APTITUDE TEST FOR PLUS ONE ADMISSION (MODEL QUESTIONS)

SCIENCE STREAM

PHYSICS

1. A small object is placed 10cm infront of a plane mirror. If you stand behind the object, 30cm from the mirror and look at its image, for what distance must you focus your eyes?
   A. 20cm
   B. 60cm
   C. 80cm
   D. 40cm
   E. 30cm

2. The engine of a car produces an acceleration of 6 ms^{-2} in the car. If this car pulls another car of the same mass, then the acceleration would be
   A. 6 ms^{-2}
   B. 12 ms^{-2}
   C. 3 ms^{-2}
   D. 1.5 ms^{-2}
   E. 4.5 ms^{-2}

3. Two balls of different masses m_a and m_b are dropped from two different heights **a** and **b**. The ratio of time taken by the two balls to drop through these distances is
   A. a:b
   B. b:a
   C. $\sqrt{a} : \sqrt{b}$
   D. a^2:b^2
   E. a : b/2

4. A body of mass 1kg is attracted by the earth with a force which is equal to
   A. 9.8 N
   B. 6.67×10^{11} N
   C. 1N
   D. 4.9 N
   E. 9.8 m

5. Electro magnetic waves are
   A. mechanical waves
   B. longitudinal waves
   C. latitudinal waves
   D. reversed waves
   E. transverse waves

6. The density of ice is 0.9 g/cc and that of sea water is 1.1 g/cc. An ice berg of volume V is floating in sea water. The fraction of ice above water level is
   A. 1/11
   B. 2/11
   C. 3/11
   D. 4/11
   E. 5/11

7. The number of images of an object held between two parallel plane mirrors is
   A. infinity
   B. 1
   C. 3
   D. 0
   E. 4

8. If the velocity of light in a medium is $\frac{2}{3}$ times of the velocity of light in vacuum, then the refractive index of that medium is.
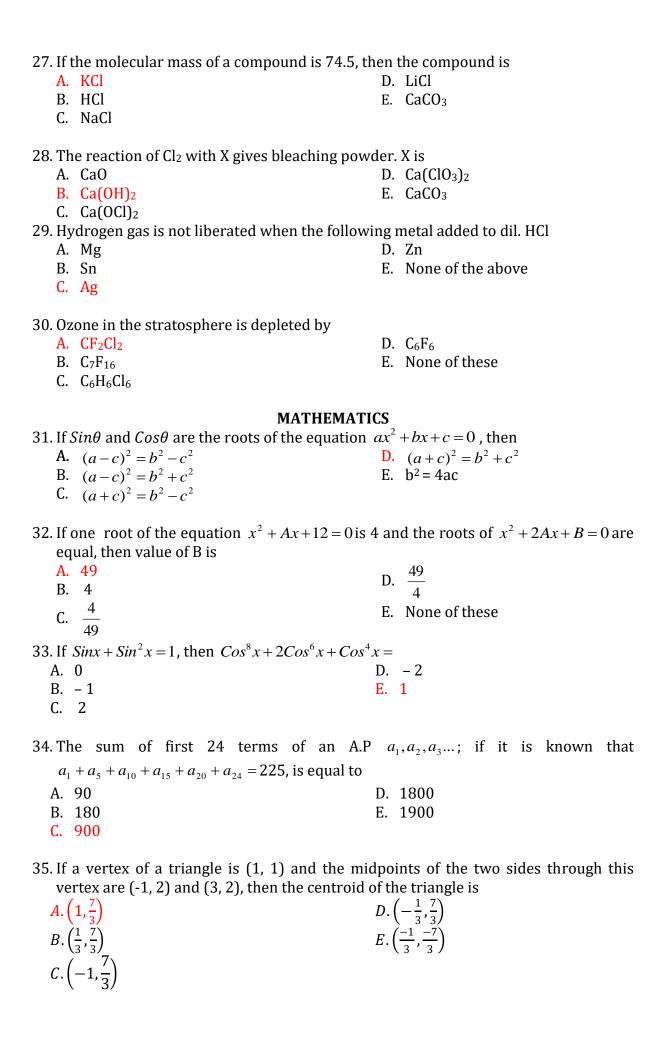   A. 3/2c
   B. 2c/3
   C. 2/3
   D. 1.5
   E. 1.33

9. The magnetic field inside the solenoid is
   A) Non uniform
   B) same at all points
   C) Variable
   D) Zero
   E) Perpendicular to each other

10. A bullet of mass 100g moving with 20m/s strikes a wooden plank and penetrates up to 20cm. Calculate the resistance offered by the wooden plank.
    A. 200N
    B. 500N
    C. 300N
    D. 150 N
    E. 100N

11. Due to the increase of pressure, the boiling point of water
    A. decreases
    B. increases
    C. remains the same
    D. none of these
    E. depends on the material of the container

12. The lengths of three copper wires are in the ratio 5:3:1 and their masses are in the ratio 1:3:5. Their resistances are in the ratio:
    A. 1:3:5
    B. 5:3:1
    C. 1:15:125
    D. 125:15:1
    E. 1:9:5

13. While launching a rocket of mass 2×10^4 kg, a force of 5×10^5N is applied for 20seconds. Calculate the velocity attained by the rocket at the end of 20seconds.
    A. 500m/s
    B. 450m/s
    C. 300m/s
    D. 350m/s
    E. 550 m/s

14. When a ray of light enters a glass slab from air
    A. It's wavelength decreases
    B. It's wavelength increases
    C. It's frequency increases
    D. Neither its wavelength nor its frequency changes
    E. It gets diffracted.

15. Three copper wires have lengths and cross-sectional areas as (l, A), ($2l$, A/2) and (l/2, 2A). Resistance is minimum in
    A. wire of cross-sectional area A/2
    B. wire of cross-sectional area A
    C. wire of cross-sectional area 2A
    D. same in all three cases.
    E. Cannot determine

CHEMISTRY

16. Sodium carbonate is a basic salt because it is a salt of
    A. Strong acid and strong base
    B. Weak acid and weak base
    C. Strong acid and weak base
    D. Weak acid and strong base
    E. None of these

17. Which of the following remains unchanged on descending a group in the periodic table
    A. Valence electrons
    B. Atomic size
    C. Density
    D. Electronegativity
    E. None of these

18. The percentage of hydrogen in water is
    A. 8.88
    B. 11.12
    C. 20.60
    D. 80
    E. 70.4

19. Kalium is the Latin name of
    A. Potassium
    B. Krypton
    C. Calcium
    D. Phosphorous
    E. Silver

20. An atom is 15 times heavier than $\frac{1}{12}^{th}$ of the mass of carbon atom (C – 12 isotope).
    The mass in a.m.u is ………………
    A. 1.25
    B. 15
    C. 14
    D. 12
    E. 7.5

21. The atomic number of an element is 11 and its mass number is 23. The correct order representing the number of electrons, protons and neutrons respectively in this atom is
    A. 11, 11, 12
    B. 11, 12, 11
    C. 12, 11, 11
    D. 23, 11, 23
    E. 11, 12, 13

22. Choose the correct Balanced equation of the reaction $Al_4C_3 + H_2O \rightarrow Al(OH)_3 + CH_4$
    A. $Al_4C_3 + 12H_2O \rightarrow 4Al(OH)_3 + 3CH_4$
    B. $2Al_4C_3 + 6H_2O \rightarrow 2Al(OH)_3 + CH_4$
    C. $3Al_4C_3 + 12H_2O \rightarrow 3Al_4(OH)_3 + 3CH_4$
    D. $Al_4C_3 + 2H_2O \rightarrow Al(OH)_3 + CH_4$
    E. None of these

23. Acid used in the manufacturing of fertilizers and explosives is
    A. HNO_3
    B. H_2SO_4
    C. H_3PO_4
    D. HCl
    E. HNO_2

24. When acid react with metal carbonates products are
    A. Salt
    B. Water
    C. CO_2
    D. CO_2 and Water
    E. Salt, CO_2 and Water

25. Periodic number of $_{13}Al^{27}$ is
    A. 1
    B. 2
    C. 4
    D. 3
    E. 5

26. Which of the following statement is not true about true solution
    A. It can pass through filter paper
    B. It is homogeneous in nature
    C. At constant temperature particles of solute settle down
    D. From a true solution the solute can be easily reversed by evaporation or crystallization
    E. None of the above

27. If the molecular mass of a compound is 74.5, then the compound is
   A. KCl
   B. HCl
   C. NaCl
   D. LiCl
   E. $CaCO_3$

28. The reaction of Cl_2 with X gives bleaching powder. X is
   A. CaO
   B. $Ca(OH)_2$
   C. $Ca(OCl)_2$
   D. $Ca(ClO_3)_2$
   E. $CaCO_3$

29. Hydrogen gas is not liberated when the following metal added to dil. HCl
   A. Mg
   B. Sn
   C. Ag
   D. Zn
   E. None of the above

30. Ozone in the stratosphere is depleted by
   A. CF_2Cl_2
   B. C_7F_{16}
   C. $C_6H_6Cl_6$
   D. C_6F_6
   E. None of these

MATHEMATICS

31. If $Sin\theta$ and $Cos\theta$ are the roots of the equation $ax^2 + bx + c = 0$, then
   A. $(a-c)^2 = b^2 - c^2$
   B. $(a-c)^2 = b^2 + c^2$
   C. $(a+c)^2 = b^2 - c^2$
   D. $(a+c)^2 = b^2 + c^2$
   E. $b^2 = 4ac$

32. If one root of the equation $x^2 + Ax + 12 = 0$ is 4 and the roots of $x^2 + 2Ax + B = 0$ are equal, then value of B is
   A. 49
   B. 4
   C. $\dfrac{4}{49}$
   D. $\dfrac{49}{4}$
   E. None of these

33. If $Sinx + Sin^2 x = 1$, then $Cos^8 x + 2Cos^6 x + Cos^4 x =$
   A. 0
   B. – 1
   C. 2
   D. – 2
   E. 1

34. The sum of first 24 terms of an A.P $a_1, a_2, a_3...$; if it is known that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$, is equal to
   A. 90
   B. 180
   C. 900
   D. 1800
   E. 1900

35. If a vertex of a triangle is (1, 1) and the midpoints of the two sides through this vertex are (-1, 2) and (3, 2), then the centroid of the triangle is
   A. $\left(1, \dfrac{7}{3}\right)$
   B. $\left(\dfrac{1}{3}, \dfrac{7}{3}\right)$
   C. $\left(-1, \dfrac{7}{3}\right)$
   D. $\left(-\dfrac{1}{3}, \dfrac{7}{3}\right)$
   E. $\left(\dfrac{-1}{3}, \dfrac{-7}{3}\right)$

36. The number of points on X axis which are at a distance c units (c < 3) from (2,3) is
    A. 1
    B. 2
    C. 0
    D. 3
    E. 4

37. If the mean of numbers 27 + x, 31 + x, 89 + x, 107 + x, 156 + x is 82, then the mean of
    130 + x, 126 + x, 68 + x, 50 + x, 1 + x is
    A. 75
    B. 157
    C. 82
    D. 80
    E. None of these

38. In a single throw of a pair of dice, the probability of getting the sum a perfect square
    is
    A. $\frac{1}{18}$
    B. $\frac{7}{36}$
    C. $\frac{1}{6}$
    D. $\frac{2}{9}$
    E. $\frac{7}{9}$

39. A sphere of radius 6 cm is dropped into a cylindrical vessel partly filled with water.
    The radius of the vessel is 8 cm. If the sphere is submerged completely, then the
    surface of the water rises by
    A. 4.5 cm
    B. 3 cm
    C. 4 cm
    D. 2 cm
    E. 5 cm

40. In two concentric circles with centre O, the radius of the outer circle is 25 cm. Chord
    AB of the outer circle is tangent to the inner circle, at D. If AB=48 cm, then the radius
    of the inner circle is
    A. 7 cm
    B. 12 cm
    C. 24 cm
    D. 15 cm
    E. 18 cm

41. The values of α and β for which the pair of linear equations 2x+3y=7,
    2αx+(α+ β)y=28 has infinite number of solution is
    A. α=4 & β=8
    B. α=5 & β=−2
    C. α= -4 & β=8
    D. α=4 & β=−8
    E. α=-5 & β=−2

42. If the three sides of a triangle are a, $\sqrt{3}a$ and $\sqrt{2}a$ then the measure of the angle
    opposite to the longest side is
    A. 45°
    B. 30°
    C. 60°
    D. 90°
    E. 75°

43. If the median of the data 6, 7, x -2, x, 17,20 written in ascending order is 16.Then x is
    A. 15
    B. 16
    C. 17
    D. 18
    E. 14

44. A pole of 6m high casts a shadow $2\sqrt{3}$ m long on the ground, then the Sun's elevation is
   A. 60°
   B. 45°
   C. 30°
   D. 90°
   E. 15°

45. A solid sphere of radius r is melted and cast into shape of a solid cone of height r, then radius of the base of the cone is
   A. 5r
   B. 3r
   C. r
   D. 4r
   E. 2r

BIOLOGY

46. The reason for diffusion inefficiency in multicellular organisms is:
   A. cell diffusion is a complex process.
   B. big size and complex body designs.
   C. cell diffusion requires lot of time.
   D. cell diffusion is rather a simple process to be carried out in multicellular organisms.
   E. None of these

47. A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains:
   A. complex proteins
   B. simple proteins
   C. fats
   D. starch
   E. All of the above

48. Sensory nerve of a reflex arc carries information from the receptor cells to the :
   A. spinal cord
   B. brain
   C. muscles of the effector organ
   D. bones of the receptor organ
   E. None of these

49. Electrical impulse travels in a neuron from:
   A. Dendrite → axon → axonal end → cell body
   B. Cell body → dendrite → axon → axonal end
   C. Dendrite → cell body → axon → axonal end
   D. Axonal end → axon → cell body → dendrite
   E. Dendrite → Cell body → Dendrite → Axonal end

50. Select the mismatched pair
   A. Adrenaline: Pituitary gland
   B. Testosterone: Testes
   C. Estrogen : Ovary
   D. Thyroxin: Thyroid gland
   E. Estrogen: Thyroxin

51. In plants the role of cytokinin is:
   A. Promote cell division.
   B. Wilting of leaves.
   C. Promote the opening of stomatal pore.
   D. Help in the growth of stem.
   E. None of the above

52. What is the cause behind the fast-spreading of bread mould on bread slices?
   (i) Numerous pores present in the air
   (ii) Due to the presence of thread-like hyphae
   (iii) Traces of moisture and essential nutrients
   (iv) Formation of round shaped sporangia
   A. (i) and (iii)
   B. (ii) and (iv)
   C. (i) and (ii)
   D. (iii) and (iv)
   E. (ii) and (iii)

53. The number of chromosomes in parents and off springs of a particular species remains constant due to:
    A. Doubling of chromosomes after zygote formation.
    B. Halving of chromosomes during gamete formation.
    C. Doubling of chromosomes after gamete formation.
    D. Halving of chromosomes after gamete formation.
    E. None of these

54. The alternative form of gene is called:
    A. dominant character
    B. recessive character
    C. alternative genes
    D. allele.
    E. None of these

55. A recessive homozygotes is crossed with a heterozygote of the same gene. What will be the phenotype of the F1 generation?
    A. All dominant
    B. 75% dominant, 25% recessive
    C. 50% dominant, 50% recessive
    D. 25% dominant, 50% heterozygous, 25% recessive
    E. 30% dominant, 10% recessive

56. A pea plant is represented by Rr. This represents the:
    A. Genetic composition of an individual
    B. Characteristics which are visible in an organism.
    C. Alternate form of genes
    D. Number of chromosomes
    E. None of these

57. Mendel proposed that every character is controlled by-
    A. one factor
    B. two factors
    C. one chromosome
    D. two chromosomes
    E. None of these

58. What happens to the earth's temperature due to the greenhouse effect?
    A. Increases
    B. Decreases
    C. Remains the same
    D. Increase and decrease
    E. All of the above

59. Why is it difficult to degrade non-biodegradable wastes?
    A. Because non-biodegradable wastes cannot be recycled.
    B. Because microorganisms cannot decompose it.
    C. They can be made into organic wastes.
    D. Because they get accumulated.
    E. All of the above

60. Which of the following is not due to man's activities?
    A. Volcanic eruption
    B. Global warming
    C. Thinning of the ozone layer
    D. Pollution of the environment
    E. None of these