

Institute for Integrated Programmes and Research in Basic Sciences (IIRBS)

Mahatma Gandhi University, Kottayam

CAT Entrance Examination

Syllabus is based on the plus-two level science topics with a weightage of marks as

Chemistry	- 25%
Physics	- 25%
Biology	- 15%
Mathematics	- 15%
General Knowledge (Computer science, Environmental science, current affairs etc)	- 20%

Model Questions (Representative)

- In a Schottky defect
 - an ion moves to interstitial position between the lattice points
 - electrons are trapped in a lattice site
 - some lattice sites are vacant
 - some extra cations are present in interstitial space
- Which law specifically governs the relative lowering of vapour pressures in solutions?
 - van't Hoff law
 - Boyle's law
 - Raoult's law
 - Amagat's law
- Which of the following is the correct Gibbs equation?
 - $\Delta G = \Delta H + T\Delta S$
 - $\Delta G = \Delta H - T\Delta S$
 - $\Delta G = \Delta H - 2T\Delta S$
 - $\Delta G = \Delta H - 3T\Delta S$
- The correct order of enthalpy of dissociation of halogens
 - $F_2 > Cl_2 > Br_2 > I_2$
 - $Cl_2 > Br_2 > F_2 > I_2$
 - $Cl_2 > F_2 > Br_2 > I_2$
 - $F_2 > Br_2 > Cl_2 > I_2$
- The source of nitrogen in Gabriel synthesis is
 - Sodium azide
 - sodium nitrite
 - potassium nitrate
 - potassium phthalimide
- What will be the order of the reaction if doubling the concentration of a reactant increases the rate by a factor of 4 and tripling the concentration of a reactant by a factor of 9?
 - First order
 - Zero order
 - Second order

- D. Third order
7. A body floats in water such that 0.3 of its volume is outside. The relative density of the body is
- A. 0.7
 - B. 0.3
 - C. 0.6
 - D. 3/7
8. For a simple pendulum the graph between L and T will be a
- A. Hyperbola
 - B. Curved one
 - C. Parabola
 - D. Straight line
9. The speed of sound will be greatest in
- A. Air
 - B. Vacuum
 - C. Water
 - D. Metal
 - E. 2341 V
10. If the horizontal components of earth's magnetic field at a place is 0.3×10^{-4} T. If the angle of dip is 60° , what is the total magnetic field of earth?
- A. 0.4×10^{-4} T
 - B. 0.34×10^{-4} T
 - C. 0.8×10^{-4} T
 - D. 0.6×10^{-4} T
11. A radioactive element has a half-life period of 1600 years. After 6400 years what amount will remain?
- A. 1/2
 - B. 1/16
 - C. 1/8
 - D. 1/4
12. Which of the following is a scalar quantity?
- A. Displacement
 - B. Velocity
 - C. Energy
 - D. Momentum
- A. 2Ω , 7Ω
13. If the centromere is situated in the middle of two equal arms of chromosomes, such chromosome is referred as –
- A. Acrocentric
 - B. metacentric
 - C. telocentric
 - D. sub metacentric
14. Which is the region of the stem where the leaves are born
- A. Internodes
 - B. Nodes
 - C. Petiole
 - D. Stalk
15. The effect of Anti Diuretic Hormone (ADH) on the kidney is to;
- A. Increase the excretion of water
 - B. Increase the excretion of Na^+
 - C. Increase the permeability of the distal nephron to water

- D. Decrease the glomerular filtration rate
16. Sugar found in DNA is
- A. Dextrose
 - B. Levulose
 - C. Glucose
 - D. Deoxyribose
17. If A is an orthogonal matrix, which of the following is true?
- A. $A=A^T$
 - B. $AA^T=I$
 - C. $A^T=I$
 - D. $AA^T A=I$
18. A cyclist pedals from his house to his college at a speed of 10Km/hr and back from the college to his house at 15Km/hr then find the average speed.
- A. 10
 - B. 12
 - C. 12.5
 - D. 14
19. If $\sin^{-1}(\sin x) = x$, then x is
- A. $\frac{\pi}{2}$
 - B. $\frac{\pi}{4}$
 - C. $\frac{\pi}{6}$
 - D. $\frac{\pi}{3}$
20. If $\sin^{-1}(\sin x) = x$, then x is equal to
- A. $\frac{\pi}{2}$
 - B. $\frac{\pi}{4}$
 - C. 0
 - D. 1
21. How many pins are in 8085 microprocessor?
- A. 64
 - B. 16
 - C. 40
 - D. 126
22. The first definition of Artificial Intelligence was established by
- A. John MacCarthy
 - B. Allie Miller
 - C. Bernard Marr
 - D. Alan Turing
23. World Water Day
- A. March 21
 - B. March 22
 - C. September 21
 - D. September 22
24. Allergy is caused by the production of..... in the body
- A. Hormones
 - B. Enzymes
 - C. Vitamins
 - D. Histamines

25. Nobel prize in literature in the year 2021 was won by
- A. David Julius
 - B. Abdulrazak Gurnah
 - C. Louise Glück
 - D. Benjamin List