ARAVALI INTERNATIONAL SCHOOL

MID TERM EXAM (2020-21)
CLASS – X
SUBJECT – SCIENCE
Date: 25-09-2020

Time : 3 Hrs. **M.M: 80**

Name : _____ Roll No. _____ Teacher's Signature _____

General Instructions:

- Paper is divided into three parts
- PHYSICS carries 26 marks
- CHEMISTRY carries 26 marks
- BIOLOGY carries 28 marks
- All questions are compulsory.

Physics

SECTION – A(1x7=7)

1. A doctor has prescribed a corrective lens of power +1.5D. Identify the lens.

2. Which of the following phenomena of light are involved in the formation of a rainbow?
a) reflection, refraction, dispersion
b) refraction, dispersion, total internal reflection
c) scattering, dispersion, total internal reflection
d) reflection, refraction, scattering

3. State and define the unit of current.

4. Analyze the following statement - the propagation of light of different colours of white light in air.
Relate the correct option with the above statement.
a) Red light moves fastest
b) Blue light moves faster than green light
c) All the colours of the white light moves with the same speed
d) Yellow light moves with the mean speed as that of the red and the violet light.

5. Length of a wire and its cross sectional area is doubled. What is the change in its resistivity?

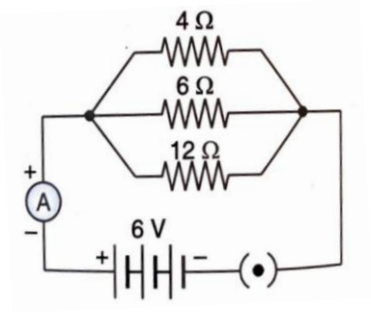
6. The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light
a) is scattered the most by smoke and fog
b) is scattered the least by smoke and fog
c) is absorbed the most by smoke and fog
d) moves fastest in air

7. In torches, search lights and headlights of vehicles, the bulb is placed
a) between the pole and the focus of the reflector
b) very near to the focus of the reflector
c) between the focus and center of curvature of the reflector
d) at the center of curvature of the reflector

SECTION – B(3x3=9)

8. In glass slab, the colours of spectrum recombine to their original direction of propagation while emerging out. Prism have a different shape and varying thickness. So all colours cover a different length of path and disperse. Explain the reason and draw a well labelled diagram to illustrate this effect of two inverted prisms.

9. Observe the given diagram carefully and answer



(a) How much current does the least of the three resistors, draw from the given battery?
(b) What would be the reading of the ammeter?
(c) Is the equivalent resistance of the parallel combination shown, more or less than the least of the individual resistances?

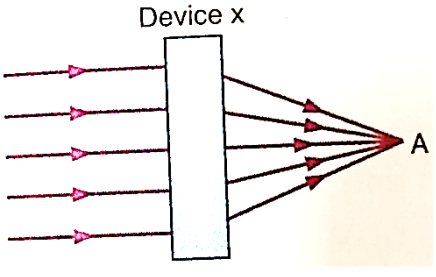
10. (a) Refractive index of water is 1.33. What does this statement mean?
(b) Light enters from air into water which has a refractive index of 1.33. Calculate the speed of light in water.
(c) Can refractive index of any medium be less than 1? Justify.

OR

(a) Refractive indices of media A,B,C and D are given below;
A) 1.33
B) 1.44
C) 1.52
D) 1.65
In which of these four media is the speed of light maximum and why? Also find refractive index of medium D w.r.t. A.
(b) A pencil dipped in glass tumbler appears to be bent at the interface of air and water. Will it bend to the same extent when dipped in kerosene? Give reason.

SECTION C (2 x 5 = 10)

11.



(a) Name the phenomenon responsible for change in the path of rays.
(b) Identify the device X.
(c) What is point A called?
(d) Which physical quantity does the reciprocal of the distance, between the device and the point A,denote?
(e) Write SI unit of the quantity named in point 4 above.

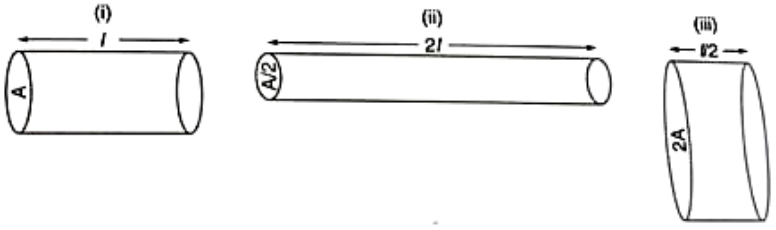
12. (a) Write Joules law of heating. Also give its mathematical formation.

(b) Two lamps, one rated 100 W, 220 V and other 60 W, 220 V are connected in parallel to electric mains supply. Find the current drawn by the bulbs from the line if supply voltage is 220 V.

OR

(a) The figure shows three cylindrical copper conductors along with their face areas and lengths.

Discuss in which geometrical shape the resistance will be highest.



(b) Two lamps, one rated 40 W at 220 V and other 100 W at 220 V, are connected in parallel to electric supply at 220 V.

i) Draw a circuit diagram to show the connections.

ii) Calculate the current drawn from the electric supply.

iii) Calculate the total energy consumed by two lamps together when they operate for one hour.

CHEMISTRY

SECTION – A (1X7=7)

13. Which of the following is (are) double displacement reaction(s)?

i) $Pb + CuCl_2 \rightarrow PbCl_2 + Cu$

ii) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$

iii) $C + O_2 \rightarrow CO_2$

iv) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

a) (i) and (iv) b) (ii) only

c) (i) and (ii) d) (iii) and (iv)

14. In a double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed, while performing activity if lead nitrate is not available, which of the following can be used in its place?

a) Lead Sulphate (Insoluble)

b) Lead Acetate

c) Ammonium Nitrate

d) Potassium Sulphate

15. _____ are the medicine used to treat indigestion.

16. Write balanced chemical equation for reaction of limestone and vinegar.

17. Which among the following statements is incorrect for magnesium metal.

a) It burns in air with dazzling flame.

b) It reacts with cold water to form magnesium oxide and hydrogen gas.

c) It reacts with hot water to form magnesium hydroxide and hydrogen gas.

d) It reacts with steam to form magnesium hydroxide and hydrogen gas

18. Hydrargyrum is _____ in room temperature.

19. Draw the Lewis dot structure of alkyne with molecular formula C_3H_4.

SECTION – B (3×3=9)

20. A, B and C are three elements which undergo chemical reaction according to following equation

$A_2O_3 + 2B \rightarrow B_2O_3 + 2A$
$3CSO_4 + 2B \rightarrow B_2(SO_4)_3 + 3C$
$3CO + 2A \rightarrow A_2O_3 + 3C$

Answer the following questions with reasons:

a) Which element is most reactive?
b) Which element is least reactive?
c) What is the type of reactions listed above?

21. You have been provided with three test tubes. One of them contains distilled water and other two contains an acidic solution and a basic solution respectively. If you are given only red litmus paper, how will you identify content of each test tube?

22. State reasons for the following:

a) Metals are good conductors of heat.
b) Some copper is added to pure gold to make ornaments.
c) On treatment with dilute H_2SO_4 ,nonmetals do not produce hydrogen gas,

OR

A gas is produced when concentrated sulphuric acid is added to solid sodium chloride taken in a test tube. The gas coming out of the delivery tube is passed over dry blue litmus paper, then over moist litmus paper. What would you observe? Explain reason with the help of chemical equation.

SECTION – C (5X2=10)

23. Answer questions after reading the following paragraph:

Tooth decay starts when pH of the mouth is lower than 5.5. Tooth enamel is made up of calcium hydroxyapatite (crystalline form of calcium phosphate) is hardest substance in the body. It does not dissolve in water, but corrodes when pH of mouth falls below 5.5. Bacteria present in mouth produces acid by degradation of sugar and food particles in mouth after eating. The best way to prevent this is to clean mouth after eating. Using toothpaste which are generally basic, for cleaning the teeth can neutralize the excess acid and prevent tooth decay.

a) What is the composition of material of teeth?
b) What should be the pH of mouth to prevent damage to teeth?
c) Which of the following should be avoided to prevent tooth decay?
[Bread, cucumber, cakes , sweets]
d) Write the best way to prevent damage to teeth.

24. An element A burns with golden flame in air. It reacts with another element B which has the atomic number 17 to give a product C. An aqueous solution of C n electrolysis gives a compound D and liberates hydrogen gas. Identify A, B, C and D. Also write the equations involved in the above reactions.

OR

In the formation of a compound XY_2, atom X donates one electron to Y atom. Show the electron dot structure of X and Y. Also show the formation of XY_2,What is the nature of bond in XY_2? Write any three properties of XY_2. Electronic configuration of X and Y are as follows:
X – 2, 8, 2 Y – 2, 7

BIOLOGY

SECTION – A(1x6=6)

25. One of the following has a saprophytic mode of nutrition. The organism is :
a) Mushroom b) Malarial parasite c) Leech d) Lice

26. The vein which brings clean blood from the lungs into the heart is known as:
a) Pulmonary vein b) Hepatic vein
c) Superior vena cava d) Pulmonary artery

27. The instrument for measuring blood pressure is called:
a) manometer b) sphygmomanometer
c) barometer d) potentiometer

28. Which of the following is correct regarding bile?
a) Secreted by bile duct and stored in the liver
b) Secreted by the gall bladder and stored in the liver
c) Secreted by the liver and stored in the bile duct
d) Secreted by the liver and stored in the gall bladder

29. The number of chromosomes in parents and off springs of a particular species remains constant due to:
a) Doubling of chromosomes after zygote formation
b) Halving of chromosomes during gamete formation
c) Doubling of chromosomes after gamete formation
d) Halving of chromosomes after gamete formation

30. Which among the following is necessary to carry out the blood coagulation in a cut or wound?
a) White Blood Cells b) Blood plasma
c) Platelets d) Red blood cells

SECTION – B(3x4=12)

31. a) In a bisexual flower, inspite of the young stamens being removed artificially,the flower produces fruit. Provide a suitable reason for the above situation.
b) Draw the diagram of a flower and label the four whorls

32. The following questions consist of two statements-Assertion(A) and Reason(R).Answer the questions selecting the appropriate option below:
a) Both A and R are true and R is the correct explanation for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

i) **Assertion:** Pollination is the transfer of pollen grains to the anther.
Reason: Pollination is carried out by wind, birds and insects.
ii) **Assertion:** Contraception is used to avoid unnecessary pregnancies
Reason: Contraception is used by both males and females.
iii) **Assertion:** When air is passed through lime water, lime water turns milky.
Reason: Air contains 78% nitrogen and 21% oxygen

33. a) Why is small intestine in herbivores longer than in carnivores?

b) Name the type of respiration in which the end products are:

i) C_2H_5OH and CO_2

ii) CO_2 and H_2O

iii) Lactic acid

34. a) Discuss the role of Transpiration in transportation in plants.

b) What are the components of transport system in highly developed plants?

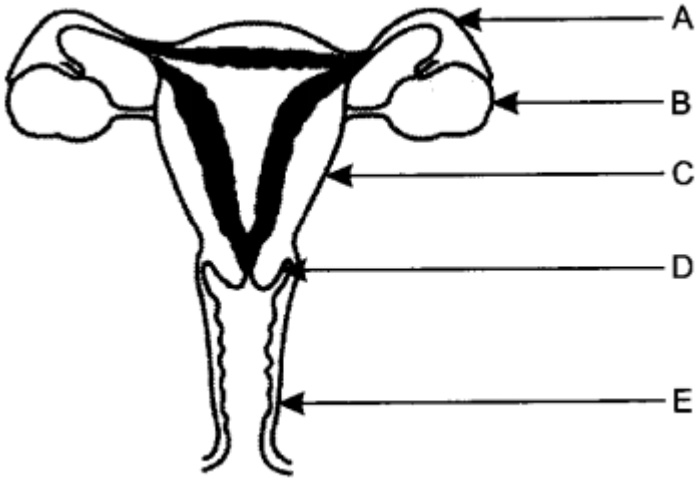
OR

a) Differentiate between a Gamete and a Zygote.

b) Discuss different methods of Contraception.

SECTION – C (5x2=10)

35. a) Name the parts labelled A, B, C, D and E.



b) Where do the following functions occur?

i) Production of an egg

ii) Fertilisation

c) What would be the ratio of chromosome number between an egg and its zygote? How is the sperm genetically different from the egg?

36. a) Leaves of a healthy potted plant were coated with Vaseline. Will this plant remain healthy for long? Give reasons for your answer.

b) What will happen to the rate of photosynthesis in a plant under the following circumstances?

i) Cloudy day in the morning but bright sunshine in the afternoon.

ii) No rainfall in the area for a considerable time.

iii) Gathering of dust on the leaves.

OR

a) Define Phagocytosis.

b) Arrange the following processes involved in the nutrition in animals in the correct order (in which they take place) and discuss about each process In Humans.
Assimilation, Egestion, Ingestion, Absorption, digestion