REVIEW FOR ENTRANCE EXAM:

MATHEMATICS:

1. Simplifying Complex fractions:

\[
\frac{3}{4} \div \frac{9}{10} = \frac{3}{4} \times \frac{10}{9}
\]

\[
\frac{3}{5} \div \frac{1}{5} = \frac{3}{5} \times \frac{5}{1}
\]

2. Converting decimal into common fraction:

1. Convert 0.75 to a fraction = __________
2. Convert 2.35 to a fraction = __________

3. Finding percentages:

a. 50 is _____% of 100

b. Express 7/8 as percent ______

4. Extracting square root of numbers. Find the root of the following number:

\[\sqrt{120} = ______\]

ALGEBRA:

5. Solving Complex Equations:

\[\frac{3(x - 1)}{5} = 6\]

Word problems:

6. If 5 shirts and 3 ties cost $52 and each tie costs $4, what is the cost of a shirt?

7. In a school, 25% of the teachers teach basic math. If there are 50 basic math teachers, how many teachers are there in the school?

8. Find the cost per pound of a coffee mixture made from 14 lb of coffee that costs USD 20 per pound and 32 lb of coffee that costs USD 50 per pound.

9. A train and a car start at the same place. The train is going 40 miles per hour and a car is going in the opposite direction at 60 miles per hour. How long will it be until they are 100 miles apart?

10. An airplane flying a distance of 750 miles used 60 gallons of gasoline. How many gallons will it need to travel 2,500 miles?
GEOMETRY:

11. Finding the unknown angles in the figures below:

\[ \begin{align*}
\text{Left Triangle:} & \quad 92^\circ \quad \text{Left Angle} \quad 27^\circ \quad \text{Bottom Angle} \\
\text{Right Triangle:} & \quad \text{Right Angle} \quad y \quad \text{Top Angle} \quad 34^\circ
\end{align*} \]

\[ \begin{align*}
x & = \quad \_\_\_\_\_\_^\circ \\
y & = \quad \_\_\_\_\_\_^\circ
\end{align*} \]

12. Find the Area of a triangle with: Base = 4m, Height = 9m

13. What is the value of x in the figure below? (Formula: \( A^2 + B^2 = C^2 \))

\[ \begin{align*}
\text{Triangle:} & \quad 14 \quad \text{Side} \quad x \\
\text{Base:} & \quad 48 \\
x & = \quad \_\_\_\_\_\_ \text{cm}
\end{align*} \]

14. Find the area of the shaded region:

\[ \begin{align*}
\text{Rectangle:} & \quad 12 \text{ cm} \quad 8 \text{ cm} \quad 5 \text{ cm} \\
\text{Inside Rectangle:} & \quad 3 \text{ cm}
\end{align*} \]
15. Find the Circumference of circles:

The diameter of a circle is 4 centimeters. What is the circumference?
Formula: $C = \pi \cdot \bar{d}$

The radius of a circle is 4 inches. What is the circumference?
Formula: $C = 2 \cdot \bar{r}$

16. What is the measure of the radius of the circle that circumscribes a triangle whose sides measure 9, 40 and 41?

17. Define:
- supplementary angles
- complementary angles
- vertical angles
- acute angle
- right angle
- obtuse angle
- straight angle

18. Using this triangle find:

\[
\begin{array}{c}
\text{4.9} \\
\text{2.8} \\
\text{35°} \\
\text{4.0}
\end{array}
\]

- $\sin(35°) = \text{Opposite / Hypotenuse}$
- $\cos(35°) = \text{Adjacent / Hypotenuse}$
- $\tan(35°) = \text{Opposite / Adjacent}$
CHEMISTRY and PHYSICS

20. Pressure Conversion: Pressure = Force / Area
22. Describe Newton’s three laws of motion.
23. Change 25º Celsius to ___ Fahrenheit.
24. Change 90 ° Fahrenheit to ___ Celsius.
25. What is sound? How is it measured?
27. What is the Periodic Table of Elements?
ENGLISH - READING COMPREHENSION:

28. Read the text that follows. Write an essay in which you will explain your understanding and interpretation of what you read. Typically, an effective essay will contain a minimum of 300 words. Give importance to:

- Whether you include key points of the lecture
- Grammar
- Vocabulary and organization

A Brief History of Airplanes and Aviation Safety

The history of airplanes and helicopters in aviation is still a relatively short chapter. However, the amount of progress between the Wright brothers first flight and current aviation is nothing short of amazing.

The leap in aviation technology can be attributed to the advancement in computer technology and the demand for safer and more efficient airplane designs for war, business, and air travel.

No history of aviation is complete without mention of the Wright brothers. While there were numerous prior aircraft designs and flight attempts, the Wright brother’s airplane design would set the standard for the future. Their 12-second flight in 1903 was the first controlled, engine-powered flight with a heavier-than-air aircraft (as opposed to balloons and blimps). It's when the history of airplanes really began.

A New Era

World War One (1914-1918) ushered in a new era of flight.

Pilots began to need a system for communicating with their commanders and ground personnel, and the first communications equipment was invented - the radiotelephone.

The standard materials of wood and fabric were replaced by aluminum, which was lighter, stronger, and safer. As capturing new flight records and performing acrobatics became popular, biplanes were phased out for the development of monoplanes, which were sleeker and more maneuverable.

By the onset of World War Two (1939-1945) flight instruments had been invented, airplanes were equipped with radar, and the first jet engine was already in production.
Following the world wars, the age of jet airliners began, as airline companies like Pan Am and airplane manufacturers like Boeing combined to transport millions of passengers around the world. High cruising altitudes and transoceanic flights were the results of improved aerodynamics, aircraft metal types, and improvements to the engines.

Airplane design has remained relatively consistent since then, with the majority of major changes coming from new electronic systems and composite structures, in response to the increased need for efficiency in communications, navigation and aircraft operating costs.

**History of Airplane Design**

The single greatest step in the history of airplane design was the introduction of the turbine powered engine. These engines transformed the aviation world, by drastically increasing the speed, rate of climb, maneuverability, and distance traveled. All large transport aircraft are equipped with more than one engine, so if one engine fails there are back-up engines that will provide enough power for a safe landing.

Along with turbine powered engines came the need for cabin pressurization. A cabin pressurization system allows an airplane to safely ascend to a high altitude cruising level while maintaining a low altitude level inside the cabin for passenger comfort.

High altitude cruising is more efficient and keeps the airplane above most bad weather and turbulence, making the trip more comfortable for passengers and crew, as well as lessening the stress on the airplane.

Current changes in airplane design include the use of technologically advanced communications, radar, global positioning systems (GPS), and autopilot systems.

These help pilots navigate busy airways and fly safely around severe weather. The autopilot and various alert systems are not a replacement for hands-on flying, but aid the pilot by providing flight assistance as needed so other flight management tasks can be accomplished.

ENGLISH GRAMMAR:

29. Read and Correct the errors, if any, in the following paragraph:

Janet came home from a trip to Europe. She 1) placed the keys and her purse on a table. Suddenly, she 2) heard a noise coming from the kitchen. She thought it was the 3) neighbor radio. There was that strong sound, once again, but now it seemed louder. It was as if someone was 4) moving pots and pans. She 5) didn’t know what to do. The kitchen door slowly opened. “Tom!” she exclaimed. “What are you doing 6) here? she asked her brother. I came to visit and wanted to 7) give you a surprise. “Your 8) favorite’s brother is cooking your preferred meal”, Tom said. “You are my only brother”, Janet replied. They both laughed. “It is nice to see you again”, Janet said. They 9) hugged each other.

   1) A. placed   B. place   C. places
   2) A. herd     B. hear    C. heard
   3) A. neighbor B. neighbor’s C. neighbors
   4) A. puts     B. pots    C. potts
   5) A. don’t    B. didn’t  C. not
   6) A. here!”  B. here?   C. here?”
   7) A. give     B. given   C. gave
   8) A. favorites B. favorite’s C. favorite
   9) A. hugged   B. hugh    C. hugged

30. Word Knowledge:

1. We all encountered difficulties.
   A. recall   B. overcome   C. retreat   D. meet

2. Small most nearly means:
   A. sturdy    B. round     C. cheap     D. little

3. You must inform us.
   A. ask       B. turn      C. tell      D. ignore