KendriyaVidyalaya North Lakhimpur

Holiday Homework

Class XI (SCIENCE)

SUBJECT: (ENGLISH)

1. Read the novel prescribed in your syllabus and answer the following questions.
    a) Write the summary of each chapter.
    b) Give character sketch of Virginia, Ghost, Mr Otis, Lord Canterville, Twins and Duke.
    c) Comment on the themes of the novel.
2. Make a PPT based on above mentioned questions.

विषय :- हिन्दी

1. पढ़ाये गए समस्त पाठों का अभ्यास करें |
2. वितान के समस्त पाठों को पढ़ें |
3. 2 आलेख, 2 फीचर और 4 निबंध और 2 पत्र लिखें
4. 15 पृष्ठ सुलेख लिखें |
5. अभिव्यक्ति और माध्यम के पढाये गए भाग का अभ्यास करें |

कमल नयन सिंह

परास्नातक शिक्षक

SUBJECT: MATHS

Q.1. In an A.P. if mth term is n and the nth term is m, where m≠ $n, find\ the\ pth\ term.$

Q.2. If the sum of n terms of an AP is $(pn + qn)^2, where\ p\ and\ q\ are\ constants, find\ the\ first\ term\ and\ common\ difference$?

Q.3. The sum of n terms of two AP,s are in the ratio 5n+4 : 9n+6. Find the ratio of their 18^{th} term?

Q.4. $the\ ratio\ of\ sums\ of\ \ m\ and\ nterms\ of\ an\ AP\ is\ m^2 : n^2. Show\ that\ the\ ratio\ of\ mth\ and\ nth\ terms\ is\ (2m-1):(2n-1).$

Q.5. $If\ \frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is the arithmetic mean between a and b, then find the value of n.

Q.6. Find the sum to n terms of the sequence 0.6 + 0.66 +0.666 +0.6666+…….?

Q.7. $If\ the\ 1st\ and\ nth\ term\ of\ a\ G.P.\ are\ a\ and\ b, respectively, and\ if\ P\ is\ the\ product\ of\ first\ n\ terms\ , Prove\ that\ P^2 = (ab)^n.$

Q.8. $Show\ that\ the\ ratio\ of\ sum\ of\ the\ sum\ of\ first\ n\ terms\ of\ a\ G.P.\ to\ the\ sum\ of\ terms\ from\ (n+1)th\ to\ (2n)th\ terms\ is\ \frac{1}{r^n}.$

Q.9.
$The\ sum\ of\ two\ numbers\ is\ six\ times\ their\ geometric\ mean, show\ that\ the\ numbers\ are\ in\ ratio$

$(3+2\sqrt{2}):(3-2\sqrt{2}).$

Q.10. $Find\ the\ sum\ to\ n\ terms\ of\ the\ series: 5+11+19+41+\cdots\ldots\ldots\ldots\ldots?$

Q.11.Find the sum to n terms of the series whose nth term is n(n+1).

Q.12.
$Let\ the\ sum\ of\ n, 2n, 3n\ terms\ of\ an\ AP\ be\ S_1, S_2, and\ S_3\ respectively, show\ that\ S_3 = 3(S_2 - S_1).$

Q.13.$The\ ratio\ of\ A.M, and\ G.M.\ of\ two\ positive\ numbers\ a\ and\ b, is\ m: n. Show\ that\ a:b = \left(m+\sqrt{m^2-n^2}\right):\left(m-\sqrt{m^2-n^2}\right).$

Q.14.
$The\ slope\ of\ a\ line\ is\ double\ of\ the\ slope\ of\ another\ line. If\ the\ tangent\ of\ the\ angle\ between\ them\ is\ \frac{1}{3}, find\ the\ slope\ of\ the\ line.$

Q.15. $If\ three\ points\ (h,0),(a,b)\ and\ (0,k) lies\ on\ a\ line, show\ that\ \frac{a}{h}+\frac{b}{k}=1.$

Q.16.
$Find\ the\ equation\ of\ line\ passing\ through\ (-3,5)\ and\ perpendicular\ to\ the\ line\ through\ the\ \ points\ (2,5) and\ (-3,6).$

Q.17.
$Find\ the\ equation\ of\ line\ that\ cuts\ off\ equal\ intercepts\ on\ the\ coordinate\ axex\ and\ passes\ through\ the\ point\ (2,3).$

Q.18.
$Point\ P(a,b) is\ the\ mid\ point\ of\ a\ line\ segmentbetween\ the\ axes. Show\ that\ the\ equation\ o\ the\ line\ is\ \frac{x}{a}+\frac{y}{b}=2.$

Q.19.
$The\ perpendicular\ from\ the\ origin\ to\ a\ line\ meet\ it\ at\ the\ point\ (-2,9), find\ the\ equation\ of\ line.$

Q.20. $Find\ the\ angle\ between\ the\ lines\ y-\sqrt{3}x-5=0\ and\ \sqrt{3}y-x+6=0.$

Q.21. Find the distance $of\ the\ point\ (-1,1) from\ the\ line\ 3x-4y-26=0.$

Q.22.
$Find\ the\ coordinates\ of\ foot\ of\ perpendicular\ from\ the\ point\ (-1,3)\ to\ the\ line\ 3x-4y-16=0.$

Q.22.
$If\ p\ and\ q\ are\ the\ lengths\ of\ perpendicualrs\ from\ the\ origin\ to\ the\ lines\ x\cos\theta - y\sin\theta = k\cos 2\theta\ and\ x\sec\theta + y\,\mathrm{cosec}\,\theta = k, respectively,$

$$prove\ that\ p^2+4q^2=k^2.$$

Q.23.
$If\ p\ is\ the\ length\ of\ perpendicular\ from\ the\ origin\ to\ the\ line\ whose\ intercepts\ on\ thje\ axes$

$are\ a\ and\ b, then\ show\ that\ \frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}.$

Q.23.
$Show\ that\ the\ equation\ of\ line\ passing\ through\ origin\ and\ making\ an\ angle\ \theta\ with\ the\ line\ y=mx+c\ is\ \frac{y}{x}=\frac{m\pm tan\theta}{1\mp m\ tan\theta}.$

Q.24. $Find\ the\ centre\ and\ radius\ of\ circles: i).\ x^2+y^2-4x-8y-45=0 \qquad ii).\ 2x^2+2y^2-x=0.$

Q.25.
$Find\ the\ equation\ of\ circle\ passing\ through\ the\ point\ (2,3) and\ (-1,1) and\ whose\ centre\ lie\ on\ the\ line\ x-3y-11=0.$

Q.26.
$Find\ the\ equation\ of\ circle\ passing\ through\ the\ point\ (0,0) and\ makinf\ intercepts\ a\ and\ b\ on\ the\ coordinate\ axes.$

Q.27.
$Find\ the\ equation\ of\ parabola\ having\ vertex\ (0,0), passing\ through\ (5,2) and\ symmetric\ with\ respect\ to\ y-axis.$

Q.28.
$Find\ the\ coordinates\ of\ foci, the\ vertices, the\ length\ of\ major\ axis, the\ minor\ axis, the\ eccentricity\ and\ the\ length\ of\ latus\ ractum\ of\ the$

$the\ following\ ellipse: i).\frac{x^2}{49}+\frac{y^2}{36}=1 \qquad ii).\ 4x^2+9y^2=36.$

Q.29. $Find\ the\ equation\ of\ ellipse\ whose\ centre\ is\ at\ (0,0), major\ axis\ on\ y-axis\ and\ passes\ through\ the\ points\ (3,2) and\ (1,6).$

Q.30. $Find\ the\ equation\ of\ hyperbola\ having\ vertices\ (\pm 7,0) and\ eccc=eccentricity\ e=\frac{4}{3}.$

Q.31.
$Find\ the\ are\ of\ triangle\ formed\ by\ the\ lines\ joining\ the\ vertex\ of\ the\ parabola\ x^2=12y\ to\ the\ ends\ of\ its\ latus\ ractum.$

Q.32.
$An\ equilateral\ triangle\ is\ inscribed\ in\ the\ paraboal\ y^2=4ax, where\ one\ vertex\ is\ at\ the\ vertex\ of\ the\ parabola. Find\ the\ length\ of\ the\ side\ of\ the\ triangle.$

Q.33.
$verify\ that\ the\ points\ (0,7,10), (-1,6,6) and\ (-4,9,6) are\ the\ vertices\ of\ a\ right\ angle\ triangle.$

Q.34.
$Find\ the\ equation\ of\ set\ of\ pints\ P, the\ sum\ of\ whose\ distance\ from\ the\ point\ (4,0,0) and\ (-4,0,0)\ is\ equal\ to\ 10.$

Q.35.
$Find\ the\ centroid\ of\ the\ triangle\ whose\ vertices\ are\ (x_1,y_1,z_1),(x_2,y_2,z_2)\ and\ (x_3,y_3,z_3)$
.

Q.36.
Find the ratio in which the YZ plane divides he line segmentformed by joining the points $(-2,4,7)$ *and* $(3,-5,8)$.

Q.37.
If A and B be the [*points* $(3,4,5,)$ *and* $(-1,3,-7)$, *resp. find the equation of set of points P such that* $PA^2 + PB^2 = k^2$.

Q.38.
If the origin is the centroid of the triangle PQR with vertices $P(2a,2,6), Q(-4,3b,-10)$ *and* $R(8,14,2c)$, *find the value of* a , b *and* c.

Q.39. Find the following limits:- i). $\lim_{x\to 2}\left[\frac{x^3-4x^2+4x}{x^2-4}\right]$ ii). $\lim_{x\to 1}\left[\frac{x-2}{x^2-x}-\frac{1}{x^3-3x^2+2x}\right]$ iii)$\lim_{x\to 0}\left[\frac{\sqrt{1+x}-1}{x}\right]$.

iv). $\lim_{x\to 0}\left[\frac{\sin 3x}{\sin 5x}\right]$ v). $\lim_{x\to 0}[cosecx - cotx]$vi). $\lim_{x\to \pi}\left[\frac{\sin(\pi-x)}{\pi(\pi-x)}\right]$
vii). $\lim_{x\to 0}\left[\frac{\cos 2x-1}{\cos x-1}\right]$

Q.40. *Evaluate* $\lim_{x\to 0}(f(x))$, *where* $f(x) = \begin{cases} \frac{x}{|x|} & x \neq 0. \\ 0 & x = 0 \end{cases}$

Q.41.
Suppose $f(x) = \begin{cases} a+bx, & x<0 \\ 4 & x=0 \\ b-ax, & x>1 \end{cases}$ *and if* $\lim_{x\to 1} f(x) = f(1)$, *find the possible values of* a *and* b.

Q.42. *Find all possible values of* n *if* $\lim_{x\to 2}\frac{x^n-2^n}{x-2} = 80, n \in N$

Q.43. Find the value of :- i). $\lim_{x\to 0}\frac{\sqrt{1+2x}-\sqrt{1-2x}}{\sin x}$ ii). $\lim_{x\to\infty}\frac{x+sinx}{x+\cos x}$

Q.44. Find the derivative of the following functions :- i). $\frac{1}{\sqrt{ax+b}}$ ii). $(x+1)(x+2)(x+3)$ $iii).\cos\sqrt{2x+1}$ $iv).\sqrt{\cos(ax+b)}$

v). $\sqrt{\frac{x+1}{x-1}}$vi). $x^2\sin\frac{1}{x}$ vii). $\frac{\sin x+\cos x}{\sin x-\cos x}$viii). $\frac{x\,tanx}{\sec x+\tan x}$ix). $\frac{\sin x-x\cos x}{x\sin x+\cos x}$

Q.45. *If* $f(x) = 3x^n$ *and if* $f'(1) = 12$, *find the value of* n.

Q.46. *If* $f(x) = \frac{\sqrt{a}+\sqrt{x}}{\sqrt{a}+\sqrt{x}}$, *show that* $\frac{dy}{dx} = \frac{\sqrt{a}}{\sqrt{x}(\sqrt{a}-\sqrt{x})^2}$

Q.47. *Fnid the derivative of the following functions usinf first principle method* : −

i). $f(x) = x^2$ ii). $f(x) = \frac{1}{\sqrt{x}}$ $iii).f(x) = \tan x$iv). $f(x) = \sqrt{\cos x}$
v). $f(x) = \frac{2x+3}{x-2}$

NOTE :- Revise chapters from 9 to 13.

1. How does Young's modulus change with the rise in temperature?
2. What is a perfectly plastic body? Give examples.
3. State the two factors on which the modulus of elasticity depend.
4. What is the value of modulus of rigidity for an incompressible liquid.
5. Draw the stress versus strain graph for a metallic wire, when stretched up to the breaking point. Explain.
6. Four identical hollow cylindrical columns of mild steel support a big structure of mass 50000kg. The inner and outer radii of each column are 30cm and 40cm respectively. Assuming the load distribution to be uniform, calculate the compressional stress of each column. The Young's modulus of steel is 2×10^{11} Pa.
7. What is the density of ocean water at a depth, where the pressure is 80atm, given that its density at the surface is $1.03\times10^{3}\text{kg}m^{-3}$? Compressibility of water $=45.8\times10^{-11}Pa^{-1}$. Given $1\text{atm}=1.013\times10^{5}\text{Pa}$.
8. Which fall faster – big rain drops and small rain drops?
9. Two balls A and B have radii in the ratio 1:2. What will be the ratio of their terminal velocities in a liquid?
10. What is critical velocity of a liquid? When does the streamline flow become turbulent?
11. Why does the velocity increases when water flowing in a broader pipe enters a narrow pipe?
12. State Bernoulli's principle. What is the fundamental principle on which Bernoulli's theorem is based?
13. Define angle of contact. What are the factors on which angle of contact depend?
14. Water rises to a height of 20mm in a capillary. If the radius of the capillary is made $\frac{1}{3}$rd of its previous value, to what height will the water now rise in the tube?
15. What happens when a capillary tube of insufficient length is dipped in a liquid?
16. A small ball of mass m and density ρ is dropped in a viscous liquid of density ρ. After sometime the ball falls with a constant velocity. Calculate the viscous force on the ball.
17. State and prove Pascal's law of transmission of fluid pressure.
18. What is the excess pressure inside a bubble of soap solution of radius 5mm? Given that the surface tension of soap solution at the temperature (20^{0}C) is 2.5×10^{-2}N/m. If an air bubble of same dimension were formed at a depth of 40cm inside a container containing the soap solution (of relative density 1.20), what would be the pressure inside the bubble? ($1\text{atm}=1.01\times10^{5}\text{Pa}$)

19. In Millikan's oil drop experiment, what is the terminal speed of a drop of radius 2×10^{-5}m and density 1.2×10^{3}kgm^{-3}? Take the viscosity of air at the temperature of the experiment to be 1.8×10^{-5}Nsm^{-2}. How much is the viscous force on the drop at that speed?
20. State and explain Kirchhoff's law of heat radiation.
21. A mercury thermometer is transferred from melting ice to a hot liquid. The mercury rises 0.9 of the distance between lower and upper fixed points. What is the temperature of the liquid?
22. Why a small gap is left between the iron rails of railway tracks?
23. A long metal rod is bent to form a ring with a small gap. If the rod is heated, will the gap increase or decrease?
24. Two stars radiate maximum energy at wavelength 3.6×10^{-7}m and 4.8×10^{-7}m respectively. What is the ratio of their temperatures?
25. What is meant by coefficient of linear expansion and cubical expansion? Derive the relationship between them.
26. Define thermal conduction and convection. How are these modes of transfer different from thermal radiation?
27. State Stefan's law and Wein's displacement law. How will you derive Newton's law of cooling from Stefan's law.
28. A hole is drilled in a copper sheet. The diameter of the hole is 4.24 and 27^0C. What is the change in the diameter of the hole if the sheet is heated 227^0C? Coefficient of linear expansion of copper = $1.7\times10^{-5}\ ^0C^{-1}$
29. A 10kW drilling machine is used to drill a bore in the small aluminium block of mass 8kg. How much is the rise in temperature of the block in 2.5 mins assuming 50% of power is used up in heating the machine itself or lost to the surroundings. Specific heat of aluminium =0.91J$g^{-1}\ ^0C^{-1}$
30. A copper block of mass 2.5kg is heated in a furnace to a temperature of 500^0C and then placed on a large ice block. What is the maximum amount of ice that can melt? (specific heat of copper =0.39 J$g^{-1}\ ^0C^{-1}$ and heat of fusion of water=335Jg^{-1}
31. What is the specific heat of a gas in a isothermal process?
32. When a gas is suddenly compressed its temperature rises. Why?
33. During adiabatic changes, the volume of a gas is found to depend inversely on the square of its absolute temperature. Find how its pressure will depend on its absolute temperature.
34. What is the significance of the area of the closed curve on a P-V diagram?
35. On what factors the efficiency of a Carnot's engine depends?
36. What is the nature of P-V diagram for isobaric and isochoric processes?

37. State two essential requirements of an ideal heat engine?
38. What amount of heat must be supplied to 2×10^{-2}kg of nitrogen at room temperature to raise its temperature by $45\ ^0$C at constant pressure? Given molecular weight of N_2 is 28 and R=8.3J$mol^{-1}K^{-1}$ and $C_V = \frac{7}{2}R$.
39. A steam engine delivers 5.4×10^8J of work per minute and services 3.6×10^9J of heat per minute from its boiler. What is the efficiency of the engine? How much heat is wasted per minute?
40. An electric heater supplies heat to a system performs work at a rate of 100W. If the system performs work at a rate of 75joules per second, at what rate is the internal energy increasing?

SUBJECT-CHEMISTRY

CHAPTER S- BLOCK ELEMENT

GROUP 1 ELEMENT : ALKALI METAL

- PROPERTIES OF ALAKLI METAL
    1. Electronic configuration
    2. Ionisation enthalpy
    3. Hydration enthalpy
    4. Physical properties
- GENERAL CHARACTERISTICS OF COMPOUND OF ALKALI METALS:
    1. Oxides of alkali metals
    2. Hydride of alkali metals
    3. Halides of alkali metals
    4. Salts of oxo-acids
- ANOMALOUS PROPERTIES OF LITHIUM
- DIFFERENTIATE BETWEEN LITHIUM AND OTHER ALKALI METALS
- SHOW THE SIMILARITIES BETWEEN LITHIUM AND MAGNESIUM
- BIOLOGICAL IMPORTANCE OF SODIUM AND POTASSIUM

GROUP 2 ELEMENT : ALKALINE METAL

- GENERAL CHARCTRICS OF THE ATOMIC AND PHYSICAL
- PROPERTIES OF THE ALKALINE EARTH METALS ARE
    1. Electronic configuration
    2. Atomic radii
    3. Ionisation enthalpy
    4. Hydration enthalpy
    5. Physical properties
- ANOMALOUS BEHAVIOUR OF BERYLLIUM
- DIAGONAL RELATIONSHIP BETWEEN BERYLLIUM AND ALUMINIUM
- BIOLOGICAL IMPORTANCE OF MAGNESIUM AND CALCIUM

P –BLOCK ELEMENT:

- ANOMALOUS BEHAVIOUR OF BORON
- IMPORTANT COMPOUND OF BORON
- ALLOTROPES OF CARBON
- SILICON DIOXIDE (SIO_2)
- SILOCONES
- SILICATES
- ZEOLITES

SUBJECT-BIOLOGY

1. Differentiate between-
    a. Diffusion and osmosis
    b. Apoplast and symplast pathways
2. Explain why xylem transport is unidirectional and phloem transport is bidirectional.
3. What causes opening and closing of guard cells of stomata during transpiration.
4. What is hydroponics?
5. What do you mean by toxicity of micronutrients? Give examples
6. What is photosynthesis? Write the equation to represent photosynthesis.
7. Who discovered that the green parts of plants purify the noxious air in the presence of light? Explain the experiment.
8. Where does photosynthesis take place? Explained with labelled diagram the structure of chloroplast.
9. Name various kinds of chlorophyll molecules present in photosynthetic organisms.

SUBJECT-COMPUTER SCIENCE

- Revision 11^{th} and 12^{th} Chapter and solve all C++ Program.