

Sample Questions for IGP Admission Examinations ¹

¹Last updated: 2024-10-07

1 Sample Mathematics Questions

1. When $f(x) = \frac{x+1}{x}$, what is $f(f(x))$?

2. Find the maximum value of the function

$$f(x) = -3x^2 + 6x - 1.$$

3. Solve

$$\sin^2(x) + 2(\cos(x) - 1) = 0$$

for x , when $-\frac{\pi}{2} < x < \frac{\pi}{2}$.

2 Sample Physics Questions

1. Consider each of the following statements and determine whether it is True or False.
 - (a) Charge is a vector quantity.
 - (b) Conductor contains many bound electrons.
 - (c) Area under the curve in Figure 1 represents the displacement.

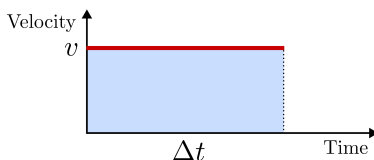


Figure 1: Velocity-time plot

2. Answer the following questions.
 - (a) What is the quantity of electric charge that passes through a wire carrying a steady current of 1 A over a period of 60 seconds?
 - (b) At atmospheric pressure and room temperature (300 K), a tuning fork oscillates at 300 Hz. Calculate the wavelength of the tone emitted.
3. Answer the following questions and explain your reasoning.
 - (a) A ball is thrown horizontally from a cliff top. Horizontal velocity is 10 m/s. Height of the cliff is 20 m. What is the range of the ball? Assume $g = 10 \text{ m/s}^2$.
 - (b) For the circuit shown in Figure 2, find the current in each resistor and the current drawn from the 40-V source.

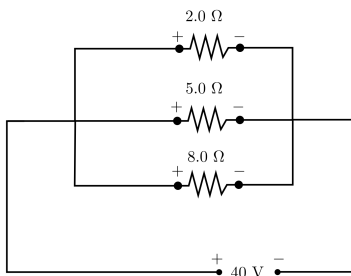


Figure 2: Circuit with three resistors

3 Sample Chemistry Questions

1. Assign oxidation states of each element in HNO_3 .
2. Calculate the empirical formula of a compound that contains 40% carbon, 6.7% hydrogen, and 53.3% oxygen by mass.
3. Determine the cell potential for the following galvanic cell at standard conditions, given the standard reduction potentials.



Standard reduction potentials:

