

- 1 Compound A reacts with B to form red coloured product C. If the formation of this product is to be studied by colorimetry experiment which colour light has to be used.
 - a) Green
 - b) Blue
 - c) Yellow
 - d) Red
- 2 Specimen A studied by UV-Vis spectroscopy has absorbance of 0.038 at the wavelength of 651 nm. What is the transmittance percentage of this compound?
 - a) 93.6%
 - b) 92.6%
 - c) 91.6%
 - d) 90.6%
- 3 The stretching vibration of the functional group X-Y appear at 1750 cm^{-1} in IR spectroscopy. At what wavenumber the functional group with isotope of X having two atomic unit larger will appear
 - a) larger than the X-Y
 - b) lesser than the X-Y
 - c) No change
 - d) situation not possible at all
- 4 How many fundamental vibration modes the hypothetical molecule AX_3 will have
 - a) 9
 - b) 8
 - c) 7
 - d) 6
- 5 The IR spectrum will never have 100% transmittance due to
 - a) scattering of light by the sample
 - b) reflection of light by the cell
 - c) inaccurate cancellation of solvent absorbance
 - d) all the above
- 6 If the temperature is decreased, the population difference between ground and excited spin state
 - a) Increases
 - b) Decreases
 - c) No change
 - d) Initially increases and then decreases
7. Two nuclei having same spin quantum number will have
 - a) Same magnitude of spin angular momentum and magnetic moment
 - b) Different magnitude of spin angular momentum and magnetic moment
 - c) Will have same resonance frequency
 - d) Will have same population difference
- 8 The protons in t-butyl group in the $\text{CH}_3\text{COC}(\text{CH}_3)_3$ molecule will appear
 - a) Less field
 - b) Larger chemical shift
 - c) Less chemical shift
 - d) Less frequency
- 9 EPR spectrum an organic free radical recorded at $9.45 \times 10^9\text{ Hz}$ has three transitions at 3300, 3350 and 3400 G respectively, the g value of this radical is
 - a) 2.0155
 - b) 2.0255
 - c) 0.20155
 - d) 0.20255
- 10 Which of the following metal ions are EPR active: Ti^{3+} , Co^{2+} , Zn^{2+} , Mg^{2+}
 - a) All the above
 - b) Co^{2+} , Zn^{2+}
 - c) Ti^{3+} , Mg^{2+}
 - d) Ti^{3+} , Co^{2+}