



ARMY BURN HALL COLLEGE FOR BOYS
Model Paper for Entry Test – Class HSSC-I

Time Allowed: 1 Hour

Maximum Marks: 60

INSTRUCTIONS

- Write your Roll Number only on the top right corner.
- Do not write your name or any other information.
- Do not use lead pencil.
- Avoid erasing, cutting, overwriting, etc.
- Any sign, mark, name, etc written on Answer Script to disclose your identity will disqualify you for admission to the College.

ATTEMPT ALL QUESTIONS

BIOLOGY PORTION
SECTION–A (Marks 5)

Q. 1 Circle the correct option.

- i. A non-functional finger like process attached at the blind end of Caecum:
 A. colon B. appendix C. duodenum D. chyme
- ii. CNS consists of:
 A. nerves B. brain C. spinal cord D. both B and C
- iii. The movement of an animal as a whole from one place to another:
 A. coordination B. locomotion C. reproduction D. respiration
- iv. Which one of the following is responsible for alcoholic fermentation?
 A. algae B. bacteria C. yeast D. none of these
- v. Pick out the one which is recessive trait in pea plant:
 A. wrinkled seed B. purple flower C. flat pod D. round seed

SECTION–B (Marks 15)

Q. 2 Attempt all questions. Each question carries three marks. (5×3 = 15)

- i. Write down the structural similarities between Chloroplast and Mitochondrion.
- ii. What is pericardium? What function does it perform?
- iii. What do you know about bead and string model of chromatin?
- iv. What do you know about osmoregulatory function of human kidney?
- v. Write a note on Ammonification and Nitrification.

CHEMISTRY PORTION
SECTION-A (Marks 5)

Q. 1 Circle the correct option.

- i. In an irreversible reaction, equilibrium is:

A. established quickly	B. established stonily
C. never established	D. established when reaction stops
- ii. Stem 'But' stands for _____ carbon atoms?

A. 2	B. 3	C. 4	D. 5
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- iii. The functional group –COOH is found in:

A. alcohols	B. ketones	C. carboxylic acid	D. ester
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- iv. Which of the following is an alcohol?

A. CH_3OCH_3	B. CH_3OH	C. CH_3COOH	D. C_6H_5OH
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- v. Which reacts explosively with methane?

A. F_2	B. Cl_2	C. Br_2	D. I_2
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SECTION-B (Marks 15)

Q. 2 Attempt all questions. Each question carries three marks. (5×3 = 15)

- i. Draw Bohr's structure of the following elements.

(a) ${}_{11}^{23}Na$	(b) ${}_{20}^{40}Ca$
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- ii. Explain the conclusions drawn by Rutherford's experiment.
- iii. Write K_c expression of the following equation and also determine its unit?

$$COCl_2(g) \rightleftharpoons CO(g) + Cl_2(g)$$
- iv. Draw all the possible isomers of butane (C₄H₁₀).
- v. Differentiate between fat soluble and water soluble vitamins with examples.

PHYSICS PORTION
SECTION-A (Marks 5)

Q. 1 Circle the correct option.

- i. A straight line parallel to time axis on a distance time graph tells that the object is:

A. moving with constant speed	B. at rest
C. moving with variable speed	D. in motion
- ii. A source of frequency of 500 Hz emits waves of wavelength 0.4 m, how long does the wave take to travel 600 m?

A. 3 sec	B. 6 sec	C. 200 sec	D. 240 sec
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- iii. The energy released during fission of 1 kg of Uranium-235 is about:

A. $6.7 \times 10^{10}J$	B. 6.5×10^8J	C. 6.2×10^8J	D. $6.7 \times 10^{11}J$
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- iv. In a circular motion the point about which a body goes around, is ____ the body.

A. inside	B. outside	C. passing through	D. none of these
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- v. SI unit of thermal conductivity of a solid is:

A. $Jkg^{-1} K^{-1}$	B. JK^{-1}	C. JK^{-1}	D. $Wm^{-1} K^{-1}$
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SECTION-B (Marks 15)**Q. 2 Attempt all questions. Each question carries three marks. (5×3 = 15)**

- Derive graphically third equation of motion.
- How can you differentiate between e.m.f and potential difference?
- Suppose direction of current passing through two straight wires is same. Draw the pattern of magnetic field of current due to each wire.
- If a transformer is used to supply voltage to a 17 V model train which draws a current of 0.8 A. Calculate the current in the primary if the voltage in the a.c. is 240 V.
- Why value of ' g ' changes from place to place?

MATHEMATICS PORTION
SECTION-A (Marks 5)**Q. 1 Circle the correct option.**

- The value of i^9 is _____
A. 1 B. -1 C. i D. $-i$
- $a^3 + b^3$ is equal to _____
A. $(a-b)(a^2 + ab + b^2)$ B. $(a+b)(a^2 - ab + b^2)$
C. $(a-b)(a^2 - ab + b^2)$ D. $(a-b)(a^2 + ab - b^2)$
- $\text{Sec}\theta\text{Cot}\theta =$ _____
A. $\text{Sin}\theta$ B. $\frac{1}{\text{Cos}\theta}$ C. $\frac{1}{\text{Sin}\theta}$ D. $\frac{\text{Sin}\theta}{\text{Cos}\theta}$
- Product of the cube roots of unity is _____
A. 1 B. 0 C. -1 D. 3
- An equation, which remains unchanged when ' x ' is replaced by $\frac{1}{x}$ is called a / an:
A. exponential equation B. reciprocal equation
C. radical equation D. none of these

SECTION-B (Marks 15)**Note: Attempt all questions. Each question carries five marks. (3×5 = 15)**

Q. 2 Simplify:
$$\sqrt{\frac{(216)^{\frac{2}{3}} \times (25)^{\frac{1}{2}}}{(0.04)^{-\frac{3}{2}}}}$$

Q. 3 Verify:
$$\frac{\text{Cos}^2\theta}{\text{Sin}\theta} + \text{Sin}\theta = \text{Cosec}\theta$$

Q. 4 Solve the equation $4.2^{2x+1} - 9.2^x + 1 = 0$