MANAV RACHNA INTERNATIONAL SCHOOL
Scholarship Test Paper
For Grade – XI (Session 2022-23)
Current Grade of the Student - X (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. In a game of billiards, A can give B 20 points in 60 and he can give C 30 points in 60. How many points can B give C in a game of 100?

a) 50 b) 40 c) 25 d) 15

Q2. There were 28 people at last week's board meeting. If the ratio of men to women was 4:3, how many women were at the meeting?

a) 16 b) 12 c) 7 d) 4

Q3. Arrange the words given below in a meaningful sequence.
1. Poverty 2. Population 3. Death
4. Unemployment 5. Disease

a) 2, 3, 4, 5, 1 b) 3, 4, 2, 5, 1 c) 2, 4, 1, 5, 3 d) 1, 2, 3, 4, 5

Q4. Fact 1: All chickens are birds.
Fact 2: Some chickens are hens.
Fact 3: Female birds lay eggs.
If the first three statements are facts, which of the following statements must also be a fact?

I. All birds lay eggs.
II. Hens are birds.
III. Some chickens are not hens.

a) II only
b) II and III only
c) I, II, and III
d) None of the statements is a known fact.

Q5. Rajesh walks 7 km to the north then turns left and walks 3 km. Then takes another left and continues walking this time another 7 km forward. How much distance in km is he away from the starting point?

a) 10km b) 6km c) 3km d) 2km

Q6. Complete the sequence- B2CD, _____, BCD_4, B_5CD, BC_6D

B_2C_2D	BC_3D	B_2C_3D	BCD_7
1.	2.	3.	4.

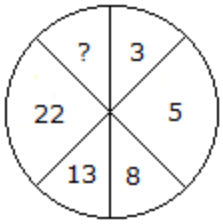
a) 1 b) 2 c) 3 d) 4

Q7. Which number will replace the question mark?

18	24	32
12	14	16
3	?	4
72	112	128

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

Q8. Which number will replace the question mark?



a) 45 b) 29 c) 37 d) 39

Q9. In a certain coding system MOTHER is coded as PQWJHT, how will you code SISTER?

a) VKUVHT b) VKVVHU c) VKVVHT d) VKVVHS

Q10. In each of the following questions, two statements numbered I and II are given. There may be cause and effect relationship between the two statements. These two statements may be the effect of the same cause or independent causes. These statements may be independent causes without having any relationship. Read both the statements in each question and mark your answer.

STATEMENTS:

(I) The government has recently fixed the fees for professional courses offered by the unaided institutions which are much lower than the fees charged last year.

(II) The parents of the aspiring students launched a severe agitation last year protesting against the high fees charged by the unaided institutions

1. Statement I is the cause and statement II is its effect
2. Statement II is the cause and statement I is its effect
3. Both the statements I and II are independent causes
4. Both the statements I and II are effects of independent causes

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

SECTION B
ENGLISH

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

The sun had just risen. The annual marathon in my town is usually held during a heat wave. My job was to follow the runners in an ambulance to render medical attention. The driver and I were in an air-conditioned ambulance behind approximately one hundred athletes waiting for the race to start. "We're supposed to stay behind the last runner, so drive slowly," I said to the driver, Doug, as we began to creep forward.

"Let's just hope the last runner is fast!" He laughed. As they began to pace themselves, the runners were running way ahead. It was then that my eyes were drawn to a woman in blue running shorts and a baggy white T-shirt. She clenched her fists tightly. She pushed herself forward, ready to begin the race. "Doug, look!" We knew we were already watching our "last runner." Her feet were turned in, yet her left leg was turned out. Her legs were so crippled and bent that it seemed impossible for her to be able to walk, let alone run a marathon.

Doug and I watched in silence as she slowly moved forward. We would move forward slightly, then stop and wait for her to gain some distance. As I watched her struggle to put one foot in front of the other, I found myself cheering for her and urging her forward. I wanted her to stop, and at the same time, I prayed that she would not. Finally she was the only runner left in sight. Tears streamed down my face as I sat on the edge of my seat and watched with awe, amazement and even reverence as she

pushed forward with sheer determination through the last miles. When the finish line came into sight, trash lay everywhere and the cheering crowds had long gone home.

Yet, standing straight and ever so proud waited a lone man. He was holding one end of a ribbon of crepe paper tied to a post. She slowly crossed through, leaving both ends of the paper fluttering behind her. There was a look of triumph in her before she collapsed and lay limp on the ground. Hurray! She made it.

I do not know this woman's name, but that day she became part of my life – a part I often depend on. For her, it wasn't about beating the other runners, or winning a trophy, it was about finishing what she had set out to do, no matter what. When I think things are too difficult or too time consuming, or I get those I-just-can't-do-it feeling, I always think of the last runner. Then I would realize how easy the task before me really is.

On the basis of your reading of the above passage, answer the following questions:

i. From paragraph 1, quote a two-word phrase which indicates clearly that the marathon was held on a very hot day. 1

ii. Why did Doug "hope the last runner is fast"? 1

iii. How do you know that the last runner was determined to finish the race right from the beginning? 2

iv. Where were the writer and Doug throughout the race? 1

v. In the second last paragraph, what does "it" refer to? 1

vi. Find the synonyms for the words/phrases given below.

(a) to provide(para 1) (b) An unpleasant feeling of fear(para 2) 1

vii. Give an inspiring title to this passage. 1

viii. Think and write about your motivational moments. 2

Q2. As Markus Natten postulates in his poem " My mind was really mine to use which ever way I choose", express your views in the form of a paragraph(150-200 words) on how making informed choices and facing challenges with certainty makes one self-reliant. 10

SECTION C
MATH

Q1. If the zeroes of the polynomial $f(x) = x^3 - 12x^2 + 39x + a$ are in AP, the value of a is:

a) 28 b) – 28 c) 30 d) – 30

Q2. If $x^2 + y^2 + z^2 = 2(x - y - z) - 3$, then $2x - 3y + 4z$ is

a) 1 b) 2 c) – 1 d) 0

Q3. X takes 3 hours more than Y to walk 30 km. But, if X doubles his pace, he is ahead of Y by $1\frac{1}{2}$ hours. The speed of walking in km/hr of X and Y respectively is

a) 10, 5 b) $\frac{10}{3}, 5$ c) 5, 10 d) $5, \frac{10}{3}$

Q4. If the mth term of an A.P. is 1/n and nth term of an A.P. is 1/m, then the value of (mn)th term is.

a) mn b) $\frac{1}{mn}$ c) 1 d) – 1

Q5. The radius of a solid iron sphere is 8cm. Eight rings of iron plate of external radius $6\frac{2}{3}cm$ and thickness 3 cm are made by melting this sphere, then the internal diameter of each ring is

a) 4cm b) 8cm c) 2cm d) 16cm

Q6. If $\sin\theta + 2\cos\theta = 1$, then $2\sin\theta - \cos\theta$ is equal to:

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

Q7. The elevation of a hill from a place on the ground due east of it is 60° and at another place due south of the first, the elevation is 45°. If the distance two places is 1000 m, the height of the hill is _____

a) $1000\sqrt{3}$ m b) $1000\sqrt{6}$ m c) $500\sqrt{3}$ m d) $500\sqrt{6}$ m

Q8. What will be the range of values k can take if $x^2 - kx + 1 = 0$?

a) $-1 < k < 1$ b) $-5 < k < 5$ c) $-2 < k < 2$ d) $-7 < k < 7$

Q9. The sum of n terms of two APs are in the ratio $(3n + 8) : (7n + 15)$.
Find the ratio of their 12th terms.

a) 19 : 25 b) 19 : 35 c) 7 : 25 d) 7 : 16

Q10. A peacock is sitting on the top of a pillar, which is 9m high. From a point 27m away from the bottom of the pillar a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock pounces on it. If their speeds are equal, at what distance from the hole is the snake caught?

a) 12m b) 15m c) 27m d) 9m

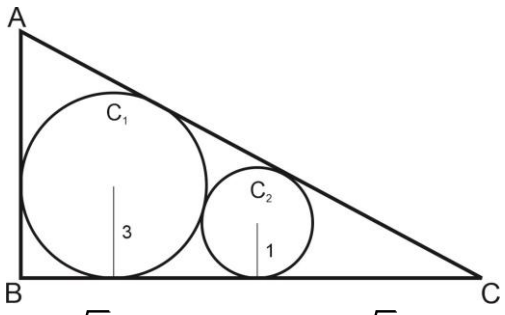
Q11. A fires 5 shots to B's 3 but A kills only once in 3 shots while B kills once in 2 shots. When B has missed 27 times, A has killed _____

a) 30 birds b) 60 birds c) 72 birds d) 90 birds

Q12. If A (1, 4), B(3, 0), C(2, 1) are the vertices of a triangle, then the length of the median through C is:

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

Q13. In the adjoining figure, ABC is a triangle in which angle B is 90° and the circle C_1 has radius 3. A circle C_2 of radius 1 touches side AC, BC and the circle C_1. Then length AB is equal to:



a) $3+6\sqrt{3}$ b) $10+3\sqrt{2}$ c) $10+2\sqrt{3}$ d) $9+3\sqrt{3}$

Q14. The value of k, so that the equation $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common are

a) $3\frac{27}{2}$ b) $9,\frac{27}{4}$ c) $-3,\frac{-27}{4}$ d) $-3,\frac{4}{27}$

Q15. The radius of circle A is 1/3 the radius of circle B. Circle A rolls around circle B one trip back to its starting point. How many times circle A spins around itself?

a) 3 b) 4 c) 6 d) 7

Q16. The first term of a sequence is 2005. Each succeeding term is the sum of the cubes of the digits of the previous term. What is the 2005th term of the sequence?

a) 250 b) 125 c) 175 d) 100

Q17. If $\frac{1}{x+y}=\frac{1}{x}+\frac{1}{y}$, then the value of $\left(\frac{x}{y}\right)^6+\left(\frac{y}{x}\right)^6$ is

a) 6 b) 3 c) 1 d) 2

Q18. A bus for Delhi leaves every forty minutes from a bus stand. An enquiry clerk told a passenger that the bus had already left ten minutes ago, and the next bus will leaves at 10:45 am. At what time did the enquiry clerk given the information to the passenger?

a) 10:05 am b) 9:55 am c) 10:35 am d) 10:15 am

Q19. A batsman in his 18th inning makes a score of 150 runs and thereby increasing his average by 6. Find his average after 18th inning:

a) 52 b) 42 c) 60 d) 48

Q20. A letter of English alphabet is chosen at random. The probability that it is a letter of the word 'RANDOM' is

a) 11/26 b) 3/13 c) 1/6 d) 9/26

Q21. If $\frac{x}{y}+\frac{y}{x}=-1\ \left(x,y\neq 0\right)$, the value of $x^3 - y^3$ is

a) 1 b) – 1 c) 0 d) $\frac{1}{2}$

Q22. Any solution of the linear equation 2x + 0y + 9 = 0 in two variables is of the form

a) $\left(\frac{-9}{2},m\right)$ b) $\left(n,\frac{-9}{2}\right)$ c) $\left(0,\frac{-9}{2}\right)$ d) (– 9, 0)

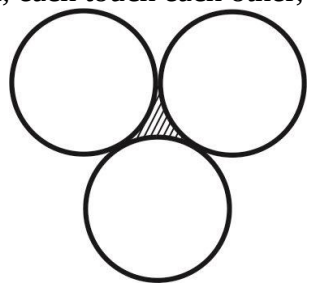
Q23. The difference between the semi-perimeter and the sides of a ΔABC are 5cm, 7cm and 8cm respectively. The area of the triangle is:

a) $10\sqrt{14}cm^2$ b) $20\sqrt{14}cm^2$ c) $20\sqrt{7}cm^2$ d) $10\sqrt{7}cm^2$

Q24. If tanθ + sinθ = m and tanθ – sinθ = n then $m^2 - n^2$ is equal to

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

Q25. If three equal circles of radius 3cm, each touch each other, then the area of the shaded portion is:



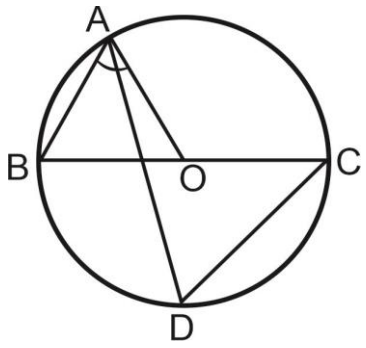
a) $\frac{\sqrt{3}}{2}\left(2-\pi\right)cm^2$ b) $\frac{9}{2}\left(2\sqrt{3}-\pi\right)cm^2$

c) $\frac{9}{2}\left(2\sqrt{3}+\pi\right)cm^2$ d) $\frac{3}{2}\left(\sqrt{3}-\pi\right)cm^2$

Q26. If the right circular cone is separated into three solids of volume V1, V2, V3 by two planes parallel to the base and trisect the altitude, then V1 : V2 : V3 is

a) 1 : 2 : 3 b) 1 : 4 : 6 c) 1 : 6 : 9 d) 1 : 7 : 19

Q27. In the given figure BC is a diameter of the circle and ∠BAO = 60° then ∠ADC =



a) 30° b) 120° c) 45° d) 60°

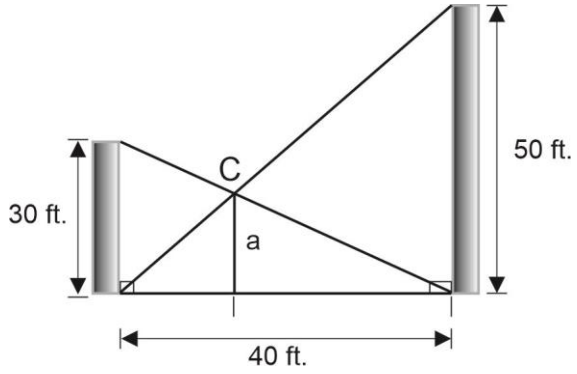
Q28. Pipe A and B can fill cistern in 10 minutes and 15 minutes respectively. Pipe C can empty the full cistern in 5 minutes. Pipe A and B are opened for 4 minutes and then outlet pipe C is also opened. Cistern can be emptied by C in

a) 24 minutes b) 20 minutes c) 18 minutes d) 30 minutes

Q29. Ramesh runs a lawn service, which includes mowing, edging, trimming and aerating a lawn. His fixed cost includes insurance, his salary and monthly payments on equipment and amounts to Rs. 4000 per month. The variable costs include gas, oil, hourly wages for his employees and miscellaneous expenses, which run about Rs. 75 per lawn. The average charge for full service lawn care is Rs. 115 per visit. How many lawns Ramesh must service each month to break even?

a) 100 b) 120 c) 140 d) 160

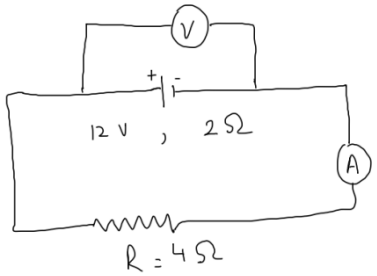
Q30. Two poles, 30 feet and 50 feet tall, are 40 feet apart and perpendicular to the ground. The poles are supported by wires attached from the top of each pole to the bottom of the other, as in the figure. A coupling is placed at C where the two wires cross. What is the horizontal distance of C to the taller pole?



a) 32 feet b) 25 feet c) 18 feet d) 30 feet

SECTION D
SCIENCE

Q1. The potential difference applied across a given resistor is altered so that the heat produced per second increases by a factor of 9. By what factor does the applied potential difference change?



a) 3 b) 9 c) 1/3 d) 1/9

Q2. Ram was performing an experiment on the optical bench using a convex lens. He fixed the position of object and image needle at a distance of 90 cm. He changed the position of the lens between the object and the image needle and found there are at least two positions of lens for which the fixed position of the object and the image needle form perfect object image case. What would possibly be the focal length of the lens?

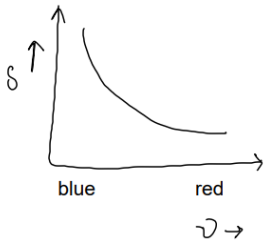
a) 20 cm b) 25 cm c) 30 cm d) 35 cm

Q3. Sarita while playing with a disc and marbles, kept the disc floating in the air by throwing 10 marbles per second against it from below. If mass of each marble is 'm' and 'v' is the velocity of impact of each marble on it. What is the force exerted by the marble per second on the disc?

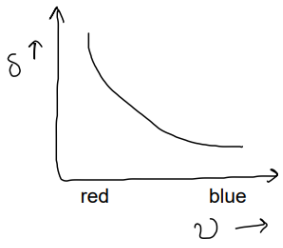
a) mv b) 2mv c) 20 mv d) Zero

Q4. Shyam wanted to understand how the frequency of light varies with the angle of deviation when incident on a triangular glass prism. Which of the following graphs will help him understand the variation of components of white light?

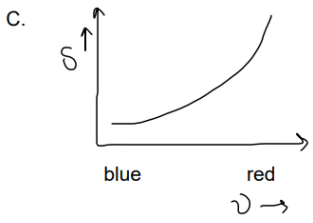
A.



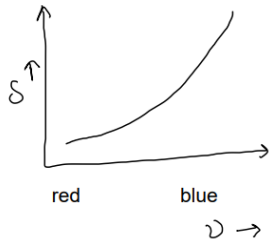
B.



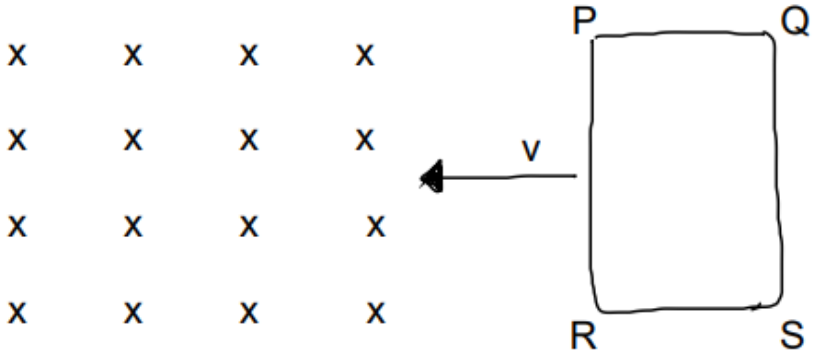
C.



D.

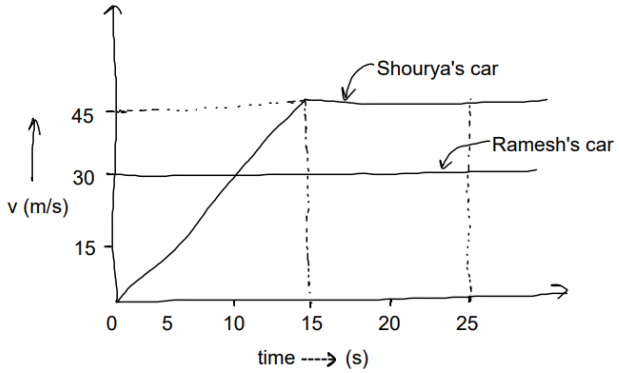


Q5. A closed loop PQRS is moving into uniform magnetic field acting at right angles to the plane of the paper as shown. State the direction of the induced current in the loop.



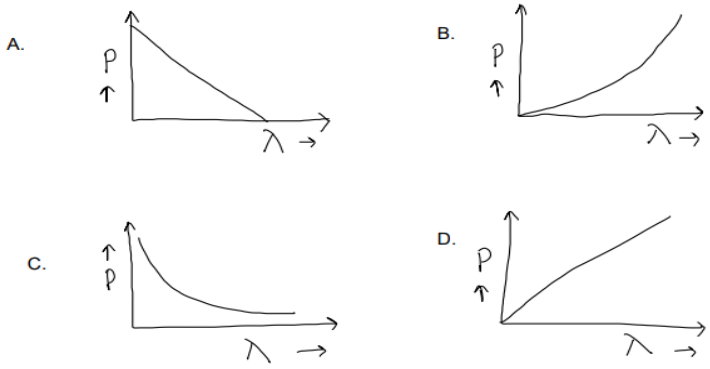
a) Anticlockwise
b) Clockwise
c) First anticlockwise, then clockwise
d) Current will not be induced

Q6. As soon as Shourya started his car from rest, Ramesh's scooter which was moving with uniform speed overtakes the car. The velocity time graphs are shown in the figure. After how much time will the Shourya catch up Ramesh?



a) 15 seconds
b) 7.5 seconds
c) 22.5 seconds
d) 25 seconds

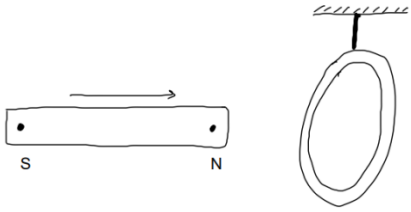
Q7. Identify the correct plot of power of a lens with wavelength of light.



Q8. Copper and silicon are cooled from 300 K and 60 K. What can you say about change in their resistivity?

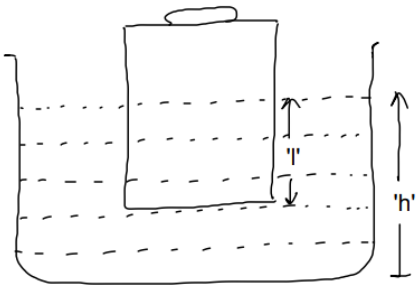
a) Increases, increases
b) Decreases, increases
c) Decreases, decreases
d) Increases, decreases

Q9. A copper ring is suspended by a thread in vertical plane. In the north pole of a magnet is brought near the ring in a horizontal direction as shown in the figure. What will be the effect on the ring?



a) Ring will be attracted towards the magnet.
b) Ring will be repelled away.
c) Ring will oscillate.
d) No change.

Q10. A wooden block, with a coin placed on its top, floats in water as shown in the figure. If the coin falls in the water then:



a) 'l' decreases and 'h' increases
b) 'l' increases and 'h' decreases
c) Both 'l' and 'h' increase
d) Both 'l' and 'h' decrease

Q11. An acid having pH 6 is diluted 1000 times. What will be the pH of the final solution?

a) 7.442 b) 6.424 c) 5.624 d) 6.996

Q12. A bivalent metal has an equivalent mass of 32. The molecular mass of metal nitrate is……

a) 168 b) 192 c) 188 d) 182

Q13. How many litres of water must be added to 1 litre of an aqueous solution of HCl with pH of 1 to create an aqueous solution of HCl with pH of 2?

a) 9L b) 0.1 L c) 0.9 L d) 2 L

Q14. Naturally occurring Boron consists of two isotopes whose atomic masses are 10.01 and 11.01. The atomic mass of Boron is 10.81. Find out the percentage of each isotope in natural Boron:

a) 35% and 65%
b) 20% and 80%
c) 27% and 73%
d) 15% and 85%

Q15. How many electrons can fit in the orbital for which n = 3 and l = 1?

a) 2 b) 6 c) 10 d) 14

Q16. Four elements A, B, C and D form a series of compounds having the formulae AB, B_2, CB_3, DB_2, DB_3. If the jumbled up atomic numbers of A, B, C, D are 13, 19, 26, 35. What are the order of atomic numbers of A, B, C, D?

a) A=26; B=13; C=19; D=35
b) A=13; B=26; C=35; D=19
c) A=35; B=19; C=26; D=13
d) A=19; B=35; C=13; D=26

Q17. What will be the resultant pH when 200 ml of an aqueous solution of HCl (pH =2) is mixed with 300 ml of an aqueous solution of NaOH (pH = 12)?

a) 12.39 b) 10.42 c) 11.31 d) 13.36

Q18. Which of the following elements show covalency greater than 4?

a) Be b) P c) B d) H

Q19. Those elements impart colour to the flame on heating in it, the atoms of which require low energy for the ionization (i.e; absorb energy in the visible region of spectrum). The elements of which of the following groups will impart colour to the flame?

a) Group - 2 b) Group - 3 c) Group - 1 d) Both A and C

Q20. A chemical A is used for the preparation of washing soda to recover ammonia. When CO_2 is bubbled through an aqueous solution of A, the solution turns milky. It is used for white wash. What is the chemical formula of A?

a) $CaCO_3$ b) CaO c) $Ca(OH)_2$ d) $Ca(HCO_3)_2$

Q21. Read the following statements and find out the incorrect statement.

(i) The alimentary canal begins with an anterior opening – mouth and it opens out posterior through anus.
(ii) The mouth leads to oral cavity or buccal cavity. The oral cavity has number of teeth, a muscular tongue and three pairs of salivary glands.
(iii) The first set of teeth is called temporary milk teeth or permanent adult teeth which are replaced by a set of permanent or deciduous teeth.
(iv) The upper surface of the tongue has small projections called taste buds.

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

Q22. Match the column-I and column -II, and choose the correct combination from the options given:

Column I	Column II
(i) Ammonotelism	K. Birds
(ii) Bowman's capsule	L. Water reabsorption
(iii) Micturition	M. Bony Fish
(iv) Uricotelism	N. Urinary bladder
(v) ADH	O. Renal tubule

a) (i) - L; (ii) -N ; (iii) - O; (iv) - M; (v) – K
b) (i) - M; (ii) - O; (iii) - N; (iv) - K; (v) – L
c) (i) - K; (ii) - O; (iii) - N; (iv) - M; (v) – L
d) (i) - M; (ii) - N; (iii) - O; (iv) - K; (v) - L

Q23. How many types of cells are present in an embryo sac?

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

Q24. Female AaBb is crossed to male AAbb gametes shall be:

a) Female – AB and ab, Male – AA and bb
b) Female – Aa and Bb, Male – AA and bb
c) Female – AB, Ab, aB and ab, Male – Ab
d) Female – AA, bb, AB and ab, Male – Ab

Q25. An organism with two identical alleles is……

a) Dominant b) Hybrid c) Heterozygous d) Homozygous

Q26. The process of exchange of O_2 from the atmosphere with CO_2 produced by cell is called……..

a) Respiration b) Breathing c) Metabolism d) Both A and B

Q27. A person with blood group B requires blood. The blood group which can be given is …….

a) A and B b) A and AB c) B and O d) A, B, AB and O

Q28. Choose the wrong statement regarding urine formation.

a) Henle's loop plays an important role in concentration of urine.
b) Protein-free fluid is filtered from blood plasma into Bowman's capsule.
c) ADH helps in water elimination, making the urine hypotonic.
d) Filtration is a non-selective process performed by glomerulus.

Q29. The female gametes of an angiospermic plant have 14 chromosomes in their nucleus. The chromosome number in the embryo, endosperm, zygote and the cells of the seedling will be, respectively……

a) 28, 42, 28, 28
b) 28, 28, 28, 14
c) 28, 42, 28, 14
d) 42, 28, 14, 28

Q30. In F_2 generation of a Mendelian dihybrid cross the number of phenotypes and genotypes are ……

a) Phenotype – 4; genotype – 16
b) Phenotype – 9; genotype – 4
c) Phenotype – 4; genotype – 8
d) Phenotype – 4; genotype – 9