# MILITARY COLLEGE SUI
# XI LATERAL ENTRY INDUCTION EXAM
# MODEL PAPER CHEMISTRY & PHYSICS

**Time: 2 Hrs** **Total Marks: 100**

## CHEMISTRY PAPER (50 Marks)

**Note: All questions are compulsory. Write your answers as per the questions asked and allocated marks. Support your answers with chemical equations and diagrams where necessary.**

### SHORT QUESTIONS (15 Marks)

Q.1 **Write down brief answers of following questions**: - **(3x5=15)**

a. Write down common uses of following chemicals: -

(i) Nitric Acid (ii) Phosphoric Acid (iii) Potassium Hydroxide

b. Give one example for each of following families of organic compounds: -

(i) Ethers (ii) Ketones (iii) Carboxylic Acids

c. Write down chemical reactions involved for preparation of oxalic acid from ethyne.

d. A solution contains 40g urea dissolved in 500$cm^3$ of solution. Calculate the molarity of this solution.

e. Write down electronic distribution for an atom of following elements: -

(i) $_{16}S$ (ii) $_{12}Mg$ (iii) $_{18}Ar$

### LONG QUESTIONS (35 Marks)

Q.2 State Law of Mass Action and drive its mathematical expression for a generalized reaction. **(7)**

Q.3 What is Lewis concept for acids and bases? Give two examples for each. **(7)**

Q.4 What are nucleic acids. Explain in detail. **(7)**

Q.5 Define Pollution. Explain role of $SO_x$, Carbon Monoxide and $NO_x$ as air pollutants. **(7)**

Q.6 Define hardness of water and explain its types in detail. **(7)**

## PHYSICS PAPER (50 Marks)

**Note: All questions are compulsory. Write your answers as per the questions asked and allocated marks. Support your answers with diagrams where necessary.**

### SHORT QUESTIONS (15 Marks)

Q. 1 **Give short answers to the following questions.** **(5x3 = 15)**

a. Derive 2$^{nd}$ Equation of Motion.

b. Define Newton's 2$^{nd}$ Law of Motion. Derive its formula

c. Describe Newton's Law of Gravitation.

d. Define Power and its SI unit.

e. Differentiate between Temperature and Heat.

### LONG QUESTIONS (35 Marks)

Q.2 What is Simple Pendulum? Prove that motion of Simple Pendulum follows SHM. **(7)**

Q.3 What is Total Internal Reflection? Explain with diagram. Also describe its conditions. **(7)**

Q.4 Define and explain Coulomb's Law of charges. **(7)**

Q.5 Define and explain Transformer and its types. **(7)**

Q.6 What is Nuclear Fission Reaction? Explain in detail. **(7)**

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# XI LATERAL ENTRY INDUCTION EXAM
# MODEL PAPER ENGLISH & MATHEMATICS

**Time: 2 Hrs** **Total Marks: 100**

## ENGLISH PAPER (50 Marks)

**Note: All questions are compulsory. Write your answers as per the questions asked and allocated marks.**

### SECTION A (20 Marks)

Q. 1 **Write down brief answers of following questions**: - **(6x2 = 12)**

a. How does a book connect the reader and writer?(A world without books)
b. Why should people be given more opportunity to read books? (A world without books)
c. How should we cross a road? (Unity, Faith and Discipline)
d. Why have traffic rules been designed? (Unity, Faith and Discipline)
e. Who was Joe? How did he treat Pip? (Great expectations)
f. What happened to the prisoner's wealth after his death? (Great expectations)

Q.2 **Answer all the questions from given stanza**. **(4x2 = 08)**

Once or twice though you should fail,
If you would at least prevail,
Try again.
If we strive , 'tis no disgrace
Though we did not win the race—
What should you do in that case?
Try Again.

**Questions**

a. What is the main message of the stanza?
b. According to the poem, how should one respond to failure?
c. What does the poet mean by "tis no disgrace" in the stanza?
d. How does the poet encourage perseverance despite losing a race?

### SECTION B (30 Marks)

Q.3 Write an application to principal of your school for emergency leave. **(10)**

Q.4 Write an essay on one of the following topics. **(10)**

a. "The importance of discipline in a student's life"
b. "The impact of social media on youth"

Q.5

a. Correct the following sentences. **(5)**
   (1) The teacher give us a homework yesterday.
   (2) The student was go to the library.
   (3) The book was wrote by a famous author.
   (4) The school start at 8 am.
   (5) The teacher ask us to solve the math problem.
b. Change the narration of the following sentences. **(5)**
   (1) "Don't drive so fast" warned the police officer.
   (2) My friends said, "we are going to beach tomorrow".
   (3) The librarian said, " You should return the books"
   (4) The coach said, "You will play a football match next week."
   (5) The language instructor asked if I could speak more slowly.

# MATHEMATICS PAPER (50 Marks)

**Note: All questions are compulsory. Write your answers as per the questions asked and allocated marks.**

## SHORT QUESTIONS (15 Marks)

Q.1 **Write down brief answers of following questions**: - **(3x5=15)**

a. Solve $\sqrt{3x+100}-x=4$

b. Derive Quadratic formula.

c. Find the mean proportional of $9p^6q^4 and\ r^8$

d. If $x-\frac{1}{x}=7$, then find the value of $x^3-\frac{1}{x^3}$

e. The expression $lx^3+mx^2-4$ leaves the remainder of $-3$ and $12$ when divided by $(x-1)$ and $(x+1)$ respectively. Calculate the value of $l$ and $m$.

## LONG QUESTIONS (35 Marks)

Q.2 The Marks of six students in Maths are as follows. Determine variance and standard deviation **(7)**

| Student | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Mark | 60 | 70 | 30 | 90 | 80 | 42 |

Q.3 If $\operatorname{cosec}\theta = 13/12$ and $\sec\theta > 0$, Find the remaining trigonometric functions. **(7)**

Q.4 State and prove APOLLONIUS Theorem **(7)**

Q.5 Calculate the length of chord which stands at a distance of $5\ cm$ from the center of acircle whose radius is $9\ cm$. **(7)**

Q.6 In a correspondence of two triangles, if three sides of one triangle are congruent to the corresponding three sides of the other, then the two triangles are congruent. **(7)**