7. Draw the logic circuit diagram:

- (X+Y’) (Y’+Z) (Z+X+Y’) Use Only NOR Logic Gate
- AB’C + A’B + BC’ Use Only NAND Logic Gate

Q8. Write the steps for problem solving techniques.

Q9. Define Algorithm, Pseudocode & Flowchart and also write at least two programs using them.

Q10. Write the symbols of Flowchart with their job (function).

PHYSICAL EDUCATION

• **Make a project File of the following topics on A4 sheets.**

***Project-1**

Labelled diagram of field & equipment of any one game of your choice of the given list.

Basketball, Volleyball, Football, Badminton, Table tennis and Cricket

*** Project -2**

Write the procedure and benefits of any two Asanas, yogic kriyas and Pranayam.

*** Project -3**

SAI KHELO INDIA TEST