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A QUEST FOR SCIENCE ASPIRANTS !

CLASS 9

Science Aptitude Test

SCIENCE APTITUDE TEST

TIME : 3 HOURS | **MAX MARK : 400** | **DATE : 21- 01- 2024**

INSTRUCTIONS

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

Caution : Class, as given on paper above MUST be correctly marked on the answer OMR sheet before attempting the paper. Wrong Class will give wrong results.

1. This booklet consists of 100 questions. Question paper consists of 4 sections. Marking scheme is given in table below:

Section	Subject	Questions No.	Making Scheme for each questions	
			Correct Answer	Wrong Answer
PART - **I**	Mental Ability	15	4	-1
PART - **II**	Mathematics	40	4	-1
PART - **III**	Physics & Chemistry	30	4	-1
PART - **IV**	Biology	15	4	-1

3. Answers have to be marked on the OMR sheet. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
4. Blank papers, cellular phones, smart watches, log tables, slide rule, calculator and electronic devices, in any form, are not allowed.

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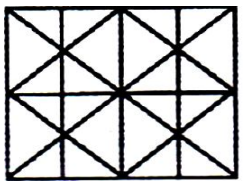
PART - I : MENTAL ABILITY

1. What is the number of straight lines in the following figure ?



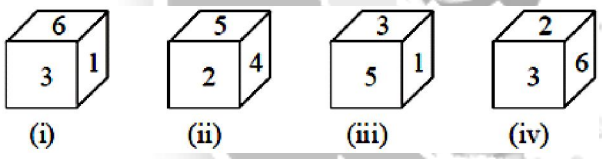
(a) 11 (b) 14
(c) 16 (d) 17

2. Observe the following sequence:
A B A A B A B B A A A B B A A B A B A A
How many A's are followed by B's?
(a) 7 (b) 2
(c) 5 (d) 6

3. Find the missing term? 4, 10, ..., 82, 244, 730
(a) 24 (b) 28
(c) 77 (d) 218

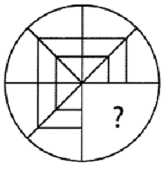
4. Seismography: Earthquake: : Barometer : ?
(a) Landslides (b) Volcanoes
(c) Pressure (d) Resistance

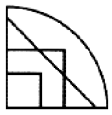
5. A dice has been thrown four times and produces following results.

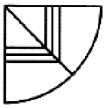
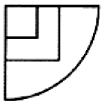


Which number will appear opposite to the number 3?
(a) 4 (b) 5
(c) 6 (d) 1

6. In each of these questions, trace out the suitable alternative to fit into the blank space in figure in order to complete the pattern.



(a)  (b) 

(c)  (d) 

7. What was the day on 26th January 1950, when first Republic Day of India was celebrated ?
(a) Monday (b) Tuesday
(c) Thurday (d) Friday

8. What is the angle covered by the minute hand in 22 minutes?
(a) 66° (b) 110°
(c) 121° (d) 132°

9. Kalpana travels 3 km eastwards and then turns left and travels 6 km. She then turns right, and travels 2 km and then travels 3 km northwards. She finally travels 5 km westwards. How far is she from the starting position and in which direction?
(a) 9 km and North-east
(b) 9 km and North-west
(c) 13 km and North-east
(d) 9 km and North

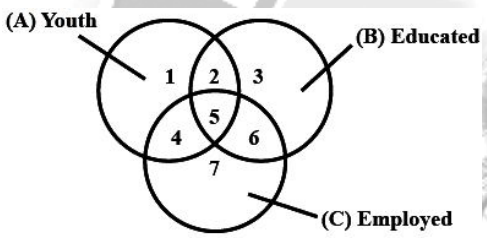
10. Study the pattern of the numbers in the following questions and select the missing numbers in the place of question mark (?). Mark the correct alternative on your answer-sheet as directed.

21	56	70
45	87	84
115	180	?

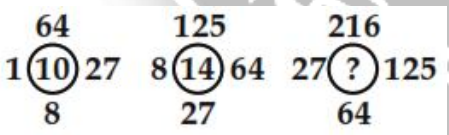
(a) 130 (b) 195
(c) 295 (d) 150

Space for Rough Work

11. If 5 January 2001 was Friday, then which was the day on 25 December 2001?
    (a) Monday (b) Tuesday
    (c) Wednesday (d) Thursday
12. If in a certain language, 943 is coded as BED and 12448 is coded as SWEET, how is 492311 coded in that language ?
    (a) EDSWBS (b) TSWBDD
    (c) DSWTEE (d) EBWDSS
13. In each of the following questions, four words are given, out of which three are same in one way and the fouth one is different from others. Select the odd one.
    (a) Poland (b) Korea
    (c) Greece (d) Spain
14. Study the diagram below and identify the region representing youth who are employed but not educated.



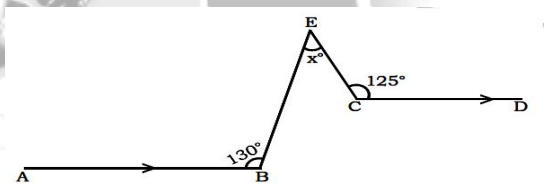
    (a) 4 only (b) 1, 4, 7
    (c) 4, 7 (d) 4, 5, 6
15. The given set of figures carry certain characters. Assuming that the characters in set follow a similar pattern, find the missing character.



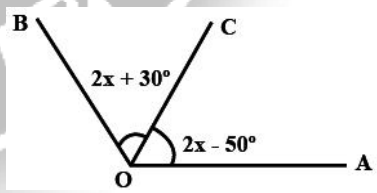
    (a) 2 (b) 9
    (c) 17 (d) 18

PART - II : MATHEMATICS

1. π is _____ number.
    (a) a rational
    (b) an irrational
    (c) a rational and an irrational
    (d) None
2. P(x) = 5 is a polynomial of degree _____.
    (a) 2 (b) 0
    (c) 1 (d) $\frac{1}{2}$
3. If x + 1 is a factor of the polynomial $2x^2 + kx$, then the value of k is
    (a) –3 (b) 4
    (c) 2 (d) –2
4. Position of point (–6,0) on graph paper is:
    (a) On OY' axis (b) On OX' axis
    (c) in the second quadrant
    (d) in the fourth quadrant
5. In the figure, AB || CD. Then x° is



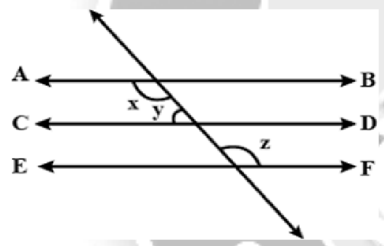
    (a) 70° (b) 75°
    (c) 65° (d) 130°
6. What value of x will make AOB a straight line?



    (a) 30º (b) 50º
    (c) 49º (d) none

Space for Rough Work

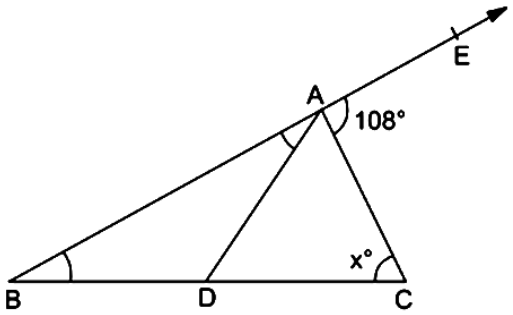
7. If $t^2 - 4t + 1 = 0$, then the value of $\left(t^3 + \frac{1}{t^3}\right)$ is.
   (a) 44 (b) 48
   (c) 52 (d) 64
8. One of the factors of $x^4 + 4$ is:
   (a) $x^2 + 2$ (b) $x^2 - 2x + 2$
   (c) $x^2 - 2$ (d) None
9. The greater among $\sqrt{17} - \sqrt{12}$ and $\sqrt{11} - \sqrt{6}$ is
   (a) $\sqrt{17} - \sqrt{12}$ (b) $\sqrt{11} - \sqrt{6}$
   (c) Both are equal (d) Can't say
10. The value of x in is $\sqrt[3]{4x - 7} - 5 = 0$
    (a) 33 (b) 44
    (c) 55 (d) None
11. If 17x + 13y = 41 and 13x + 17y = 19, then x + y=____.
    (a) 3 (b) 6
    (c) 2 (d) 10
12. In the given figure, if AB | |CD, CD | |EF and Y : Z = 3 : 7, then find x : z.



    (a) 5 : 7 (b) 3 : 5
    (c) 5 : 3 (d) 1 : 1
13. If M is a perfect square number, then the next immediate square number is:
    (a) M + 5 (b) $M^2 + 2M$
    (c) $M + 2\sqrt{M} + 1$ (d) None
14. A river 2m deep and 45m wide is running at the rate of 3km/hr. The amount of water that runs into the sea per minute is:
    (a) 4500 m^3 (b) 27000 m^3
    (c) 3000 m^3 (d) 2700 m^3
15. If $3\sqrt{5} + \sqrt{125} = 17.88$, then what will be the value of $\sqrt{80} + 6\sqrt{5}$?
    (a) 13.41 (b) 20.46
    (c) 21.66 (d) 22.35
16. If each side of a square is increased by 50%, the ratio of the area of the resulting square to that of the given square is
    (a) 3 : 2 (b) 5 : 4
    (c) 4 : 9 (d) 9 : 4
17. The degree of the polynomial $\left(2x^5 + 3x^4 + 2x^2 - 10x + 1\right)^3$ is
    (a) 8 (b) 5
    (c) 10 (d) 15
18. The repair cost of a cycle is 2.5% of its cost price. If the repair cost is Rs. 120, then the cost price of the cycle is
    (a) Rs. 2800 (b) Rs. 3800
    (c) Rs. 4800 (d) Rs. 4200
19. Unit place digit in the product of first 40 natural numbers.
    (a) 6 (b) 0
    (c) 5 (d) 8
20. The graph of the linear equation 2x + 5y = 10 meets the x-axis at the point
    (a) (0, 2) (b) (2, 0)
    (c) (5, 0) (d) (0, 5)

Space for Rough Work

21. In the given figure, AD divides $\angle BAC$ in the ratio 1 : 3 and AD = DB. Determine the value of x.



(a) 80^0 (b) 72^0
(c) 54^0 (d) 90^0

22. The value of $2.\overline{45} + 0.\overline{36}$ is

(a) $\frac{67}{33}$ (b) $\frac{24}{11}$
(c) $\frac{31}{11}$ (d) $\frac{167}{110}$

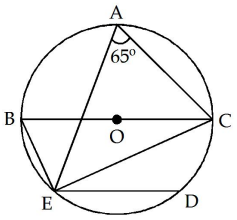
23. The value of $4 - \cfrac{5}{1 + \cfrac{1}{3 + \cfrac{1}{2 + \frac{1}{4}}}}$

(a) $\frac{40}{31}$ (b) $\frac{4}{9}$
(c) $\frac{1}{8}$ (d) $\frac{31}{40}$

24. The average of 9 numbers is 8. What should be added as 10th number to make the average 9?

(a) 10 (b) 72
(c) 18 (d) 90

25. In the given figure, chord ED is parallel to the diameter BC of the circle. Given, $\angle CAE = 65^o$, find $\angle DEC$.



(a) 55 (b) 35
(c) 25 (d) 40

26. When the product

$$\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right).....\left(1+\frac{1}{n}\right),$$

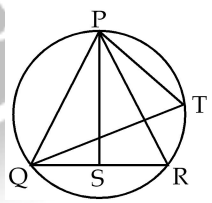
simplified it becomes

(a) n (b) $\frac{n-1}{2}$
(c) $\frac{n+1}{2}$ (d) $\frac{n}{2}$

27. If the numerator of a fraction is decreased 25 percent and the denominator of that fraction is increased 25 percent, then the difference between the resulting and the original fractions represent what percentage decrease?

(a) 40% (b) 45%
(c) 50% (d) 60%

28. In the fig. (Not to scale)



Space for Rough Work

$\angle QPS = \angle SPR = 2\angle PQS$

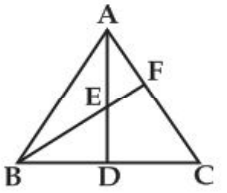
$\angle PSR = 3\angle PRS$

Then $\angle PTQ$

(a) 25^0 (b) 15^0

(c) 36^0 (d) 30^0

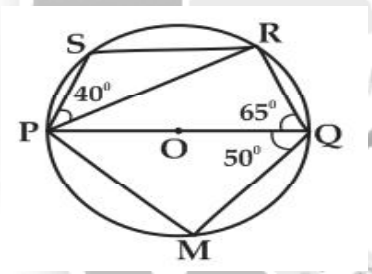
29. In the given figure, AD is a median of ΔABC and E is the midpoint of AD. If BE is joined and produced to meet AC in F then AF = ?



(a) $\frac{1}{2}AC$ (b) $\frac{1}{3}AC$

(c) $\frac{2}{3}AC$ (d) $\frac{3}{4}AC$

30. If O is the centre of the circle, then measure of QPM in the following figure is:



(a) 65° (b) 50°

(c) 40° (d) 72°

31. The length of the longest rod that can be placed in a room of dimensions (10 m × 10 m × 5 m) is

(a) 15 m (b) 16 m

(c) $10\sqrt{5}$ m (d) 12 m

32. The remainder when $x^4 - y^4$ is divided by (x - y) is

(a) 0 (b) x + y

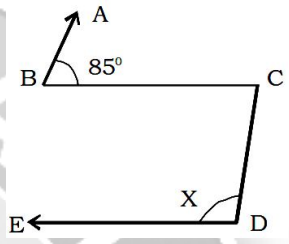
(c) $x^2 - y^2$ (d) $2y^4$

33. Rationalize $x = \frac{1}{2-\sqrt{3}}$

(a) $2+\sqrt{3}$ (b) 10

(c) $7+2\sqrt{3}$ (d) 8

34. In the given figure AB||CD and BC||DE then the value of x is _____



(a) 95^0 (b) 90^0

(c) 85^0 (d) 80^0

35. The speed of the boat is 10 kmph, If the boat takes 8 hours to complete the downstream journey and 12 hrs to complete the journey upstream, then the speed of the stream is

(a) 4 kmph (b) 3 kmph

(c) 2 kmph (d) 1 kmph

36. If (x + a) be a common factor of $x^2 + px + q$ and $x^2 + lx + m$, then the value of a is

(a) $\frac{m+q}{l-p}$ (b) $\frac{m-q}{l+p}$

(c) $\frac{m+q}{l+p}$ (d) $\frac{m-q}{l-p}$

Space for Rough Work

37. Find the value of $\left[\left[\frac{a}{b}\right]^{\sqrt{99}-\sqrt{97}}\right]^{\sqrt{99}+\sqrt{97}}$

(a) $\frac{b^2}{a^2}$ (b) $\frac{b}{a}$

(c) $\sqrt{\frac{b}{a}}$ (d) $\frac{a^2}{b^2}$

38. Number of real roots of the quadratic equation are $(x-4)^2+(x-5)^2+(x-6)^2=0$

(a) 2 (b) 1

(c) 0 (d) none of these

39. An equilateral triangle is inscribed in a circle of radius 6 cms. Find its sides.

(a) $4\sqrt{3}$ cms (b) $6\sqrt{3}$ cms

(c) $8\sqrt{3}$ cms (d) 10 cms

40. E is the mid-point of the non-parallel side BC of a trapezium ABCD. From a point E line parallel to CD is drawn which intersects AD at F. EF = ?

(a) 2 AB (b) $\frac{1}{2}$AB

(c) 2 (AB + CD) (d) $\frac{1}{2}$(AB + CD)

PART - III : PHYSICS & CHEMISTRY

1. Which of the following is not the unit of time ?

(a) Micro second (b) Leap year

(c) Lunar month (d) Light year

2. The ratio of the numerical values of the average velocity and average speed of a body is

(a) unity

(b) unity or less than unity

(c) unity or more than unity

(d) Can't be decided

3. The acceleration of a moving body can be found from

(a) area under velocity - time graph

(b) area under distance -time graph

(c) slope of the velocity- time graph

(d) slope of distance-time graph

4. A body moves in straight line with velocity V_1 for 1/3rd time and for remaining time with V_2. Find average velocity.

(a) $\frac{v_1}{3}+\frac{2v_2}{3}$ (b) $\frac{v_1}{3}+\frac{v_2}{3}$

(c) $\frac{3v_1}{3}+\frac{v_2}{3}$ (d) $v_1+\frac{2v_2}{3}$

5. Two trains are each 50 m long moving parallel towards each other at speeds 10 m/s and 15 m/s respectively. After what time will they pass each other?

(a) $5\sqrt{\frac{2}{3}}$ sec (b) 4 sec

(c) 2 sec (d) 6 sec

6. Impulse is

(a) a scalar quantity

(b) equal to change in the momentum of a body

(c) equal to rate of change of momentum of a body

(d) a force

Space for Rough Work

7. An object will continue moving with uniform velocity when
   (a) the resultant force on it is increasing continuously
   (b) the resultant force is at right angles to its rotation
   (c) the resultant force on it is zero
   (d) the resultant force on it begins to decrease
8. A person sitting in an open car moving at constant velocity throws a ball vertically up into air. The ball falls
   (a) outside the car
   (b) in the car ahead of the person
   (c) in the car to the side of the person
   (d) exactly in the hand which threw it up
9. A marble block of mass 2 kg lying on ice when given a velocity of 6 m/s is stopped by friction in 10 s. Then the magnitude of friction is
   (a) 0.6 N (b) 6 N
   (c) 12 N (d) 1.2 N
10. Unit of energy is
   (a) kwh (b) joule
   (c) electron volt (d) All of these
11. If a light body and heavy body have same kinetic energy, then which one has greater linear momentum?
   (a) Lighter body (b) Heavier body
   (c) Both have same momentum
   (d) Can't be predicted
12. Speed of sound is maximum in
   (a) solids (b) liquids
   (c) gases
   (d) depends on the temperature of the medium
13. What is unit of Power?
   (a) W (b) N
   (c) D (d) J
14. Two spheres of masses m and M are situated in air and the gravitational force between them is F. The space around the masses is now filled with a liquid of density 3. The gravitational force will now be
   (a) 3 F (b) F
   (c) F/3 (d) F/9
15. According to Archimedes' principle, loss of weight of a body immersed in a liquid is equal to
   (a) weight of the liquid displaced
   (b) weight of the total liquid
   (c) weight of the body
   (d) None of these
16. Which one of the following statements is correct?
   Statements 1: Physical state of a substance can be changed by changing its temperature.
   Statement 2: Physical state of a substance can be changed by changing pressure.
   (a) Statement 1
   (b) Statement 2
   (c) Both statements are correct
   (d) Both statements are incorrect
17. Which one of the following statements is correct?
   Statement 1: If temperature of a solid substance is increased, the force of attraction between its molecules will also increase
   Statement 2: If temperature of a solid substance is increased, the force of attraction between its molecules will decrease
   (a) Statement 1 only
   (b) Statement 2 only
   (c) Both statements are correct
   (d) Both statements are incorrect
18. Bromine has a melting point of - 7.2^{0}C and a boiling point of 59^{0}C. At what temperature will bromine have a definite volume but no definite shape?
   (a) 65^{0}C (b) 36^{0}C
   (c) -26^{0}C (d) 98K

Space for Rough Work

19. Why does a gas from a small container when transferred to a larger container occupy all the space available?
    (a) Gas has no definite mass.
    (b) Gas has no definite shape.
    (c) Gas has no definite volume.
    (d) Gas has no definite density.
20. Which of the following property does not prove that water is a compound?
    (a) Water is made up of two different elements, which chemically combined with one another in a fixed proportion
    (b) Water has fixed boiling point
    (c) The constituents of water cannot be separated by simple physical methods
    (d) Distilled water and tap water have same taste and constituents
21. Which of the following statements are true for pure substances?
    I. Pure substances contain only one kind of particles.
    II. Pure substances may be compounds or mixtures.
    III. Pure substances have the same composition throughout.
    IV. Pure substances can be exemplified by all elements other than nickel.
    (a) I and II (b) I and III
    (c) III and IV (d) II and III
22. Two elements X and Y combine to give a product Z. The correct statement about Z is
    (a) Z has more mass than that of X
    (b) Z has less mass than that of X
    (c) Z has less mass than that of Y
    (d) Z show same properties as that of X and Y
23. Which of the following forms a colloidal solution in water?
    (a) Salt (b) Glucose
    (c) Starch (d) Barium nitrate
24. Calculate the number of moles present in 400 grams of $CaCO_3$.
    (a) 2moles (b) 3moles
    (c) 1mole (d) 4moles
25. Which one of the following is correct about elements?
    (a) Elements are consisting of one type of atoms.
    (b) Atoms of element are smallest part of a substance.
    (c) All the elements are consisting of same type of atoms.
    (d) All the above
26. What do oxygen atom and oxide ion have in common?
    (a) Same size
    (b) Same number of electrons
    (c) Same electronic configuration
    (d) Same number of protons
27. Which has maximum number of atoms ?
    (a) 24 g of C (b) 56 g of Fe
    (c) 27 g of Al (d) 108 g of Ag
28. Which fundamental particles are not present in the normal hydrogen?
    (a) Electron (b) Proton
    (c) Neutron (d) All of these
29. The valency of silicon is :
    (a) 2 (b) 4
    (c) 6 (d) 8
30. The number of neutrons in an atom having atomic number 11 and mass number 23 is:
    (a) 11 (b) 10
    (c) 13 (d) 12

Space for Rough Work

PART - IV : BIOLOGY

1. To solve the food problem of the country, which among the following is necessary?
   (a) Increased production and storage of food grains
   (b) Easy access of people to the food grain
   (c) People should have money to purchase the grains
   (d) All of the above
2. Lysosome arises from
   (a) Endoplasmic reticulum
   (b) Golgi apparatus
   (c) Nucleus
   (d) Mitochondria.
3. Cork is impervious to water because it has deposition of
   (a) Lignin (b) Pectin
   (c) Suberin (d) All of these.
4. Ligament connects
   (a) Bone to muscle (b) Bone to bone
   (c) Organ to bone
   (d) Blood vessels to adipose tissue
5. Haemoglobin is invovled in
   (a) Transport of oxygen
   (b) Transport of some carbon dioxide
   (c) Both A and B
   (d) Transport of urea.
6. Harmful UV radiations coming from sun to earth are absorbed by -
   (a) O_2 (b) CO_2
   (c) N_2 (d) Ozone
7. Ameoba reproduce through -
   (a) Binary fission (b) Budding
   (c) Fertilisation (d) Tertiary fusion
8. The multicellular organism which reproduces by budding is
   (a) amoeba (b) yeast
   (c) paramecium (d) hydra
9. The smallest bacterium is
   (a) Paramoecium (b) amoeba
   (c) Vibrio (d) Mycoplasma
10. Which of the following tissues has dead cells?
    (a) Parenchyma (b) Sclerenchyma
    (c) Collenchyma (d) Epithelial tissue
11. Girth of stem increases due to
    (a) apical meristem
    (b) lateral meristem
    (c) intercalary meristem
    (d) vertical meristem
12. Intestine absorb the digested food materials. What type of epithelial cellsare responsible for that?
    (a) Stratified squamous epithelium
    (b) Columnar epithelium
    (c) Spindle fibres
    (d) Cuboidal epithelium
13. Nerve cell does not contain
    (a) axon (b) nerve endings
    (c) tendons (d) dendrites
14. Cartilage is not found in
    (a) nose (b) ear
    (c) kidney (d) larynx
15. Voluntary muscles are found in
    (a) alimentary canal
    (b) limbs
    (c) iris of the eye
    (d) bronchi of lungs

Space for Rough Work