Paper Code – 6015

M.Sc. Semester-III (New Course)

Chemistry

July-Septermber-2021

CHN-604(A) Organic Photochemistry

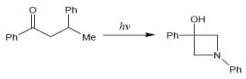
કુલ સમય :– : ૩૦ મીનીટ કુલ પ્રશ્નો : ૩૫ વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૧૮

નોંધ : વિદ્યાર્થીએ માત્ર ૧૮ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૧૮ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

1. HOMO for 1,3-Butadiene in ground state is…….
   A. Ψ1 B. Ψ2 C. Ψ3 D. Ψ4
2. Which of the following transition has highest energy
   A. $\sigma \rightarrow \sigma^*$ B. $\pi \rightarrow \sigma^*$ C. $\pi \rightarrow \pi^*$ D. $n \rightarrow \sigma^*$
3. Which of the following electromagnetic radiation has higher wavelength
   A. Gamma rays B. Ultraviolet C. Infrared D. Radio frequency
4. In Beer's-Lambert's law fraction of absorbed light denoted by
   A. I/I_0 B. I_0/I C. I_0 D. I
5. α-cleavage of carbonyl compound is also known as
   A. Norrish type – I B. Norrish type – II C. Oxy di - π methane D. None of these
6. Di- π methane type rearrangement generally carried out in……..solvent
   A. Polar B. Non polar C. Both A and B D. None
7. In 1,3,5 Hexatriene the number of nodes present in HOMO in its ground state
   A. One B. Two C. Three D. Four
8. In Diels-Alder reaction the number of π-electrons involved are
   A. 4 B. 6 C. 5 D. 2
9. Which transition is important to photochemical reaction of carbonyl group
   A. $n \rightarrow \pi^*$ B. $\sigma \rightarrow \sigma^*$ C. $n \rightarrow \sigma^*$ D. None
10. Norrish type –I reaction given by…….type ketones
    A. Saturated acyclic ketones B. Saturated cyclic ketones C. Both A and B D. None
11. In β- cleavage reaction intermediate is…….
    A. Carbocation B. Carbanion C. Bi radical D. All of above
12. β- cleavage reaction first step mechanism is
    A. C_α - C_β bond cleavage B. 1,2-Hydrogen shift C. Combination of Bi radical D. None
13. Photo rearrangement of β, γ- unsaturated ketones are
    A. Stereospecific B. Stereoselective C. Enantioselective D. Enantiospecific
14. Di- π methane rearrangement given by
    A. Cyclic dienes B. Acyclic dienes C. Both A and B D. None
15. Conjugated dienes gives total ……..type of photochemical reaction
    A. One B. Two C. Three D. Four
16. Barton reaction is given by
    A. Halide B. Nitrites C. Oxides D. None
17. In the following reaction in which reaction δ – hydrogen required
    A. Sommlet – Haushes rearrangement B. Di - π methane C. Barton reaction D. None
18. The quantum efficiency of a photochemical reaction is defined as _____
    A. ratio of molecules decomposed in a given time to the number of quanta absorbed in the same time
    B. number of molecules decomposed in a given time
    C. number or quanta absorbed percent time
    D. ratio of' molecules decomposed in a given time to the number of quanta emitted in the same time
19. Which of the following are the principle laws of photochemistry?
    A. Grothus-Draper and Stark-Einstein law B. Raoult's and Dalton's law
    C. Raoult's and Henry's law D. Lambert's and Beer's law
20. In photochemical reactions, absorption of _____ radiations takes place.
    A. ultraviolet and visible B. radio C. only visible D. visible and x-rays
21. Which of the following is an incorrect statement?
    A. Photochemical reactions are caused by absorption of ultraviolet only
    B. When a molecule or atom in the ground state (S0) absorbs light, one electron is excited to a higher orbital level
    C. It is possible for the excited state S1 to undergo spin inversion
    D. First step in photochemistry is excited state (photo excitation)
22. The quantum yield, φ, of a photochemical reaction is expressed as
    A. no. of molecules decomposed or formed no. of photons of radiation energy absorbed
    B. no. of molecules activated no. of photons of radiation energy absorbed
    C. no. of molecules of reactants no. of photons of radiation energy absorbed
    D. none of the above

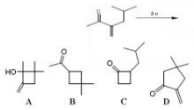
23. In photochemical reactions, the absorption of light takes place in
A. primary processes only B. secondary processes only
C. either primary or secondary process D. both primary and secondary processes

24 .The following photochemical transformation proceeds through



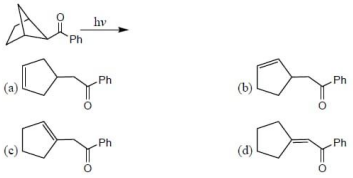
A. Norrish type I reaction B. Norrish type II reaction
C. Barton reaction D. Paterno - Buchi reaction

25. Amongst the following, the major products formed in the following photochemical reactions are



A. A and C B. B and C C. A and D D. A and B

26. The major product formed in the following photochemical reaction is

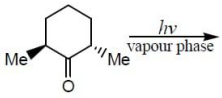


27. Thermolysis of allyl phenyl ether generates
A. o-allylphenol only B. o- and p-allylphenols C. o-, m- and p-allylphenols D. m-allylphenol only

28. The concerted photochemical reaction between two olefins leading to a cyclobutane ring is:
A. π2s + π 2a cycloaddition B. π 2s + π 2s cycloaddition
C. σ 2s + σ 2s cycloaddition D. π 2s +σ 2a cycloaddition

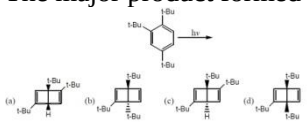
29. A photochemical reaction is _____ light.
A. Used to convert heat energy into B. Accompained with emission of C. Catalysed by D. Initiated by

30. The cyclic product(s) of the following photochemical reaction is(are)

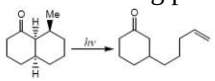


A. only*cis*-1, 2-dimethylcyclopentane B. only*trans*-1, 2-dimethylcyclopentane
C. a mixture of *cis*– and *trans*-1, 2-dimethylcyclopentanes D. only 2, 6-dimethylcyclohexanol

31. The major product formed in the following photochemical reaction is

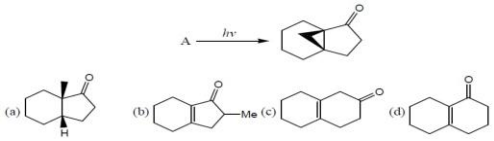


32. The following photochemical conversion proceeds through



A. Barton reaction B. Paterno-Buchi reaction
C. Norrish type I reaction D. Norrish type II reaction

33. Structure of the starting material A in the following photochemical Norrish reaction, is



34. Number of modes in LUMO of 1,3-butadiene in ground state
A. One B. Two C. Three D. Four

35. LUMO in 1,3,5-Hexatriene in ground state
A. Ψ1 B. Ψ2 C. Ψ3 D. Ψ4