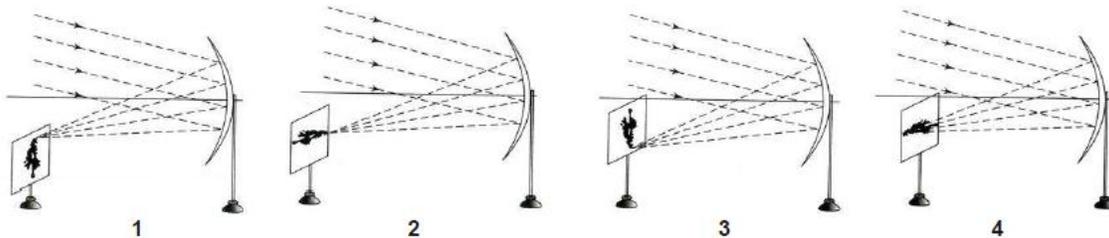


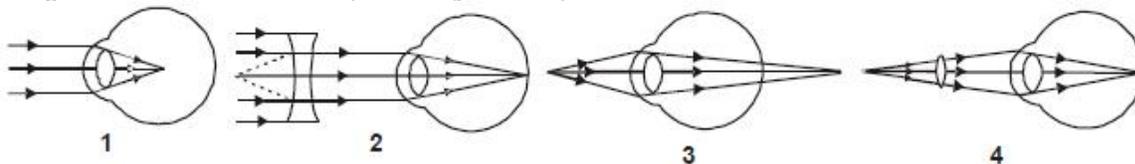
SCIENCE OLYMPIAD – 2017-18
MOCK PAPER
CLASS X

- When a number of resistors are connected end to end such that the tail end of one resistor is connected to head end of other resistor so as to form a closed circuit then such a circuit is called _____.
(A) Parallel circuit (B) Series circuit (C) Mixed circuit (D) None of these
- You see a rainbow formation. Then the Sun is _____.
(A) Behind you (B) In front of you (C) On your left hand side (D) On your right hand side
- Parallel rays, from the top of a distant tree, incident on a concave mirror, form an image on the screen.



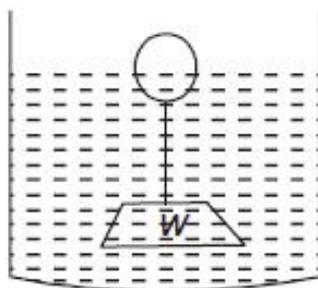
The diagram correctly showing the image of the tree on the screen is _____.
(A) 1 (B) 2 (C) 3 (D) 4

- Figures 1, 2, 3 and 4 respectively correspond to _____.



- The shortsighted eye, the correction of long sight, the long sighted eye and the correction of short sight
- The shortsighted eye, the correction of short sight, the long sighted eye and the correction of long sight
- The long sighted eye, the correction of short sight, the shortsighted eye and the correction of long sight
- None of these

- A balloon filled with air is weighed (W) so that it just floats in water as shown in the figure.



When it is further pushed by a short distance in to the water and then released it will _____.
(A) Come back to its original position

- (B) Stay at the depth where it stands submerged
- (C) Sink to the bottom
- (D) Sink down a little further but will not reach the bottom

6. Inertia is the property of a body which preserves its state of rest or uniform motion in a straightline. The following factors tell more about inertia.

- (i) Greater the mass of a body, greater is its inertia
- (ii) Greater the inertia of a body, the less will be the acceleration produced by a given force.
- (iii) The law of inertia is the same as Newton's first law of motion.

Which combination is true ?

- (A) (i) & (iii) (B) (i) & (ii) (C) (i), (ii) & (iii) (D) (ii) & (iii)

7. If we go inside a mine and drop a 10 kg iron ball and 1 kg aluminium ball from the top of a highplatform _____.

- (A) Both will reach the floor at the same time (B) 1 kg weight will reach the floor first
- (C) 10 kg weight will reach the floor first
- (D) It is not possible to indicate which of the two will reach the floor first without further data

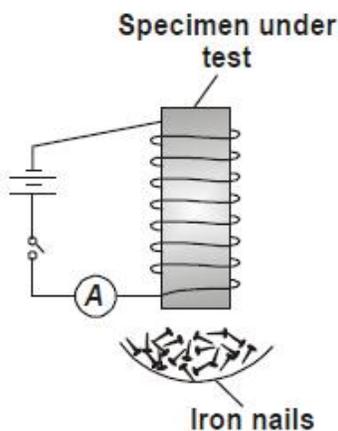
8. Read the given statements and mark the correct option.

Statement I : A normal human eye can clearly see all the objects at different distances.

Statement II : The human eye has the capacity to suitably adjust the focal length of its lens to a certain extent.

- (A) Both statement I and statement II are true and statement II is the correct explanation of statement I.
- (B) Both statement I and statement II are true but statement II is not the correct explanation of statement I.
- (C) Statement I is true but statement II is false. (D) Statement I is false but statement II is true.

DIRECTION: Read the passage carefully and answer Q. nos. 9 and 10.



Three specimens of magnetic materials were tested using the apparatus testshown in the diagram. When the switch is closed, the specimenpicks up some of the iron nails but when the switch is opened, many or most of the nails fall off. The number of nails picked up and left sticking on were found for three specimens. The tableshows the results.

Specimen	Number of nails picked up	Number of nails retainedby the specimen
X	5	4

Y	20	10
Z	40	3

9. Which material is the best electromagnet among the three?

(A) X (B) Y (C) Z (D) All of these

10. What does the number of nails left sticking on the material indicate ?

(A) Ability to retain magnetism when current is removed

(B) Ability to induce e.m.f.

(C) Ability to retain current

(D) Ability to change strength of magnetic field

11. Match column I with column II and select the correct option from the codes given below.

Column I Column II

(a) Electric current (i) Volts

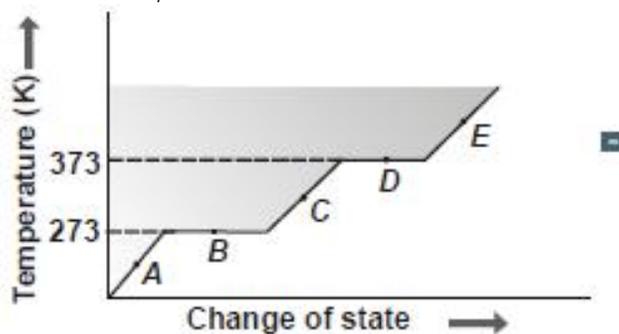
(b) E.m.f.(ii) Ohm

(c) Resistance (iii) Ohmmeter

(d) Resistivity (iv) Ampere

(A) aiv,bii,ci,diii(B) aiii,biv,ci,dii(C) aiv,bi,cii,diii(D) aiii,bi,cii,div

12. What is the physical state of A, C and E ?



(A) A solid, C liquid, E gas

(B) A solid, C gas, E liquid

(C) A liquid, C gas, E solid

(D) A liquid, C solid, E gas

13. Oxygen gas is enclosed in a container. Various conditions are applied on the gas and the change is studied. Under which of the following conditions, the distance between the molecules of oxygen gas would decrease?

(i) Increasing pressure on oxygen in the enclosed container

(ii) Leaking out some oxygen from the container

(iii) Increasing the volume of the container

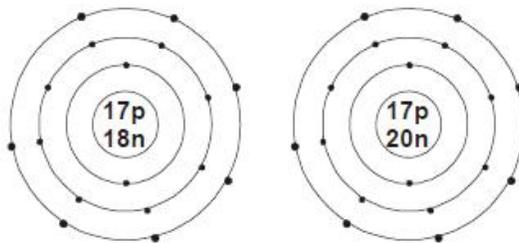
(iv) Adding more oxygen gas to the container without increasing volume of the container

(A) (i) and (ii) (B) (i) and (iii) (C) (ii) and (iii) (D) (i) and (iv)

14. The weight of a molecule of the compound $C_{60}H_{122}$ is _____.

(A) 1.4×10^{-21} g (B) 1.09×10^{-21} g (C) 5.025×10^{23} g (D) 16.023×10^{23} g

15. The given diagram represents two isotopes of an element. What is the element? What is their symbolic representation



- (A) Chlorine, $_{17}\text{Cl}$, $_{17}\text{Cl}$ (B) Chlorine, $_{18}\text{Cl}$, $_{20}\text{Cl}$
 (C) Fluorine, $_{17}\text{F}$, $_{17}\text{F}$ (D) Bromine, $_{17}\text{Br}$, $_{17}\text{Br}$

16. Columns I and II contain the type of mixtures and the method to separate them. Given below is the key to the matching of the columns. In which option column I is correctly matched to column II ?

Column I

Column II

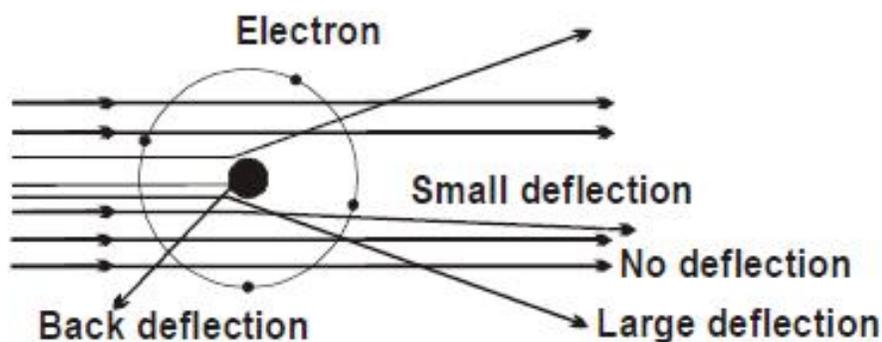
- A. Common salt from sea water p. Separating funnel
 B. Suspension of oil and water q. Chromatography

C. Cream from milk r. Evaporation

D. Dyes in black ink s. Centrifugation

- (A) Ap Bq Cr Ds (B) Aq Bp Cr Ds (C) Ap Br Cs, Dq (D) Ar Bp Cs Dq

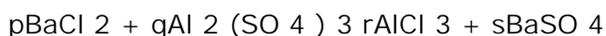
17. In Rutherford's alpha particle scattering experiments, a thin gold metal foil was bombarded by high speed alpha particles. Rutherford observed that _____.



- i. Most of the alpha particles (nearly 99%) passed through the gold foil undeflected.
 ii. Some of the alpha particles were deflected by small angles.
 iii. Very few alpha particles (1 in 20000) were either deflected by very large angles or were actually reflected back along their path. These observations led to the discovery of _____.

- (A) Nucleus (B) Electrons (C) Neutrons (D) Protons

18. Barium chloride reacts with aluminium sulphate to give aluminium chloride and precipitate of barium sulphate. The equation for this reaction can be written as _____.



What is the value of coefficients p, q, r and s to write a balanced equation?

p q r s p q r s

- (A) 2 3 3 1 (B) 2 1 3 3

- (C) 1 2 3 4 (D) 3 1 2 3

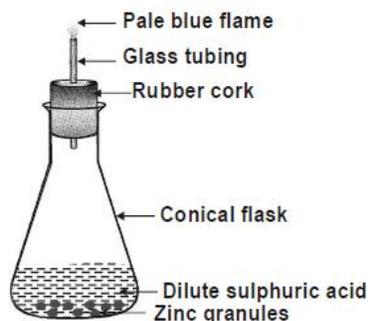
19. A double bond between two carbon atoms is formed by _____.

- (A) Transfer of two electrons from one carbon atom to the other

- (B) Transfer of one electron from one carbon atom to the other
 (C) Sharing two pairs of electrons (D) Sharing two electrons

20. Place a few pieces of granulated zinc in a conical flask. Pour dilute sulphuric acid in the flask and close it properly. What observations are correct regarding the experiment?

- (A) The chemical reaction between zinc and dilute sulphuric acid takes place with change in state.
 (B) The chemical reaction proceeds with evolution of a gas.



- (C) The chemical reaction proceeds with evolution of heat energy
 (D) All the observations are correct

21. A few drops of phenolphthalein indicator were added to an unknown solution P. It acquired pink colour. Now another unknown solution Q was added to it dropwise and the solution ultimately became colourless. Predict the nature of solutions P and Q.

- (A) Solution P is basic and Q is an acid. (B) Solution Q is basic and P is an acid.
 (C) Solutions P and Q both are basic. (D) Solutions P and Q both are acidic

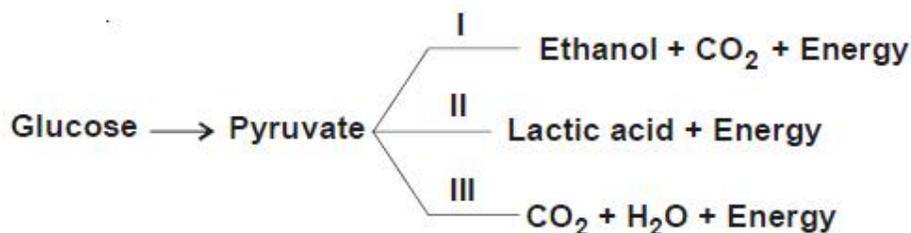
22. The positions of three elements X, Y and Z in the periodic table are shown below.

- (A) Y is a metal and X is less electropositive than Z
 (B) Y is a nonmetal and X is more electropositive than Z

Period	Group 1	Group 2
2	-	Y
3	-	-
4	X	Z
5	-	-

- (C) Y is a metal and X is more electropositive than Z
 (D) Y is a metal and X is as electropositive as Z

23. The given flow chart shows three steps of glucose breakdown in different conditions. Which of the following steps takes place in the mitochondria?



- (A) Step I (B) Step II (C) Step III (D) Both (B) & (C)

24. Which of the following types of blood cells are associated with blood clotting?



25. The sensitive plant *Mimosa pudica* shows seismonastic movement as a result of which the whole leaf droops down. The drooping is due to _____.

- (A) Loss of turgidity of the basal part of the leaf
- (B) Swelling of the basal part of the leaf
- (C) Change in direction of the leaf growth
- (D) None of these

26. Which of the following pairs are correctly matched?

- (i) Cereal crops Sorghum
 - (ii) Pulse crops Lentil
 - (iii) Oil seed crops Sesame
 - (iv) Fodder crops Castor
- (A) (i) & (ii) (B) (ii) & (iv) (C) (i), (ii) & (iii) (D) (iii) & (iv)

27. Mendel used a number of contrasting visible characters of garden pea. Which of the following is incorrect pair of contrasting characters ?

- (A) Tall / Dwarf Height of stem
- (B) Round / Wrinkled Shape of seed
- (C) White / Red Colour of flower
- (D) Yellow / Green Colour of seed

28. Which of the following modes of asexual reproduction is observed in Hydra ?

- (A) Binary fission and budding
- (B) Multiple fission and regeneration
- (C) Regeneration and budding
- (D) Budding and fragmentation

29. Select the incorrect statement regarding the male reproductive system.

- (A) The formation of germ cells or sperms takes place in the testes
- (B) Testes secrete the hormone oestrogen
- (C) Testes are located in scrotum
- (D) The sperms are carried through the vas deferens

30. Farmers have cultivated wild cabbage as a food plant and generated different vegetables from it by selection. Given below are some of its evolved types along with their characteristics. Select the incorrect match among them.

- (A) Sterile flowers – Cauliflower
- (B) Swollen parts – Kohlrabi
- (C) Arrested flower development – Broccoli
- (D) Smaller leaves – Kale

31. Which of the following muscles are involuntary in action?

- (A) Muscles of limbs
- (B) Muscles of heart
- (C) Muscles of iris
- (D) Both (B) & (C)

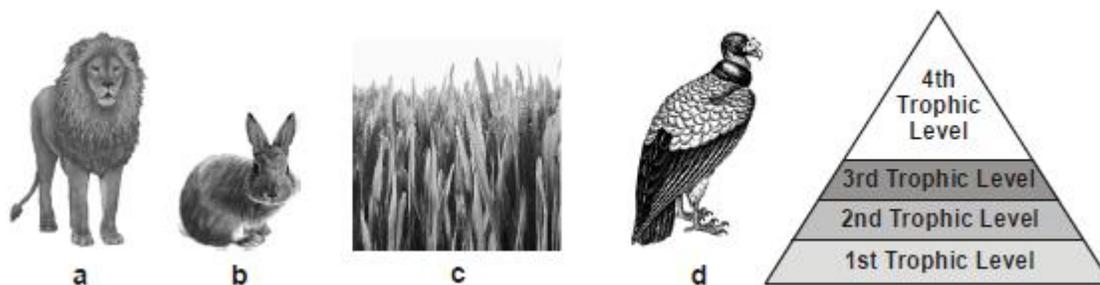
32. Pulse polio immunisation programme was launched in 1995-1996 with an aim to eradicate polio disease from the world. It involves simultaneous administration of polio drops (polio vaccine) to whole of the high risk population (i.e., children under three years of age) on a single day throughout the nation. What is the basic aim of this programme?

- (A) To immunise those children who were not earlier immunised or are partially immunised
- (B) To boost the immunity of children already immunised
- (C) To replace the disease causing virus by harmless vaccine virus in the environment
- (D) All of the above

33. The given figure shows the different trophic levels of a food chain in a grassland ecosystem. Select the correct sequence of organisms that will occupy the pyramid from

its base to apex.

- (A) c, b, d, a (B) c, b, a, d (C) c, d, b, a (D) d, a, b, c



34. Read the given statements and mark the correct option.

Statement I : Fossil fuels are nonrenewablesources of energy.

Statement II : Excessive use of fossil fuels causes pollution and leads to global warming.

- (A) Both statements I & II are true and statement II is the correct explanation of statement I.
(B) Both statements I & II are true but statement II is not the correct explanation of statement I.
(C) Statement I is true but statement II is false. (D) Statement I is false but statement II is true

35. Read the given statements and select the correct option.

Statement 1 : A concave mirror and a convex lens both have the same focal length in air. When they are submerged in water, they will still have the same focal length.

Statement 2 : The refractive index of water is greater than the refractive index of air.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
(B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
(C) Statement 1 is true but statement 2 is false.
(D) Statement 1 is false but statement 2 is true

36. No heat loss occurs during flow of charge in superconductors because

- (A) Speed of charge is slow in it
(B) It is a bad conductor of heat
(C) It offers zero resistance
(D) It generates very small voltage.

37. How do we know that fission isn't responsible for the Sun's energy ?

- (A) Fission doesn't produce enough energy per gram of fuel.
(B) If fission were going on in the Sun, the Sun would explode.
(C) If fission were going on in the Sun, the Sun's mass would increase.
(D) There isn't very much fissionable material in the Sun.

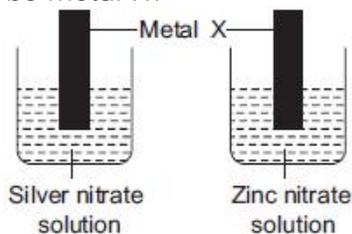
38. Which of the following statements is true with respect to diamond ?

- (A) The carbon atoms are connected to each other by metallic bonds.
(B) In the diamond crystal, the carbon atoms are very loosely packed.
(C) Each carbon atom in the crystal is surrounded by four other carbon atoms forming a rigid 3-D structure.
(D) Diamond can be synthesised by subjecting pure carbon to very low pressure and temperature.

39. Which of the following statements regarding natural selection is true?

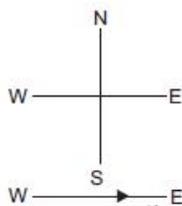
- (A) It is a process in which members of a population inherit traits that enable them to survive better and produce offspring.
- (B) It is based on the isolation of natural populations and selective breeding of organisms.
- (C) It provides diversity without any adaptation.
- (D) All of these

40. Strips of metal X were dipped into two solutions as shown:
A greyish metallic deposit was found on both strips.
Which of the following could be metal X?



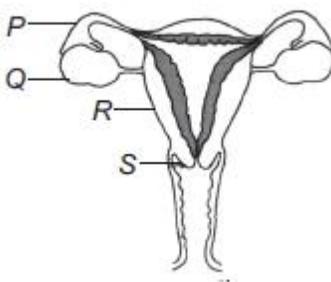
- A) Cu (B) Mg (C) Pb (D) Fe

41. A constant current flows in a horizontal wire in the plane of the paper from west to east as shown in the given figure. The direction of magnetic field will be north to south, at a point _____.



- (A) Directly above the wire
- (B) Directly below the wire
- (C) Located in the plane of the paper, on the north side of the wire
- (D) Located in the plane of the paper, on the south side of the wire

42. In which labelled part of the given figure does the fertilisation of an ovum by a sperm take place?



- (A) P (B) Q (C) R (D) S

43. Which of the following statements about the given reaction are not correct?



- I. Fe_2O_3 is getting oxidised to Fe.
 - II. Fe_2O_3 is acting as a reducing agent.
 - III. CO is acting as a reducing agent.
 - IV. CO is getting reduced to CO_2 .
- (A) III only (B) I, II and IV (C) II and IV (D) I and III