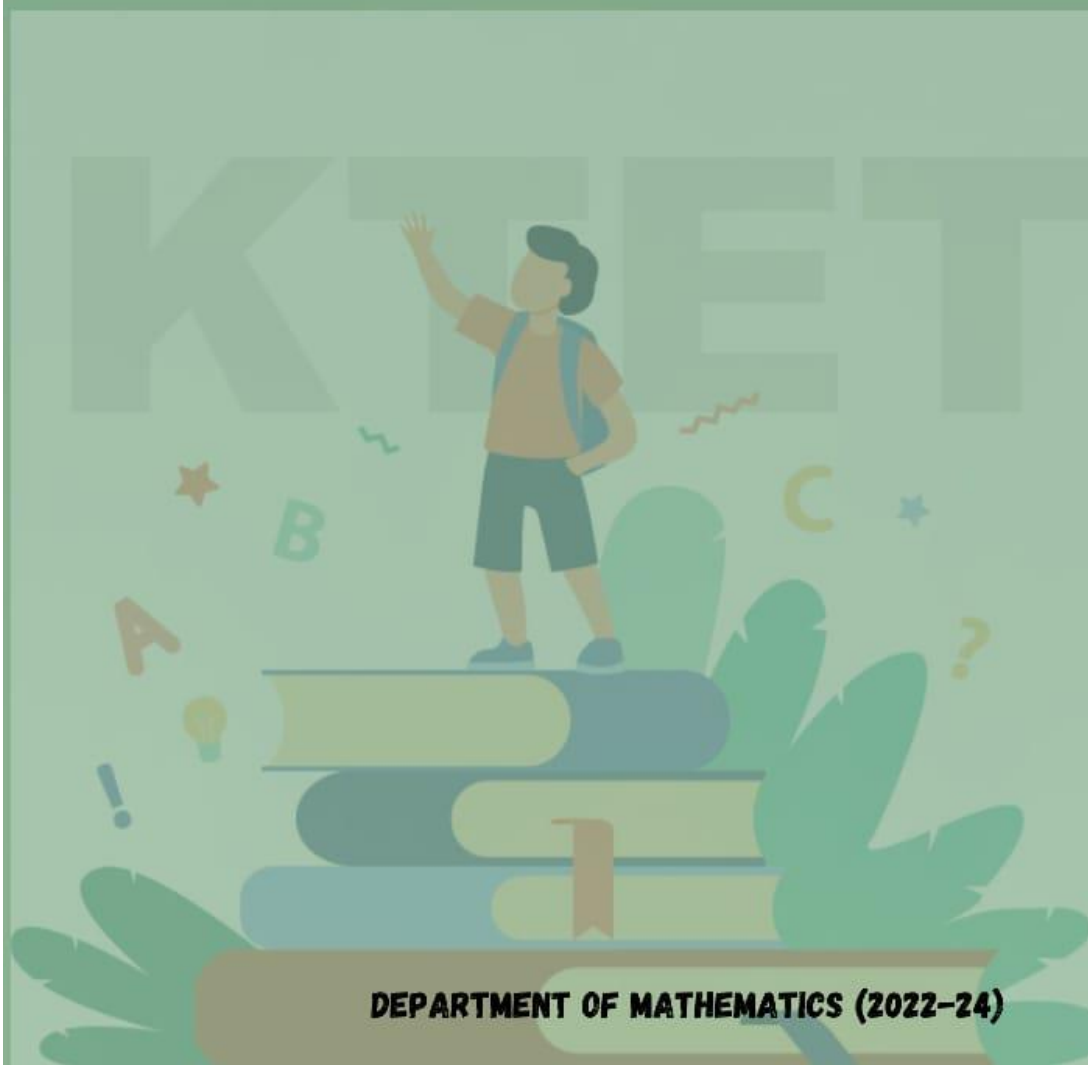


COMPENDIUM OF K-TET QUESTIONS



DEPARTMENT OF MATHEMATICS (2022-24)

P.K.M COLLEGE OF EDUCATION MADAMPAM

December 2022

COMPENDIUM OF K-TET QUESTIONS

P K M COLLEGE OF EDUCATION, MADAMPAM

DEPARTMENT OF MATHEMATICS

BATCH 2022-2024

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EDITORIAL

Kerala Teacher Eligibility Test (KTET) exam is conducted by Pareeksha Bhavan, Kerala twice a year in order to determine the eligibility of aspirants possessing adequate skills to teach in Lower Primary, Upper Primary as well as High School classes in the state of Kerala. For student teachers who are enrolled in BEd with mathematics as their optional subject needs to clear K-TET exam for that particular subject along with their core subjects of BEd curriculum.

It is observed that students face problems while writing the exams and while preparing for the exams. The main reason for it is the shortage of questions to work with. Students need an abundant supply of questions to work with and to get acclimatised with the question pattern. Compendium of K-TET Questions is specifically aimed to resolve such issues. The package is designed in such a way that students have access to substantial amount of questions and its answers and they can use them in an hazard free manner.

The teacher educator as well as the student teachers worked as a team to gather questions and its answers. I strongly believe that this attempt would help those who are preparing for K-TET examination.

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MATHEMATICS

STATISTICS

- Find the mean deviation about the mean of the following data.
 X_i : 2 5 6 8 10 12
 F_i : 2 8 10 7 8 5

a. 2.3 b. 2.4 c. 2.5 d. 2.6
- Find the standard deviation and variance of the following.
 X_i : 6 8 10 12 14 16 18 20 22 24

a. SD= $\sqrt{55}$ Variance=55 b. SD= $\sqrt{22}$ Variance=22 c. SD= $\sqrt{44}$ Variance=44 d. SD= $\sqrt{33}$ V=33
- If the number of squares of the first n natural numbers is 285, then n is?

a. 4 b. 5 c. 8 d. 6
- If the probability of hitting a target is $\frac{5}{7}$, then what is the probability of missing the target?

a. $\frac{2}{6}$ b. $\frac{2}{7}$ c. $\frac{2}{3}$ d. $\frac{2}{8}$
- From a pack of 52 playing cards 2 cards are drawn at random. What is the probability that both are ace?

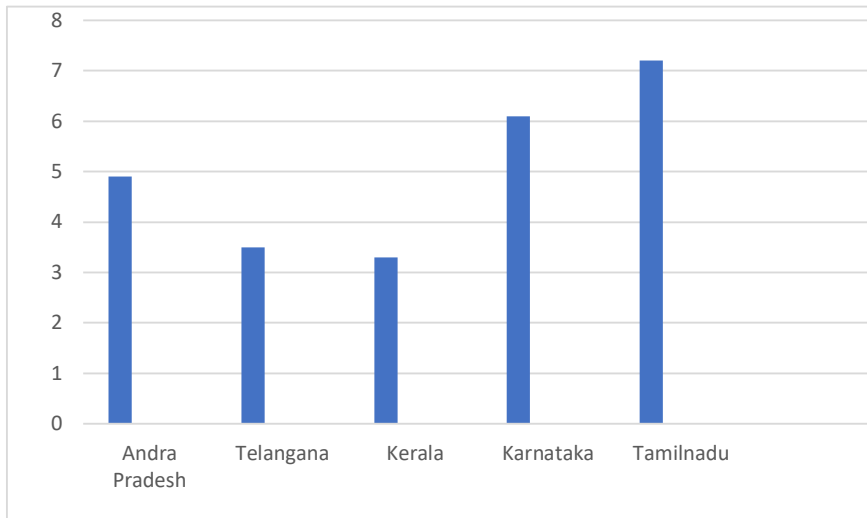
a. $\frac{1}{221}$ b. $\frac{1}{220}$ c. $\frac{1}{223}$ d. $\frac{1}{245}$
- A bag contains 100 tickets numbered 1,2,3,...,100. If a ticket is drawn from the bag what is the probability that the number on the ticket contains the digit 2?

a. $\frac{19}{100}$ b. $\frac{20}{100}$ c. $\frac{19}{200}$ d. $\frac{18}{100}$
- Paper slips bearing number from 50 to 99 are placed in a box. A man chooses a slip from the box at random. What is the probability that it shows a prime number?

a. $\frac{1}{3}$ b. $\frac{1}{5}$ c. $\frac{1}{6}$ d. $\frac{1}{8}$
- Two fair dice are thrown. What is the probability that the sum of the numbers that appear on the dice is a multiple of 3?

a. $\frac{1}{2}$ b. $\frac{1}{4}$ c. $\frac{1}{3}$ d. $\frac{1}{7}$

9. A box contains paper slips numbered from 1 to 100. Two slips are drawn together from the box. What is the probability that the product of the numbers drawn is even?
- a. $\frac{3}{9}$ b. $\frac{8}{9}$ c. $\frac{6}{9}$ d. $\frac{7}{9}$
10. The arithmetic mean and standard deviation of 100 observations are 60 and 5 respectively. If each observation is multiplied by 3 and increased by 5, then the new mean and standard deviation are?
- a. Mean=185, SD=15 b. Mean=186, SD=14 c. Mean=185, SD=18 d. Mean=189, SD=15
11. Two dice each numbered 1 to 6 are thrown. What is the probability that the sum of the numbers that turn up is 8?
- a. $\frac{5}{30}$ b. $\frac{2}{36}$ c. $\frac{4}{26}$ d. $\frac{5}{36}$
12. In a school drama group there are 6 boys and 5 girls. Another group contains 4 boys and 4 girls. If one pupil is selected at random from each group what is the probability that one is a boy and the other is a girl.
- a. $\frac{1}{7}$ b. $\frac{1}{2}$ c. $\frac{1}{3}$ d. $\frac{1}{7}$
13. What is the median of the following numbers?
28,42,36,54,19,26,22,47,17,48,17,19,22,26,28,36,42,47,48,54
- a. 31 b. 33 c. 32 d. 34
14. The algebraic sum of deviations of 30 observations measured from 20 is 3. The arithmetic mean of the observations is?
- a. 20.2 b. 20.1 c. 20.7 d. 20.4
15. If the middle number of 25 consecutive natural numbers is 31, then the sum of all those numbers is?
- a. 770 b. 885 c. 995 d. 775
16. The population statistics (in crores) of South Indian states are given in the following graph



Which states population is very close to the average population of these states?

- a. Andra Pradesh b. Telangana c. Kerala d. Karanataka

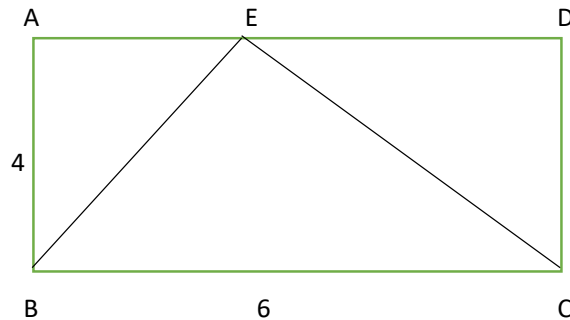
17. In the histogram of a frequency distribution, a line is drawn parallel to the y- axis, dividing the area of the histogram in to two equal parts. The point where the line cuts the x- axis corresponds to what?

a.

18. Cards numbered from 1 to 25 are put in a box. One card is taken out and is declared to be an odd number. What is the probability that it is a prime?

- a. $\frac{3}{13}$ b. $\frac{5}{13}$ c. $\frac{7}{13}$ d. $\frac{5}{25}$

19. ABCD is a rectangle with AB= 4cm, BC= 6cm. Area of the triangle CDE is 8 square centimetres. If a dot is put inside the rectangle. What is the probability of the dot being inside the triangle ABE?



- a. $\frac{1}{4}$ b. $\frac{1}{8}$ c. $\frac{1}{2}$ d. $\frac{1}{6}$

20. The marks obtained by students in an exam is given

Score	No of students
-------	----------------

Below 30	3
Below 40	7
Below 50	12
Below 60	20
Below 70	32
Below 80	42
Below 90	48
Below 100	50

How many students has scored between 60 and 69?

- a. 11 b. 12 c. 13 d. 14

21. In a simultaneous throw of two coins, the probability of getting at least one head is?

- a. $\frac{3}{4}$ b. $\frac{2}{4}$ c. $\frac{5}{4}$ d. $\frac{2}{9}$

22. From a pack of 52 cards, one card is drawn at random. What is the probability that the card drawn is a ten or a spade?

- a. $\frac{4}{13}$ b. $\frac{5}{13}$ c. $\frac{7}{13}$ d. $\frac{8}{14}$

23. Given that E and F are events such that $P(E) = 0.6$, $P(F) = 0.3$ and $P(E \cap F) = 0.2$, then $P(E|F)$?

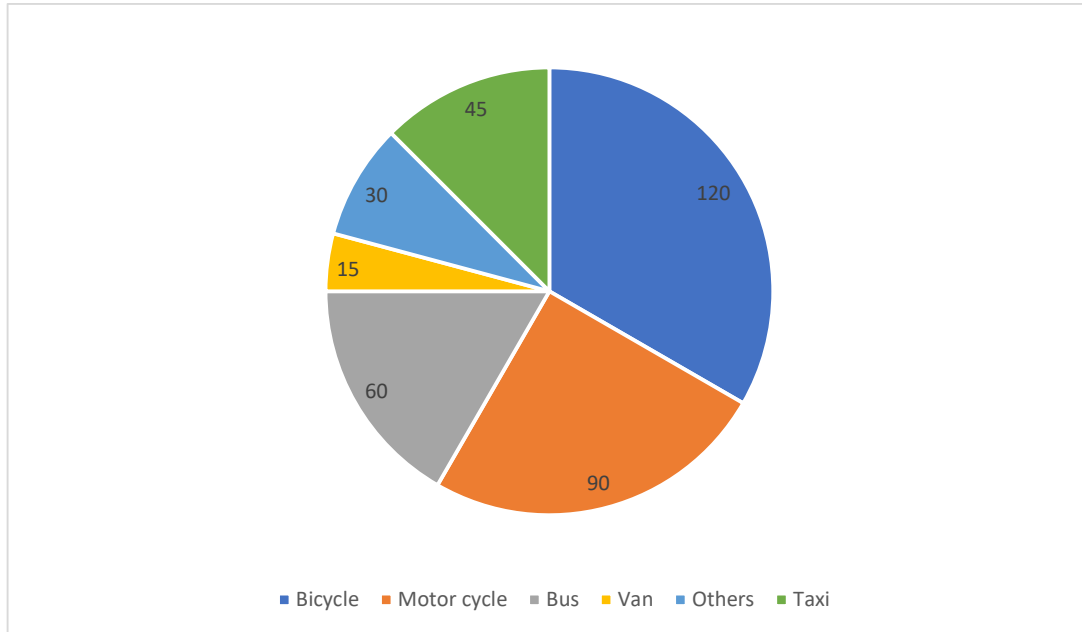
- a. $\frac{2}{4}$ b. $\frac{3}{2}$ c. $\frac{2}{3}$ d. $\frac{7}{3}$

24. Total angles in Pie chart are?

- a. 380° b. 360° c. 180° d. 270°

25. While constructing Frequency Distribution, the number of classes used depends upon?

26. Study the following pie chart



If the annual production of motor cycle is 1.80 lacs, the annual production of Bicycle is?

- a. 2.3 b. 2.7 c. 2.5 d. 2.4

ANSWERS

- 1) 2.3 2) $SD = \sqrt{33}$, Variance= 33 3) 8 4) $\frac{2}{7}$ 5) $\frac{1}{221}$ 6) $\frac{19}{100}$ 7) $\frac{1}{5}$ 8) $\frac{1}{3}$ 9) $\frac{7}{9}$
 10) Mean=185, SD=15 11) $\frac{5}{36}$ 12) $\frac{1}{2}$ 13) 32 14) 20.1 15) 775 16) Andhra Pradesh
 17) $\frac{5}{13}$ 18) $\frac{1}{6}$ 19) 12 20) $\frac{3}{4}$ 21) $\frac{4}{13}$ 22) $\frac{2}{3}$ 23) 360° 24) Size of the class
 25) 2.4 lacs

EXPONENTIATION, ALGEBRA

1). If $(2p)^5=220$ then what is the value of p?

- A)3 B)6 C)4 D)5

2. If $53+53+53+53+53=5p$ then what is the value of p?

- A)1 B)5 C)10 C)4

3. If $5n=625$ then $5n+2=?$

- A)78125 B)3125 C)15625 D)625

4. $144(1/2)+216(1/3) =?$

- A)18 B)32 C)24 D)36

5. $(-1)^{100}+(-1)^{101} =?$

- A)1 B)0 C)-1 D)2

6. If $3^7 + 3^7 + 3^7 = 3^x$, then $x =?$

- A)7 B)9 C)8 D)21

7. $810.2 \times 810.3 =?$

- A)81 B)27 C)9 D)3

8. If $(ma)^b \times (mb)^a = m^2$, then $ab =?$

- A)2 B)0 C)4 D)1

9. $23+33+43 +53 + \underline{\hspace{1cm}}$. Find the next term.

- A)6 B)36 C)216 D)18

10. If $(3n)(1/2) = 729$, then $n =?$

- A)12 B)10 C)15 D)14

11. If $(2x)(1/3) = 32$, then $x =?$

- A)12 B)20 C)15 D)18

12. $(240)(1/2) =?$

- A)210 B)220 C)216 D)222

13. If a is a non zero integer, then $a^{x-y} \times a^{y-z} \times a^{z-x} =?$

- A)0 B)1 C)a D)a²

14. How many times 727 is 728?

- A)2 B)7 C)1 D)28
15. The value of k for which $kx+3y-k+3=0$ and $12x+ky=k$ have infinitely many solutions is
A)6 B)3 C)8 D)5
16. If the equation $2x^2+4x+p=0$ has equal roots then find p .
A)0 B)1 C)2 D)3
17. If $p(x)=x^4-8x^3+24x^2-32x+16$ is a polynomial function. Then find $p(3)$.
A)3 B)2 C)1 D)0
18. What do we get on simplifying the expression
 $(X/x+1) + (x+1/x) - (1/x(x+1))$
A)0 B)2 C)x D)1
19. What is the remainder when the polynomial $4x^3+2x^2+x+(1/2)$ is divided by $2x-1$
A)0 B)1 C)2 D)1/2
20. If $1/x = x-1$, then one value of x is
A) $(3(1/2)+1)/2$ B) $(3(1/2)-1)/2$ C) $(5(1/2)+1)/2$ D)1
21. Which of the following is a factor of $3x^3-4x^2-6x+7$
A) $x+1$ B) $x+2$ C) $x-1$ D) $x-2$
22. If $x-(1/x)=3$, then $x^3-(1/x^3)=?$
A)36 B)18 C)25 D)9
23. x^3+x^2+x+1 is a factor of which of the following polynomial?
A) x^4-1 B) x^4+1 C) $x^4-x^3+x^2-x$ D) $x^4-x^3+x^2-x+1$
24. If $4x^2+kx+25$ is a perfect square, then what is the value of k ?
A)8 B)15 C)20 D)1
25. If $(x+(1/x))=2$, then $x^2+1/x^2=?$
A)4 B)2 C)8 D)12

Answers

- 1) 4 2) 4 3) 15625 4) 18 5) 0 6) 8 7) 9 8) 1 9) 216 10) 12 11) 15 12) 220 13) 1 14) 7
15) 6 16) 2 17) 1 18) 2 19) 2 20) $(5(1/2)+1)/2$ 21) $x-1$ 22) 36 23) x^4-1 24) 20 25) 2

AVERAGE, DISTANCE AND TIME

1. A flight covering a distance of 1200 km could reduce the travel time by 30 minutes, due to an additive tailwind that increases the average speed by 120 km/hr. What was the duration of the flight in hours?

- a) 3 hours b) 2 hours c) 2 hours 30 minutes d) 2 hours 10 minutes

2. A boat can go 16 km downstream and 10 km upstream in 3 hours. It can also go 24 km downstream and 5 km upstream in 2 hours. In how much time (in hours) will it cover a distance of 64 km downstream.

- a) 1 hour b) 2 hours c) 3 hours d) 1 hour 30 minutes

3. Without any stoppage, Sunil travels a certain distance at an average speed of 80 km/hr. With stoppages, he covers the same distance at an average speed of 60 km/hr. How many minutes per hour does he stop for?

- a) 30 minutes b) 10 minutes c) 20 minutes d) 15 minutes

4. Two trains, X and Y, travel from A to B at average speeds of 80 km/hr and 90 km/hr respectively. If X takes an hour more than Y for the journey, then the distance between A and B is ____.

- a) 720 km b) 790 km c) 700 km d) 740 km

5. A train travels at an average speed of 36 km / h . How far will it go in 3 minutes ?

- a) 108 km b) 108 m c) 1.8 km d) 180 m

6. A train took 3 hours and 30 minutes to cover 210 kilometers. What is its average speed in km/ hr?

- a) 50 b) 60 c) 64 d) 70

7. The average weight of a kid in a group of 10 is 40 kilograms. When Suresh also joined them, the average became 41 kilograms. How much does Suresh weight?

- a) 10 kg b) 40 kg c) 41 kg d) 51 kg

8. If the average of 5 consecutive natural numbers is 25, then what is the average of next 5 consecutive natural numbers?

- a) 28 b) 32 c) 30 d) 35

9. A train takes 20 minutes to travel a distance of 30 kilometers, and then the speed of the train in kilometer / hour is

- a) 60 b) 90 c) 80 d) 120

10. Average of 8 consecutive natural numbers is 38.5. What is the smallest of these 8 numbers?

- a) 33 b) 35 c) 38 d) 42

11. A train of length 100 meters is running at a speed of 72 kilometers / hour. What is the time required for the train to cross a bridge 500 meters long?
- a) 50 b) 20 c) 45 d) 30
12. What is the average of all numbers in the sequence 5, 10, 15,, 95 ?
- a) 50 b) 45 c) 48 d) 54
13. There are three positive numbers. One-third of the average of all the three numbers is 8 less than the greatest number. The average of the smallest and the second smallest number is 8. What is the greatest number?
- a) 22 b) 11 c) 10 d) 8
14. A bus covers a certain distance in 2 hours at an average speed of 40 km / hr. If a bicycle requires 5 hours to cover the same distance, then what is the average speed of the bicycle?
- a) 10 b) 32 c) 16 d) 45
15. The average weight of 10 children is 50 kg. When a new child joined the group the average weight is reduced by 1 kg. What is the weight of the new child?
- a) 35 b) 39 c) 40 d) 30
16. There are three positive numbers. One-third of the average of all the three numbers is 8 less than the greatest number. The average of the smallest and the second smallest number is 8. What is the greatest number?
- a) 11 b) 9 c) 10 d) 12
17. Two trains are going from Bangalore to Chennai with a speed of 80km/hr and 100km/hr. If the train with slower speed starts 1 hour before then find the time taken by the second train to catch the 1st train.
- a) 5 hour b) 3.5 hours c) 4 hours d) 4.5 hours
18. A motorcycle is moving at the speed of 25 km/hour and its speed is increased by 7 km/hour at the end of each hour. How much time it will take to cover a distance of 225 km?
- a) 11/2 hours b) 6 hours c) 5 hours d) 7 hours
19. Find the average speed of train if it covers first half of the distance at 3 kmph and second half of the distance at 6 kmph.
- a) 3 kmph b) 4 kmph c) 5 kmph d) 4.5 kmph
20. If Maya goes to office at a speed of 40 km/hr, she reaches 5 minutes late, if she travels at the speed of 60 km/hr, she is 10 minutes early. What is the distance to office from her home?
- a) 45 kmph b) 50 kmph c) 30 kmph d) 55 kmph
21. The driver of an auto-rickshaw sees a person 70 meters ahead of him. The person is 110 meters behind after 30 seconds. If the speed of the auto-rickshaw is 28 km/h, what is the speed of the person?
- a) 6.4 kmph b) 8 kmph c) 8.5 kmph d) 5 kmph

22. A man travels from A to B at a speed of 36 km/hr in 74 minutes and he travels a distance from B to C with a speed of 45 km/hr in 111 minutes. Find the average speed of whole journey.
- a) 42 km/h b) 50 km/h c) 41.4 km/h d) 52 km/h
23. A man leaves from P at 6 AM and reaches Q at 2 PM on the same day. Another man leaves Q at 8 AM and reaches P at 3 PM on the same day. At what time do they meet?
- a) 11 am b) 10.48 am c) 1 pm d) 11.30 am
24. A train crossed a 110 m long platform in 13.5 seconds and a 205 m long platform in 18.25 seconds. What was the speed of the train?
- a) 78 km/h b) 72 km/h c) 57 km/h d) 70 km/h
25. A train having a length of 500 m passes through a tunnel of 1000 m in 1 minute. What is the speed of the train in Km/hr?
- a) 90 km/h b) 100 km/h c) 60 km/h d) 65 km/h
26. A 1200 m long train crosses a tree in 120 sec, how much time will it take to pass a platform 700 m long?
- a) 200 seconds b) 199 seconds c) 190 seconds d) 150 seconds
27. A car completes a journey in seven hours. It covered half of the distance at 40 kmph and the remaining half at 60 kmph speed. Then, what is the distance (in km) covered?
- a) 336 km b) 350 km c) 240 km d) 500 km
28. A car travels some distance at a speed of 8 km/hr and returns at a speed of 12 km/hr. If the total time taken by the car is 15 hours, then what is the distance (in km)?
- a) 80 km b) 55km c) 72 km d) 68 km
29. Two trains, one 152.5 m long and the other 157.5 m long, coming from opposite directions crossed each other in 9.3 seconds. The combined speed of the two trains every hour would then be ____.
- a) 130 km/h b) 135 km/h c) 125km/h d) 120 km/h
30. Running at a speed of 60 km per hour, a train passed through a 1.5 km long tunnel in two minutes. What is the length of the train?
- a) 550 m b) 560 m c) 500 m d) 520 m
31. The two trains are moving in opposite directions to each other. The speeds of both trains are 105 km/hr and 120 km/hr. Find the relative speed of the two trains with respect to each other.
- a) 250 km/h b) 100 km/h c) 200 km/h d) 225 km/h
32. A man covers a certain distance by a train running at a speed of 40 km/hr and covers the same distance back by walking at a speed of 8 km/hr. If the whole journey took 12 hours, then what is the distance of one side of the journey (in km)?
- a) 240 b) 80 c) 81 d) 68

33. The distance between Delhi and Lucknow is 520 km. A train covers 70 km in the first hour and if it runs at the speed of 90 kmph to cover the rest of the distance, then what is the total time taken?

- a) 6 hours b) 4 hours c) 120 minutes d) 7 hours

34. A train travels at a speed of 66 km/h and halts at five junctions for a certain time. It covers a distance of 1485 km in one day. For how long (in minutes) does the train stop at each junction, if it halts for the same period of time at all the junctions?

- a) 36 b) 20 c) 18 d) 30

ANSWERS

- 1) 2 hours 30 minutes 2) 2 hours 3) 15 minutes 4) 720 km 5) 1.8 km 6) 60 7) 51 kg
8) 30 9) 90 10) 35 11) 30 12) 50 13) 11 14) 16 15) 39 kg 16) 11 17) 4 hours
18) 11/2 hours 19) 4 kmph 20) 30 kmph 21) 6.4 kmph 22) 41.4 km/hr 23) 10:48 AM
24) 72 km/hr 25) 90 km/hr 26) 190 seconds 27) 336 km 28) 72 km 29) 120 km/hr
30) 500 m 31) 225 km/hr 32) 80 km 33) 6 hrs 34) 18 minutes

ARITHMETICS, GRAPHS OF ELEMENTARY FUNCTIONS

- 1) If an angle is its own complementary angle, then its measure
a) 80° b) 45° c) 60° d) 90°
- 2) Cos zero degree is
a) 0 b) 1 c) Not defined d) None of these
- 3) Volumes of two cubes are in the ratio 8:27. Ratio of their surface area is
a) 2:3 b) 3:2 c) 4:9 d) 9:4
- 4) What is the largest number of 4 digits which divided by 6, 9, 12, 15 or 18 leaves 1 as remainder in each case?
a) 9901 b) 9899 c) 1081 d) 9673
- 5) How many 3 digit numbers, in all, are divisible by 6?
a) 140 b) 150 c) 160 d) 170
- 6) A certain sum amount to Rs 5832 in 2 yr at 8% per annum compound interest, the sum is
a) Rs 5000 b) Rs 5200 c) Rs 5280 d) Rs 5400
- 7) Find the largest common divisor of 102 and 1170
a) 10 b) 7 c) 6 d) 8
- 8) If $7n + 9 > 100$ and n is an integer, then smallest possible value of n is.25 respectively. The rate of interest was
a) 13 b) 12 c) 14 d) 15
- 9) The sum of natural numbers and its square equal the product of the first three prime numbers. The number is
a) 2 b) 3 c) 5 d) 6
- 10) The mean of five numbers is 18. If one number is excluded, their mean is 16. The excluded number is
a) 25 b) 26 c) 27 d) 30
- 11) The distance between two parallel line chords of length 8 cm each in a circle of diameter 10 cm is.
a) 6 cm b) 7cm c) 8cm d) 5.5cm

12) If $(3x - y) : (x + 5Y) = 5:7$, then the value of $(x + y) : (x - y)$ is

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

13) If $a + b = 5, a^2 + b^2 = 13$, the value of $a - b$ (where $a > b$) is

- a) 1 b) -2 c) 2 d) -1

14) $8^3 \times 8^2 \times 8^{-5}$ is equal to

- a) 0 b) 1 c) 2 d) None of the above

15) A sum is invested at compound interest payable annually. The interest including principal in two successive years was Rs 225 and Rs 236.25 respectively. The rate of interest was

- a) 4.5% b) 5% c) 8% d) 6.25%

16) What is the domain of the function $f(x) = \sqrt{(64 - x^2)}$

- a) $-8 \leq x \leq 8$
b) $x \leq 8$
c) $x < 8$
d) $-8 < x < 8$

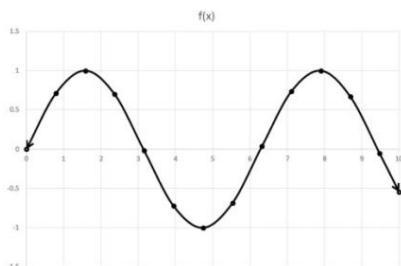
17) What is the domain of the function $f(x) = \frac{1}{x+2}$

- a) All real numbers except -2 b) All positive numbers
b) All real number except 2 c) All integers

18) What is the range of $y = x^2$?

- a) $y < 0$
b) $y \geq 0$
c) $y > 0$
d) $y \leq 0$

19) $f(x)$ Is a sine curve. What area the domain and range of this function



- a) Domain : All real numbers
Range: $-1 \leq f(x) \leq 1$
b) Domain : All real numbers
Range: $-1 < f(x) < 1$

20) Which analysis can be performed to determine if an equation is a function?

- a) Vertical line test b) Calculating zeroes
 b) Calculating domain and range c) Horizontal line test

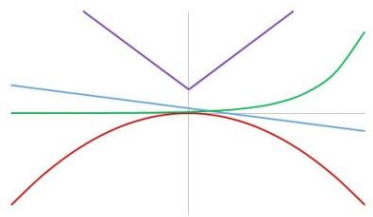
21) Let $f(x) = 2 - 2x + x^2$ and $g(x) = 2x - 1$. What is $f(g(x))$?

- a) $2x^2 - 4x + 3$ b) $2x^3 - 8x + 5$
 b) $x^3 + 3$ d) $4x^3 - 4x + 5$

22) Write $2x + 7y = 8$ in slope-intercept form

- a) $y = \frac{2}{7}x + \frac{8}{7}$
 b) $y = \frac{-2}{7}x - \frac{8}{7}$
 c) $y = \frac{2}{7}x - \frac{8}{7}$
 d) $y = \frac{-2}{7}x + \frac{8}{7}$

23) Based on the figure, which line depicts a quadratic function?



- a) None of them b) Green line c) Blue line d) Purple line e) Red line

24) What is the radius of the circle given by the equation: $x^2 + 4x + y^2 - 12y = 24$

- a) 8 b) 9 c) 11 d) 7 e) 10

25) Let $f(x) = 5 - (1 + x)^3$. What is $f^{-1}(x)$?

- a) $f^{-1}(x) = (5 - x)^3 - 1$
 b) $f^{-1}(x) = (1 - 5x)^{\frac{1}{3}} - 1$
 c) $f^{-1}(x) = (5 - x)^{\frac{1}{3}} - 1$
 d) $f^{-1}(x) = ((5 - x)^3 - 1)^{\frac{1}{3}}$

ANSWERS

1) 45 2) 1 3) 4:9 4) 9901 5) 150 6) Rs 5000 7) 6 8) 14 9) 5 10) 26 11) 6cm 12) 3:1

13) 1 14) 1 15) 5% 16) $-8 \leq X \leq 8$ 17) All real numbers except -2 18) $y \geq 0$

19) Domain : All real numbers Range: $-1 \leq f(x) \leq 1$ 20) Vertical line test 21) $4x^2 - 8x + 5$

22) $y = \frac{2}{7}x + \frac{8}{7}$ 23) Red line 24) 8 25) $f^{-1}(x) = (5 - x)^{\frac{1}{3}} - 1$

TRIGNOMETRY

- Find the value of $\sin^2 10 + \sin^2 20 + \sin^2 30 + \dots + \sin^2 80$.
A) 2 B) 3 C) 1 D) 4
- Find the value of $16/\sqrt{3} (\cos 50^\circ \cos 10^\circ \cos 110^\circ \cos 60^\circ)$.
A) 1 B) 2 C) -1 D) -2
- If $\sin 21^\circ = x/y$, then $\sec 21^\circ - \sin 69^\circ$ is equal to -----
A) $X^2/y \sqrt{(y^2-x^2)}$ B) $Y^2/y \sqrt{(y^2-x^2)}$
C) $X^2/y \sqrt{(x^2-y^2)}$ D) $Y/x \sqrt{(x^2-y^2)}$
- The value of $\tan 60^\circ / \cot 30^\circ$ is equal to:
A) 0 B) 1 C) 2 D) 3
- If x and y are complementary angles, then
A) $\sin x = \sin y$ B) $\tan x = \tan y$
C) $\cos x = \cos y$ D) $\sec x = \operatorname{cosec} y$
- If $\sec 4\theta - \sec 2\theta = 3$ then the value of $\tan 4\theta + \tan 2\theta$ is:
A) 8 B) 4 C) 6 D) 3
- The least value of $8\operatorname{cosec} 2\theta + 25\sin^2 \theta$ is:
A) $10\sqrt{2}$ B) $40\sqrt{2}$ C) $20\sqrt{2}$ D) $30\sqrt{2}$
- $\sin 2B = 2 \sin B$ is true when B is equal to
A) 90° B) 60° C) 30° D) 0°
- Find the value of $\cos 20^\circ \times \cos 40^\circ \times \cos 80^\circ$
A) $1/4$ B) $1/8$ C) $1/16$ D) $1/12$
- If $\sec 2\theta + \tan 2\theta = 5/3$, then what is the value of $\tan 2\theta$?
A) $2\sqrt{3}$ B) $\sqrt{3}$ C) $1/\sqrt{3}$ D) Cannot be determined
- If $\cos x \cdot \cos y + \sin x \cdot \sin y = -1$ Then $\cos x + \cos y$ is
A) -2 B) 1 C) 0 D) 2
- If in $\triangle ABC$, $\angle C = 90^\circ$, then $\sin(A + B) =$
A) 0 B) $1/2$ C) $1/\sqrt{2}$ D) 1
- In $\triangle ABC$, right-angled at B , $AB = 24$ cm, $BC = 7$ cm. The value of $\tan C$ is:
A) $12/7$ B) $24/7$ C) $20/7$ D) $7/24$
- What is the minimum value of $\sin A$, $0 \leq A \leq 90^\circ$
A) -1 B) 0 C) 1 D) $1/2$
- $5 \tan^2 A - 5 \sec^2 A + 1$ is equal to
A) 6 B) -5 C) 1 D) -4
- If $\{(2 \sin \theta - \cos \theta) / (\cos \theta + \sin \theta)\} = 1$, then the value of $\cot \theta$ is.....
A) $1/2$ B) $1/3$ C) 3 D) 2
- The value of $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$ is....
A) 1 B) 0 C) $2 \cos \theta$ D) $2 \sin \theta$
- If $\cot A + \operatorname{cosec} A = 3$ and A is an acute angle, then the value of $\cos A$ is....
A) $4/5$ B) 1 C) $1/2$ D) $1/\sqrt{3}$
- If θ be an acute angle and $7 \sin^2 \theta + 3 \cos^2 \theta = 4$, then the value of $\tan \theta$ is....
A) $\sqrt{3}$ B) $1/\sqrt{3}$ C) 1 D) 0

20. If $\sin \theta + \sin^2 \theta = 1$, then $\cos^2 \theta + \cos^4 \theta = ..$
 A) -1 B) 0 C) 1 D) 2
21. If a and b are complementary angles, then what is $\cos a \operatorname{cosec} b - \cos a \sin b$ equal to?
 A) $\sec b$ B) $\cos a$ C) $\sin a$ D) $-\tan b$
22. The value of $\cos 25^\circ - \sin 25^\circ$ is...
 A) Positive but less than 1 B) Positive but greater than 1
 C) Negative D) 0
23. If $\sin(A+B) = 1$, where $0 < B < 45^\circ$, then what is $\cos(A-B)$ equal to?
 A) $\sin 2B$ B) $\sin B$ C) $\cos 2B$ D) $\cos B$
24. If $y \sin 45^\circ \cos 45^\circ = \tan^2 45^\circ - \cos^2 30^\circ$, then $y = ...$
 A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) -2 D) 2
25. Evaluate $\cos^2 45^\circ - \sin^2 15^\circ$.
 A) $1/\sqrt{2}$ B) $\sqrt{2}/3$ C) $\sqrt{3}/4$ D) $\sqrt{4}$

Answers

1. D) 4 2. C) -1 3. A) $x^2/y \sqrt{y^2-x^2}$ 4. B) 1 5. D) $\sec x = \operatorname{cosec} y$ 6. D) 3
 7. C) $20\sqrt{2}$ 8. D) 0° 9. B) $1/8$ 10. B) $\sqrt{3}$ 11. C) 0 12. D) 1 13. B) $24/7$
 14. B) 0 15. D) -4 16. A) $\frac{1}{2}$ 17. B) 0 18. A) $4/5$ 19. B) $1/\sqrt{3}$ 20. C) 1
 21. C) $\sin a$ 22. A) Positive but less than 1 23. A) $\sin 2B$ 24. B) $1/2$
 25. C) $\sqrt{3}/4$

GEOMETRY OF SOLIDS, CIRCLES

Category 3

1. The radius of a circle $x^2 + y^2 - 6x - 8y + 24 = 0$

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

2. The equation of circle with centre (1,-2) and radius 4 cm is :

- a) $x^2 + y^2 + 2x - 4y = 16$
b) $x^2 + y^2 + 2x - 4y = 11$
c) $x^2 + y^2 + 2x + 4y = 16$
d) $x^2 + y^2 - 2x + 4y = 11$

3. The radius of the circle $x^2 + y^2 + x + c = 0$ passing through the origin is

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

4. If the center of a circle is the point (3,4) and it touches the line $3x + 4y - 5 = 0$, then find the radius of circle.

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

5. Find the equation of a circle whose centre is (2,-5) and which passes through the point (3,2)?

- a) $x^2 + y^2 + 4x + 10y - 21 = 0$
b) $x^2 + y^2 - 4x + 10y + 21 = 0$
c) $x^2 + y^2 - 4x + 10y - 21 = 0$
d) None of these

6. The number of the tangents that can be drawn from (2,6) to $x^2 + y^2 = 40$ is

- a) 0 b) 1 c) 2 d) more than 2

7. Calculate the perimeter a square with vertices on a circle of diameter 1cm.

- a) $2\sqrt{2}$ b) 2 c) $\sqrt{2}$ d) $3\sqrt{2}$

8. Calculate the perimeter a regular hexagon with vertices on a circle of diameter 1cm

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

9. A wire was bent into a circle of diameter 4 cm. What would be the diameter of a circle made by bending a wire of half the length ?

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

10. What is the radius of the incircle of a right triangle having perpendicular sides of length 5 cm and 12 cm.

- a) 3 b) 2 c) 5 d) 6

11. Perimeter of a quadrant of a circle of radius r is equal to :

- a) $2r + \frac{\pi r}{2}$ b) $r + \frac{\pi}{2}$ c) $r + \frac{\pi r}{2}$ d) $2r + \pi/2$

12. If a circle of radius 7 cm is divided into 10 equal parts, then the area of each sector is :

- a) 15 cm^2 b) 15.3 cm^2 c) 15.4 cm^2 d) 15.2 cm^2

13. The ratio of the area and circumference of a circle of radius 4 cm is :

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

14. The radius of a circle whose circumference is equal to the sum of circumferences of the circles of diameter 36 cm and 20 cm :

- a) 20 cm b) 28 cm c) 30 cm d) 21 cm

15. The length of a wire in the form of an equilateral triangle is 44 cm. If it is rebent into the form of a circle is :

- a) 152 cm^2 b) 154 cm^2 c) 153 cm^2 d) 156 cm^2

16. The height of a hollow cylinder is 7 cm and its radius is 3.5 cm. Then the surface area is :

- a) 152 cm^2 b) 153 cm^2 c) 154 cm^2 d) 151 cm^2

17. The circumference of the circular base of a cone is 50 cm. If the slant height of it is 10 cm, the curved surface area of the cone is :

- a) 230 cm^2 b) 250 cm^2 c) 251 cm^2 d) 252 cm^2

18. A solid cylinder and a cone have the same radius and height. If the volume of cylinder is 27 cm^3 , then the volume of cone is :

- a) 9 cm^3 b) 10 cm^3 c) 8 cm^3 d) 11 cm^3

19. The number of plane surfaces in a solid cone is :

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

20. The surface area of a sphere whose radius is 7 cm, is :

- a) 516 cm^2 b) 515 cm^2 c) 616 cm^2 d) 615 cm^2

21. Ratio between the radii of two solid spheres is 2:3, then the ratio between their volume is :

- a) 3:27 b) 2:18 c) 8:27 d) 4:16

22. The solid described by revolution of a semi circle about a fixed diameter is a :

- a) Sphere b) Circle c) square d) Triangle

23. Fifteen solid spheres are made by melting a solid metallic cone of base diameter 2 cm and height 15 cm. The radius of each sphere is :

a) $2/\sqrt[3]{3}$ b) $1/\sqrt[3]{4}$ c) $1/\sqrt{2}$ d) $1/\sqrt[3]{3}$

24. The radius of a sphere is $2r$, then its volume will be

a) $32/3 \pi r^3$ b) $16/3 \pi r^3$ c) $22/3 \pi r^3$ d) $32/3 r^3$

25. If the radius of a cylinder is 4 cm and height is 10 cm, then the total surface area of a cylinder is :

a) 351 cm^2 b) 352 cm^2 c) 353 cm^2 d) 350 cm^2

26. If the volume of a cube is 1728 cm^3 , the length of its edge is equal to :

a) 12 cm b) 11 cm c) 10 cm d) 13 cm

27. If the ratio of volumes of two spheres is 1:8, then the ratio of their surface area is :

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

28. The largest sphere is cut off from a cube of side 6 cm. The volume of the sphere will be

a) $32 \pi \text{ cm}^3$ b) $33 \pi \text{ cm}^3$ c) $31 \pi \text{ cm}^3$ d) $36 \pi \text{ cm}^3$

ANSWERS

1) 1 2) $x^2+y^2-2x+4y=11$ 3) $1/2$ 4) 4 5) $x^2+y^2-4x+10y-21=0$ 6) 1 7) $2\sqrt{2}$ 8) 3 cm 9) 2 cm
10) 2 11) $2r+\pi r/2$ 12) 15.4 cm^2 13) 2:1 14) 28 cm 15) 154 cm^2 16) 154 cm^2 17) 250 cm^2
18) 9 cm^3 19) 1 20) 616 cm^2 21) 8:27 22) Sphere 23) $1/34$ 24) $32/3 r^3$ 25) 352 cm^2
26) 12 cm 27) 1:4 28) $36\pi \text{ cm}^3$

GEOMETRY OF QUADRILATERALS, SOLIDS

Category 2

1. Three angles of a quadrilateral are 75° , 95° and 75° , the fourth angle is:
a) 120° b) 130° c) 110° d) 100°
2. A diagonal of a rectangle is inclined to one side of the rectangle at 25° . The acute angle between the diagonals is:
a) 30° b) 40° c) 50° d) 60°
3. If angles A, B, C and D of a quadrilateral ABCD, taken in order, are in the ratio 3: 7: 6: 4, then ABCD is a:
a) Rhombus b) Trapezium c) Parallelogram d) Hexagon
4. ABCD is a rhombus such that $\angle ABC = 40^\circ$, then $\angle ADC$ is equal to:
a) 30° b) 20° c) 40° d) 50°
5. If the diagonal of a rhombus are 18 cm and 24 cm respectively, then its side is equal to;
a) 15 cm b) 13 cm c) 12 cm d) 16 cm
6. If one angle of a parallelogram is 24° less than twice the smallest angle, then the measure of the largest angle of a parallelogram is:
a) 100° b) 112° c) 115° d) 110°
7. If two non parallel sides of a trapezium are equal then it is called as:
a) Isosceles trapezium b) Perpendicular trapezium c) Irregular trapezium
8. In a parallelogram ABCD if $A = 115$, find D :
a) 70° b) 65° c) 75° d) 80°
9. A parallelogram whose diagonals are equal but do not bisect each other at right angles:
a) Square b) Rectangle c) Triangle
10. The length of a diagonals of a rhombus are 16 cm and 12 cm. The length of each side of the rhombus is:
a) 11 cm b) 12 cm c) 10 cm d) 14 cm
11. If the angle of a parallelogram is two third of its adjacent angle , the smallest angle of the parallelogram is :
a) 62° b) 72° c) 70° d) 60°
12. If the quadrilateral formed by joining the mids of the sides of a quadrilateral is a:
a) Parallelogram b) Trapezium c) Rhombus d) cone
13. If the base of the parallelogram is thrice its height and the area is $108 m^2$, then find the base:
a) 12m b) 15m c) 18m d) 19m
14. Which of the following properties are not true for a parallelogram?
a) Its diagonals are equal
b) Its diagonals are perpendicular to each other
c) The diagonals does divide the figure into four congruent triangles
d) All the above

15. The diagonals of a quadrilateral PQRS bisect each other at right angles. If $PQ = 5.5$ cm, then the perimeter of PQRS is :
 a) 22 cm b) 21 cm c) 20 cm d) 18 cm
16. The ratio of two sides of a parallelogram is 4:3. If its perimeter is 56 cm. Find the lengths of its sides :
 a) 12 cm, 13 cm b) 14 cm, 15 cm c) 16 cm, 12 cm d) 11 cm, 13 cm
17. The length of a rectangle is 8 cm and each of its diagonals measures 10 cm. Find its breadth?
 a) 7 cm b) 8 cm c) 5 cm d) 6 cm
18. In a trapezium ABCD, $AB \parallel CD$, $\angle A = (2x - 35^\circ)$, $\angle B = y^\circ$, $\angle C = 85^\circ$ and $\angle D = (3x + 65^\circ)$. The values of x and y are respectively :
 a) $30^\circ, 60^\circ$ b) $20^\circ, 80^\circ$ c) $10^\circ, 50^\circ$ d) $60^\circ, 30^\circ$
19. Angles of a quadrilateral are in the ratio 3:6:8:13. The largest angle is :
 a) 158° b) 156° c) 152° d) 150°
20. If PQRS is a parallelogram, then $\angle Q - \angle S$ is equal to:
 a) 1° b) 0° c) 2° d) 3°
21. Equation of a sphere whose centre is (a, b, c) and radius r is :
 a) $(x - a)^2 + (y - b)^2 + (z - c)^2 = r^2$
 b) $(x + a)^2 + (y + b)^2 + (z + c)^2 = r^2$
 c) $(x - a)^2 - (y - b)^2 - (z - c)^2 = r^2$
 d) $(x + a)^2 - (y + b)^2 - (z + c)^2 = r^2$
22. Sum of the measure of the interior angles of a polygon is 1620° . Find the number of sides of the polygon:
 a) 10 b) 11 c) 12 d) 13
23. If a box has a length of 8 cm, a width of 20 and a height of 7 cm, what is the volume ?
 a) 1000 cm^3 b) 1200 cm^3 c) 1120 cm^3 d) 1121 cm^3
24. What is the surface area of the prism? length 20 cm and height 5 cm and width 550 cm.
 a) 400 cm^2 b) 510 cm^2 c) 550 cm^2 d) 500 cm^2
25. A box of milk has length of 8 cm and a height of 5. The volume is 280. What is the width ?
 a) 7 b) 8 c) 6 d) 5
26. A cylinder is moulded in to the shape of a sphere. Which of the following factors will be same for both the shapes ?
 a) Surface area b) Volume c) Width d) Height
27. The diameter of a sphere is 6 cm. It is melted and drawn into a wire of diameter 2mm. The length of the wire is :
 a) 35 m b) 32 m c) 34 m d) 36 m
28. The lateral surface area of a right circular cone of height 28 cm and base radius 21 cm is :
 a) 2310 b) 2325 c) 2450 d) 2120

ANSWERS

- 1) 120° 2) 50° 3) Trapezium 4) 40° 5) 15 cm 6) 112° 7) Isosceles trapezium 8) 65°
 9) Rectangle 10) 10 cm 11) 72° 12) Parallelogram 13) $b = 18$ cm 15) 22 cm 16) 16 cm, 12 cm
 17) 6 cm 18) $30^\circ, 60^\circ$ 19) 156° 20) 0° 21) $(x - a)^2 + (y - b)^2 + (z - c)^2 = r^2$ 22) 11
 23) 1120 cm^3 24) 500 cm^2 25) 7 26) Volume 27) 36 m 28) 2310

FRACTION, PERCENTAGE, RATIO AND PROPORTION

1. Ramesh spends $\frac{1}{5}$ of his salary on rent, $\frac{1}{10}$ of salary on clothes and $\frac{3}{5}$ of his salary on food. He still has Rs. 1700, his salary is-
a.19000 b.20000 c.17000 d.18000
2. Suman left $\frac{1}{5}$ of his property for eldest son, $\frac{1}{6}$ of his property to his second son and $\frac{5}{6}$ of his remaining to his daughter, how much was left over?
a. $\frac{19}{180}$ b. $\frac{180}{19}$ c. $\frac{18}{190}$ d. $\frac{8}{19}$
3. If $\frac{1}{3}$ of a number is 4 more than its $\frac{1}{5}$ th, then what will be the number?
a.30 b.20 c.35 d.40
4. If a fraction's numerator is increased by 1 and denominator is increased by 2 then the fraction becomes $\frac{2}{3}$ but when the numerator is increased by 5 and denominator is decreased by 1, then fraction becomes $\frac{5}{3}$, what is the original fraction?
a. $\frac{7}{5}$ b. $\frac{5}{7}$ c. $\frac{6}{7}$ d. $\frac{7}{6}$
5. $\frac{1}{5}$ of a number is equal to $\frac{5}{8}$ of the second number. If 35 are added to the first number then it becomes 4 times of second number. What is the value of second number?
a.25 b.20 c.35 d.40
6. $\frac{1}{4}$ of a number subtracted from $\frac{1}{3}$ of the number gives 12. Then the number is-
a.122 b.144 c.133 d.165
7. Sachin travelled $\frac{2}{11}$ of his journey by bus, $\frac{17}{22}$ by train and walked the remaining 1 km. How far did he go?
a.22 b.21 c.20 d.23
8. A lamp post has half of its length in mud, $\frac{1}{3}$ of its length in water and $\frac{11}{2}$ m above the water, the total length of the lamp post is-
a.23 b.32 c.33 d.43
9. What must be subtracted from the sum of $\frac{133}{16}$ and $\frac{53}{16}$ to have the remainder equal to their difference?
a. $\frac{53}{8}$ b. $\frac{53}{10}$ c. $\frac{8}{53}$ d. $\frac{3}{85}$
10. A piece of cloth is $\frac{1}{5}$ red, $\frac{1}{3}$ green and the rest is white. If the white piece is 7 m long then the length of the piece of the cloth is-
a.16 b.17 c.15 d.20
11. What is the number, $12\frac{1}{2}\%$ of which is 64?
a.510 b.210 c.512 d.521
12. The value of x when 5% of $\sqrt{2x}$ is 0.01 will be?
a.0.01 b.0.02 c.0.2 d.0.03
13. The difference of two numbers is 20% of the larger number. If the smaller number is 20, the larger number is?
a.20 b.25 c.35 d.40

14. There is 26% iron in a mixture. To find 91 kg iron, how much mixture we need?
a.350 kg b.315kg c.300kg d.310kg
15. In an examination 36% are pass marks. If an examinee gets 17 marks and fails by 10 marks what are the examination marks?
a.75 b.52 c.95 d.70
16. Subtracting 40% of a number from the number, we get the result as 30. Find the number.
a.40 b.45 c.55 d.50
17. The salary of a worker was first increased by 10% and there after decreased by 5%. What was the effect in his salary?
a.4.5% b.4.2% c.4.3% d.4.1%
18. 35% of a number is 105. What percentage of that number is 100?
a. $32\frac{1}{3}$ b. $33\frac{1}{3}$ c. $33\frac{2}{3}$ d. $23\frac{1}{3}$
19. Two numbers are respectively 60% and 20% more than a third. What percentage is the second of the first?
a.70% b.75% c.50% d.25%
20. Express $\frac{1}{3}$ as percentage of $\frac{5}{9}$.
a.70% b.53% c.60% d.63%
21. If A:B =3:4 and B:C=5:6 what is A:C?
a.8:5 b.5:8 c.6:5 d.5:6
22. The sum of two number is 40 and difference is 4. Find the number and find the ratio.
a. 22,18,11:9 c. 22,11,11:9
b. 22,19,11:9 d.21,18,9:11
23. If $x : y = 1 : 2$, $y : z = 2 : 3$ and $z : a = 3 : 4$ find $x : y : z : a$
a.1:2:3:4 b.1:2:3:5 c.2:1:3:4 d.4:2:3:1
24. Two numbers are in the ratio 7 : 8. If 6 is Subtracted from each, the resulting numbers are in ratio 5 : 6. Find the numbers?
a.24,22 b.22,24 c.21,24 d.26,21
25. The two number are in ratio 2 : 3. If sum of the square two numbers is 20800, find the numbers?
a.80,120 b.120,80 c.12,80 d.8,120
26. If A, B, C and D are four numbers such that A:B=2:3, B:C=4:5,C:D=5:8, then A:D is equal to-
a.1:3 b.3:1 c.2:3 d.3:2
27. Anita bought some pencils, erasers and papers from a stationary shop. If the ratio of the pencils and the erasers is the same as that of erasers and graph papers and she bought 10 pencils and 40 papers . Find the number of eraser bought by her?
a.20 b.12 c.40 d.30
28. Two positive numbers x and y are inversely proportional. If x increases by 10% , then y decreases by-
a.100/11 % b.11/100% c.12/100 % d.10/11 %
29. Matt sold 35 tickets to the school play and Renee sold 45 tickets. What is the ratio of the number of tickets Matt sold to the number of tickets Renee sold?

a.40:30 b.30:40 c.45:35 d.35:45

30. A team won 10 games and lost 7 games. What was this team's ratio of wins to losses?
a.10:7 b.7:10 c.1:7 d.7:1

ANSWERS

1. 17000 2.19/180 3. 30 4. 5/7 5. 40 6. 144 7. 22 8. 33
9. 53/8 10. 15 11. 512 12. 0.02 13. 25 14. 350 kg 15. 75
16. 50 17. 4.5% 18. $33\frac{1}{3}$ 19. 75% 20. 60% 21. 5:8 22. 22,18,11:9
22. 1:2:3:4 23. 21,24 24. 0,120 25. 1:3 26. 20 27. 100/11%
28. 35:45 29. 10:7

GEOMETRY, COORDINATE GEOMETRY, CONIC SECTON

1 Find the value of Y which is the distance between the point P (2,-3) and Q (10, 9) is 10 units?

a) $Y=2$ or $Y=-6$ b) $Y=3$ or $Y=-9$

c) $Y=-3$ or $Y=9$ c) $Y=4$ or $Y=8$

2 If (1,2),(4,y),(x,6),(3,5) are the vertices of a parallelogram taken in order find x and y ?

a) $X=2, Y=1$ b) $X=5, Y=3$ c) $X=6, Y=3$ d) $X=7, Y=0$

3 Find the area of a rhombus if it vertices are (3,0),(4,5),(-1,4) and (-2,1) ?

a) 20 units b) 15 units c) 22 units d) 24 units

4 Find the area of a triangle (2, 3), (-1, 0), (2,-4)?

a) $21/2$ b) $23/2$ c) $25/3$ d) $21/3$

5 In each of the following find the value of k, for which of the points are collinear (7, -2), (5, 1), (3,-k)?

a) $K=4$ b) $K=2$ c) $K=1$ d) $K=0$

6 Find the centre of a circle passing through the points (6,-6),(3,-7) and (3,3) ?

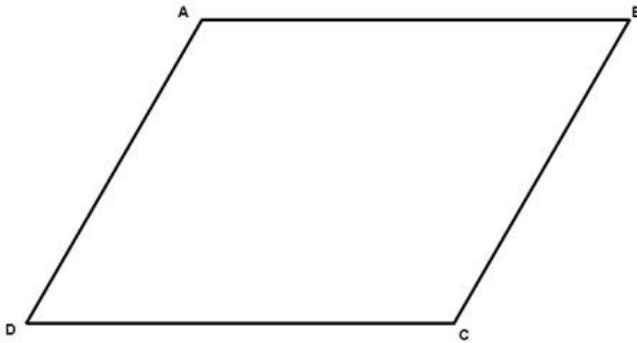
a) $(X,Y) = (-2,3)$ b) $(X,Y) = (0,0)$

c) $(X, Y) = (3,-2)$ d) $(X,Y) = (1,-1)$

7 Calculate slope of the line when P = (0,-1), Q = (4, 1)?

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

8 Find the 4th vertex of parallelogram



$$A = (3, 2) \quad B = (8, 4)$$

$$C = (X, Y) \quad D = (5, 7)$$

a) $(X, Y) = (10, 9)$ b) $(X, Y) = (8, 7)$

c) $(X, Y) = (9, 10)$ d) $(X, Y) = (7, 8)$

9. Find the equation of a line passing through $(2, -1)$ and it is parallel to the line $x + 2y - 5 = 0$?

a) $X + 3Y = 2$ b) $X + 2Y = 0$ c) $X + 2Y = 1$ d) $X - 2Y = -1$

10. Find the area of the quadrilateral vertices taken in order are $(-4, -2), (-3, -5), (3, -2)$ and $(2, 3)$?

a) 28 square unit b) 24 square units c) 20 square units d) 26 square units

11. Find the area of triangle $(-5, -1), (3, -5), (5, 2)$?

a) 30 unit b) 20 unit c) 22 units d) 32 unit

12. Find a relation between x and y if the points $(x, y), (1, 2)$ and $(7, 0)$ are collinear?

a) $X + 3Y - 7 = 0$ b) $X - 3Y - 7 = 0$ c) $2X + Y = 3$ d) $X + 2Y$

13. If $A(1, 1), B(6, 3)$ and $D(3, 5)$ are the vertices of a parallelogram ABCD then vertex C is?

a) $(8, 7)$ b) $(6, 7)$ c) $(7, 8)$ d) $(3, 8)$

14. Find the value of k which of the points are collinear $(8, 1), (k, -4), (2, -5)$?

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

15. Find the area of triangle formed by the vertices $(4, 5), (10, 12)$ and $(-3, 2)$?

- a) 2 b) 2.5 c) 3.5 d) 3

16. Find the equation of the circle with centre (3, 2) and radius 4, centre (h, k) = (-3, 2)?

- a) $X^2 + Y^2 + 6X - 4Y - 3 = 0$ b) $X^2 - Y^2 + 6X - 4Y = 0$
c) $X^2 + Y^2 + 6X + 4Y - 3 = 0$ d) $X^2 + Y^2 + 6X - 4Y + 3 = 0$

17. Find the equation of circle passing through the points (4, 1) and (6, 5) and whose centre is on the line $4x + y = 16$?

- a) $X^2 + Y^2 + 6X + 8Y + 15 = 0$ b) $X^2 + Y^2 - 6X - 8Y + 15 = 0$
c) $X^2 + Y^2 - 6X - 8Y - 15 = 0$ d) $X^2 + Y^2 - 6X + 8Y + 15 = 0$

18. Find the coordinates on the foci, the vertices of the ellipse?

- a) Foci= (4, 0), (-4, 0), Vertices= (5, 0), (-5, 0)
b) Foci= (3, 0), (-3, 0), Vertices= (4, 0), (-4, 0)
c) Foci= (1, 0), (-1, 0), Vertices= (3, 0), (-3, 0)
d) Foci= (5, 0), (-5, 0), Vertices= (4, 0), (-4, 0)

19. Find the equation of a circle $x^2 + y - 6y - 9 = 0$ and passing through the points (-4, -3)?

- a) $(X + Y)^2 + (Y + 3)^2 = 10$ b) $(X - Y)^2 + (Y + 3)^2 = 10$
c) $(X - Y)^2 + (Y - 3)^2 = 10$ d) $(X + Y)^2 + (Y - 3)^2 = 10$

20. Which of the following is the reflection of the point (-3, 4) on the line $x = 3$?

- a) (9, 4) b) (5, 4) c) (9, 5) d) (4, 9)

21. The perpendicular bisector of the line segment joining the points A(1,1) and B(3,5) cuts the X axis at ?

- a) (8, 8) b) (0, 0) c) (0, 8) d) (8, 0)

22. A point on the Y axis which is equidistant from (2,5) of (2,-3) is ?

- a) $Y = -2$ b) $Y = 2$ c) $Y = 1$ d) $Y = -1$

23. The coordinates of the point which are equidistant from the points (-1, 5), (1, 1), (9, 5) are?

- a) (5, 5) b) (5, 4) c) (4, 5) d) (4, 4)

24. Which of the following points lies on the line joining the points (2,5) and (6,7) ?

- a) (7, 7) b) (8, 8) c) (6, 6) d) (5, 5)

25. Area of the triangle with vertices (0,0),(2,0) and (0,4) is ?
- a) 3 square unit b) 2 square unit
c) 1 square unit d) 4 square unit
26. Which of the following is a point on the line with slope 2 and passing through the point (3, 2)?
- a) (0, 2) b) (2, 0) c) (0, 0) d) (3, 0)
27. Find the possible number of points with integral coordinates whose distance from (1, 2) is 2 units?
- a) 4 b) 3 c) 5 d) 2
28. Calculate the perimeter a square with vertices on a circle of diameter 1 c.m?
- a) 1 b) 2 c) 3 d) 5
29. Calculate the perimeter a regular hexagon with vertices on a circle of diameter 1 c.m?
- a) 2c.m b) 1c.m c) 3 c.m d) 4c.m

ANSWERS

1. b) $Y = 3$ or $Y = -9$ 2. c) $X = 6, Y = 3$ 3. d) 24 units 4. a) $2\frac{1}{2}$ 5. a) $K = 4$
6. c) $(X, Y) = (3, -2)$ 7. a) $\frac{1}{2}$ 8. a) $(X, Y) = (10, 9)$ 9. b) $X + 2Y = 0$ 10. a) 28 square units
11. d) 32 unit 12. c) $X + 3Y - 7 = 0$ 13. a) (8, 7) 14. b) 3 15. c) 3.5
16. a) $X^2 + Y^2 + 6X - 4Y - 3 = 0$ 17. b) $X^2 + Y^2 - 6X - 8Y + 15 = 0$
18. a) Foci = (4, 0), (-4, 0) Vertices = (5, 0), (-5, 0) 19. c) $(X - Y)^2 + (Y - 3)^2 = 10$
20. a) (9, 4) 21. d) (8, 0) 22. d) $Y = 1$ 23. c) (4, 5) 24. b) (8, 8)
25. d) 4 square unit 26. b) (2, 0) 27. a) 4 28. b) 2 29. c) 3 c.m

GENERAL SCIENCE

ANIMAL NUTRITION, BODY STRUCTURE, ECOSYSTEM AND BIO DIVERSITY

1. which of the following has a holophytic mode of nutrition?

- A) Amoeba B) Lion C) Euglena D) Earthworm

2. Golden rice contains high amount of ____

- A) Vitamin E B) Vitamin A C) Vitamin C D) Vitamin B

3. Which of the following is not a rich source of protein

- A) Milk B) Egg C) Seafood D) Groundnut oil

4. Which is the richest source of Vitamin A ?

- A) Milk B) Carrot C) Egg D) Seafood

5. What is the chemical name of Vitamin K ?

- A) Retinol B) Phylloquinone C) Tocopherol D) Biotin

6. Which one among the following is known as animal starch ?

- A) Cellulose B) Glucose C) Glycogen D) Pectin

7. The protein found in human hair and nail is known as

- A) Myosin B) Keratin C) Collagen D) Thrombin

8. The colour of the human skin is due to

- A) Melanin B) Blood C) Dermis D) None of them

9. In one minute ,heart beats____ times

- A) 56 B) 72 C) 82 D) 60

10. Hardest part in human body is

- A) Dentine B) Collagen C) Melanin D) Enamel

11. Smallest blood vessel in the body is
A)capillary B)Artery C)Vein D)Vena cava
12. The body organ which is not present in pair is
A)Kidney B)Heart C)Eye D)Ear
13. Name the smallest bone in the human body?
A)Stapes B)Incus C)Malleus D)Vomer
14. Kidney is a part of _____
A)Respiratory system B) Digestive system
C)Nervous system D)Excretory system
15. Which of the following is called the complete food
A) cereal B)Vegetables C) Milk D) Fruits
16. Maximum absorption of food takes place in____
A)Small Intestine B)stomach C)Large Intestine DMouth
17. Which of the following is the most productive ecosystem?
A) Estuary B) Open sea C) Desert D)Mountain
18. A food chain starts with
A)carnivores B)Herbivores
C)Photosynthesizing organisms D)Decomposers
19. *Nepenthes* is _____
A)primary producer B)Consumer
C)Both primary producer and consumer D)None of them
20. Which of the following bacteria has potential for nitrogen fixation?
A) Nitrosomonas B) Nitrobacter
C) Nitrosococcus D) Rhizobium
21. Decomposers are____
A)Heterotrophs B)Autotrophs C)Autoheterotrophs D)Organotrophs
22. Conservation with in the natural habitat is
A)Ex situ conservation B)In situ conservation
C)zoo D)Botanical garden
23. All are in situ conservation except one
A) Natural park B) Sanctuaries C) zoo D) Biosphere

24. Red data book contains__
A)All plant species B)All animal species
C)Economically important species D)Threatened species
25. Approximately 50% of total world species are present on
A)Tropical rain forest B)Coral reefs
B)Temperate Rain forest D)Temperate deciduous forest

ANSWERS

1. Euglena 2. Vitamin 3. Groundnut oil 4. Carrot 5. Phylloquinone
6. Glycogen 7. Keratin 8. Melanin 9. 72 times 10. Enamel
11. Capillary 12. Heart 13. Stapes 14. Excretory system 15.Milk
16. Small intestine 17. Estuary 18. Photosynthesizing organism
19. Both primary producer and consumer 20. Rhizobium 21. Heterotrophs
22. In situ conservation 23. Zoo 24. Threatened species
25. Tropical rain forest

MAGNETISM, ENERGY, THERMAL EXPANSION, COSMETICS

1. Permanent magnet is made from
 - a) Silicon Steel
 - b) Cobalt Steel
 - c) Nickel Steel
 - d) Manganese Steel
 - e) None of the above/More than one of the above
2. Which one of the following is a natural magnet?
 - a) Copper
 - b) Silicon
 - c) Zinc
 - d) Lodestone. (Fe_3O_4)
 - e) None of the above/More than one of the above
3. What does the forefinger indicate in the Fleming's right hand rule?
 - a) Direction of motion of conductor
 - b) Direction of induced current
 - c) Direction of motion of coil
 - d) Direction of the magnetic field
 - e) None of the above
4. What does the forefinger indicate in the Fleming's right hand rule?
 - a) Direction of motion of conductor
 - b) Direction of induced current
 - c) Direction of motion of coil
 - d) Direction of the magnetic field
 - e) None of the above/More than one of the above
5. Paramagnetic substances are:
 - a) Weakly repelled to a magnet.
 - b) Strongly repelled to a magnet.
 - c) Strongly attracted to a magnet
 - d) Weakly attracted to a magnet.
 - b) None of the above/More than one of the above
6. Air is an example of _____.
 - a) Paramagnetic material
 - b) Diamagnetic material
 - c) Ferromagnetic material
 - d) Antiferromagnetic material
7. Earth's magnetism is due to:
 - a) Dynamo effect
 - b) Doppler effect

- c) Solar effect d) Magnus effect

8. Magnetism at the centre of Bar magnet is _____.

- a) Minimum b) Zero
c) Negative d) Maximum

9. Material in the superconducting state is -

- a) Paramagnetic b) diamagnetic
c) ferromagnetic d) antiferromagnetic

10. Which of the following is a non-renewable source of energy?

- a) Wood b) Sun c) Fossil fuels d) Wind

11. Acid rain happens because

- a) Sun heats up the upper layer of the atmosphere
b) Burning of fossil fuels releases oxides of carbon, nitrogen and sulphur in the atmosphere
c) Electrical charges are produced due to friction amongst clouds
d) Earth atmosphere contains acids

12. Fuel used in thermal power plants is

- a) Water b) Uranium c) Biomass d) Fossil fuels

13. In a hydro power plant

- a) Potential energy possessed by stored water is converted into electricity
b) Kinetic energy possessed by stored water is converted into potential energy
c) Electricity is extracted from water
d) Water is converted into steam to produce electricity

14. Ocean thermal energy is due to

- a) Energy stored by waves in the ocean
b) Temperature difference at different levels in the ocean
c) Pressure difference at different levels in the ocean
d) Tides arising out in the ocean

15. Choose the incorrect statement.

a) We are encouraged to plant more trees so as to ensure clean environment and also provide biomass fuel.

b) Gobar gas is produced when crops, vegetable wastes, etc., decompose in the absence of oxygen.

c) The main ingredient of biogas is ethane and it gives a lot of smoke and also produces a lot of residual ash.

d) Biomass is a renewable source of energy.

16. In a hydroelectric power plant more electrical power can be generated if water falls from a greater height because

a) Its temperature increases

b) Larger amount of potential energy is converted into kinetic energy

c) The electricity content of water increases with height

d) More water molecules dissociate into ions

17. It is possible that with decrease in temperature volume may increase. True or False?

a) True b) False

18. What is the relation between coefficient of area expansion (A) and coefficient of volume expansion (B)?

a) $B = 1.5A$ b) $A = 1.5B$ c) $A = 3B$ d) $B = 3A$

19. What is the value of coefficient of area expansion for a sphere? Assume coefficient of linear expansion is α .

a) 2α b) α c) 3α d) $\alpha/2$

20. A rod is lying on the ground with both ends free. It has a length of 1m. Coefficient of linear expansion equal to 1.1×10^{-5} per $^{\circ}\text{C}$. Calculate the strain when the change in temperature is 10K.

a) 11×10^{-5} b) 1.1×10^{-5} c) 0 d) 311.3×10^{-5}

21. What is the unit of coefficient of area expansion?

a) Per $^{\circ}\text{C}$ b) $^{\circ}\text{C}$ c) per $(^{\circ}\text{C})^2$ d) $(^{\circ}\text{C})^2$

22. An agent used to clean the surface of teeth and thereby decrease the tooth decay, mouth odor is

a) Abrasive b) Dentifrice c) Dental paste d) Dental cone

23. The most frequently used surfactant in shampoo are

a) Anionic b) Cationic c) Non-ionic d) All

24. Zinc pyrithine in shampoo is used as

a) Conditioner b) Cleansing
c) Antidandruff agent d) Detergent

25. Titanium dioxide commonly used in

a) Vanishing cream b) Sunscreen Cream
c) Ophthalmic Cream d) Aqueous calamine cream

26. Vanishing Cream is an ointment that may be classified as

a) Water soluble base b) Oleaginous base
c) Absorption base d) Emulsion base

27. All the following statements are true, except,
- Most of bleaching products are hydrogen peroxide based
 - Hydrogen peroxide is a strong oxidant and can form free radicals
 - Carbamide peroxide decomposes to release hydrogen peroxide in an Aqueous medium
 - Hydrogen peroxide is used as good humectants
28. Following is the approved UV filter excluding
- Sulisobenzone
 - TiO₂
 - MCC
 - Zinc oxide
29. Amla fruit contains high amounts of _____, except
- Ascorbic acid
 - Curcumin
 - Emblicanin A
 - Emblicanin B
30. These surfactants are most widely used in the preparation of washing Powder but not in cosmetics
- Lauryl sulphate
 - Alkyl benzene sulphonates
 - Myristyl sulphate
 - None of the above

ANSWERS

- Cobalt Steel
- Lodestone (Fe₃O₄)
- Direction of the magnetic field
- Direction of the magnetic field
- Weakly attracted to a magnet
- Paramagnetic material
- Dynamo effect
- Zero
- Diamagnetic
- Fossil fuels
- Alkyl benzene sulphonates
- Fossil Fuels
- Potential energy possessed by stored water is converted into electricity
- Temperature difference at different levels in the ocean
- The main ingredient of biogas is ethane and it gives a lot of smoke and also produces a lot of residual ash
- Larger amount of potential energy is converted into kinetic energy
- True
- $B = 1.5A$
- 2α
- 0
- per °C
- Dentifrice
- Anionic
- Antidandruff agent
- Sunscreen Cream
- Water soluble base
- Hydrogen peroxide is used as good humectants
- MCC
- Curcumin
- Alkyl benzene sulphonates

CELLULAR EQUILIBRIUM, EXCRETION, PLANT REPRODUCTION

- 1.----- Provides the primary by which water gets transported into and out of the cells.
a) Osmosis b) Fermentation c) Budding d) Transmembrane
2. Osmosis is a special kind of -----
a) Regulation b) Absorption c) Diffusion d) Adsorption
3. Which of the following solution contains a low concentration of solute relative to another solution?
a) hypertonic b) isotonic c) duerotonic d) hypotonic
4. The plant cell absorbs ----- by osmosis.
a) water b) sulphur c) phosphorous d) carbon
5. In the osmosis, osmotic potential of the cell is known as
a) cytotic potential b) water potential
c) animated potential d) generic potential
6. Most effective light for stomatal opening is
a) red b) blue c) green d) yellow
7. Diffusion of water through selectively permeable membrane is
a) osmosis b) imbibition c) translocation d) diffusion
8. Water is forcefully pushed beyond endodermis of the root through the process of
a) diffusion b) transmembrane transport
c) symplast pathway d) apoplast pathway
9. Transpiration is a phenomenon pertaining to
a) activated transport b) diffusion c) osmosis d) facilitated diffusion
10. Phenomena through which water is absorbed by solids such as colloids leading them to increase in volume is
a) diffusion b) imbibition c) facilitated diffusion d) osmosis
11. The transport of molecules against the concentration gradient is called as
a) Active transport b) passive transport c) diffusion d) osmosis
12. Which of the following process is uphill process?

- a) passive transport b) osmosis c) diffusion d) Active transport
13. Which of the following are characteristics of active transport?
- a) uphill process b) require energy
c) against electrochemical gradient d) all of these
14. Which of the following ions can be transported by active transport?
- a) glucose b) N₂ c) O₂ d) CO₂
15. Active transport is ----
- a) Spontaneous b) Non- Spontaneous c) Both d) None of the above
16. Bowman capsule is located in
- a) Cortex b) Henle's loop c) Bladder d) None of the above
17. The structure that connects a kidney to the urinary bladder is the
- a) Ureter b) Urethra c) Renal pelvis d) Collecting duct
- 18.---- is a yellow pigment that is formed after dead blood cells are processed in the liver . It is also primarily responsible for the yellow colour of urine
- a) Zeaxantine b) Urochrome c) Carotenoids d) None of the above
- 19.---- produces urea as the excretory substance in the human body.
- a) Kidney b) Liver c) Urinary bladder d) Digestive system
20. The process of filtering the blood using an artificial kidney is called
- a) Endoscopy b) Dialysis c) ECG d) Scanning
21. The ---- is a network of tiny blood vessels located at the beginning of a nephron .
- a) Renal calyces b) Renal pyramid c) Bowman's capsule d) Glomerulus
22. The ---- synthesizes most of the excretory compound in humans and is eliminated through----
- a) Liver , Urine b) Kidneys , Urine c) Liver , Bile juice d) None of the above
23. Which of the following is the functional unit of kidney ?
- a) Exon b) Nephron c) Cilia d) Neuron
24. Which of these are one of the agents of pollination?
- a) Fire b) Air c) Water d) Heat
25. What is honey bee covered with all over its body when it helps in pollination?
- a) Fur b) Dust c) Pollen grains d) Food particles
26. Which of them is an example which helps in water pollination?
- a) Oxalis b) Commelina c) Vallisneria d) None of the above

27. Some plants have seeds with hooks for

- a) Pollination b) Fertilisation c) Dispersion d) Reproduction

28. For seeds the task of fruit is to

- a) keep them fresh b) protects them c) disperse them only d) protect and disperse them

29. The seeds in the digestive system of animals are

- a) absorbed in large intestine b) digested later in small intestine
c) passed out through anus d) stored in rectum

30. The flow of seeds far away from their parent plants is known as

- a) Dispersion b)Pollination c) Fertilization d) Reproduction

ANSWERS

1. Osmosis 2. Diffusion 3. Hypotonic 4. Water 5. Water potential 6. Blue

7. Osmosis 8. Transmembrane transport 9. Diffusion 10. Imbibition

11. Active transport 12. Active transport 13. all of these 14. Glucose

15. Non- Spontaneous 16. Cortex 17. Ureter 18. Urochrome 19. Liver

20. Dialysis 21. Glomerulus 22. Liver, Urine 23. Nephron 24. air,water

25. Pollen grains 26. Vallesneria 27. Dispersion 28. protect and disperse them

29. passed out through anus 30. Dispersion

STATIC ELECTRICITY, SOUND, MOTION, CHEMICAL REACTION AND APPLICATION

1. What is the formula to calculate the power?
a) $P = w*t$ b) $P = w/t$ c) $P = w+t$ d) $P = w-t$
2. The electricity built on the surface of a substance is known as.....
a) Current electricity b) Static electricity
c) Dc d) Ac
3. Unit of electric power is....
a) Radians b) Watts c) Joules d) Seconds
4. If a body in translatory motion moves along a curved path then the motion is...
a) Oscillatory motion b) Rotatory motion
c) Curvilinear motion d) Uniform motion
5. A bicycle is moving on a straight road at a constant speed. The wheels of the cycle exhibit:
a) Circular and periodic motion b) Circular, translational and periodic motion
c) Circular and translational motion d) Translational and periodic motion
6. Why does a person climbing a mountain bend forward?
a) Due to fatigue b) To increase velocity
c) To increase stability d) Due to religious belief
7. A passenger in a moving bus is thrown forward when the bus suddenly stops. This is explained by....
a) By Newton's first law b) By Newton's second law
c) By Newton's third law d) By principle of conservation of momentum
8. An echo returned in 2s. What is the distance of the reflecting surface from the source, given that the speed of the sound is 342m/s.
a) 342 m b) 648 m c) 171 m d) 85.5 m
9. Why are the soles of the shoes treated?
a) To give the shoes more protection b) To decrease friction

c) To increase friction d) To increase life of the shoes

10. A train accelerated from 18km/h to 72km/h in 10s. The distance travelled by train?

a) 355 m b) 325 m c) 125 m d) 255 m

11. A body of 20 kg is lying at rest. Under the action of a constant force, it gains a speed of 7 m/s. The work done by the force will be...

a) 490 J b) 500 J c) 390 J d) 430 J

12. A car approaching a school zone slows down from 36 m/s to 9 m/s with constant acceleration -3 m/s^2 . How much time is car required to slow down to final velocity?

a) 11 s b) 9 s c) 8 s d) 12 s

13. A body of mass 50kg accelerates from rest at the rate of 8 m/s^2 . What distance would be the body travel in 15 s?

a) 800 m b) 750 m c) 850 m d) 900 m

14. On immersing an iron nail in CuSO_4 solution for a few minutes., You will observe....

- a) No reaction takes place b) The colour of the solution faded away
- c) The surface of iron nails acquires a black coating
- d) The colour of the solution changes to green

15. What happens when dilute hydrochloric acid is added to iron filings?

- a) Hydrogen gets oxidized b) Iron gets reduced
- c) Iron displaces hydrogen from hydrochloric acid d) No reaction takes place

16. Chlorine gas is passed in an aqueous potassium iodide solution to form potassium chloride solution and solid iodine. Identify the type of reaction.

- a) Decomposition reaction b) Displacement reaction
- c) Double displacement reaction d) Double decomposition reaction

17. Identify the most reactive and least reactive metals: Al, K, Ca, Au.

a) Al, Ca b) K, Au c) K, Ca d) Au, Ca

18. Magnesium ribbon is rubbed before burning because it has a coating of.....

- a) Basis magnesium carbonate b) Basis magnesium oxide
- c) Basis magnesium sulphide d) Basic magnesium chloride

19. Which of the following are exothermic process:

- a) Reaction of water with quick lime b) Dilution of an acid
- c) Evaporation of water d) Sublimation of camphor (crystals)

A) 1 and 2 C) 2 and 3
B) 1 and 4 D) 2 and 4

20. Which of the following is an endothermic process:
- a) Dilution of sulphuric acid b) Condensation of water vapours
 c) Sublimation of dry ice d) Respiration in human beings
- a) 1 b) 2 c) 3 d) 4
21. What type of Chemical reactions take place when electricity is passed through water?
- a) Displacement b) Decomposition c) Combination d) Double displacement
22. Which of the following gases can be used for storage:
1. Carbon dioxide or oxygen 2. Helium or Nitrogen
 3. Carbon dioxide or Helium 4. Nitrogen or oxygen
- a) 1 b) 2 c) 3 d) 4
23. Oxidation is a process that involves...
- a) Addition of oxygen b) Addition of hydrogen
 c) Removal of oxygen d) Removal of hydrogen
24. Give the ratio in which Hydrogen and Oxygen are present in water by volume.
- a) 1:2 b) 1:1 c) 2:1 d) 1:8
25. Which of the following is the most suitable reactor for the pharmaceutical industry?
- a) PBR b) MFR c) PFR d) Batch reactor

ANSWERS

1. B) $P = W/t$ 2. B) Static electricity 3. B) Watts 4. C) Curvilinear motion
5. B) Circular, Translational and periodic motion 6. C) To increase stability
6. A) By Newton's first law 7. A) 342 m 8. C) To increase friction 9. C) 125 m
10. A) 490 J 11. B) 9 s 12. D) 900 m 13. D) The colour of the solution changes to green
14. C) Iron displaces hydrogen from hydrochloric acid 15. B) Displacement reaction
16. B) K, Au 17. B) Basis magnesium oxide 18. A) 1 and 2 19. C) 3
20. B) Decomposition 21. B) 2 22. A) Addition of Oxygen 23. C) 2:1
2. D) Batch reactor

GERMINATION OF SEED

1. What are the factors affecting seed germination?
 - a. Water, Oxygen, Temperature
 - b. Pressure, Oxygen, Temperature
 - c. Oxygen, Volume, Water
 - d. Water only
2. The process in which a seed develops into a plant is called?
 - a. Cell germination
 - b. Stem germination
 - c. Seed germination
 - d. Plant germination
3. What are the steps in seed germination?
 - a. Effect of light on seed germination
 - b. Imbibition
 - c. Respiration
 - d. All the above
4. The incapacity of a viable seed to germinate under favourable condition is called?
 - a. Plant dormancy
 - b. Seed dormancy
 - c. Cell dormancy
 - d. Stem dormancy
5. Cashew is originated from?
 - a. Brazil
 - b. Spain
 - c. China
 - d. India
6. The first part which comes out of a seed is called?
 - a. Stem
 - b. Root
 - c. Radicle
 - d. Plant
7. In most species of plant, food is stored in?
 - a. Cotyledon
 - b. Leaf
 - c. Root
 - d. Stem
8. The miniature plants contain one or two seed leaves is called?
 - a. Cotyledon
 - b. Shrub
 - c. Radicle
 - d. Stem
9. After the root has grown downwards, a small shoot grows upward, towards light. This shoot is known as?
 - a. Cotyledon
 - b. Plumule
 - c. Stem
 - d. Leaf
10. Maize is an example of monocotyledonous seed. True or false?
 - a. True
 - b. False
11. In seed, food is generally stored in?
 - a. Cotyledons or endosperms
 - b. Cells
 - c. Nucleus
 - d. Cell wall
12. Reproductive whorls of a flower are?
 - a. Root
 - b. Flower
 - c. Stamens and carpels
 - d. Leaf
13. Pollen is produced in the?
 - a. Plumule
 - b. Cotyledon
 - c. Root
 - d. Anther

14. If the cotyledons remain under the soil, then such seeds type of germination is called?
a. Epigeal b. Hypogeal c. Monogeal d. Polygeal
15. If the cotyledons are pushed above the soil, then such type of germination is called?
a. Epigeal b. Hypogeal c. Monogeal d. Polygeal

ANSWERS

1. Water, Oxygen, Temperature 2. Seed germination
3. Imbibition, Respiration, Effect of light on seed germination 4. Seed dormancy
5. Brazil 6. Radicle 7. Cotyledon 8. Cotyledon 9. Plumule
10. True 11. Cotyledons or endosperms 12. Stamens and carpels
13. Anther 14. Hypogeal 15. Epigeal

CELL

1. Organisms with a single cell are called?
a. Unicellular organisms b. Multicellular organisms
c. Polycellular organisms d. Noncellular organisms
2. Organisms with more than one cell are called?
a. Unicellular organisms b. Multicellular organisms
c. Polycellular organisms d. Noncellular organisms
3. Who discovered cell?
a. Robert Brown b. Robert Hook
c. Charles Darwin d. Robert Hanks
4. Who discovered the nucleus of a cell?
a. Robert Brown b. Robert Hook
c. Charles Darwin d. Robert Hanks
5. Colourless material comprising the living part of a cell, including the cytoplasm, nucleus and other organelles is called?
a. Cell wall b. Nucleus c. Protoplasm d. DNA
6. Nucleus is separated from cytoplasm by?
a. Nuclear membrane b. DNA c. RNA d. Cell fluid
7. Tissues combine to form?
a. Cell b. Tissue layer c. Organ d. Atom
8. Cells which lack nuclear membrane are?
a. Prokaryotic cells b. Eukaryotic cells
c. Dikaryotic cells d. None of these
9. The control centre of all the activities of a cell is?
a. Nuclear Membrane b. Nucleus c. Cell wall d. None of these
10. Genes are located in?
a. Nucleus b. Cell c. DNA d. Chromosomes
11. The empty blank looking structures in the cytoplasm is?
a. Vacuoles b. Cell wall c. Nucleus d. Protoplasm
12. The other name of cell membrane is?
a. Nuclear membrane b. Cell wall c. Tissue d. Plasma membrane
13. The basic structural and functional unit of all living organism is?
a. Cell b. Atom c. Nucleus d. Molecules

14. _____ cells are branched.
a. Tissue b. Organ c. Muscle d. None of these
15. The _____ cell transfers the messages.
a. Nerve b. Organ c. Muscle d. None of these
16. The cell wall is living in nature. True or false?
a. True b. False
17. The cytoplasm and nucleoplasm make up the protoplasm. True or false?
a. True b. False

ANSWERS

1. Unicellular organisms 2. Multicellular organisms 3. Robert Hooke
4. Robert Brown 5. Protoplasm 6. Nuclear membrane 7. Organs
8. Prokaryotic cells 9. Nucleus 10. Chromosomes 11. Vacuoles
12. Plasma membrane 13. Cell 14. Muscle 15. Nerve 16. False
17. True

BASIC CONCEPTS OF FORCE, TYPE OF MIXTURES, METALS

1. Aon an object is called a force.
a)Push b)Pull c) Push or Pull
2. The motion imparted to objects was due to the action of a
a)Mass b)Force c)Density
3. Forces applied on an objects in the same direction To one another
a)add b) multiplies c)substracts
4. The net force on an object isif the two forces acting on it in opposite directions are equal.
a) Infinity b) Zero c) Not defined
b)
5. The strength of a force is usually expressed by its
a)direction b)magnitude c)symbol
6. Effects of force depends on.....
a)magnitude b)direction c)both magnitude \$direction
7. Leaves or fruits fall on the ground due to
a)magnetic force b)gravitational force c) electrostatic force d) muscular force
8. It is the force that enables us to perform all activities involving movement or bending of our body.
a) Magnetic b) Electric c) muscular
9. Muscular force is an example of
a) Contact force b) Non-contact force c) Zero force
10. The force which always resists the motion is
a) Friction b) Electrostatic c) Magnetic
11. The force exerted by a magnet.....
a) Attractive b) Repulsive c)Attractive or repulsive
12. Force of gravity is an example of.....
a) Repulsive force b) Attractive force c) Both repulsive and attractive

13. The Acting on a unit area of a surface is called pressure.
a) Mass b) Force c) speed
14. What is the SI unit of force
a) Jule b) Newton c) Pascal
15. A force increases the speed of a 1.0kg object from 4 m/s to 8 m/s. The work done by the force will be
a) 22 J b) 23 J c) 24 J d) 32 J
16. Which forces moves an aircraft through the air ?
a) Magnetic force b) Thrust force c) Gravitational force
17. The gravitational force between the two objects is F.If both objects are $1/4^{\text{th}}$ of their original masses without changing distance between them, then the gravitational force will become
a) $F/12$ b) $F/13$ c) $F/16$
18. The force of gravity acting on an object is also known as.....
a) Weight b) Mass c) pressure
19. Mercury is used in barometer because of its?
a) Low density b) High density
20. The atmospheric pressure at sea level isatm
a) 0 b) 2 c) -1 d) 1
21. Pascal is the unit of
a) Pressure b) Force c) weight
22. An example of a heterogeneous mixture is.....
a) Hard water b) Dirty water c) Rain water
23. Which mixture has a property of Tyndall effect?
a) Colloid b) Suspension c) Decantation
24. What do we call the mixture that compose solute and solvent ?
a) Mixtures b) Solution c) Solvent
25. When we mixed the salt and water , which is the solute ?
a) Salt b) Water c) Both salt and water
26. Dust in the air is an example of mixture
a) Heterogeneous b) Solution c) Homogeneous
27. The components of a solution are :
a) Solute b) Solvent c) Both solute and solvent
28. Which of the following is not a metal ?

- a) Copper b) Sulphur c) Aluminium d) Iron

29. The metal which produces hydrogen gas on reaction with dilute hydrochloric acid as well as sodium hydroxide solution is :

- a) Aluminium b) copper c) sodium d) iron

30. The metal which is liquid at room temperature is

- a) Aluminium b) Mercury c) sodium d) Potassium

31. Materials having of both metals and non-metals are

- a) Mettalooids b) Non mettalooids

32. Which metal react readily with cold water ?

- a) copper b) Potassium c) Sodium d) Iron

33. Which one of the following is metal ?

- a) C b) N c) Na d) O

34. The property of metal by which it can be drawn into wires is called

- a) Ductility b) Maliability

35. Which one of the following is the hardest metal ?

- a) Gold b) Iron c) Platinum d) Tungsten

36. Most malleable metals are.....

- a) Tungsten b) Gold c) Gold, Silver d) Silver

37..... is the most ductile metal

- a) Silver b) Gold c) Iron d) platinum

Answers

1. (c) Push or pull 2. (b) Force 3. (a) Add 4. (b) Zero 5. (b) Magnitude
6. (c) Both magnitude and direction 7. (b) Gravitational force 8. (c) Muscular
9. (a) Contact force 10. (a) Friction 11. (c) Attractive or Repulsive
12. (b) Attractive force 13. (b) Force 14. (b) Newton 15. (c) 24 J 16. (b) Thrust force
17. (c) F/16 18. (a) Weight 19. (b) High density 20. (d) 1 21. (a) Pressure
22. (b) Dirty water 23. (a) Colloid 24. (b) Solution 25. (a) Salt 26. (c) Homogeneous
27. (c) Solute and solvent 28. (d) Iron 29. (a) Aluminium 30. (b) Mercury
31. (a) Metalloids 32. (c) Sodium 33. (c) Na 34. (a) Ductility 35. (d) Tungsten
36. (c) Gold, Silver 37. (b) Gold

DISEASES, POLLUTION AND CARDIOVASCULAR SYSTEM

1. ----- is defined as a state of complete physical, mental social and psychological well being.
a. Strength b. Muscle c. Happiness d. Health
2. Malaria is caused by ?
a. Protozoa b. virus c. Bacteria d. Fungus
3. Malaria affects which part of the Human Body?
a. WBC b. RBC and liver c. Skin d. Intestine
4. Cholera disease is caused by?
a. Virus b. Bacteria c. Protozoa d. Fungus
5. Cholera affects which part of the Human Body?
a. RBC b. Liver c. Intestine d. Muscles
6. AIDS is caused by?
a. virus b. Protozoa c. Fungus d. Bacteria
7. AIDS disease is caused by which virus?
a. Diptheria b. HIV c. Polio d. Typhoid
8. AIDS affects which part of the Human Body?
a. Lungs b. WBC c. Liver d. RBC
9. What is the name of the test for HIV virus?
a. BIOPSY b. WIDAL c. ELIZA test d. TINE test
10. Diarrhoea disease is caused by?
a. Protozoa b. Fungus c. Bacteria d. Virus
11. Diarrhoea affects which part of the Human Body?
a. Blood cells b. Intestine c. Lungs d. Liver
12. Rabies disease is caused by?
a. Virus b. Bactria c. Fungus d. Protozoa
13. Rabies affects which part of the Human Body?
a. Nervous system b. circulatory system c. Reproductive system d. Immune system

14. Goitre is caused by?
 a. virus b. Protozoa c. Fungus d. Bacteria
15. Goitre affects which part of the Human Body?
 a. Intestine b. Liver c. Parathyroid gland d. Heart
16. Which of the following facts are incorrect?
 a. Global warming is the rise in the average temperature of the earth's climate system
 b. Eutrophication is observed in water bodies
 c. The greenhouse effect is a natural phenomenon
 d. Ozone is harmless to breath
17. Measuring BOD (Biological Oxygen Demand) is primarily used for?
 a. Estimating the types of microbes
 b. Determine the level of dissolved oxygen
 c. Estimating the quantity of organic matter in sewage water
 d. None of the above
18. Cosmic rays, such as gamma rays are a source of which kind of pollution?
 a. Soil pollution b. Noise pollution
 c. Radiation pollution d. Thermal pollution
19. Lichens are good bio indicators for?
 a. Air pollution b. Environmental radiation
 c. Soil pollution d. None of the above
20. Carbon dioxide is primarily called a greenhouse gas. Why?
 a. Traps light b. Traps heat
 c. Traps warm currents d. None of the above
21. Chlorofluorocarbon is used in ?
 a. Refrigerator b. Air conditioners c. Perfumes d. All
22. Acid rain is caused by increase in the atmospheric concentration of?
 a. Methane b. Carbon dioxide c. CFCs d. Sulphur dioxide and Nitrogen oxides
23. Increase in the concentration of pollutants in higher trophic level is known as ?
 a. soil erosion b. Biomagnification c. global warming d. Biological oxygen demand
24. Lead is one of the most serious environmental pollutants which affects?
 a. Soil b. land c. air d. noise
25. Lichens indicates pollution by?
 a. Sulphur dioxide b. carbon dioxide
 c. nitrogen dioxide d. chlorides
26. Sound becomes hazardous noise pollution at decibels ?
 a. Above 20 b. Above 60 c. Above 80 d. Above 100

27. Taj Mahal at Agra may be damaged by?
a. Carbon dioxide b. Chlorides c. Acid rain d. CFCs
28. Smog is a combination of ?
a. chlorides b. Smoke and fog c. oxides d. none of the above
29. Fluoride pollution mainly affects which part of the body?
a. Teeth b. muscles c. skeleton d. glands
30. All arteries carry oxygenated blood except
a. Systemic b. Hepatic c. Pulmonary d. Cardiac
31. Single heart circuit occurs in
a. Fishes b. Frog c. Reptiles d. Man
32. Which of these has a closed type of circulatory system?
a. Cockroach b. Fish c. Mollusca d. Scorpion
33. Carotico- systemic arch arise from?
a. right ventricle b. bicuspid valve
c. Left ventricle d. SA node
34. Mitral valve is another name of?
a. Bicuspid valve b. left ventricle
c. right ventricle d. S A node
35. Heart rate is controlled by which cranial nerve?
a. 8 th b. 10 th c. 9 th d. 11 th
36. Which organ receives only oxygenated blood?
a. veins b. spleen c. left ventricle d. right ventricle
37. Blood vessel which brings oxygenated blood to left auricle is?
a. bicuspid valve b. spleen c. Pulmonary vein d. right auricle
38. Impulse of heart beat originates from?
a. left ventricle b. S.A node
c. right ventricle d. bicuspid valve
39. Blood pressure is controlled by?
a. bicuspid valve b. circulatory system
c. parathyroid gland d. Adrenal gland
40. Function of human spleen is to?
a. Control blood volume b. control blood pressure
c. receives deoxygenated blood d. none of these
41. The most active phagocytic white blood cells are?

- a. basophils b. Neutrophils and monocytes
c. eosinophils d. none of these
42. The middle layer of heart is known as?
a. pericardium b. epicardium
c. Myocardium d. none of these
43. Which chamber of heart pumps blood into systemic circulation?
a. right ventricle b. Left ventricle
c. left auricle d. right auricle
44. How many chambers does heart have?
a. 4 b. 3 c. 2 d. 5
45. Normal blood pressure is?
A. 80/120 mmHg b.120/80 mmHg
c. 8/120 mmHg d.12/180 mmHg
46. What is the name of the circulation between the heart and lungs?
a. systemic b. hepatic c. Pulmonary d. none of these
47. Device used to measure blood pressure?
a. stethoscope b. Sphygmomanometer
c. glucometer d. otoscope
48. A hollow muscular organ that pumps blood through out the body?
a. liver b. kidney c. Heart d. none of these

ANSWERS

1. Health 2. Protozoa 3. RBC and liver 4. Bacteria 5. Intestine 6. Virus
7. HIV 8. WBC 9. Elisa test 10. Protozoa 11. Intestine 12. Virus
13. Nervous system 14. Virus 15. Parathyroid gland 16. d
17. Estimating the quantity of organic matter in sewage water 18. Radiation pollution
19. Air pollution 20. Traps heat 21. Refrigerators
22. Sulphur dioxide and Nitrogen oxides 23. Biomagnification 24. Soil
25. Sulphur dioxide 26. Above 80 27. Acid rain 28. Smoke and fog 29. Teeth
30. c 31. a 32. c 33. Left ventricle 34. Bicuspid valve 35. 10 th 36. Spleen
37. Pulmonary vein 38. S.A Node 39. Adrenal gland 40. Control blood volume
41. Neutrophils and Monocytes 42. Myocardium 43. Left ventricle 44. 4
45. 120/80 mmHg 46. Pulmonary 47. Sphygmomanometer 48. Heart

TRANSPARENT AND OPAQUE OBJECTS, SOLAR SYSTEM, SIMPLE MACHINES

1) Which is the closest planet to the sun ?

- a) Mercury b) Venus c) Uranus d) Neptune

2) Which is the farthest planet from the sun?

- a) Mercury b) Neptune c) Mars d) Earth

3) Which is the smallest planet in the solar system?

- a) Earth b) Mars c) Jupiter d) Uranus

4) The largest planet in the solar system is ?

- a) Earth b) Saturn c) Mars d) Venus

5) Which is the bright and hottest planet in the solar system?

- a) Uranus b) Venus c) Earth d) Saturn

6) Mars is known as

- a) Red planet b) Green planet c) Blue planet d) Black planet

7) Which planet is known as the earth's twin?

- a) Uranus b) Venus c) Saturn d) Mars

8) The exact time taken by the earth for single rotation on its own axis?

- a) 24 hrs b) 24 hrs 30ms c) 23 hrs 54 minutes 7.8 sec d) 23 hrs 56 minutes 4.09 sec

9) If there is no sun the colour of the sky would be

- a) Blue b) Orange c) Black d) Green

10) The planet with maximum number of moons?

- a) Earth b) Venus c) Saturn d) Mars

11) Phobos and deimos are the moons of

- a) Saturn b) Uranus c) Venus d) Mars

12) How many moons does Neptune have?

- a) 14 b) 27 c) 5 d) 12

13) The "Green planet" of solar system is

- a) Saturn b) Uranus c) Mars d) Neptune

14) The planet that rotates from east to west?

- a) Venus and Uranus b) Mercury and Mars
c) Uranus and Neptune d) Jupiter and Saturn

15) Substances that allow light to pass through them are called

- a) Opaque b) Translucent c) Transparent d) None of these

16) Name of the body which absorbs all colours?

- a) Yellow b) white c) Red d) Black

17) An object looks red when seen through a piece of red glass. What is the actual colour of the object?

- a) Red b) White c) Green d) Black

18) A cyan colour light ray is passed through a blue filter. What is the colour of the light which comes out through the filter?

- a) Green b) Cyan c) Yellow d) Blue

19) In _____ lens, all the rays diverge after refraction?

- a) Concave b) Bi-concave c) Convex d) Bi-convex

20) A lever consists of a rod free to move about the fixed point is called?

- a) Fulcrum b) Load c) Effort d) All of these

21) The force that is applied to move an object is called?

- a) Load b) Fulcrum c) All of these d) Effort

22) The distance between the load and the fulcrum is called?

- a) Load arm b) Effort arm c) Fulcrum d) All of these

23) The distance between the effort and the fulcrum is called?

- a) Effort arm b) Load arm c) Both d) none of these

24) Depending on the position of fulcrum, load and effort, there are _____ types of lever?

- a)2 b)4 c)3 d)none of these

25) Pulley is a _____ machine?

- a) complex machine b) simple machine c)Big d)none of these

26) In hospitals and other places, inclined planes called?

- a)Ramp b)Slope c)Foot path d)All of these

27) A _____ is a simple machine like a nail with grooves cut in it?

- a) Lever b) screw c)Both d)none of these

28) In class 3 levers, the effort is between the _____ and load?

- a) Fulcrum b) Object c) Force d) All of these

29) A lever of class 2 always _____ fore?

- a) increase b) decrease c) Both d) none of these

ANSWERS

1) a) Mercury 2) b) Neptune 3) c) Jupiter 4) a) Earth 5) b) Venus 6) a) Red planet

7) d) Venus 8) d) 23 hrs 56 minutes 4.09 sec 9) c) Black 10) c) Saturn 11) d) Mars

12) a) 14 13) b) Uranus 14) a) Venus and Uranus 15) c) Transparent 16) d) Black

17) a) Red 18) d) Blue 19) a) Concave 20) a) Fulcrum 21) d) Effort 22) a) Load arm

23) a) Effort arm 24) c) 3 25) b) Simple Machine 26) a) Ramp 27) b) Screw

28) a) Fulcrum 29) b) Decrease

