MANAV RACHNA INTERNATIONAL SCHOOL
Scholarship Test Paper
For Grade – X (Session 2022-23)
Current Grade of the Student - IX (Session 2021-22)

Date: 19.02.2022
Duration: 2 Hours **M.M.: 100**

KINDLY FILL IN THE DETAILS

Name: _____

Father's Name: _____

Mother's Name: _____

Examination Centre: Manav Rachna International School _____

Name and Signature of the Invigilator: _____

GENERAL INSTRUCTIONS:

This paper is divided into 4 sections

SECTION – A: Logic and Reasoning: **20 marks** (Each question carries 2 marks)
SECTION – B: English: **20 marks** (Marks have been mentioned against the questions)
SECTION – C: Math: **30 marks** (Each question carries 1 mark)
SECTION – D: Science: **30 marks** (Each question carries 1 mark)

- All sections are compulsory.
- Read each question carefully before answering.
- **Objective Questions need to be tick marked in the question paper itself and submitted.**
- **Subjective Questions need to be attempted in the answer sheets provided and submitted.**

SECTION A
LOGIC AND REASONING

Q1. If a rectangle is called a circle, a circle a point, a point a triangle, a triangle a square, then wheel is a:

a) rectangle b) circle c) point d) triangle

Q2. In the series given below, how many 8's are there each of which is exactly divisible by its immediate preceding as well as succeeding numbers ?

2 8 3 8 2 4 8 2 4 8 6 8 2 8 2 4 8 3 8 2 8 6

a) five b) four c) one d) two

Q3. Sam ranked 9th from the top and 38th from the bottom amongst the chess participants.. How many participants are there in all?

a) 45 b) 46 c) 47 d) 48

Q4. In a class, seven students are standing in a row. Q is standing left to R but right to P. O is standing right to N and left to P. Similarly, S is standing right to R and left to T. Find out who is standing in the middle?

a) Q b) R c) P d) S

Q5. If in a certain language FASHION is coded as FOIHSAN, how is PROBLEM coded in that code?

a) PELBORM b) PRBOELM c) RPBOELM d) RPBOELM

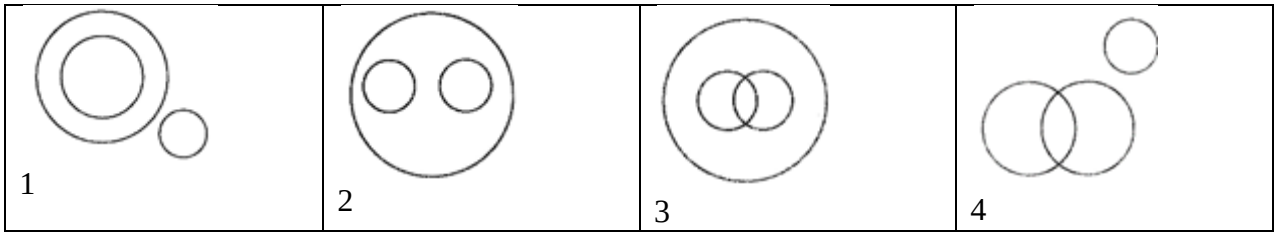
Q6. Select the correct set of symbols which will fit in the given equation?
5 0 3 5 = 20

a) x, x, x b) -, +, x c) x, +, x d) +, -, x

Q7. If you write down all the numbers from 1 to 100, then how many times do you write 3 ?

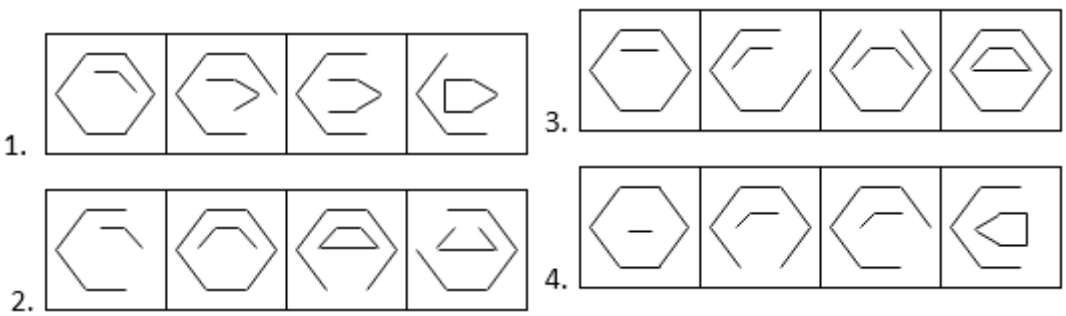
a) 11 b) 18 c) 20 d) 21

Q8. Which is the most appropriate image to go along with this- Dog, Carnivore, Tiger?



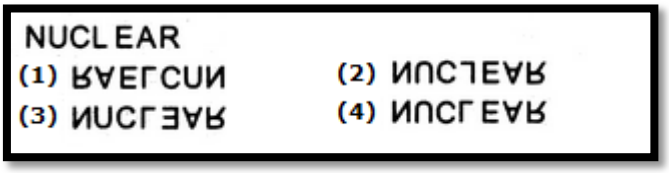
a) 1 b) 2 c) 3 d) 4

Q9. Which of the following series of figures follows the given rule?
Rule: The closed figure loses its sides, and the open figure gains its sides as the series proceeds.



a) 1 b) 2 c) 3 d) 4

Q10. Choose the alternative which closely resembles the water-image of the given combination.



a) 1 b) 2 c) 3 d) 4

SECTION B
ENGLISH

Q1. **Read the following passage and answer the questions that follow:**

I. Every day millions of shoppers hit the stores in full force, both online and on foot- searching frantically for the perfect gift. Last year, Americans spent over $30 billion at retail stores in the month of December alone. Aside from purchasing holiday gifts, most people regularly buy presents for other occasions throughout the year, including weddings, birthdays, anniversaries, graduations, and baby showers. This frequent experience of gift giving can engender ambivalent feelings in gift givers. Many relish the opportunity to buy presents, because gift giving offers a powerful means to build stronger bonds with one's closest peers. At the same time, many dread the thought of buying gifts, they worry that their purchases will disappoint rather than delight the intended recipients.

II. Anthropologists describe gift giving as a positive social process serving various political, religious and psychological functions. Economists, however, offer a less favorable view. According to Wald Fogel (1993), gift giving represents an objective waste of resources. People buy gifts that recipients would not choose to buy on their own, or at least not spend as much money to purchase (a phenomenon referred to as the deadweight loss of Christmas). To wit, givers are likely to spend $100 to purchase a gift that receivers would spend only $80 to buy themselves. The deadweight loss suggests that gift givers are not very good at predicting what gifts others will appreciate. That in itself is not surprising to social psychologists. Research has found that people often struggle to take account of others perspectives- their insights are subject to egocentrism, social projection and multiple attribution errors.

III. What is surprising is that gift givers have considerable experience acting both as gift givers and gift recipients, but nevertheless tend to overspend each time they set out to purchase a meaningful gift. In the present research, we propose a unique psychological explanation for this overspending problem. That is, the gift givers equate how much money they spent with how much recipient will appreciate the gift. Although a link between gift price and feelings of appreciation might seem intuitive to gift givers, such an assumption may be unfounded.

IV. Why do gift givers assume that gift price is closely linked to gift recipients' feelings of appreciation? Perhaps givers believe that bigger (that is more expensive) gifts convey strong signals of thoughtfulness and consideration. According to Camerer (1988) and others, gift giving represents a symbolic ritual whereby gift givers attempt to signal their positive attitude towards the intended recipient and their willingness to invest resources in a future relationship.

V. The notion of gift givers and gift recipients being unable to account for the other party's perspective seems puzzling because people slip in and out of these roles every day, and in some cases multiple times in the course of the same day. Yet despite the extensive experience that people have as both

givers and receivers, they often struggle to transfer information gained from one rule(example as a giver) and apply it in another complementary role (example as a receiver).In theoretical terms, people fail to utilize information about their own preferences and experiences in order to produce more efficient outcome in their exchange relations. In practical terms, people spend hundreds of dollars each year on gifts, but somehow never learn to calibrate their gift expenditure according to personal insight.

Based on your reading and understanding of the above passage, answer the questions below:

a. Why do many relish the opportunity of gift giving? 2
b. What does the practice of gift giving indicate? 1
c. Find out a word from the passage which is an antonym of the word 'delude' 1
d. How does personal insight help a consumer? 2
e. Find out the word from the passage which is synonymous to the work 'gauge' 1
f. What is the theme of the given passage? 1
g. What is the most valuable gift you have ever received till date? Why do you consider it to be so? 2

Q2. You had witnessed a lot of voluntary work taken up by the COVID warriors in the year gone by and were truly inspired by it. Today, you went out of your comfort zone to extend help and comfort to someone who needed immediate medical assistance. Describe your experience in the form of a paragraph in about 150-200 words. You are Anshuman/ Anju studying at Rockford School, New Delhi. 10

SECTION C
MATH

Q1. $2^X = 3^Y = 6^{-Z}$, then $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}$ is equal to

a) 2 b) 3 c) 1 d) 0

Q2. If $25^{x-1} = 5^{2x-1} - 100$, then x is:

a) 0 b) 1 c) 2 d) 3

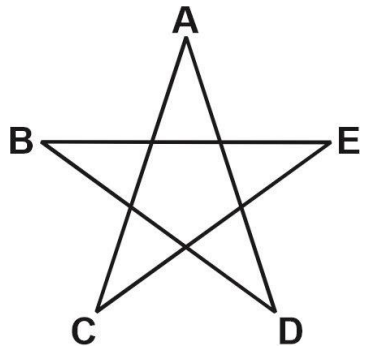
Q3. $(x^2 + x - 2)$ is the G.C.D. of the expressions $(x - 1)(2x^2 + ax + 2)$ and $(x + 2)(3x^2 + bx + 1)$. The values of 'a' and 'b' is:

a) 5, 4 b) – 5, 4 c) 5, – 4 d) – 5, – 4

Q4. If $x^3 + px + r$ and $3x^2 + p$ have a common factor, then

a) $\frac{p^2}{9}+\frac{r}{2}=0$ b) $\frac{p^3}{27}-\frac{r^2}{4}=0$ c) $\frac{p^3}{27}+\frac{r^2}{4}=0$ d) $\frac{p^2}{9}+\frac{r^2}{4}=0$

Q5. In the given figure, $\angle A + \angle B + \angle C + \angle D + \angle E$ is equal to



a) 90° b) 180° c) 270° d) 360°

Q6. Let ABC be a right angled triangle with AC as its hypotenuse, then AC^3 will be

a) $= (AB^3 + BC^3)$ b) $< (AB^3 + BC^3)$ c) $> (AB^3 + BC^3)$ d) none of these

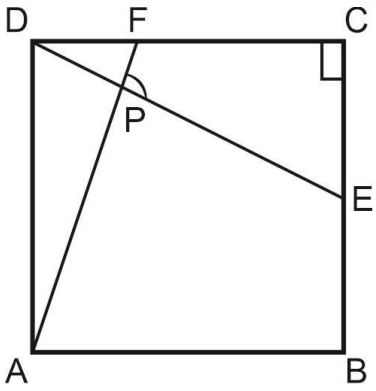
Q7. The perimeter of a right angle triangle is 40 cm. Its hypotenuse is 17cm. Find the area of the triangle:

a) 289 cm^2 b) 120 cm^2 c) 60 cm^2 d) 80 cm^2

Q8. The orthocenter of the triangle formed by the lines x = 0, y = 0 and x + y = 2 is

a) (0, 0) b) (0, 1) c) (0, 2) d) (2, 0)

Q9. In the given figure, ABCD is square and AF = DE, then $\angle EPF$ = _____.



a) 60° b) 30° c) 45° d) 90°

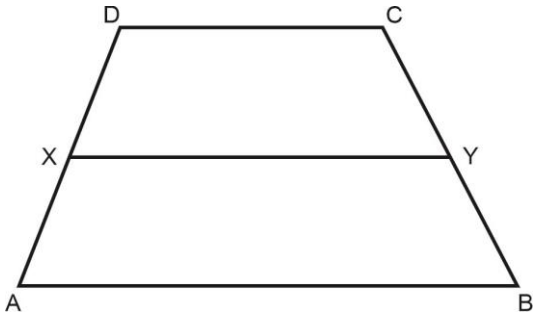
Q10. E and F are respectively the mid-points of non-parallel sides of a trapezium ABCD, then EF = _____.

a) $\frac{1}{2}(AB - CD)$ b) $\frac{1}{2}(AB + CD)$ c) $\frac{1}{2}(AB \times CD)$ d) none of these

Q11. ABCD is a rectangle. F and E are mid points of BC and CD respectively. If area of BEF = $7cm^2$, then area of ABCD is:

a) $49cm^2$ b) $42cm^2$ c) $28cm^2$ d) $56cm^2$

Q12. In the figure, ABCD is a trapezium in which AB || DC and DC = 40 cm and AB = 60cm. If X and Y are respectively the mid points of AD and BC, then which of the following is true?



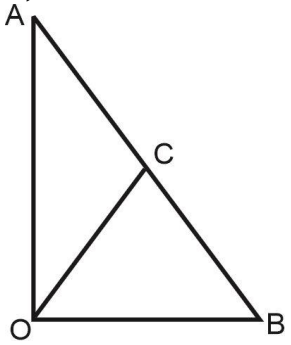
a) Area of trapezium ABCD = $\frac{11}{9}$ area (XYCD)

b) Area of DCYX = $\frac{9}{11}$ ar (XYBA)

c) Area of DCYX = $\frac{9}{11}$ ar (trapezium ABCD)

d) None of these

Q13. In the figure, $\angle AOB = 90°$, AC = BC, OA = 12cm and OC = 6.5cm, then the area of ΔAOB:

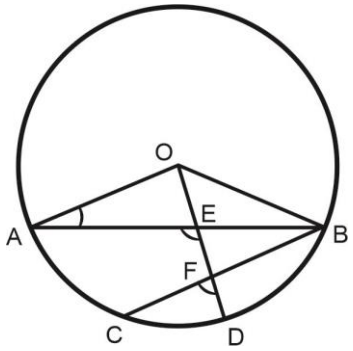


a) $60cm^2$ b) $45cm^2$ c) $50cm^2$ d) $30cm^2$

Q14. The perimeter of a rhombus is '2p' cm, the sum of its diagonals is 'm' cm. Then area of rhombus is

a) $\frac{m^2 - p^2}{2}$ b) $\frac{1}{2}mp$ c) $m^2 - p^2$ d) $\frac{m^2 - p^2}{4}$

Q15. In the figure, O is the centre of the circle. BC = OA, ∠OAB = 20° and ∠AED = 120°, then the value of ∠CFD _____



a) 50° b) 60° c) 70° d) 80°

Q16. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. The ratio of their volumes is:

a) 2 : 3 : 1 b) 1 : 2 : 3 c) 3 : 1 : 2 d) 3 : 2 : 1

Q17. Find the remainder when $(23)^{17} + (15)^{17}$ is divided by 19

a) 2 b) 7 c) 5 d) 0

Q18. 4 bells toll together at 9:00 am. They toll after 7,8,11 and 12 seconds respectively. How many times will they toll together again in the next 3 hours?

a) 6 b) 7 c) 5 d) 4

Q19. If (x – 2) is a common factor of expressions $x^2 + ax + b$ and $x^2 + cx + d$, then value of $\frac{b-d}{c-a}$ is

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

Q20. The graph of a polynomial intersects the x-axis in 3 points, then its degree can not be:

a) 2 b) 3 c) 4 d) 5

Q21. When a certain 2 – digit number is divided by the number obtained by reversing the digits, the quotient is 2 and the remainder is 7. If the number is divided by the sum of its digits the quotient is 7 and the remainder is 6. Find the product of the digits of the original number.

a) 46 b) 64 c) 38 d) 83

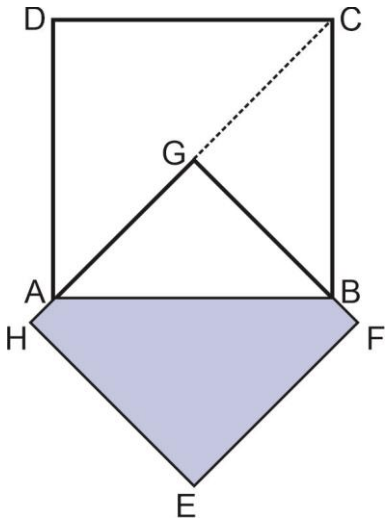
Q22. If $x = \frac{a-b}{a+b}, y = \frac{b-c}{b+c}, z = \frac{c-a}{c+a}$ then value of $\frac{(1+x)(1+y)(1+z)}{(1-x)(1-y)(1-2)}$ is

a) abc b) $a^2b^2c^2$ c) 1 d) – 1

Q23. In triangle ABC, the altitude from A to BC meets BC at D, and the altitude from B to CA meets AD at H. If AD = 4cm, BD = 3cm, CD = 2cm and $\frac{AB}{BD}=\frac{AH}{HD}$, then the length of HD is _____

a) $\frac{\sqrt{5}}{2}cm$ b) $\frac{3}{2}cm$ c) $\sqrt{5}cm$ d) $\frac{5}{2}cm$

Q24. Squares ABCD and EFGH are congruent, AB = 10cm, and G is the centre of square ABCD. The area of the shaded region in the plane is _____



a) 100 cm^2 b) 125cm^2 c) 75 cm^2 d) 175 cm^2

Q25. If a commission of 10% is given on the marked price of a book, the publisher gains 20%. If the commission is increased to 15%, the gain is _____

a) $16\frac{2}{3}\%$ b) $13\frac{1}{3}\%$ c) $15\frac{1}{6}\%$ d) none of these

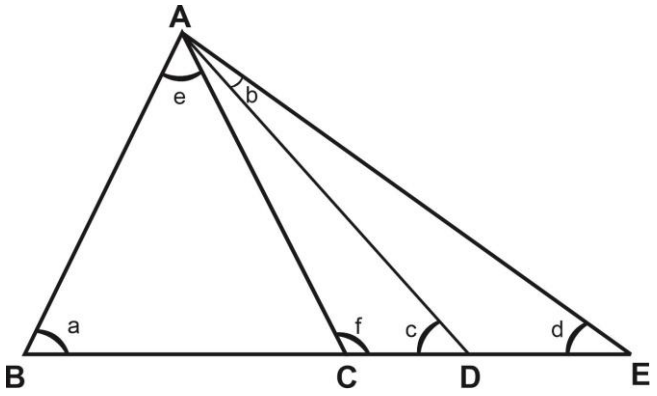
Q26. A circle is inscribed in an equilateral triangle of side 36 cm. Find the area of the triangle excluding the area of circle.

a) 121.74 cm^2 b) 151.74 cm^2 c) 198.74 cm^2 d) 221.74 cm^2

Q27. The length of the minute hand and the hour hand of a clock are 7cm and 5cm respectively. Find the difference of the distance moved by the tips of the two hands of the clock in 4 days.

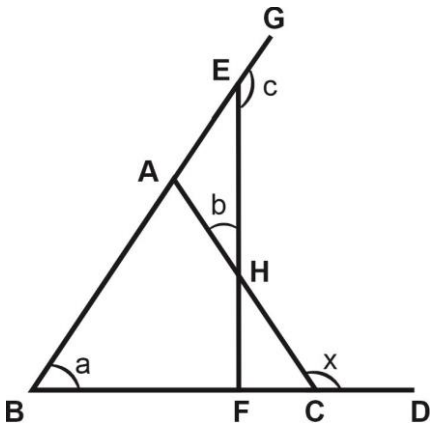
a) 2972.57 cm b) 3957.72 cm c) 3972.57 cm d) 3792.72 cm

Q28. In the following figure, the value of d + b + f is:



a) 2 (a + c) b) 2 (a + e) c) 2 (a + c + e) d) a + c + e

Q29. In the following figure, find the value of 'x'.



a) 180° – a + b + c b) 180° – b + a + c
c) 180° – c + a + b d) none of these

Q30. Two regular polygons are such that the ratio between their number of sides is 1 : 2 and the ratio of the measures of their interior angles is 4 : 5, then find the number of sides of each polygon.

a) 8 and 16 b) 10 and 20 c) 6 and 12 d) none of these

SECTION D
SCIENCE

Q1. A billiard ball of mass 100 grams strikes a wall horizontally with a speed of 20 m/s and it rebounds along the same path with same velocity in opposite direction. What is the change in momentum of the ball?

a) 0 kgm/s b) 2 kgm/s c) 4 kgm/s d) 1 kgm/s

Q2. A parachutist bails out of an aeroplane and falls 100m without friction. Then he opens his parachute and reaches the ground at a speed of 4m/s with constant deceleration of $2m/s^2$. At what height did he bail out of the aeroplane?

a) 396 m b) 496 m c) 596 m d) 696 m

Q3. Shardha dropped two stones of masses 10 kg and 25 kg respectively simultaneously from top of a 15 m tall tower. At any instant during the fall, they have equal:

a) Kinetic energy
b) Potential energy
c) Acceleration
d) Linear momentum

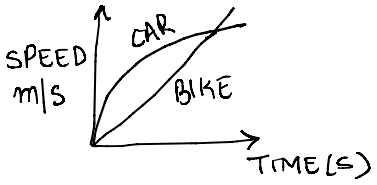
Q4. A force of 12 N is applied on a box of mass 2 kg to pull it through a distance of 3m on a smooth horizontal surface. It was then lifted vertically up to a height of 5m. What is the total work done on the box?

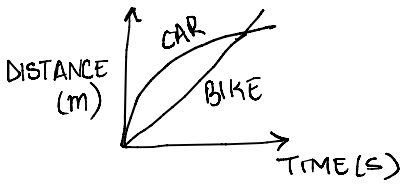
a) 36 J b) 100 J c) 136 J d) $\sqrt{36^2 + 100^2}\,J$

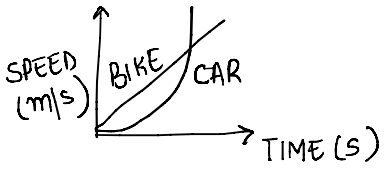
Q5. Carefully read the following cases:
Case 1: A stone of 250 grams is lifted to a height of 10 m on Earth
Case 2: A stone of mass 850 grams is lifted to height of 12 m on Saturn
Case 3: A stone of mass 1 kg is lifted to a height of 2 m on Jupiter.

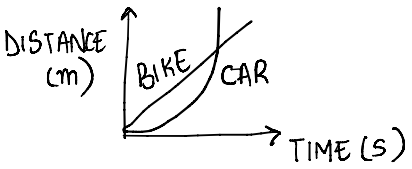
Which of the following is correct about the cases shared above?
a) More energy is required in Case 1 than in Case 2
b) More energy is required in Case 2 than in Case 3
c) Equal amount of energy is required in Cases 1 and 3
d) Equal amount of energy is required in Cases 1 and 2

Q6. At the traffic light, the instant the light turned green, a car starts moving with an acceleration of $2m/s^2$. At the same instant, another bike moving with uniform speed of 13 m/s overtakes the car. Which of the following graphs interpret the situation?

a)


b)


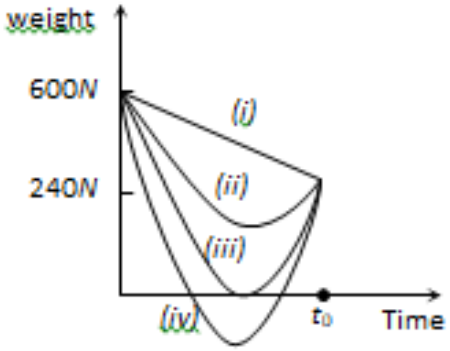
c)


d)


Q7. A ball of mass 2 kg falls through a height of 10m on a rigid floor and then rebounds to a height of 7m. What percentage of energy did it loose on striking the ground?

a) 20 % b) 30 % c) 25 % d) 35 %

Q8. Suppose, the acceleration due to gravity at the earth's surface is 10 m/s^2 and at the surface of Mars it is 4.0 m/s^2. A 60 *kg* passenger goes from the earth to the Mars in a spaceship moving with a constant velocity. Neglect all other objects in the sky. Which part of figure best represents the weight (net gravitational force)of the passenger as a function of time?

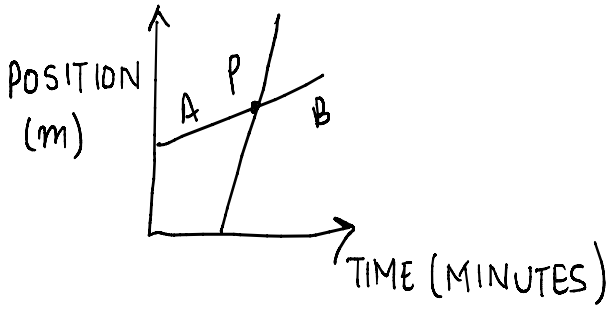


a) (i) b) (ii) c) (iii) d) (iv)

Q9. If the radius of the earth were to shrink by 1% its mass remaining the same, the acceleration due to gravity on the earth's surface would

a) Decrease by 2% b) Remain unchanged
c) Increase by 2% d) Increase by 1%

Q10. Observe the position time graph for bodies A and B respectively
What do you infer from the graph?



a) They collide at point P
b) They move at same speed at point P
c) They are at rest at point P
d) They meet while crossing position corresponding to point P

Q11. 96 grams of Magnesium on complete burning with oxygen gives – (Mg=24)

a) 100 grams of MgO b) 120 grams of MgO
c) 140 grams of MgO d) 160 grams of MgO

Q12. The percentage of Nitrogen in urea is about (N = 14, H = 1, C =12, O = 16)

a) 28.0 b) 46.6 c) 59.1 d) 61.0

Q13. What is the atomicity of Aluminium oxide?

a) 7 b) 6 c) 5 d) 4

Q14. Which one of the following groups represent a collection of isoelectronic species
(Atomic Number Cs = 55; Br = 35)

a) N^{3-}, F^{-}, Na^{+} b) Be, Al^{3+}, Cl^{-} c) Ca^{2+}, Cs^{+}, Br d) Na^{+}, Ca^{2+}, Mg^{2+}

Q15. What amount of oxygen, O_2 (in moles) contains 1.8×10^{22} molecules?

a) 0.030 b) 0.030 c) 0.30 d) 3.0

Q16. The number of atoms present in 1 mole of an element is equal to Avogadro Number. Which of the following elements contain the maximum number of atoms?

a) 4g of He b) 46g of Na c) 0.40g of Ca d) 12 He

Q17. A drop each of two non-corrosive and non-irritating liquids A and B at a temperature of 22º C are placed on the skin. Liquid-A gives a more cooling sensation than liquid-B. Which of the following can be said about the liquids A and B?

a) Liquid-A has higher boiling point than that of liquid-B.
b) Liquid-A has higher latent heat of vaporisation than that of liquid-B.
c) Liquid-A has lower latent heat of vaporisation than that of liquid-B.
d) The boiling points of liquid-A and liquid-B are equal.

Q18. Identify the false statement among the following:

a) Compound is homogeneous in nature.
b) In compound constituents do not retain their properties.
c) The constituents of a mixture can be separated by physical method.
d) During formation of mixtures there is a change in the molecular composition.

Q19. Assertion (A): Rate of evaporation is less in rainy season.
Reason (R): Rate of evaporation is directly proportional to humidity.

a) Both A and R are true and R is the correct explanation for A.
b) Both A and R are true but R is not the correct explanation for A.
c) A is true and R is false.
d) A is false and R is true.

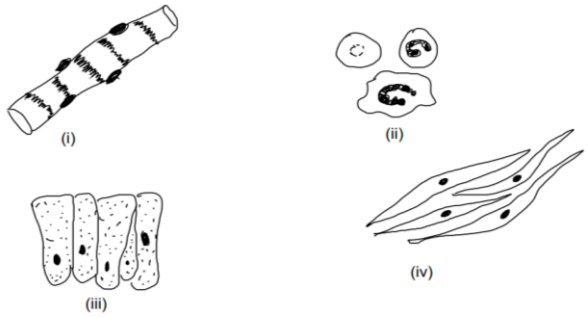
Q20. Assertion (A): Baking soda ($NaHCO_3$) is a compound.
Reason (R): Properties of $NaHCO_3$ are absolutely different from sodium, carbon, hydrogen and oxygen.

a) Both A and R are true and R is the correct explanation for A.
b) Both A and R are true but R is not the correct explanation for A.
c) A is true and R is false.
d) A is false and R is true

Q21. Read the following statements carefully and select the correct options given below.
(i) In 1838, Matthias Schielden, a German botanist, examined a large number of plants and observed that all plants are composed of different kinds of cells which form the tissues of the plant.
(ii) The cells of a human cheek have a cell wall as the delimiting structure of the cell.
(iii) Cells differ greatly in shape, size and activities.
(iv) The organization of the prokaryotic cell is fundamentally similar even though prokaryotes exhibit a wide variety of shapes and functions.
(v) Bacteria can be classified into four groups on the basis of the differences in the cell envelopes and the manner in which they respond to the staining procedure.

a) (ii), (iii) and (v) b) (i), (ii) and (iv)
c) (ii), (iii) and (iv) d) (i), (iii) and (iv)

Q22. Four slides are observed under the light microscope. Identify the four spots:



a) (i)–Smooth muscle, (ii)–Blood, (iii)–Adipose Tissue, (iv)–Cardiac Muscle
b) (i)–Striated muscle, (ii)–Blood, (iii)–Columnar Epithelium, (iv)–Smooth Muscle
c) (i)–Smooth muscle, (ii)–Blood, (iii)–Areolar Tissue, (iv)–Cardiac Muscle
d) (i)–Neural axon, (ii)–Blood, (iii)–Adipose Tissue, (iv)–Cardiac Muscle

Q23. In sclerenchyma, cell wall is …….

a) Lignified b) Suberised c) Pectinised d) Cutinised

Q24. Connective tissues are classified into:

a) Three types: loose connective tissue, dense regular tissue and dense irregular tissue
b) Two types: areolar tissue and adipose tissue
c) Three types: loose connective tissue, dense connective tissue and specialized connective tissue
d) Four types: blood, bone, cartilage and adipose.

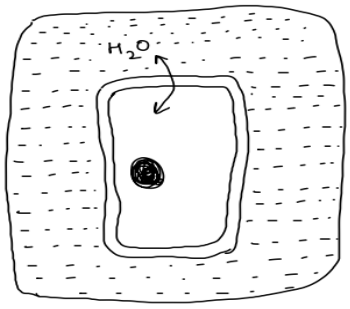
Q25. Which of the following is an incorrect match?

a) Pneumonia – air borne disease
b) Amoebiasis – transmitted through contaminated food
c) Chikungunya – Vector borne disease
d) Common cold – water borne disease

Q26. Which of the following statement is wrong?

a) Malarial parasite requires two hosts: human and mosquitoes to complete its life cycle.
b) AIDS is an example of infectious disease which is fatal.
c) Cancer is a non-infectious disease which is a major cause of death all over the globe.
d) Filariasis is a slowly developing acute inflammation of the organs.

Q27. Identify the figure and select the correct statement.



a) The movement of water occurred across the membrane moving from area of high water potential to an area of lower water potential.
b) Water flows into the cell and out of the cell and is in equilibrium.
c) Water diffuses into the cell causing the cytoplasm to build up pressure against the wall.
d) None of the above.

Q28. Identify ATP:

a) AMP + Pi + Pi
b) ADP + Pi
c) AMP + 2 Pi
d) As written in 'A' 'B' and 'C'

Q29. While working, we move our organs like hands, arms, legs etc. Which among the following is correct?

a) Smooth muscles contract and pull the ligament to move the bones.
b) Smooth muscles contract and pull the tendons to move the bones.
c) Skeletal muscles contract and pull the tendon to move the bones.
d) Skeletal muscles contract and pull the ligament to move the bones.

Q30. Choose the incorrect statement (s):

(i) Acne is not caused by staphylococci.
(ii) High blood pressure is caused by excessive weight and lack of exercise.
(iii) Cancer cannot be caused by genetic abnormalities.
(iv) Peptic ulcers are caused by eating acidic food.

a) (iii) and (iv) b) Only (iii) c) (i) and (iv) d) (i), (ii) and (iv)s