INDIAN ASSOCIATION OF PHYSICS TEACHERS

NATIONAL STANDARD EXAMINATION IN JUNIOR SCIENCE 2016 -17

Date of Examination: 20TH November, 2016

Time: 1000 to 1200 Hrs

Q. Paper Code: JS530

Write the question paper code mentioned above on YOUR answer sheet (in the space provided), otherwise your answer sheet will NOT be assessed. Note that the same Q. P. Code appears on each page of the question paper.

Instructions to Candidates –

1. Use of mobile phones, smartphones, ipads during examination is **STRICTLY PROHIBITED**.
2. In addition to this question paper, you are given answer sheet along with Candidate's copy.
3. On the answer sheet, make all the entries carefully in the space provided **ONLY** in **BLOCK CAPITALS** as well as by properly darkening the appropriate bubbles.
   Incomplete/ incorrect/carelessly filled information may disqualify your candidature.
4. On the answer sheet, use only **BLUE or BLACK BALL POINT PEN** for making entries and filling the bubbles.
5. The email ID and date of birth entered in the answer sheet will be your login credentials for accessing performance report. Please take care while entering.
6. Question paper has 80 multiple choice questions. Each question has four alternatives, out of which **only one** is correct. Choose the correct alternative and fill the appropriate bubble, as shown.

7. A correct answer carries 3 marks whereas 1 mark will be deducted for each wrong answer.
8. Any rough work should be done only in the space provided.
9. Use of **non-programmable** calculator is allowed.
10. No candidate should leave the examination hall before the completion of the examination.
11. After submitting your answer paper, take away the Candidate's copy for your reference.

Please DO NOT make any mark other than filling the appropriate bubbles properly in the space provided on the answer sheet.

Answer sheets are evaluated using machine, hence CHANGE OF ENTRY IS NOT ALLOWED.

Scratching or overwriting may result in a wrong score.

DO NOT WRITE ON THE BACK SIDE OF THE ANSWER SHEET.

Instructions to Candidates (continued) –

Read the following instructions after submitting the answer sheet.

12. **Comments regarding this question paper, if any, may be sent by email only to iapt.nse@gmail.com till 29th November, 2016.**
13. **The answers/solutions to this question paper will be available on our website – www.iapt.org.in by 2nd December, 2016.**
14. **CERTIFICATES and AWARDS –**
    Following certificates are awarded by the IAPT to students successful in NSEs

    (i)Certificates to "Centre Top 10%" students

    (ii)Merit Certificates to "Statewise Top 1%" students

    (iii)Merit Certificates and a book prize to "National Top 1%" students

15. Result sheets can be downloaded from our website in the month of February. The "Centre Top 10%" certificates will be dispatched to the Prof-in-charge of the centre by February, 2017.
16. List of students (with centre number and roll number only) having score above MAS will be displayed on our website (**www.iapt.org.in**) by **22nd December, 2016.** See the **Eligibility Clause** in the Student's brochure on our website.
17. Students eligible for the INO Examination on the basis of selection criteria mentioned in Student's brochure will be informed accordingly.

Indian Association of Physics Teachers

NATIONAL STANDARD EXAMINATION IN JUNIOR SCIENCE 2016-2017

Total time: 120 minutes   Marks: 240

Only one out of four options is correct

1) Two bodies A and B are charged with equal magnitude of charge but A with positive charge and B with negative. If M_A and M_B are masses before charging and $M_A^/$ and $M_B^/$ are the masses after charging, then (m_0 is some constant mass)

   a) $M_A^/ = M_A + m_0$ and $M_B^/ = M_B - m_0$ 　　　b) $M_A^/ = M_A - m_0$ and $M_B^/ = M_B + m_0$

   c) $M_A^/ = M_B^/$ 　　　　　　　　　　　　　　　　d) $M_A^/ = M_A - \frac{m_0}{2}$ and $M_B^/ = M_B + m_0$

2) The number of natural numbers $n \leq 30$ for which $\sqrt{n + \sqrt{n + \sqrt{n + \cdots}}}$ is a natural number is

   a) 30 　　　　　b) Zero 　　　　　c) 6 　　　　　d) 5

3) Elements **A**, **B** and **C** have atomic numbers **X**, **X+1** and **X+2**, respectively. '**C**' is an alkali metal. '**A**' reacts with another element '**Y**' to form the compound '**AY**'. '**A**' and '**Y**' belong to the same group. '**AY**' possesses an

   a) ionic bond 　　　b) covalent bond 　　　c) metallic bonding 　　　d) coordinate bond

4) Air has three major components: nitrogen, oxygen, and argon. Given that one mole of air at sea level is made up of 78% nitrogen, 21% oxygen, and 1% argon, by volume. What is the density of air? Assume that gases behave in an ideal manner. (Atomic mass of argon is 40 amu)

   a) 14.62 g/L
   b) 1.3 g/L
   c) 29 g/L
   d) 0.65 g/L

5) A conductor of length L has a varying cross section with area 2A at P and A at Q as shown in the adjacent figure. If it´ carries a steady current I, then

   a) Net charge per unit volume near *P* is more than net charge per unit volume near *Q*.
   b) Net charge per unit volume near *Q* is less than net charge per unit volume.
   c) Current per unit area near *P* is more than current per unit area near *Q*.
   d) Current per unit area near *P* is less than current per unit area near *Q*.
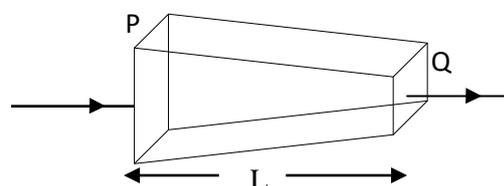
6) The number of natural numbers $n \leq 30$ for which $\sqrt{n + \sqrt{n + \sqrt{n + \cdots}}}$ is a prime number is

    a) Three   b) Zero   c) Nine   d) Two

7) Rhodoferax fermentans is a species of photosynthetic bacteria. From your knowledge about bacteria in general, identify the components that CANNOT be present in this organism.

    a) Chloroplasts
    b) ATP
    c) Ribosomes
    d) Cell wall

8) If atmospheric humidity decreases, transpiration rate

    a) Decreases because the concentration gradient between the mesophyll and the atmosphere decreases.
    b) Stays the same because active transport does not depend on humidity
    c) increases because of the higher concentration gradient between the air spaces of the mesophyll and the atmosphere
    d) Decreases because the concentration of water vapour decreases

9) Vessels A and B are made of conducting material. Both contain water. Vessel A floats in B. Vessel B is now heated at a uniform rate, then

    a) Water in A boils first.
    b) Water in A boils some time after water in B starts boiling.
    c) Water in both A and B start boiling simultaneously.
    d) Water in A does not boil.

10) The number of squares formed by 5 vertical and 4 horizontal lines (all are equispaced) is

    a) 60   b) 20   c) 40   d) 46

11) If 0.50 mole of a monovalent metal (M^{+1}) halide is mixed with 0.2 mole of a divalent metal (L^{+2}) phosphate, the maximum number of moles of M_3PO_4 that can be formed is

    a) 0.25   b) 0.30   c) 0.16   d) 0.20

12) Every major city in India has a pollution control board to monitor air and water pollution. The following data is from three different localities in Bangalore city from the year 2015.

Locality	Annual average of SO_2 in the air (volume/volume)
P	16.3 mL/m^3
Y	16.3 ppb (m^3/m^3)
Z	16.3 ppm (m^3/m^3)

ppb stands for parts per billion and ppm stands for parts per million. These are different units to express

concentration. They are very similar to percentage (which is actually parts per hundred).

Based on the above data, which place will you choose to live in?

a) All localities are equally polluted, so I have no preference.
b) P is the more polluted than Y and Z, hence I will live in either Y or Z.
c) Locality Y is least polluted, hence I will live in Y.
d) Z and Y are more polluted than P, hence I will live in P.

13) A body thrown vertically up reaches a maximum height and returns back. Its acceleration is

a) Downward during both ascent and descent.
b) Downward at all positions except at the highest point, where it is zero.
c) Upward during both ascent and descent.
d) Downward during ascent and upward during descent.

14) The number of integers a, b, c for which $a^2 + b^2 - 8c = 3$ is

a) 2   b) Infinite   c) 0   d) 4

15) Which of the following is NOT produced by the endoplasmic reticulum?

a) Lipids
b) Proteins
c) Monosaccharides
d) Hormones

16) Vaccines prevent infections by pathogens by:

a) Presenting the body's immune system with antigens in a controlled manner, so that it is prepared to counter the pathogen producing it when it attempts to infect the body
b) Affecting the reproductive cycle of the invading pathogen
c) Binding to antigens on the surface of the pathogen and inactivating it
d) Affecting the metabolic pathways of the pathogen

17) Velocity of a particle moving along a straight line varies with time as shown in the adjacent figure. Net forces acting on the particle are $F_1, F_2, F_3, F_4,$ and F_5 in the intervals OA, AB, BC, CD and DE respectively. Indentify the correct statement

a) F_1 increases with time.
b) F_5 is initially positive and then becomes negative
c) F_1 and F_2 are in opposite directions
d) F_3 is negative.
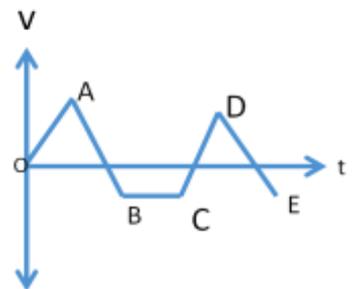
18) If set X consists of three elements then the number of elements in the power set of power set of X is

a) 3^3 b) 2^3 c) 3^8 d) 2^8

19) The heat of neutralisation of CH_3COOH, HCOOH, HCN and H_2S are -55.2, -56.07, -2.8 and -3.34 kJ per equivalent respectively. The increasing order of strength of these acids is.

   a) HCOOH $<$ CH_3COOH $<$ H_2S $<$ HCN

   b) H_2S $<$ HCN $<$ HCOOH $<$ CH_3COOH

   c) HCN $<$ H_2S $<$ CH_3COOH $<$ HCOOH

   d) CH_3COOH $<$ HCOOH $<$ HCN $<$ H_2S

20) To prevent the formation of oxides, peroxides, and superoxides, alkali metals are sometimes stored in an unreactive atmosphere. Which of the following gases should not be used for lithium:

   a) Ne
   b) Ar
   c) N_2
   d) Kr

21) A wooden block (W) is suspended by using a cord from a heavy steel ball (B). The entire system is dropped from a height. Neglecting air resistance, the tension in the cord is

   a) Zero

   b) The differences in the masses of B and W

   c) The differences in the weights of B and W

   d) The weight of B

22) In a n −sided regular polygon, the radius of the circum-circle is equal in length to the shortest diagonal. The number of values of $n < 60$ for which this can happen is

   a) 0   b) 1   c) 10   d) 2

23) Which of the following does NOT contain living cells?

   a) Bone tissue
   b) Xylem sieve tubes
   c) Phloem
   d) Epidermis

24) If DNA was made of 6 nucleotides instead of 4, what are the total number of triplet codons possible?

   a) 24
   b) 18
   c) 64
   d) 216

25) A circus performer of weight W is standing on a wire as shown in the adjacent figure. The tension in the wire is

a) Approximately $\frac{W}{4}$

b) Approximately $\frac{W}{2}$

c) Much more than $\frac{W}{2}$

d) Much less than $\frac{W}{2}$

26) Number of integers n such that the number $1 + n$ is a divisor of the number $1 + n^2$ is

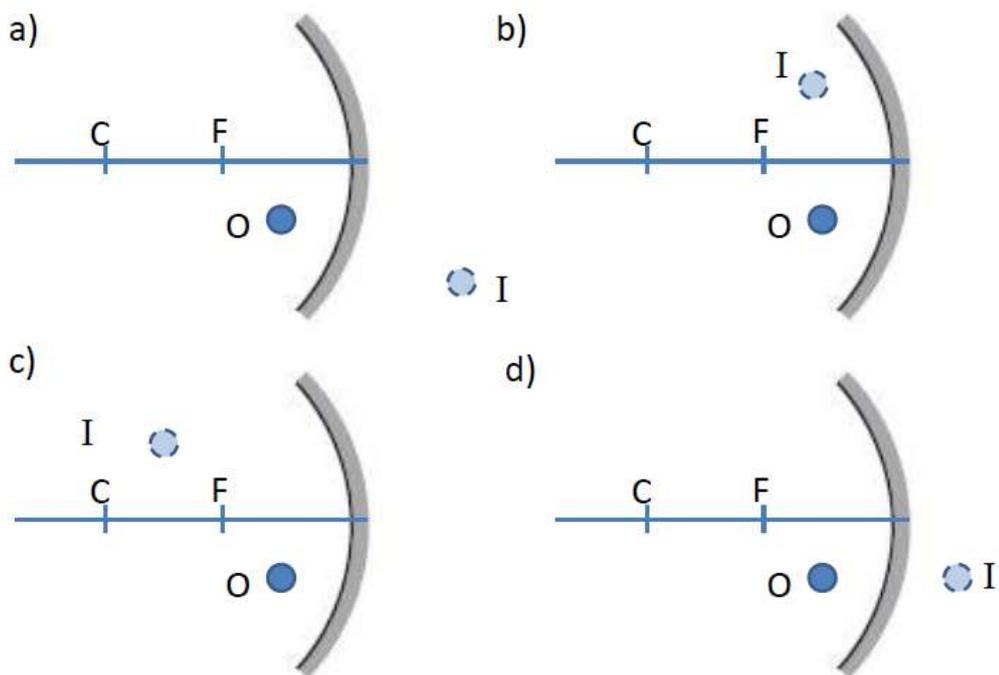   a) 0   b) 1   c) 4   d) 2

27) When 1 gram of a mixture of aluminium and zinc was treated with HCl, a gas was liberated. At the end of the reaction, the volume of the liberated gas was found to be 524 cm³, under STP conditions. The individual weights of aluminium and zinc in the mixture, respectively, are:

    a) 0.2g and 0.8g   b) 0.8g and 0.2g   c) 0.5g and 0.5g   d) 0.322g and 0.678g

28) Choose that element which is most different from the other three:

a) Carbon

b) Nitrogen

c) Silicon

d) Phosphorous

29) In the following diagrams O is point object and I is its image formed by a concave mirror. Indentify the diagram in which position of image I is nearly correct.

30) If for $x, y > 0$ we have $\frac{1}{x} + \frac{1}{y} = 2$ then the minimum value of xy is

   a) 2   b) 1   c) 4   d) $\sqrt{2}$

31) Which of these is a mollusc?

    a) Lobster
    b) Scorpion
    c) Crab
    d) Octopus

32) What is the mechanism used by the kidneys to remove waste products from the body?

    a) Nephrons convert nitrogenous waste to uric acid and pass it out as urine
    b) Nephrons actively transport uric acid and other nitrogenous waste Â into the proximal and distal convoluted tubules, from where it is collected to form urine.
    c) The blood is filtered to retain cells and large plasma proteins within the blood. The remaining filtrate passes through the proximal and distal convoluted tubules, where needed substances are reabsorbed.by active transport
    d) Nephrons filter out the nitrogenous waste which is passed through the proximal and distal convoluted tubules and collected by the collecting duct as urine.

33) Following diagram shows refraction of parallel beam of light through a spherical surface. Indentify the correct ray diagram

a)

b)

c)

d)
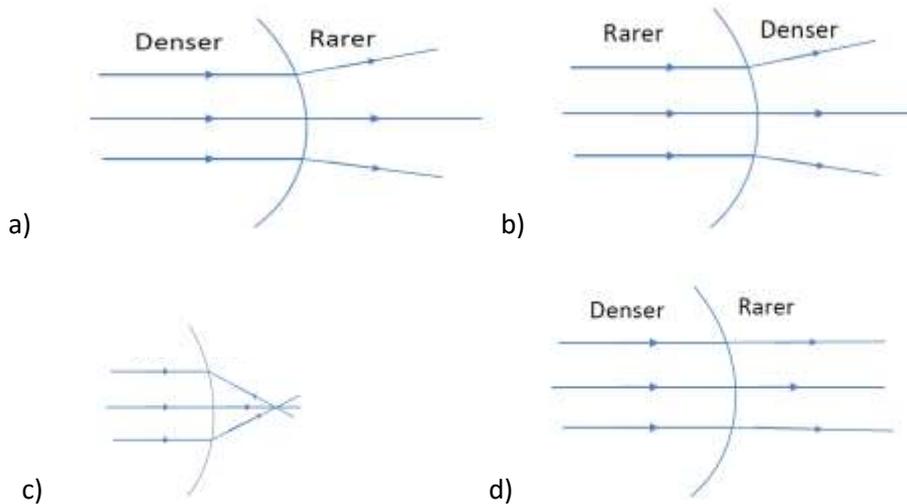
34) Tenth term in the sequence $12, 18, 20, 28, \ldots$ is

        a) 336   b) 63   c) 216   d) 68

35) An electron pair donor is a Lewis base and an electron pair acceptor is a Lewis acid. Which among the following statements, is correct?

   a) NH_3 is a Lewis acid, because nitrogen has only 6 electrons around it.

   b) BF_3 is a Lewis base, because fluorine has 8 electrons around it.

   c) NF_3 is a Lewis base, because nitrogen has a lone electron.

   d) BCl_3 is a Lewis acid because it has only 6 electrons around it.

36) Greenhouse gases absorb (and trap) outgoing infared radiation (heat) from Earth and contribute to global warming. A molecule that acts as a greenhouse gas, generally has a permanent dipole moment and sometimes for other reasons. **Going only by the condition of permanent dipole moment,** in the list of gases given below, how many can be potential greenhouse gases?

   Water, Sulphur dioxide, Boron trifluoride, carbon monoxide, carbon dioxide, nitrogen, oxygen, methane, hydrogen sulphide, ammonia.

   a) Five
   b) Six
   c) Seven
   d) Four

37) In the diagram M_1 and M_2 are two plane mirrors at right angles to each other. O is a luminous point object. Consider two images formed due to first reflection at M_1 and M_2. The area of the triangle formed by the object and two images is

   a) 4 cm^2 b) 2 cm^2
   c) 8 cm^2 d) 16 cm^2
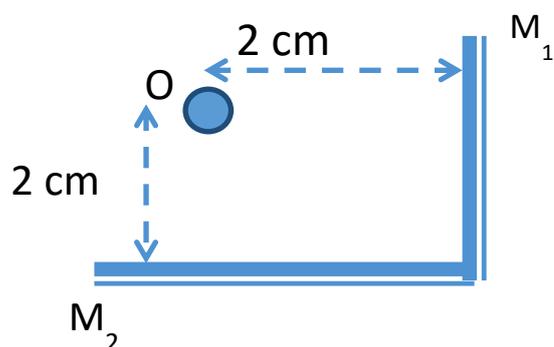
38) The probability of a point within an equilateral triangle with side 1-unit lying outside its in-circle (inscribed circle) is

   a) $1 - \frac{1}{2(\sqrt{3})}$ b) $1 - \frac{\pi}{3\sqrt{3}}$ c) $1 - \frac{\pi}{2\sqrt{3}}$ d) $1 - \frac{2\pi}{3\sqrt{3}}$

39) Penicillin cannot be used to treat influenza because:

   a) It only helps to bring the temperature down, and does not reduce the infection
   b) The penicillin is broken down by the organism
   c) Viruses do not have cell walls
   d) Reproduction of protozoans is not affected by penicillin

40) Thin cuboidal strips are made by slicing a potato. They are all made to be exactly 8 cm long and 2 mm wide. Each strip is placed in sugar solutions of different concentration. After soaking it for 5 hours, their lengths are measured again. The following graph shows the results of the experiment. What concentration of sugar solution is isotonic with the conntents of the cells of the potato.
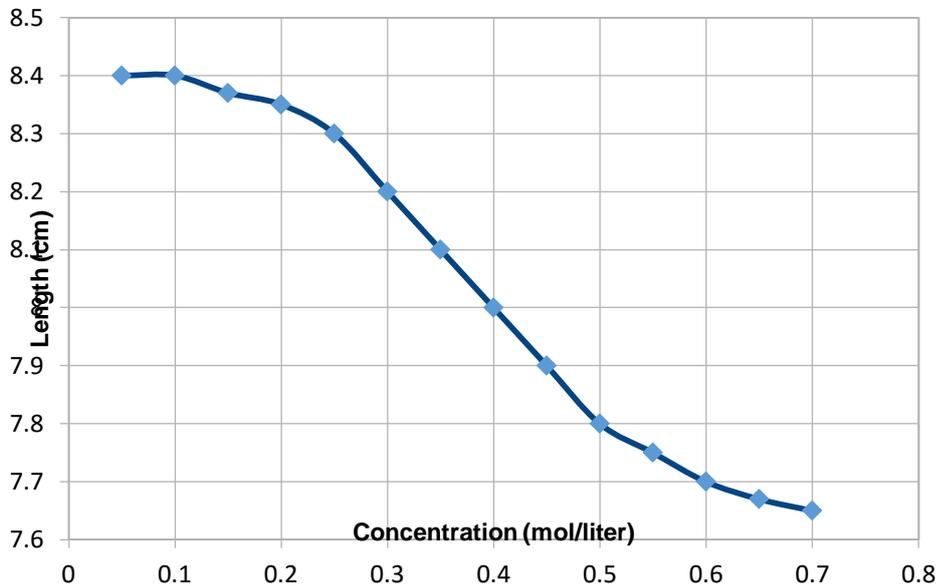
a) 0.2   b) 0.4   c) 0.6   d) 0.1

41) A fisherman of height h is standing on the bank of a lake. A fish in the water perceives his height as h'. Then

a) h' > h   b) h' < h
c)h' = h   d) h' > h or h' < h depending on position of fish

42) A triangle has perimeter 316 and its sides are of integer length. The maximum possible area for such a triangle is achieved for

a) Single triangle   b) Two triangles

c)   Three triangles   d) More than three triangle

43) Hennig Brand, one of the many alchemists was in pursuit of the philosopher's stone. Brand's method is believed to have consisted of evaporating large quantities of urine to leave a black residue that was then left for a few months. The residue was then heated with sand, driving off a variety of gases and oils. The final substance to be driven off, was condensed as a white solid, which he called as "cold fire" as it was luminous and glowed in the dark and also caught fire on slight warming and producing a large quantity of light. It has also been called as the "Bearer of light". Which element is "cold fire"?

a) Lithium   b) Tungsten   c) Phosphorous   d) Cesium

44) When solid KOH is mixed with solid NH_4Cl, a gas is produced. Which gas is it?

      a) Chlorine   b) hydrogen   c) hydrogen chloride   d) ammonia

45) Object A is completely immersed in water. True weight of object A is W_A. Weight of water with beaker is W_B. Let B be the buoyant force. W_1 and W_2 are scale readings of spring balance and weighing scale respectively

    a) $W_1 = W_A$ b) $W_1 = W_A + B$

    c) $W_2 = W_B$ d) $W_2 = W_B + B$

46) Number of numbers less than 40 having exactly four divisors is

      a) 15   b) 12   c) 11   d) 14

47) Antibodies play an important role in defending the body against infections by which of the following mechanisms:

    a) They engulf the bacteria and make them harmless
    b) They bind to the surface of pathogens, so that they can be easily   identified and removed by other cells of the immune system
    c) They enter the pathogen and prevent cell division
    d) They are highly reactive and chemically react with the DNA of the pathogen

48) The figure shows a food web, where A, B, C, D etc. are different species. And the direction of the arrows symbolizes the direction of flow of nutrients
An increase in the population of which species is likely to decrease the population of species A

    a) Species D   b) Species F   c) Species G   d) Species E

49) A point object O is kept at origin. When a concave mirror M_1 placed at $x = 6$ cm, image is formed at infinity. When M_1 is replaced by another concave mirror M_2 at same position, image is formed at $x = 30$ cm, then ratio of the focal length of M_1 to that of M_2 is

    a) $\frac{3}{4}$ b) $\frac{4}{3}$ c) 5   d) $\frac{1}{5}$

50) The number $3^8(3^{10} + 6^5) + 2^3(2^{12} + 6^7)$ is

    a) A perfect square and a perfect cube
    b) Neither a perfect square nor a perfect cube
    c) A perfect cube but not a perfect square
    d) A perfect square but not a perfect cube

51) Melting point of a substance is 10°C. What does this mean?

      a) The substance is a liquid at 10°C.

      b) The substance is a solid at 10°C.

      c) There is an equilibrium between solid phase and liquid phase at 10°C.

      d) The substance is 50% solid and 50% liquid at 10°C.

52) The following substances have approximately same molecular mass. Which is likely to have the highest boiling point?

    a) *n*-butane
    b) isobutane
    c) *n*-butanol
    d) isobutanol

53) U-tube contains some amount of mercury. Immiscible Liquid X is poured in left arm immiscible liquid Y is poured in the right arm. Length of liquid X is 8 cm, length of liquid Y is 10 cm and upper levels of X and Y are equal. If density of Y is 3.36 g·cm^{-3} and density of Hg is 13.6 g·cm^{-3} then density of X is

a) 0.8 g·cm^{-3} b) 1.2 g·cm^{-3} c) 1.4 g·cm^{-3} d) 1.6 g·cm^{-3}
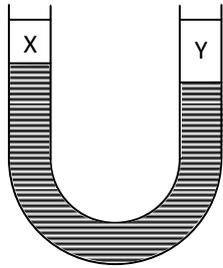
54) Let the number of rectangles formed by 6 horizontal and 4 vertical lines be n and those formed by 5 vertical and 5 horizontal lines be m then we have

    a) $n = m$ b) $n \geq m + 1$ c) $m \geq n$ d) $m > n + 5$

55) In a human cell undergoing Meiosis, what are the total number of cellular DNA molecules present during Prophase-I

    a) 23   b) 46   c) 69   d) 92

56) During gaseous exchange in the alveoli, what happens to nitrogen?

    a) There is no net nitrogen exchange, as nitrogen is filtered out by the alveoli.

    b) The nitrogen is absorbed by the alveolus to form amino acids.

    c) The nitrogen is filtered out by the alveolus, as the nitrogen molecule is too large to cross the gaps in the capillaries

    d) There is no net nitrogen exchange, as the blood is saturated with nitrogen

57) The effective resistance between A and D in the circuit shown in the adjacent figure is

a) $5\,\Omega$ b) $10\,\Omega$

c) $15\,\Omega$ d) $20\,\Omega$
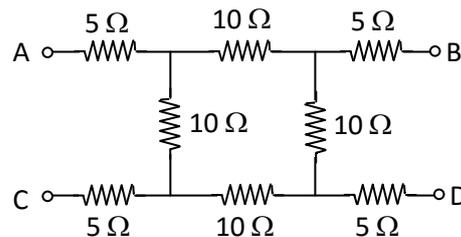
58) If $ABCD$ is a rhombus and $\angle ABC = 60^0$ then

    a) The points A, B, C, D are concyclic
    b) The quadrilateral has exactly half the area of the square with same sides as $ABCD$
    c) The quadrilateral has area $\frac{\sqrt{3}}{2} AB^2$
    d) The diagonals of the quadrilateral $ABCD$ are equal and bisect each other at right angle

59) Identify the overall change in the following set of reactions:

    1. Carbon dioxide → carbonic acid (H_2CO_3)

    2. Ethanol (alcohol) → Ethanal (aldehyde)

    3. Ethanal (aldehyde) → Ethanol (alcohol)

    4. Sulphuric acid → Sulphur trioxide (SO_3)

Choose the correct option which best describes these conversions

a) oxidation, oxidation, reduction, reduction

b) hydration, oxidation, reduction, dehydration

c) reduction, dehydration, hydration, oxidation

d) reduction, reduction, oxidation, oxidation

60) An element with atomic number 44, is below which element in the periodic table?

    a) Calcium
    b) Iron
    c) Argon
    d) Magnesium

61) Three bulbs B_1, B_2 and B_3 having rated powers 100 W, 60 W and 60 W at 250 V are connected in a circuit as shown in the adjacent figure. If W_1, W_2 and W_3 are the output powers of the bulbs B_1, B_2 and B_3 respectively, then

a) $W_1 > W_2 = W_3$ b) $W_1 > W_2 > W_3$
c) $W_1 < W_2 = W_3$ d) $W_1 < W_2 < W_3$
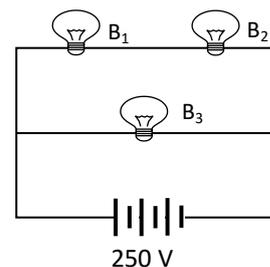
62) If $a, b > 0$ then

   a) $a + b \leq \sqrt{ab}$ b) $a + b > \sqrt{ab}$
   c) $a + b \geq \sqrt{2ab}$ d) None of the above inequalities will hold

63) Which of the following is true about ATP

   a) It is a derivative of one of the nitrogenous bases that form DNA
   b) It splits into ADP and phosphate, and the energy produced is used by muscle cells to contract
   c) It is produced in both aerobic and anaerobic conditions.
   d) All of the above

64) Which of the following statements is true regarding communication in neurons

   a) Free electrons are moved along the plasma membrane of the axon and control the expression of
      neurotransmitters
   b) A chemical signal travels along the axon and is converted into an electric impulse at the synapse
   c) An electric impulse travels along the length of the axon. The electric impulse is converted to a
      chemical signal at the synapse,
   d) An electrical signal is converted to a chemical signal by the Myelin sheath before it reaches the
      synnapse

65) Rod AB of radius 2r is joined with rod BC of radius r. They are of same material and are of same length. The combination carries a current I.
   Choose the correct statement

   a) $V_{AB} = 4V_{BC}$ b) Current per unit area in AB and BC are equal
   c) Resistance of AB is greater than that of BC d) $V_{BC} = 4V_{AB}$

66) The statement "a is not less than 4" is correctly represented by

   a) $a < 4$ b) $a > 4$ c) $a \geq 4$ d) $a \leq 4$

67) A chemist mixes two ideal liquids **A** and **B** to form a homogeneous mixture. The densities of the liquids are 2.0 g/mL for A and 3 g/mL for B. When she drops a small object into the mixture, she finds that the object becomes suspended in the liquid; that is, it neither sinks to the bottom nor does it float on the surface. If the mixture is made of 40% A and 60% B, by volume, what is the density of the object?

   a) 2.60 g/mL
   b) 2.50 g/mL
   c) 2.40 g/mL
   d) 1.50 g/mL

68) How many different compounds can have the formula, C_3H_4?

    a) One
    b) Two
    c) Three
    d) Four

69) In the figure shown, the current carrying loop is fixed, where as current carrying straight conductor is free to move. Then straight wire will (ignore gravity)

    a) remain stationary   b) move towards the loop
    c) move away from the loop   d) rotate about the axis
                                       perpendicular to plane of paper
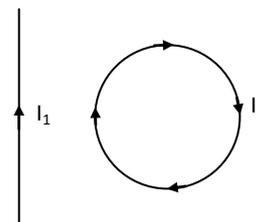
70) Two friends A and B watched a car from the top of their buildings. Angle of depression for A was 10^0 more than angle of depression for B, then

    a) A's apartment is taller than B's apartment
    b) B's apartment is taller than A's apartment
    c) A's apartment and B's apartment have same height
    d) We cannot compare the heights of the two apartments

71) How many times would a red blood cell pass through the heart during one complete cycle?

    a) Once   b) Twice   c) 4 times   d) 72 times

72) A gene has two alleles P(dominant) and p(recessive). The homozygous recessive combination leads to death in the embryo stage. If two individuals with genotype Pp are mated, out of the offspring that survive to adulthood, what is the probability of the genotype to be Pp?

    a) 0.75   b) 0.33   c) 0.5   d) 0.67

73) A convex mirror of focal length f produces an image of size equal to $\frac{1}{n}$ times the size of the object. Then the object distance is

    a) nf   b) $\dfrac{f}{n}$ c) (n + 1)f   d) (n − 1)f

74) Total surface area of a sphere S with radius $\sqrt{2} + \sqrt{3}$ cm is

    a) $400\pi\left(5 + 2\sqrt{6}\right) sqmm$ b) $\pi(\sqrt{2} + \sqrt{3})^2 \ sqcm$
    c) $2\pi(\sqrt{2} + \sqrt{3})^2 \ sqcm$ d) $40\pi\left(5 + 2\sqrt{6}\right) sqmm$

75) There are many elements in the periodic table that are named after the country, where they were first made or obtained. For example, the Latin name for copper was coined by the Romans because their chief source of copper was from the Island of Cyprus. However, there is one country in the world which was named after an element (the Latin name). A long time ago, it was believed that this country had mountains full of a valuable element, however all expeditions to find these mountains failed. But the name stuck on. The element in question is used for many applications today, and many of its compounds are used as catalysts. The ions of this metal have very good anti-microbial property and finds application in water purification. The element is

   a) Sodium
   b) Gold
   c) Silver
   d) Francium

76) All of these species have the same number of valence electrons as nitrate ion, except

   a) Carbonate ion
   b) Bicarbonate ion
   c) NF_3
   d) SO_3

77) The angle between the hour arm and the minute arm of a clock at 2:10 a.m. is

   a) Zero   b) 4° c) 5° d) 6°

78) A craft teacher reshapes the wax from a cylinder of candle with section diameter 6 cm and the height 6 cm into a sphere. The radius of this sphere will be

   a) $r = 6\sqrt{3/2}\ cm$ b) $r = 6\ cm$
   c) $r = 3\sqrt[3]{3/2}\ cm$ d) $r = 6\sqrt[3]{2}\ cm$

79) Plants absorb nitrates from the soil, which are most essential to produce:

   a) Proteins
   b) Carbohydrates
   c) Fats
   d) Cell wall

80) The dry mass (mass excluding water) of a seed in the process of germination:

   a) increases over time until the first leaves appear
   b) decreases over time until the first leaves appear
   c) stays constant until the frst leaves appear
   d) first increases and then decreaes until the first leaves appear.

Rough Sheet

JS530

<u>Rough Sheet</u>