Ques 1. In the Meter bridge for measurement of resistance the known and the unknown resistances are changed the error removed is __?

Solu. In a meter bridge, the known resistance R_1 and the unknown resistance R_2 are adjusted until the null point is reached, where no current flows through the galvanometer. At this point, the ratio of the known resistance to the unknown resistance is equal to the ratio of the lengths of the bridge wire on either side of the jockey. So, if the known and unknown resistances are interchanged, the null point will still be reached when the ratio of the resistances equals the ratio of the lengths, and the error is removed.

Ques 2. The radio-isotope used for the treatment of thyroid disorders is____

Solu. The radioisotope commonly used for the treatment of thyroid disorders is iodine-131 (\(^{131}\)I). This radioactive isotope emits beta particles and gamma rays, which can selectively destroy thyroid tissue, making it effective in treating conditions such as hyperthyroidism and thyroid cancer.

Ques 3. Synonym of alembicated

Solu. A synonym for "alembicated" is "distilled." Both terms refer to a process of purification or refinement, often associated with distillation.

Ques 4. Which of the following is used in optical fibres?

Solu. The following options are commonly used in optical fibers: 1. **Glass**: Optical fibers are primarily made of glass, typically a type called silica glass (silicon dioxide). This glass is highly transparent to light, allowing for efficient transmission of optical signals. 2. **Plastic**: While less common than glass fibers, plastic optical fibers (POF) is also used in some applications. They are typically made of polymethylmethacrylate (PMMA) or other plastic materials. Plastic fibers are easier to work with and cheaper than glass fibers but have higher signal attenuation and lower data transmission rates. So, the correct answer would be either "Glass" or "Plastic", depending on the specific type of optical fiber being referred to.

Ques 5. Logic gates A and B were connected to OR gate which was connected to AND gate While C was connected directly to AND gate. Which one will give output 1?

Solu. To determine which combination of inputs (A, B, and C) will result in an output of 1 for the given setup, let's break it down: 1. Inputs A and B are connected to an OR gate. 2. The output of the OR gate is then connected to an AND gate along with input C. 3. Input C is connected directly to the AND gate. To achieve an output of 1 from the AND gate, both of its inputs must be 1. Thus, for the given setup:- If either A or B is 1 (or both), the OR gate output will be 1.- If C is 1, it will also contribute to the AND gate output being 1. So, to get an output of 1:- Either A or B (or both) must be 1.- Additionally, C must also be 1. Therefore, the combinations of inputs that will result in an output of 1 are when either A or B (or both) are 1, and C is also 1.

Ques 6. If the work function is 8eV, then what will be the threshold wavelength?

Solu. We can calculate the threshold wavelength (λ_0) for a metal with a work function of 8 eV using the following relationship: hc / λ_0 = W_0 where: ● his Planck's constant (approximately 6.63 x 10^-34 J·s) ● the speed of light (approximately 3 x 10^8 m/s) ● λ_0 is the threshold wavelength (in meters) ● W_0 is the work function (in electron volts, eV) Here's how to find the threshold wavelength: 1. Convert Work Function to Joules: First, convert the work function from electron volts (eV) to joules (J). We know 1 eV is equal to 1.602 x 10^-19 J. Therefore: W_0 (in J) = 8 eV * (1.602 x 10^-19 J/eV) = 1.282 x 10^-18 J 2. Solve for Threshold Wavelength: Now, plug the values for h, c, and the converted W_0 into the equation and solve for λ_0: λ_0 = hc / W_0 = (6.63 x 10^-34 J·s) * (3 x 10^8 m/s) / (1.282 x 10^-18 J) ≈ 1.55 x 10^-7 meters Therefore, the threshold wavelength for the metal with a work function of 8 eV is approximately 1.55 x 10^-7 meters, which falls within the ultraviolet (UV) region of the electromagnetic spectrum. Explanation: The threshold wavelength represents the minimum wavelength (or maximum energy) of light required to eject electrons from the metal surface. Light with wavelengths longer than the threshold wavelength (lower energy) won't have enough energy to overcome the work function and liberate electrons.

Ques 7. Name reactions- hell vol hard Zelensky, Wolff Kishner reduction

Solu. 1. Hell-Volhard-Zelinsky (HVZ): ● Puts a bromine atom next to the carbonyl group in carboxylic acids. ● Useful for making other functional groups. 2. Wolff-Kishner Reduction: ● Turns aldehydes and ketones into simpler alkanes by removing the carbonyl group. ● Good for reducing certain ketones.

Ques 8. Conversion of CHO to COOH in glucose by which reagent?

Solu. Glucose CHO to COOH: Needs an oxidizing agent. ● Strong oxidizers: Break down glucose completely (e.g., conc. nitric acid). ● Milder oxidizers: Convert just the aldehyde (CHO) to a carboxylic acid (COOH) at position 1 (e.g., bromine water, Fehling's solution).

Ques 9. Number of lone pairs on Xe in XeoF4?

Solu. The Xenon (Xe) atom in XeOF4 has 1 lone pair of electrons.

Ques 10. Rate of hydride extraction in methanol? Between Cl, F, Br, I

Solu. Iodide (I) is the fastest for hydride extraction in methanol due to its larger size and lower electronegativity.

Ques 11. Highest BP in phenol, aniline, benzyl alcohol, Benzylamine

Solu. Out of phenol, aniline, benzyl alcohol, and benzylamine, phenol will have the highest boiling point (BP). Here's why: ● Hydrogen bonding: Phenol has an OH group that can

participate in hydrogen bonding with other phenol molecules. This strong intermolecular force requires more energy to overcome during boiling, leading to a higher BP. ● Weaker attractions: Aniline (amine group-NH_2), benzyl alcohol (alcohol group-OH), and benzylamine (primary amine-NH_2) have weaker intermolecular forces (either dipole-dipole or hydrogen bonding) compared to the extensive hydrogen bonding network in phenol.

Ques 12. HVZ reaction.

Solu. The Hell-Volhard-Zelinsky (HVZ) reaction is used for the alpha bromination of carboxylic acids. It converts a carboxylic acid (RCOOH) to an alpha-bromo carboxylic acid (RCHBrCOOH).

Ques 13. Question related to maximizing the perimeter of the rectangle whose sides were parallel to the coordinate axis and was part of y2=x and y=4?

Solu. Plot y^2=x and y=4. Maximize the rectangle's vertical side (length) within boundaries. Length is greatest when the rectangle touches the parabola's peak (x=4, y=2). Horizontal side (width) is always 4 units (y=4 line). Perimeter = 2(length + width) = 2(2 + 4) = 12 units. Max perimeter = 12 units.

Ques 14. BUCKET : ACTVBDJLDFSU : BONUS :_____?

Solu. Following the logic of the analogy, the answer to the missing term is: ACMNMOTVRT. Here's the breakdown: ● Each letter in "BUCKET" is replaced by two letters, following a specific pattern. ○ B->AC ○ U->TV ○ C->BD ○ K->JL ○ E->DF ○ T->SU ● Applying the same pattern to "BONUS", we expect each letter to be replaced by two new letters. ○ BO->AC(similar to B) ○ NU->TV(similar to U) ○ S->BD(similar to C) Therefore, the missing term "?": ● Would start with "AC" based on the pattern for the first letter in "BONUS". ● Need to end with "RT" to complete the established pattern observed in the other words. Hence, the answer is ACMNMOTVRT.

Ques 15. Whose calendar is the same as the calendar of the year 2003?

Solu. The calendar of a year repeats itself every 28 years due to the way leap years are distributed. Therefore, any year that is 28 years more than 2003, or a multiple of 28 years after 2003, will have the same calendar. Here are some examples:
● 2003+28=2031
● 2003+(2 x28) = 2059
● 2003+(3 x28) = 2087
These years (and any other year that is a multiple of 28 years more than 2003) will share the same calendar layout as the year 2003.

Ques 16. How many leap years were in the 8th century?

Solu. Here's how to find the number of leap years in the 8th century: Method 1: Direct Calculation 1. Define the start and end years of the 8th century: ○ Start year = 701 (since the

8th century starts at year 800 and ends at year 799, we count inclusively) ○ Endyear = 800 2. Calculate the total number of years: ○ Total years = End year- Start year + 1 = 800- 701 + 1 = 100 years 3. Determine the number of leap years considering standard leap year frequency (every 4 years): ○ Inanormal 100-year period, there would be 25 leap years (every 4th year is a leap year, except for century years not divisible by 400). 4. However, the 8th century doesn't cover a full 100-year period. It only goes from year 701 to year 800. 5. Since 800 is a leap year (divisible by 4), we need to account for it. Therefore, there are 25 leap years (standard for a century) + 1 (year 800) in the 8th century. Total leap years in the 8th century = 26 Method 2: Using the divisibility rule (more efficient for large ranges) 1. This method considers the fact that a year is a leap year if it is divisible by 4 but not by 100, or if it is divisible by 400. 2. Iterate through each year in the 8th century (from 701 to 800) and check for divisibility by 4 and 100.3. In this case, manually checking 100 years is less efficient than the direct calculation method. You can use a more suitable approach for larger century ranges. Conclusion: The 8th century had 26 leap years.