

AIR FORCE SCHOOLS
PRE-BOARD EXAMINATION: 2018-19
CLASS – X

Roll No.

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- Please check that this question paper contains **06** pages.
- Please check that this question paper contains **27** questions.
- **Please write down the Serial Number of the question before attempting it.**
- 15 minutes time has been allotted to read the question paper. The question paper will be distributed at 8.30 a. m. From 8.30 a.m. to 8.45 a.m., the students will read the question paper only and will not write any answer on the answer sheet during this period.

SCIENCE

Time allowed : 3 hours

Maximum marks : 80

General Instructions:

- i) *The question paper comprises of five sections, A, B, C, D and E. You are to attempt all the sections.*
- ii) *All questions are compulsory.*
- iii) *Internal choice is given in sections B, C, D and E.*
- iv) *Question number 1 and 2 in Section -A is **one mark** questions. They are to be answered in **one word** or in **one sentence**.*
- v) *Question number 3 to 5 in Section -B is **two marks** questions. These are to be answered in **about 30 words** each.*
- vi) *Question number 6 to 15 in Section -C is **three marks** questions. These are to be answered in **about 50 words** each.*
- vii) *Question number 16 to 21 in Section -A are **five marks** questions. These are to be answered in **about 70 words** each.*
- viii) *Question numbers 22 to 27 in Section -E are based on practical skills. Each question is a **two marks** question. These are to be answered in brief.*

SECTION – A

1. Which tissue transports soluble products of photosynthesis?

1

2. Water harvesting is an age old concept in India. Khadin is a water harvesting system of which state? 1

SECTION – B

3. An ester has the molecular formula $C_4H_8O_2$
- Write its structural formula
 - What happens when this ester is heated in presence of sodium hydroxide solution? Write the balanced chemical equation for the above reaction. 2
4. What is the basic event in reproduction? How many chromosomes are present in a germ- cell of a human being? 2
5. Give four characteristics of image formed by a plane mirror.

OR

How is optical density related to refractive index? Which medium has highest and lowest optical density? 2

SECTION – C

6. What is redox reaction? Identify the substance oxidised and substance reduced in the following reactions
- $2PbO + C \longrightarrow 2Pb + CO_2$
 - $MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + Cl_2$ 3
7.
 - Give chemical name and formula of Plaster of Paris.
 - Write down the chemical equation for the preparation of Plaster of Paris from gypsum.
 - Give two uses of Plaster of Paris.

OR

Explain the following statements by giving reasons

- Tooth decay start when the pH of mouth is lower than 5.5
 - Aqueous ammonia solution is considered to be a base although ammonia does not contain hydroxyl (OH^-) ion.
 - On passing carbon dioxide to lime water it turns milky but excess of CO_2 turns it to colourless. 3
8. Answer the following questions
- What is the difference between the chemical composition of soaps and detergents?
 - State the reason why we can wash our clothes even in hard water using detergents.

- c) Give one disadvantage of using detergents over soaps. 3
9. (i) Explain how does the plant hormone "Auxin" helps in Phototropism?
 (ii) Give an example for "Chemotropism".
 (iii) Name the plant part which is positively geotropic? 3
10. Draw a diagram of human respiratory system and label the following:
 a) part where air is filtered by fine hair and mucus
 b) balloon-like structures where exchange of gases takes place.
 c) part which separates chest cavity from abdominal cavity. 3
11. For what position of an object does a concave mirror forms a real, inverted and diminished image. Draw a ray diagram also.
- OR**
- If the image formed by a lens for all positions of the object placed in front of it is always virtual, erect, diminished. State the type of lens and also draw a ray diagram to justify your answer. 3
12. (i) Why do we use copper and aluminium for electrical transmission lines.
 (ii) An electric oven rated at 500W is connected to 220V line for 2 hours daily. Calculate the cost of electric energy consumed per month at the rate of Rs. 5 per kWh. 3
13. Resistance of a metal wire of length 1m is 26Ω at 20°C . If the diameter of the wire is 0.3mm what will be the resistivity of the metal at that temperature? 3
14. a) Name the part of biogas plant where reaction takes place in the absence of oxygen.
 b) What is minimum speed of wind to run a windmill to maintain the necessary speed of turbine in an electric generator?
 c) What are the causes of acid rain? 3
15. (i) Name any two organisms which can make organic compounds like sugar and starch from inorganic substances using radiant energy of sun. Which trophic level do they occupy in a food chain?
 (ii) Grass \longrightarrow Buffalo \longrightarrow Vulture . In the given food chain which organism will have maximum concentration of chemicals? Name this phenomenon?

OR

Calculate the amount of energy available to a Tiger in the following food chain, if 30,000 J of energy is available from sun to the plants . Explain with reason?

PLANTS \longrightarrow DEER \longrightarrow TIGER

SECTION – D

16. i) Distinguish between roasting and calcination.
ii) Write a chemical equation to illustrate the use of aluminium for joining cracked railway lines.
iii) Name the anode, the cathode and the electrolyte used in the electrolytic refining of impure copper. 5
17. a) Write the name given to the vertical columns and horizontal rows in the Modern periodic Table.
b) How does the metallic character of elements vary on moving down a vertical column? Give reason in support of your answer.
c) An element P (atomic number 20) reacts with an element Q (atomic number 17) to form a compound
- Write the position of P and Q in the modern Periodic Table.
 - Also deduce the formula of the compound formed when P reacts with Q.

OR

- i) State the modern periodic law.
ii) An element X of group 15 exists as diatomic molecule and combines with hydrogen at 773k in presence of the catalyst to form a compound, ammonia which has a characteristic pungent smell.
- a) Identify the element X. How many valence electron does it have?
b) Draw the electron dot structure of the diatomic molecule of X. What type of bond is formed in it?
c) Draw the electron dot structure for ammonia. What type of bond is formed in it? 5
18. a) Draw the diagram of Human male reproductive system and label
- (i) the organ where sperms are produced
 - (ii) any one gland that adds fluid to sperms and provide nutrition
 - (iii) common passage for both sperms and urine
- b) Testes are located outside the human body. Give reason.
c) Mention one example each of sexually transmitted diseases of bacteria and virus? 5
19. a) Explain with the help of a flowchart diagram how sex is determined genetically in an unborn human baby.

- b) Anita had a huge scar on her cheek after she met with an accident during her school days. She is worried if her baby would inherit the scar she had. The doctor informed her that the baby will not inherit the scar. Give reason.
- c) How does Gene flow takes place?

OR

- a) A pure bred Red flower plant denoted by 'RR' is crossed with pure bred White coloured flower plant denoted by 'rr'
- (i) State the colour of flowers you would expect in 'F1' generation?
- (ii) When they were self-pollinated, what must be the ratio of red and white coloured flowers in 'F2' generation?
- (iii) What must be the genetic makeup of red and white coloured flower plants in F2 generation?
- b) Differentiate between Homologous organs and Analogous organs. 5
20. A person cannot see objects beyond 1.2 m distinctly. Giving reasons, name the defect of vision and name the nature of corrective lens to rectify the defect. Also draw diagrams for defected and corrected eye. 5
21. a) State two differences between AC generator and DC generator.
- b) What is meant by electromagnetic induction?
- c) State the rule which helps to determine the direction of induced current.

OR

- a) State two ways by which the strength of an electromagnet is increased.
- b) Under what conditions is the force experienced by a current carrying conductor placed in a magnetic field maximum?
- c) A proton beam is moving along the direction of a magnetic field. What force is acting on proton beam? 5

SECTION – E

22. About 2.5g of ferrous sulphate crystal were heated. After heating for one minute.
- a) What change in colour of ferrous sulphate crystal would you observe?
- b) On smelling the gases carefully, what would you feel?

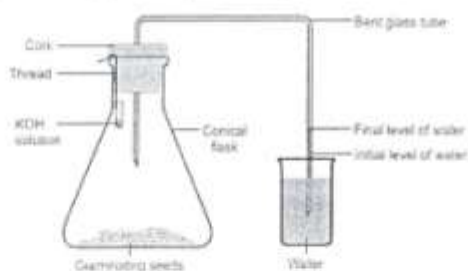
OR

List two observations which you make when you add a pinch of sodium hydrogen carbonate to acetic acid in a test tube. Write chemical equation for the reaction that occurs. 2

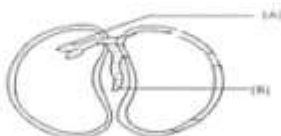
23. Two beakers A and B contain ferrous sulphate solution. In the beaker A, place small piece of copper and in beaker B, small piece of zinc is placed. What change you will observe in beaker A and B, Explain your answer. 2
24. Name the type of asexual reproduction in which two individuals are formed from a single parent and the parental identity is lost? Draw the diagrams in proper sequential order? 2

OR

In the given experiment "CO₂ is released during respiration" a person used flower buds instead of germinating seeds, and he got the same result. Give reason?



25. Name the following structures **A** and **B** in the given diagram and mention their function? 2



26. a) In an electric circuit containing resistance, key and battery, where will you connect the voltmeter to verify ohms law? 2
- b) Give two differences between Ammeter and Voltmeter. 2
27. An object of height 5cm is placed at a distance of 20cm from the optical centre 'o' of a convex lens of focal length 30 cm. Draw a ray diagram to find the position, nature and size of the image formed. Also mark optical centre 'o' and principle focus on the ray diagram. 2

OR

Draw a ray diagram to trace the path of ray of light passing through a glass slab and label the following

- a) angle of incidence
- b) angle of emergence