JEMSCO

CATALYST OLYMPIADS

*Enabling your goals*

## SAMPLE QUESTIONS

# CEO :: Class – 3 to 6

1. That's what I would like _____ Christmas

   a) for  b) at  c) in  d) are

2. The _____ thing to remember is

   a) superior  b) premier  c) premium  d) first

3. Ah there you _____! I wondered where you were?

   a) be  b) were  c) are  d) have been

4. I say, you've just ____ on my foot?

   a) stuck  b) stode  c) struck  d) trodden

5. So let's go _____ to the beginning

   a) on back  b) back  c) for  d) over

# CSO :: Class-3

1. A bird breathes and eats with the help of its
   a) mouth b) beak c) nose d) claws
2. To protect birds we must grow more
   a) trees b) animals c) insects d) worms
3. The ladybird beetle and the dragonfly are
   a) poisonous insects b) harmful insects
   c) useful insects d) not insects
4. Digestion of food is completed in the
   a) stomach b) large intestine
   c) anus d) small intestine
5. Waste materials from the blood are removed by the
   a) heart b) mouth c) kidneys d) stomach

# CSO :: Class-4

1. Which of these processes are best suited to remove insoluble substances from water?
   a) Distillation and Evaporation b) Sedimentation and decantation
   c) Sedimentation, Decantation, and Filtration d) All of these
2. Which of these is the solute in a sugar solution?
   a) Sugar b) Milk c) Water d) None of these
3. Which of these would you to separate salt from water
   a) Sedimentation b) Decantation
   c) Filtration d) Evaporation
4. Which of these does soil contain?
   a) Sand b) Remains of dead plants and animals
   c) Minerals d) All of these
5. Which of these refers to the remains of dead plants and animals that get mixed with soil?
   a) Sand b) Clay c) Humas d) Gravel

# CSO :: Class-5

1. Which of the following is a sublimable compound
   a) naphthalene balls b) common salt
   c) sugar d) chalk
2. The layer of soil which is rich in organic matter, dark in colour and suitable for growth of plants is
   a) top soil b) subsoil c) bed rock d) none of these
3. The process of removal of fertile top soil by the action of wind and water is called
   a) Soil erosion b) Soil conservation
   c) Rock erosion d) None of the above
4. Soil is classified into _____ main types
   a) four b) three c) one d) five
5. The image formed in a mirror is due to
   a) reflection b) shadow c) refraction d) energy

# CSO :: Class-6

1. Substance which allow light to pass through them are called
   a) translucent b) opaque c) transparent d) All of these
2. Which of the following is non-luminous object
   a) sun b) candle c) oil lamp d) water
3. A cell converts _____ energy into _____ energy
   a) heat, electrical b) electrical, heat
   c) chemical, electrical d) electrical, chemical
4. Filament of the bulb is made of
   a) Zinc b) Copper c) Tungsten d) Electrolyte
5. Kerosene oil is an example of
   a) Conductor b) Insulator c) Electrolyte d) None of these

# CMO :: Class-7

1. Which of the following statement is true?

   a) 1 is a prime number

   b) 1 is neither a prime nor a composite number

   c) A prime number will have the number itself as one of its factors.

   d) A composite number will have only two factors.

2. Solve: $5\frac{1}{3}+4\frac{2}{5}=$ _____

3. Solve $13\frac{2}{3}+7-\frac{1}{4}=$ _____

4. Change the following fractions as decimals:

   (i) $\frac{1}{5}$ (iii) $\frac{82}{100}$ (iii) $1\frac{2}{5}$ (iv) $9\frac{1}{4}$ (v) $14\frac{1}{8}$

5. Change the following decimals as fractions:

   (i) 1.5 (ii) 1.23 (iii) 0.625 (iv) 1.42 (v) 9.45

# CMO :: Class-8

1. What least number must be multiplied to 3456 so that the product becomes a perfect cube?

   a) 2 b) 3 c) 4 d) 6

2. The one's digit of $107^3$ is

   a) 3 b) 7 c) 9 d) 0

3. Evaluate : $\sqrt[3]{27}+\sqrt[3]{0.008}$

   a) 3.4 b) 3.1 c) 3.3 d) 3.2

4. The value of $\frac{\sqrt[3]{8}+\sqrt[3]{27}-\sqrt[3]{343}}{(2)^2-3}$ is

   a) 7 b) -2 c) 8 d) -5

5. Find the value of the expression ($9x^2 + 25y^2 - 30xy$), when $x=\frac{2}{3}$ and $y=\frac{3}{5}$

   a) 1 b) -1 c) 2 d) -2

# CMO :: Class-9

1. If $4^{44}+4^{44}+4^{44}+4^{44}=4^{x}$, then $x$ is

   a) 45 b) 44 c) 176 d) 11

2. If $\left(a+\frac{1}{a}\right)^{2}=9$ then $a^{3}+\frac{1}{a^{3}}$ equals

   a) $\frac{10\sqrt{3}}{3}$ b) $3\sqrt{3}$ c) 18 d) $7\sqrt{7}$

3. Factors of $(42 - x - x^2)$ are

   a) $(x-7)$, $(x-6)$ b) $(x+7)$, $(x-6)$

   c) $(x+7)$, $(6-x)$ d) $(x-7)$, $(x+6)$

4. Degree of the polynomial $p(x)=(x+2)(x-2)$ is

   a) 4 b) 5 c) 3 d) 1

5. If $3x+\frac{2}{x}=7$, then $\left(9x^{2}-\frac{4}{x^{2}}\right)=$

   a) 25 b) 35 c) 49 d) 30

# CMO :: Class-10

1. If $\alpha$, $\beta$ and $\gamma$ are the zeroes of the polynomial $f(x)=ax^{3}+bx^{2}+cx+d$, then $\frac{1}{\alpha}+\frac{1}{\beta}+\frac{1}{\gamma}=$

   a) $-\frac{b}{d}$ b) $\frac{c}{d}$ c) $-\frac{c}{d}$ d) $-\frac{c}{a}$

2. Find the value of $k$, for which the polynomial $p(x)=x^{100}+2x^{99}+k$ is exactly divisible by $(x+1)$.

   a) 1 b) 0 c) -1 d) -3

3. The value of $1.\overline{34}+4.1\overline{2}$ is

   a) $\frac{133}{990}$ b) $\frac{371}{290}$ c) $\frac{5169}{990}$ d) $\frac{5411}{990}$

4. If $a$ is any natural number, then $9^{n} = 5^{n}$ ends with

   a) 3 b) 4 or 6 c) 5 d) 8

5. If a number is divided by 6, the remainder is 3 then what will be the remainder when the square of the same number is divided b 6 again?

   a) 0 b) 1 c) 12 d) 3

# CPO :: Class-7

1. When the length and area of cross-section both are doubled, then its resistance

   1) Will become half
   2) Will be doubled
   3) Will remain the same
   4) Will become four times

2. The unit of potential difference is

   1) Ampere
   2) Volt
   3) Ohm
   4) Coulomb

3. How many electrons constitute a current of 1A is following through a conductor in 1 sec?

   1) $6.25 \times 10^{18}$
   2) $6.25 \times 10^{13}$
   3) $6.25 \times 10^{11}$
   4) 6.25

4. When the temperature of a metallic conductor is increased its resistance

   1) Always decrease
   2) Always increase
   3) May increase (or) decrease
   4) Remain the same

5. State whether the resistance of filament of a bulb will decrease, remain unchanged or increase when it glows

   1) Decrease
   2) Increase
   3) Remains constant
   4) Sometimes increases and sometimes decreases

# CPO :: Class-8

1. The maximum value of static friction is called

   1) Limiting friction 2) Static friction

   3) Kinetic friction 4) Rolling friction

2. A plane mirror produces a magnification of

   1) Zero 2) -1

   3) +1 4) Between 0 and +1

3. Which one of the following is not a unit of pressure?

   1) Pascal 2) Bar 3) Newton 4) atm

4. When a body is charged by rubbing, its weight

   1) remains precisely constant 2) increases slightly

   3) decreases slightly 4) may increase or decrease slightly

5. ____ is the main cause of wear and tear to tyres

   1) Poor quality of machine

   2) Friction acting between tyres and road

   3) Gravitational force of earth

   4) None of these

# CPO :: Class-9

1. The reciprocal of time period of the wave is called ___ of the wave

   1) wave velocity 2) frequency 3) wave length 4) amplitude

2. A tuning fork produces 256 waves in 2 seconds. Calculate the frequency of the turning fork

   1) 1.120 Hz 2) 125 Hz 3) 128 Hz 4) 130 Hz

3. The mass of a body at the centre the earth is

   1) Infinite 2) Zero

   3) Same as at other places 4) Grater or poles

4. If the gravitational force of earth suddenly disappears, then

   1) Weight of the body is zero

   2) Mass of the body is zero

   3) Both mass and weight become zero

   4) Neither the weight nor the mass is zero

5. The radius and acceleration due to gravity of moon are $\frac{1}{4}$ and $\frac{1}{5}$ that of earth. The ratio of the mass of earth to mass of moon is

   1) 1:80 2) 80:1 3) 1:20 4) 20:1

# CPO :: Class-10

1. The object distance $u$, image distance $v$ and focal length $f$ for a spherical mirror are related as

   1) $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ 2) $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ 3) $v - u = f$ 4) $v + u = f$

2. Which of the following mirror has magnification +1

   1) Concave Mirror 2) Convex Mirror

   3) Plain Mirror 4) Both 1 and 2

3. An object is placed 10cm infront of a concave mirror of radius of curvature 15cm, then find its position of image

   1) -30cm 2) -20cm 3) -40cm 4) -10cm

4. An object is placed 5cm infront of a concave mirror and image is formed 1.5cm behind the mirror. Find magnification

   1) 2 2) -3 3) 2 4)-2

5. The focal length of a concave mirror is 30cm. Find the position of the object in front of the mirror. So that the image is three times the size of the object

   1) 20 cm (only) 2) 40 cm (only) 3) 30 cm (only) 4) 20 cm or 40 cm

# CCO :: Class-6

1. The process of settling down of solid particles in a liquid is called
   a) decantation b) sublimation c) sedimentation d) filtration
2. The process of transferring a clear liquid after sedimentation without disturbing the sediment is known as
   a) decantation b) filtration c) condensation d) centrifugation
3. A mixture of rice and salt can be best separated by
   a) sieving b) crystallization c) hand picking d) threshing
4. Mark the incorrect statement?
   a) Two immiscible liquids can be separated by separating funnel
   b) Stone pieces from rice can be hand picked
   c) Naphthalene can be separated from a mixture by dissolving it in water
   d) Iron filing can be separated from sand with the help of a magnet
5. Stretching of a rubber band is a/an
   a) permanent change b) chemical change
   c) reversible change d) irreversible change

# CCO :: Class-7

1. Pure salt from the sea water can be obtained by

   a) neutralization b) boiling

   c) sublimation d) evaporation and crystallization

2. Balancing of equation is required to obey which of the following laws?

   a) Law of definite proportions b) Law of conservation of mass

   c) Law of multiple proportions d) Avogadro's law

3. The colour of CuO is

   a) green b) blue c) black d) white

4. The main source of oxalic acid is

   a) curd b) spinach c) lemon d) orange

5. Molecular formulae of baking soda and washing soda are respectively

   a) $Na_2CO_3$, $NaHCO_3$ b) NaCl, $Na_2CO_3$

   c) $NaHCO_3$, $Na_2CO_3$ d) NaOH, $NaHCO_3$

# CCO :: Class-8

1. Which element shows spontaneous combustion?

   a) Calcium b) Phosphorus c) Copper d) Iron

2. Which of the following phenomenon is responsible for global warming?

   a) Acid rain b) Greenhouse effect

   c) Ozone formation d) None of these

3. Which of the following has lower ignition temperature?

   a) Wood b) Paper c) Vegetable oil d) Kerosene oil

4. Flames of the mixture ..... are used for welding

   a) Oxyhydrogen b) Oxynitrogen

   c) Oxycarbon d) Oxymethane

5. The necessary conditions for combustion process to occur are

   1. availability of air / oxygen only
   2. availability of air / oxygen and fuel
   3. temperature of fuel below ignition temperature
   4. temperature of fuel above ignition temperature

   Select the correct alternative

   a) 1 and 2 b) 2 and 4 c) 3 and 1 d) 4 and 1

# CBIO :: Class-7

11. Which of the following organs are protected by rib cage [ ]

a) Brain b) Sense organs c) Lungs d) Intestine

12. Which of the following are producers [ ]

a) Herbivores b) Carnivores c) Green plants d) Bacteria

13. How much of the earth surface is covered with water [ ]

a) About two-thirds b) About three-forth

c) About one-forth d) About one half

14. In how many states of matter do water exist [ ]

a) One b) Two c) Three d) Four

15. Percentage of oxygen and carbon dioxide in the air is respectively [ ]

a) 21% and 0.03% b) 78% and 21%

c) 78% and 0.03% d) 21% and 1%

# CBIO :: Class-8

11. Some cells our body can be about a foot long these are [ ]

a) Nerve cells b) Muscle cells c) Bone cells d) Gland cells

12. Energy currency of the cell is [ ]

a) ADP b) FTP c) ATP d) All of these

13. The kitchen of the cell is called [ ]

a) Cell wall b) Nucleus c) Vacuoles d) Plastids

14. Which cell organelle is known as the control centre of the cell [ ]

a) Nucleus b) Chloroplast

c) Mitochondria d) Endoplasmic reticulum

15. Which cell organelle is known as the “power house” of the cell [ ]

a) Lysosomes b) Chloroplast c) Nucleus d) Mitochondria

11. Growing two or more crops simultaneously on the same field in a definite pattern is referred as [ ]

a) Crop rotation b) Intercropping

c) Mixed cropping d) Crop alteration

12. Crops grown in rainy season are called [ ]

a) Kharif crops b) Rabi crops

c) Rain crop d) All of the above

13. In India agriculture irrigation done by [ ]

a) Dug or tube wells b) Canals

c) Rivers d) All of the above

14. Echidna and platypus which lay eggs belongs to [ ]

a) Mammalia b) Reptilia c) Amphibia d) Aves

15. Tendons connect [ ]

a) Bone to bone b) Muscle to bone

c) Muscle to muscle d) None of the above

11. Deficiency of vasopressin causes [ ]

a) Diabetes mellitus b) Goitre

c) Diabetes insipidus d) Myxoedema

12. Medulla oblongata of hind brain controls [ ]

a) Rate of heart beat b) Equilibrium

c) Thanking d) Vision

13. Which of the following does not secrete any hormone [ ]

a) Thyroid b) Ovary c) Testes d) Spleen

14. Asexual reproduction takes place through budding in [ ]

a) Amoeba b) Yeast c) Plasmodium d) Leishmania

15. The number of chromosomes in human ovum is [ ]

a) 21 b) 22 c) 23 d) 24