TVSSC – COMMON REVISION EXAMINATION – (2019 – 2020)

SCIENCE (086)

TIME : 3 Hrs. **Max. Marks: 80**

General Instructions:

1. **The question paper comprises three sections – A, B and C. Attempt all the sections.**
2. **All questions are compulsory.**
3. **Internal choice is given in each section.**
4. **All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.**
5. **All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.**
6. **All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 -90 words each.**
7. **This question paper consists of a total of 30 questions.**

SECTION – A

1 Which kind of mirrors are used in the headlights of motor-car and why? **1**

2 Define term volt. **1**

3 What is the advantage of a solenoid over an ordinary coil? **1**

4 **Answer question numbers 4(a) to 4(d) on the basis of your understanding of the following paragraph and the related studied concepts.**

End Stage Renal Disease (ESRD) is a common illness that is increasing in incidence and prevalence. The incidence of ESRD in 2006 was 360 per million, an increase of 2.1% since 2005. The current National Kidney Foundation (NRE) guidelines define chronic kidney disease as irreversible kidney damage or decreased kidney functions. The nephrons lose their ability to filter wastes and extra fluid, creating fluid imbalances. The individual's Glomerular filtration Rate (GFR) is the best measure of overall health and function of kidneys. A GFR of 90mL/minute per 1.73 m^2 or higher is considered normal. A decreasing GFR denotes kidney damage.

4(a) Name the method by which the patient suffering from above mentioned disease can be treated with. **1**

4(b) Which of the following is not the symptom in case of kidney disease? **1**

i) swelling in legs, ankles or feet

ii) fluid retention

iii) asthma

iv) shortness of breath and drowsiness

4(c) What could be the consequence of highly decreasing GFR value according to the above passage? **1**

4(d) How will you explain the glomerular filtration rate in relation to the function or role of glomerulus? **1**

5 Answer question numbers 5 (a) to 5 (d) on the basis of your understanding of the following paragraph and the related studied concepts.

Atoms of eight elements A, B, C, D, E, F, G and H have the same number of electronic shells but different number of electrons in their outermost shell. It was found that elements A and G combine to form an ionic compound which can also be extracted from sea water. Oxides of the elements A and B are basic in nature while those of E and F are acidic. The oxide of element D is almost neutral.

5(a) To which group of the periodic table A and G belongs? **1**

5(b) Which one of the eight elements is likely to be a noble gas? **1**

5(c) Which element would have the largest atomic radius? **1**

5(d) Which one of these elements is likely to be a semi-metal or a metalloid? **1**

6 The property of persistence of vision is used in _____ **1**

a) short sightedness b) long sightedness c) cinematography d) colour vision

OR

Red colour of the sun at the time of sunrise and sunset is because _____

a) Red colour is least scattered b) Blue colour is least scattered

b) Red colour is scattered the most d) All colours are equally scattered

7 In a voltmeter there are 20 division between the 0 mark and 0.5 V mark. The least count of the voltmeter is **1**

a) 0.020 V

b) 0.025 V

c) 0.050 V

d) 0.250 V

8 The pH range most conducive for life of freshwater plants and animals is **1**

a) 6.5 – 7.5

b) 2.0 – 3.5

c) 3.5 – 5.0

d) 9.0 – 10.5

9 Which of the following statements are usually correct for carbon compounds? **1**

(i) are good conductors of electricity.

(ii) are poor conductors of electricity.

(iii) have strong forces of attraction between their molecules.

(iv) do not have strong forces of attraction between their molecules.

a) (i) and (iii) b) (ii) and (iii)

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

OR

Carbon forms four covalent bonds by sharing its four valence electrons with four univalent atoms, e.g., hydrogen. After the formation of four bonds, carbon attains the electronic configuration of

a) helium

b) neon

c) argon

d) krypton

10 The composition of aqua regia is : **1**

a) Dil.HCl : Conc. HNO_3 b) Conc. HCl : Dil.HNO_3

3 : 1 3 : 1

c) Conc.HCl : Conc.HNO_3 d) Dil.HCl : Dil.HNO_3

3 : 1 3 : 1

11 Which of the following is the odd one out? **1**

a) Petroleum

b) Hydro electricity

c) Coal

d) CNG

12 In a food chain, the snake predated on rabbit which fed on fresh green bushes. What percentage amount of the energy accumulated by rabbit, would be acquired by snakes**. 1**

a) 90%

b) 10%

c) 50%

d) 25%

OR

Which of the following is the age old concept of water harvesting system in Rajasthan?

a) Khadins b) bundhis c) surangams d) bandharas

For question numbers 13 and 14, two statements are given-one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

a) Both A and R are true and R is the correct explanation of the assertion.

b) Both A and R are true but R is not the correct explanation of the assertion.

c) A is true but R is false.

d) A is false but R is true.

13 **Assertion :** Fuse wire must have high resistance and low melting point. **1**

Reason : Fuse is used for small current flow only.

14 **Assertion :** In water, Hydrochloric acid behaves as a weak monobasic acid. **1**

Reason : In water, Hydrochloric acid acts as a proton donor.

SECTION – B

15 2 g of ferrous sulphate crystals are heated in a dry boiling tube. **3**

(i) List any two observations.

(ii) Name the type of chemical reaction taking place.

(iii) Write balanced chemical equation for the reaction and name the products formed.

16 Aluminium oxide and zinc oxide react with both acids and bases to produce salt and water. What are these oxides called? Write chemical equations in each case. **3**

OR

Write chemical equations for the following reactions:

(i) Calcium metal reacts with water.

(ii) Cinnabar is heated in the presence of air.

(iii) Manganese dioxide is heated with aluminum powder.

17 From the following elements: **3**

$_{4}Be$; $_{9}F$; $_{19}K$; $_{20}Ca$

(i) Select the element having one electron in the outermost shell.

(ii) Two elements of the same group.

(iii) Write the formula and mention the nature of the compound formed by the union of $_{19}K$ and element X (2,8,7).

18 How are fats digested in our body? Where does this process take place? **3**

OR

Give reasons for the following:

a) Adrenaline helps in dealing emergency situations.

b) Secretions of growth hormone should be specific in body.

c) Patients with diabetes are treated by giving injections of insulin.

19 a) In a bisexual flower inspite of the young stamens being removed artificially, **3** the flower produces fruit. Provide a suitable explanation for the above situation.

b) Describe the function of placenta.

20 An angiosperm plant having red coloured flowers when crossed with the other having **3** the same colour produced 40 progenies, out of which 30 plants were with red coloured flowers, 10 plants were with white coloured flowers. Find out

a) What is the possible genotype of parent plants?

b) Which trait is dominant and recessive?

c) What type of cross is this and mention its phenotypic ratio?

21 Draw a food chain that could exist is a grassland ecosystem with three tropic levels. **3** Calculate the amount of energy present at the third trophic level if 30,000 J of energy is available from the Sun.

22 i) A large number of free electrons are present in metals. Yet no current flows in the **3** absence of electric potential across it. Explain the statement with reason.

ii) What is the resistance of an ideal ammeter?

OR

i) When a 1.2 V battery is connected across an unknown resistor, there is a current of $2\ \mu A$ in the circuit. Find the value of the resistance of the resistor.

ii) How is a voltmeter connected in the circuit to measure the potential difference between two points?

23 Make a diagram to show how hypermetropia is corrected. The near point of **3** hypermetropic eye is 1 m. What is the power of the lens required to correct this defect? Assume that the near point of the normal eye is 25cm.

24 i) One gram of coal on complete combustion liberates 18 KJ of heat. Calculate the **3** amount of coal required to liberate the same amount of heat that an electric heater of 2 KW provides in one hour.

ii) Explain why it is difficult to burn a piece of wood fresh from a tree?

SECTION – C

25 Identify the compounds 'A' to 'E' in the following sequence. **5**

(i) $CH_3CH_2OH \xrightarrow[\text{Heat}]{\text{Alkaline } KMnO_4}$ **A**

(ii) CH_3CH_2OH + **A** $\xrightarrow[\text{Heat}]{\text{Conc. } H_2SO_4}$ **B +** H_2O

(iii) **B** + NaOH $\longrightarrow$ **C** + CH_3CH_2OH

(iv) **A** + $NaHCO_3$ $\longrightarrow$ **C** + **D** + H_2O

(v) CH_3CH_2OH + **E** $\longrightarrow$ CH_3CH_2ONa + H_2

OR

(i) Name the compound formed when ethanol is heated with excess of conc.H_2SO_4 at 443 k. Also write the chemical equation of the reaction stating the role of conc.H_2SO_4 in it. What would happen if hydrogen is added to the product in presence of catalyst such as Ni ?

(ii) Carbon does not form ionic compounds, Why?

26 State the reason for the following statements. **5**

(i) Tap water conducts electricity whereas distilled water does not.

(ii) Dry hydrogen chloride gas does not turn blue litmus red whereas dilute hydrochloric acid does.

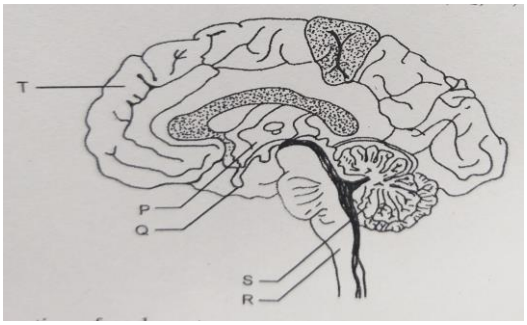
(iii) During summer season, a milkman usually adds a very small amount of baking soda to fresh milk.

(iv) For dilution of an acid, acid is added to water and not water to acid.

(v) Ammonia is a base but it does not contain hydroxyl group.

27 Name and explain the five R's to save the environment. **5**

28 a) Given below is a diagram of human brain. Label the parts P,Q,R,S and T **5**



b) Write the main function of each part.

OR

Describe in brief the role of :

i) testis ii) seminal vesicle iii) vas deferens iv) ureter v) prostrate gland

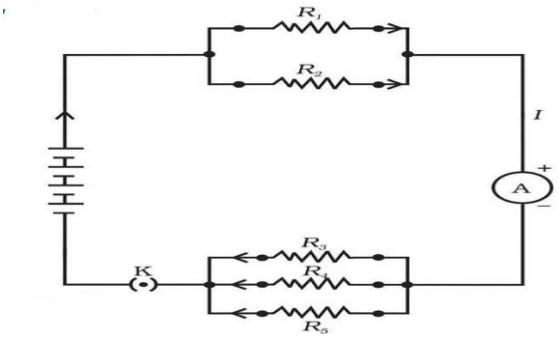
29 i) A doll of size 10 cm is placed at 35 cm in front of a concave mirror of focal length 20 cm. At what distance from the mirror should a screen be placed, so that a sharp focussed image can be obtained? Find the size and the nature of the image. **5**

ii) A concave mirror produces three times magnified (enlarged) real image of an object placed at 20 cm in front of it. Where the image located?

30 i) $R_1 = 10\ \Omega,\ R_2 = 40\ \Omega,\ R_3 = 30\ \Omega,\ \mathrm{R}_4 = 20\ \Omega,\ \mathrm{R}_5 = 60\ \Omega,$ and a 12V battery is connected to the arrangement . Calculate

a) the total resistance in the circuit, and

b) the total current flowing in the circuit. **5**



ii) How can three of resistors of resistance $4\Omega, 6\Omega, and\ 12\Omega$ be connected to give a total resistance of a) $8\ \Omega$ b) 2Ω

OR

Draw a labelled diagram of an electric motor. Explain its principle and working. What is the function of split rings in an electric motor?