

New Standard Public School, Raebareli

Half Yearly Examination-2015-16

Subject- Maths

Time: 3Hrs.

Class- XIE

M.M:-80

Note:-All questions are compulsory:-

Q.1- Attempt any four parts in which part (e) is compulsory. (Each 2 marks)

- (a) If $\sin^{-1}x = \frac{1}{3}$, then find the value of $\sin 3x$.
- (b) Find the general value of x of the equation $4 \sin^2 x = 3$.
- (c) If $\sin^{-1}x = \frac{1}{3}$, then find the value of $\cos^{-1}x$.
- (d) If $a = 2c$ and $b = 3c$, then prove that $\cos B = -1$.
- (e) Find the non-zero integral solution of the equation $|1 - i|^x = 2^x$.

Q.2- Attempt any four parts :- (Each 3 marks)

- (a) Prove that: $\frac{1}{(1-i)^2} - \frac{1}{(1+i)^2} = i$.
- (b) Solve the equation $2x + 1 = x - 3$.
- (c) The sum of n terms of an arithmetic progression is $3n^2 - n$. Find the first term and common difference.
- (d) Find the area of triangle whose vertices are $(-2, -5), (5, 3), (-1, 7)$.
- (e) Find the value of x and y if $x + y = \begin{bmatrix} 5 & 2 \\ 0 & 9 \end{bmatrix}$ and $x - y = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$

Q.3- Attempt any four parts:- (Each 3 marks)

- (a) Find the coefficient of x^9 in the expansion of $(x^3 - \frac{1}{x^4})^{10}$
- (b) Find the number of diagonals in a hexagon.
- (c) Find the sum of n terms of the series whose n^{th} term is $n^2 + 2^n$.
- (d) In any triangle ABC, prove that: $c(a \cos B - b \cos A) = a^2 - b^2$.
- (e) Prove that: $2 \cos \frac{9}{13} \cos \frac{9}{13} + \cos \frac{3}{13} + \cos \frac{5}{13} = 0$.

Q.4- Attempt any three parts:- (Each 5 marks)

- (a) Prove that: $\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix} = abc(a-b)(b-c)(c-a)$
- (b) In how many ways a team of 11 members can be formed from 6 teachers and 8 students. When it is necessary to include at least 4 teachers in a team.
- (c) Find the pairs of consecutive odd numbers in which both numbers are greater than 10 and their sum is less than 40.
- (d) If the sum of n terms of a geometric progression be S , the product be P and the sum of the reciprocals be R , then prove that $P^2 = (\frac{S}{R})^n$

Q.5- Attempt any three parts:- (Each 5 marks)

- (a) If $A = \begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 7 \\ 2 & 0 \end{bmatrix}$ then prove that $(AB)^t = b^t A^t$.
- (b) If the sum of roots of the equation $ax^2 + bx + c = 0$ is equal to the sum of their squares, then prove that $2ac = ab + b^2$.
- (c) If $\sin^{-1}x + \tan^{-1}x = \frac{\pi}{2}$, then prove that $2x^2 + 1 = \sqrt{5}$.

(d) Prove that: $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ = \frac{3}{16}$

Q.6- Attempt any one parts- (Each 6 marks)

- (a) Prove that: $n C_r + n C_{r-1} = n + 1 C_r$
- (b) By the principle of mathematical induction show that: $2^{3n} - 7n - 1$ is divisible by 49, where n is a positive integer.

Q.7- Attempt any one part. (Each 6 marks)

- (a) Prove that in the expansion of $(1 + x)^n$, the sum of the squares of the binomial coefficient is $\frac{(2n)!}{(n!)^2}$
- (b) Solve the following equations by using Cramer's rule:

$$\begin{aligned} x + 3y + z &= 5 \\ 2x - y + 3z &= 4 \\ x - 2y + 5z &= 4 \end{aligned}$$

Q.8- Attempt any one part. (Each 6 marks)

- (a) Solve the following equations by matrix method:

$$\begin{aligned} x + y + z &= 3 \\ x + 2y + 3z &= 4 \\ x + 4y + 9z &= 6 \end{aligned}$$
- (b) If $\cos^{-1} \frac{x}{2} + \cos^{-1} \frac{y}{3} = \frac{\pi}{3}$ then prove that $9x^2 - 12xy \cos \frac{\pi}{3} + 4y^2 = 36 \sin^2 \frac{\pi}{3}$.

New Standard Public School, Raebareli
Half Yearly Examination 2015-16
Class-XI E
Subject- Physics

Time:3 Hours

M.M.70

Note: All the question are compulsory.

Q.1- Choose the correct answer of all parts. (Each 2 marks)

- (A) The error in the measurement of radius of a sphere is 1%. Then the error in the calculation of the volume of the sphere will be:
 (i) 1% (ii) 2% (iii) 3% (iv) 4%
- (B) [$ML^{-1}T^{-1}$] which physical quantity present:
 (i) Modulus of rigidity (ii) coefficient of viscosity
 (iii) Latent heat (iv) gravitational potential
- (c) If angle of friction is $\cos^{-1}(4/15)$, then coefficient of friction will be:
 (i) 3/5 (ii) 2/3 (iii) 3/4 (iv) 4/5
- (d) The centre of mass of a system:
 (i) is always at its geometric centre (ii) is always any where inside it
 (iii) is always outside it (iv) May be inside or outside it
- (e) Least pressure acted on earth when man was:
 (i) Sitting (ii) position of flat
 (iii) standing on one foot (iv) standing on both feet

Q.2- Answer any three parts. (Each 2 marks)

- (a) What do you mean by escape velocity?
 (b) Write copper, steel, glass and rubber in decreasing order of there modulus of elasticity.
 (c) If vector $\vec{A} = 4\hat{i} + 3\hat{j}$ and $\vec{B} = 5\hat{i} - 2\hat{j}$, then find out $\vec{A} \cdot \vec{B}$.
 (d) Which law of motion does give the measure of force?

Q.3- Answer any three parts. (Each 2 mark)

- (a) Write down the full name of RADAR and LASER.
 (b) Find out $v = u + at$ with the help of calculus.
 (c) A force acts upon a body of mass 20kg. initially at rest, for 6 seconds after which the for ceases. Now the body describes 60m in the next 5 seconds. Find the magnitude of force.
 (d) Why do we call Newtons first law as law of inertia.

Q.4- Answer any three parts. (Each 4 marks)

- (a) A car moves with the speed of $15m.s^{-1}$. on take the break the stopping distance covered by the car is 10m. if the velocity of car is $25m.se^{-1}$ and on taking break same Negative acceleration produced, So find out new stopping distance covered by the car.
 (b) Prove that $v = r$ in curcular motion, where v is lenear velocity r is the radius of circle and is angular velocity.
 (c) If the momentum of the body is increased by 50%. What will be the percentage increase in the kinetic energy of the body?
 (d) What is work-energy theorem. Prove it.

Q.5- Answer any three parts- (Each 4 marks)

- (a) Prove that the work done in stretching a wire is give by $w = \frac{1}{2}$ stress \times strain \times volume.
 (b) Eight equal drops are falling through air each with a steady velocity of 10m/sec. it the drops coalesce, what will be the new terminal velocity of the new drop.
 (c) A ractangular 3cm \times 3cm of a wire which made a soap layer. When area becoms 3cm \times 4cm. The what work done by this process. The surface tension of soap layer is $3 \times 10^{-2}N/m$.
 (d) What do you understand by projectile motion? Prove that the path of the projectile will be a parabola.

Q.6- Answer any three parts:- (Each 4 marks)

- (a) The radius of the earth is R_e . The acceleration due to gravity on the earth- surface is g. Calculate the increase in the potential energy of a body of mass m in lifting it at a height h from the earth- surface. While the value of h is not nelgigible.
 (b) The temperature of 100g of water is to be raised from $24^{\circ}C$ to $90^{\circ}C$ by adding steam to it. Calculate the mass of steam required. The latent heat of steam is $540 k cal kg^{-1}$. The specific heat of water is $1 cal/gm ^{\circ}C^{-1}$.
 (c) State the theorem of parallel axes pertaining to moment of inertia and prove it.
 (d) What do you mean by impulse of a force? Obtain the relation between impulse and momentum.

Q.7- Answer any two parts:- (Each 6 marks)

- (a) What is Bernoulli's theorem and prove it.
 (b) What do you understand by capillarity? Find out the relation $h = \frac{2T \cos}{r \rho g}$
 (c) An artificial satellite is revalving around the earth in a circular orbit with half velocity of the escape velocity from the earth's surface. Calculate the height of satellite from the surface of earth. Radius of earth = 6400Km.

Name ----- Roll No.----- Sig. of Invigilator-----

New Standard Public School, Raebareli

Half Yearly Examination-2015-16

Subject- Chemistry

Time: 3Hrs.

Class - XIE

M.M:- 70

Note:- All the questions are compulsory. Marks are written in front of each question.

Q.1- In each part of this question, four alternatives are given select the correct alternative and write in your answer book.

- (a) No of electrons in valence shell of calcium are: (2)
(i) 2 (ii) 4 (iii) 6 (iv) 8
- (b) Oxidation number of Ni in $\text{Ni}(\text{CO})_4$ is: (2)
(i) 0 (ii) 4 (iii) 8 (iv) 2
- (c) The weight ratio of H : O in water is: (2)
(i) 1 : 1 (ii) 1 : 2 (iii) 1 : 8 (iv) 1 : 16
- (d) Which one of the following compound is highest acidic: (2)
(i) S_6O_2 (ii) Na_2O (iii) MgO (iv) FeO
- (e) To probability of finding electron in any orbital is: (2)
(i) 0 (ii) 90 - 95% (iii) 70-80% (iv) 50-60%

- Q.2- (a) Define critical temperature. (2)
(b) What is the work of salt bridge and how represent it? (2)
(c) Why mixed cryalite to obtain aluminium from alumina by electrolyte method? (2)
(d) Define ionization potential. (2)
- Q.3-(a) Calculate gram / litre concentration of 20 volume H_2O_2 . (2)
(b) Explain Pauli's exclusion principle. (2)
(c) Explain electron affinity. (2)
(d) Calculate the temperature at which the volume a sample of a gas at 127°C will be doubled at constant pressure? (2)

- Q.4- (a) Define the hybridization of orbitals. Describe Sp^3 hybridization with example. (4)
(b) In 1.4 gram CaO obtained by heating lime contains 0.4 gram oxygen. In 3.5 gram CaO obtained by combination of Ca and O_2 , 2.5 gram Ca was present on the basis of above data, prove that the law of constant proportions is correct. (4)
(c) Draw a labelled diagram of reverberatory furnace. (4)
(d) At 298k resistance of a conductivity cell filled with 0.001 mKCl solution is 1500 ohm. At this temperature specific conductance(conductivity) of 0.001 mKCl solution is 1.46×10^{-4} siemens $\times \text{cm}^{-1}$, then calculate cell constant. (4)

- Q.5-(a) Explain polar and non- polar covalent bond with example. (4)
(b) Explain Hund's rule of maximum multiplicity. (4)
(c) Write four industrial applications of hydrogen gas. (4)
(d) What is magnetic quantum number? Write the values of m for $l=3$ (4)

Q.6- Describe Nelson cell process of manufacture of sodium hydroxide with labelled diagram of apparatus used.

What happens when, white phosphorous react with caustic soda solution? (Write only chemical equation) (6)

OR

- (a) Reaction $\text{Cl}_2 + \text{OH}^- \longrightarrow \text{Cl}^- + \text{OCl}^- + \text{H}_2\text{O}$
balance by ion electron method. (2)
- (b) The volume of 0.1 gram of a gas at S.T.P. is 56ml. Find out its molecular weight. (2)
- (c) Why alkaline earth metals are weak reducing than alkali metals. (2)
- Q.7- Discuss the position of alkaline earth metals in the periodic table on the basis of their kinetic configurations. (6)

OR

Explain how to obtain blister copper from copper pyrite? Write useful chemical reactions also.

Name ----- Roll NO.----- Sig. of Invigilator-----

New Standard Public School, Raebareli
Half Yearly Examination-2015-16
Subject- Biology

Time: 3Hrs. Class - XIE M.M:- 70

Note:- All the questions are compulsory. Give the appropriate diagram to complete your answers.

Q.1-Select and write the correct answer: (Each 2 marks)

- (a) Toad is:
(i) Amphibian (ii) Fish (iii) Mammal (iv) Reptile
- (b) Bacteria was discovered by:
(i) Koch (ii) Hooke (iii) Louis Pasteur (iv) Leewenhock
- (c) Binomial Nomenclature was proposed by:
(i) Darwin (ii) Linnaeus (iii) Hugo de Vries (iv) Hutchinson
- (d) Replication or Duplication of DNA takes place in:
(i) G₁ phase (ii) G₂ phase (iii) M phase (iv) S phase
- Q.2- Why is bat kept in mammalia even though it flies? (2)
- Q.3- Who is the father of green revolution in India? (2)
- Q.4- Write the function of Ribosome. (2)
- Q.5- What is Mitotic poison? Write any one example. (2)
- Q.6- Write the function of Haemoglobin. (2)
- Q.7- Draw only a well labelled diagram of Neuran. (4)
- Q.8- Write the difference between blood & lymph. (4)
- Q.9- What do you understand by Respiratory Quotient (RQ)? Write the R.Q. of carbohydrate and Fat. (4)

OR

Draw only a well labelled diagram of an ommatidium of Cockroach.

- Q.10- Write the difference between striped and un-striped muscles. (4)
- Q.11- Write the living and non living characters of virus. (4)

OR

Write any four characteristics of Enzyme.

- Q.12- What is the difference between Homopolysaccharide and heteropolysaccharide? Write one example of each one. (4)
- Q.13- Explain the mechanism of formation of Urine in Nephron. (4)

OR

Write the important functions of Kidney.

- Q.14- Write the difference between chordates and non chordates. (4)
- Q.15- Describe with labelled diagram of internal structure and mechanism of heart in human beings. (10)

OR

Describe the mechanism of breathing in human beings.

- Q.16- Describe the structure and function of Mitochondria or Chloroplast. (10)

OR

Explain in detail about the economic importance of fungi or Bacteria.

Name ----- Roll NO.----- Sig. of Invigilator-----

New Standard Public School, Raebareli
Half Yearly Examination 15-16
Subject- Computer

Time: 3Hrs. Class - XIE M.M:- 60

Note:- Answer any 6 questions. Question 8 is compulsory.

- Q.1- (a) Describe First generation of computer. (4)
- (b) Describe Micro computer. (6)
- Q.2- (a) Describe Monitor. (4)
- (b) Explain types of computer on the basis of Applications. (6)
- Q.3- (a) Describe 1's Compliment Representation with example. (4)
- (b) What are translator programs? Describe them. (6)
- Q.4- (a) Describe Bubbled OR Gate. (4)
- (b) Convert it a/c to given instruction: (6)
- (i) $(89.125)_{10} \longrightarrow ()_2$ (ii) $(147)_8 \longrightarrow ()_{10}$
- Q.5- (a) Explain De- Morgans theorem. (4)
- (b) Describe Full adder. (6)
- Q.6- (a) Explain OCR and MICR. (4)
- (b) Describe Impact Printers. (6)
- Q.7- (a) What is cache Memory? (4)
- (b) Explain CD and DVD. (6)
- Q.8- (a) Explain CPU. (6)
- (b) What is k-map? Minimize the following expression using k-map. (4)

$$F(x, y, z) = m(1, 2, 4, 5, 6, 7)$$