## SRI GURUDATTA COACHING CENTRE(SARMA INST.)

## MATHEMATICS

1) What is the sum of all prime factors of the number 555555 .
2) Show that the sum of the two consecutive odd integers is always divisible by 4 .
3) Find the value of ' $x$ ' if $\frac{3 x-1}{5}-\frac{1+x}{2}=3-\frac{x-1}{2}$
4) Match the following Name of the point Ina triangle point of concurrence of
(i) Ortho centre
(A) Medians
(ii) Centroid
(B) Altitudes
(iii) Incentre
(C) Perpendicular bisectors of sides
(iv) Circum centre
(D) Bisectors of two external angles and bisector of third internal angle
(v) Ex-centre
(E) Bisectors of internal angles
5) If $a, b, c$ are real $a n d b \neq 0, c a n 2 b^{2}-(b+c-a)(a+b-c)$ be negative, if so give an example.
6) If ' $n$ ' is an odd positive integer $a^{n}+b^{n}$ is divisible by $a+b$. Find the remainder when $20^{13}+14^{13}$ is divided by 17 .
7) $A B C$ is an equilateral triangle, $D$ and $E$ are points on $A B$ and $A C$. Such that $D E \| B C$, If $A B=10 \mathrm{~cm}, B D=7 \mathrm{~cm}$, find the area of quadrilateral BCED.
8) If $x+\frac{1}{x}=2$. Find the value of $\left(x-\frac{1}{x}\right)^{14} 5$
9) $A B C D$ is a parallelogram. $A B$ is produced to $E$ such that $C E$ is perpendicular to $A E$ and $C E=15 \mathrm{~cm}, A C=25 \mathrm{~cm}, B E=8 \mathrm{~cm}$. Find the perimeter of the parallelogram $A B C D$.
10) If $a^{2}+b^{2}=0$ then $a=0$ and $b=0$. If $(3 x-2 y)^{2}+(5 y-7 z)^{2}=0$, find $x: y: z$.
11) In a trapezium parallel sides are 10 cm and 8 cm . Find the distance between them if its area is equal to the area of a rhombus whose diagonals are 12 cm and 18 cm long.
12) If $x^{2}+y=10$ where ' $x$ ' is a prime number and ' $y$ ' is a perfect square, find $x+y^{2}$.
13) $x^{m}+x^{n}=10, x^{m+n}=16$, then find the positive value of $x^{m}-x^{n}$.
14) The area of a circle passing through the vertices of a regular hexagon is ' $x$ ' units'. Find the area of the region not occupied by hexagon. Express in terms of ' $x$ ' and ' $\pi$ '. (Draw a neat sketch)
15) The units place of the integer formed by $5^{20}+3^{14}$ is $\qquad$ .

## PHYSICS

## I Multiple choice questions

(1) The stars are giant balls of
(A) Hydrogen
(B) Helium
(C) Oxygen
(D) Nitrogen
(2) The light from Sun reaches the earth in
(A) 8.3 sec .
(B) 8.3 min .
(C) 0.83 min .
(D) 83 sec .
(3) A train travels between two stations $P$ and $Q$. It travels with a velocity 20 KMPH from $P$ to $Q$ and returns to station $P$ with a velocity 30 KMPH . The average speed for the total journey
(A) 25 KMPH
(B) 24 KMPH
(C) $6.67 \mathrm{~m} / \mathrm{s}$
(D) $0 \mathrm{~m} / \mathrm{s}$
(4) A body moves with a variable velocity when
(A)magnitude of velocity changes
(B) direction of motion of the body changes
(C) any of A or B
(D) none of these
(5) The time in which a force of 2 N produces a change in momentum of $0.4 \mathrm{Kg} . \mathrm{m} / \mathrm{sec}$ in the body whose mass is 1 Kg is
(A) 0.2 sec
(B) 0.02 sec
(C) 0.5 sec
(D) 0.05 sec
(6) A body is floating in water, its apparent weight is equal to
(A) actual weight of the body
(B) unity
(C)weight of the body - weight in liquid
(D) none
(7) By increasing the temperature of a liquid its
(A)volume and density decreases
(B)volume increases and density decreases
(C) volume and density increases
(D)volume decreases and density increases
(8) The maximum displacement of a vibrating particle fromits mean position is called.
(A)frequency
(B)amplitude
(C)time period
(D)none of these
(9) The speed of light is maximum in
(A) glass
(B) diamond
(C) water
(D) vacuum
(10) The surest test for the electrification of a body is
(A)attraction
(B)repulsion
(C)both ' A ' and ' B '
(D) none of these

II Match the following

Column - I
(11) 36 KMPH
(12) $9.8 \mathrm{~m} / \mathrm{s}^{2}$
(13) 1 Kilo Watt Hour
(14) 0.02 km
(15) 1 newton
(16) 1 joule
(17) Velocity
(18) Force
(19) $15 \mathrm{~cm} / \mathrm{sec}$
(20) Momentum

Column - II
A. $\quad 20000 \mathrm{~mm}$
B. Mass xacceleration
C. $\quad 10^{7} \mathrm{erg}$
D. $36 \times 10^{5}$ joule
E. $\quad 10 \mathrm{~m} / \mathrm{s}$
F. $\quad 980 \mathrm{~cm} / \mathrm{sec}^{2}$
G. $\quad 10^{5}$ dynes
H. Frequency x Wave length
I. Mass x velocity
J. $\quad 0.54 \mathrm{KMPH}$

## III Fill in the blanks

(21) If a bodydoesnot change its position with respect to its surroundings, the body is said to be at $\qquad$ _.
(22) The equations of motion are applicable only when the body moves with $\qquad$ acceleration.
(23) Newton's first law of motion gives the concept of $\qquad$ —.
(24) A force of 100 N acts on a body of mass 2 Kg for 10 sec the change in momentum of the body is $\qquad$ .
$\qquad$ is an instrument used to measure the atmospheric pressure.
(26) The S.I. unit of temperature is $\qquad$ .
(27) The waves with a frequency move than 20000 Hz are called $\qquad$ _.
(28) A long sighted eye can be corrected by using a $\qquad$ lens.
(29) Opposite electric charges $\qquad$ each other.
(30) The device used to detect static electric charges on a body is called $\qquad$ .

## IV Solve the following:

(31) The length of a minute hand of a clock is 8 cm . Find the displacement and average velocity of the tip of the minute hand when it moves during a time interval from $4: 15 \mathrm{pm}$ to $4: 45 \mathrm{pm}$.
(32) A car starts from rest, attains a velocity of 36 KMPH with an acceleration of $0.2 \mathrm{~m} / \mathrm{s}^{2}$ travels 9 km with this uniform velocity and then comes to rest with a uniform deceleration of $0.1 \mathrm{~m} / \mathrm{s}^{2}$. Find the total time of travel by the car.
(33) Two balls of identical shape and size, but of different materials are acted upon by the same force, such that the acceleration of the first ball is only one fourth that of the second ball. Calculate the ratio of the mass of the first ball with respect to that of the second ball.
(34) A solid floats in liquid A with half its volume immersed and liquid $B$ with $2 / 3$ of its volume immersed. Find the ratio of densities of the liquid $A$ and $B$.
(35) A lead bullet of mass 10 gm travelling at $300 \mathrm{~m} / \mathrm{s}$ strikes against a block of wood and comes to rest. Assuming $50 \%$ of heat is absorbed by the bullet, find the increase in temperature. (Sp. Heat of lead $=150 \mathrm{~J} / \mathrm{kg} /{ }^{\circ} \mathrm{c}$ )
(36) 25 waves pass through a point in 5 sec. If the distance between one crest and the adjacent trough is 0.05 m . Calculate (a) The frequency (b) The wavelength (c) wave velocity
(37) The refractive index of water is $4 / 3$. If the speed of light in air is $3 \times 108 \mathrm{~m} / \mathrm{s}$. Find the speed of light in water.
(38) A cell can supply a charge of 300 coulomb. If the current drawn from the cell is 60 micro amp. Find the time in which cell discharges.

## CHEMISTRY

I. Define the following
$\begin{array}{llll}\text { (1) } & \text { Alloy } & \text { (2) } & \text { Reduction } \\ \text { (4) } & \text { Combustion } & \text { (5) } & \text { Thermo plastics }\end{array}$
II Give balanced equations for the following chemical changes
(1) Ferric oxide is reduced with charcoal.
(2) Sodium bicarbonate is treated with sulphuric acid.
(3) Lead (II) nitrate is strongly heated.
(4) Reaction of Sodium metal with cold water.
(5) Reaction of red hot carbon with Sulphur vapours.
(6) Sodium bicarbonate is strongly heated.
(7) Magnesium wire is burnt in air.
(8) Mercuric oxide is heated.

III Classify the following into physical and chemical changes.
(1) Lighting of a match stick (2) Magnetization of Iron
(3) Ripening of fruits
(4) Crystallization of salts from their solutions
(5) Dissolving salt in water

IV Fill up the blanks
(1) The temperature of Oxy acetylene flame is $\qquad$ ${ }^{\circ} \mathrm{C}$.
(2) A mixture of Sulphur, Nitre and Charcoal is called $\qquad$ .
(3) The process of heating the concentrated ore to a very high temperature in the presence of air is called
$\qquad$ of ore.
(4) _ alloy used for making barrels of guns and bearings.
(5) ___ fibre is called artificial silk.
(6) Neutron is denoted by the symbol $\qquad$ -.
(7) ___ consists of $95 \%$ of Methane and 5\% mixture of Ethane, Propane and Ethylene.
(8) The LPG is mixed with a small amount of strong smelling liquid called $\qquad$ .
(9) Carbon monoxide on coming contact with blood forms $\qquad$ haemoglobin.
(10) Crystalline forms of Carbon having 30 to 960 atoms in their molecules are called $\qquad$ .
V Match the following
(1) Sodium and Potassium
Set - A
(2) Chromium and Nickel
( ) (a) Protective metals
(3) Platinum and Gold
(4) Polonium and Thorium
(5) Magnesium and Calcium
(1) Poly propylene
(2) Rayon
(3) Polyester
(b) Alkaline earth metals
(4) Acrylic
(5) Poly styrene

State whether the following statements are true (T) / false (F). Write only T / F duly indicating the question number
(1) Sulphur dioxide is an acidic oxide.
(2) Melamine is used for making computer and T.V. cabinets.
(3) The property of drawing metal to make fine wires is called Malleability.
(4) Metals react with acids and liberate hydrogen gas.
(5) Dissociation of acetic acid is a chemical change.

VII Solve the following numericals.
(1) Find theweight of Oxygen required for complete burning of 3.2 gm . of Calcium and how many grams of Calcium oxide is obtained.
(2) How many grams of calcium carbonate are required to produce Carbon dioxide that is sufficient for the conversion of 10.6 gm Sodium carbonate to Sodium bicarbonate?

