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Sample Questions For Integrated Ph.D. Entrance Examination-2012

Note : Sample questions are provided to give a general idea of the style of the questions that appear in the entrance test. These questions do not reflect the difficulty level of questions in the entrance test.

PHYSICS

1. The infrared spectrum falls between:

(1) Radio waves and micro waves
(2) Micro waves and visible region
(3) Visible and ultraviolet regions
(4) Ultraviolet and x-rays

2. The colour of a star indicates its:

(1) Weight
(2) Size
(3) Distance
(4) Temperature

3. One star is going away from the Earth. Then the observer on the Earth will experience:

(1) Decrease in wave length
(2) Increase in wave length
(3) No change in wave length
(4) None of these

4. The terminal velocity of a spherical ball of radius r falling through a viscous liquid is proportional to:

(1) r
(2) r^2
(3) r^3
(4) 1/r

5. A 200 W lamp is connected to 100 volts supply. The number of electrons passing through the lamp in one minute is(charge of an electron =1.6 X 10^{-19}C):

(1) $1x10^{19}$
(2) $2x10^{15}$
(3) $7.5x10^{20}$
(4) $1x10^{12}$

CHEMISTRY

6. Which of the following type of metals are the most efficient catalysts?

(1) Alkali metal
(2) Alkaline Earth metal
(3) Transition metals
(4) Metals of p-block

7. The strongest bronsted base is:

(1) Clo_4^-
(2) Clo_3^-
(3) Clo^-
(4) Clo_2^-

8. Mohr's salt is prepared in warm distilled water by the reaction of $(NH_4)_2SO_4$ and:

(1) $FeSO_4$
(2) $Fe_2(SO_4)_3$
(3) $CaSO_4$
(4) $ZnSO_4$

9. Which among the following is correct order of reactivity with water according to electro chemical series:

(1) Cu>Zn>Mg>K
(2) K>Mg>Zn>Cu
(3) Mg>Zn>Cu>K
(4) K>Zn>Mg>Cu

10. The first order rate constant for the decompostion of N_2O_5 is $6.2 \times$ $^{-4}$ sec.$^{-1}$. The half life 10 period for the decomposition in seconds is:

(1) 1117.7 (2) 111.7
(3) 223.4 (4) 1609

BIOLOGY

11. Which is not a root:

(1) Potato (2) Carrot
(3) Sweet Potato (4) Raddish

12. Stilt roots are found in:

(1) Rice (2) Sugarcane
(3) Groundnut (4) Gram

13. RIBOSOMES are made up of:

(1) RNA and DNA (2) DNA and Protein
(3) RNA and Protein (4) DNA alone

14. Nitrogen is available for plants in the form of:

(1) Nitrogen gas (2) Nitrogen dioxide
(3) Nitrate (4) Nitric acid

15. Karyokinesis means division of:

(1) Cytoplasm into two (2) Nucleus into two
(3) Protoplasm into two (4) None of these

16. The greatest source of variations is brought about by:

(1) Mutation (2) Chromosomal aberrations
(3) Meiosis (4) Poly ploidy

17. Cell wall of bacteria is made up of:

(1) Cellulose (2) Pectin
(3) Peptidoglycon (4) Chitin

18. Which of the following is not found in Rhizopus:

(1) Sporangia (2) Rhizoids
(3) Columella (4) Setae

19. When a pollen tube enters embryo sac by piercing through integument, it is called:

(1) Mesogamy (2) Porogamy
(3) Chalazogamy (4) Pseudogamy

20. The process in which virus are involved in sexual reproduction of bacteria called:

(1) Transduction (2) Transcription
(3) Transformation (4) Translation

MATHEMATICS

21. Log tan 1^{O} + log tan 2^{O} + ... + log tan 89^{O} = ...:

(1) 1 (2) 0

(3) $\frac{\Pi}{4}$ (4) None of these

22. If xy+yz+zx=1 then $\sum \frac{xy}{1-xy}$ = ...:

(1) $\frac{1}{xyz}$ (2) $\frac{4}{xyz}$

(3) xyz (4) None of these

23. The maximum value of $\sin^2\theta + \cos^4\theta$ is:

(1) 0 (2) 1

(3) $\frac{3}{4}$ (4) $\frac{\pi}{2}$

24. In a triangle ABC, the angle A is greater than angle B. If the values of the angles satisfy the equation 3 sin x – 4 $\sin^3$x–K=0, 0 <K<1 then the measure of angle C is:

(1) $\frac{\pi}{2}$ (2) $\frac{\pi}{3}$

(3) $\frac{2\pi}{3}$ (4) $\frac{5\pi}{6}$