MATHEMATICS

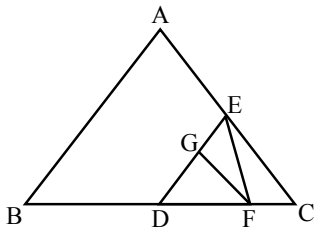
1. A shopkeeper gives 12% additional discount on the discounted price, after giving an initial discount of 20% on the labelled price of a radio. If the final sale price of the radio is ₹ 704, then what is its labeled price?

(A) ₹ 844.80 (B) ₹ 929.28 (C) ₹ 1000 (D) ₹ 1044.80

2. Simplified form of $\frac{\left(p+\frac{1}{q}\right)^{(p-q)}\left(p-\frac{1}{q}\right)^{(p+q)}}{\left(q+\frac{1}{p}\right)^{(p-q)}\left(q-\frac{1}{p}\right)^{(p+q)}}=?$

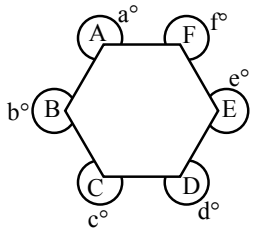
(A) $\left(\frac{p}{q}\right)^{2p}$ (B) $\left(\frac{q}{p}\right)^{2q}$ (C) $\left(\frac{p}{q}\right)^{p}$ (D) $\left(\frac{q}{p}\right)^{q}$

3. In the figure (not to scale), AB||ED and EC||GF. If ∠EGF = 101° and ∠ECF = 42° then the value of ∠ABC is



(A) 58° (B) 59° (C) 60° (D) 61°

4. For the following polygon



the value of a° + b° + c° + d° + e° + f° is

(A) 360° (B) 720° (C) 2160° (D) 1440°

5. If $x^4+\frac{1}{x^4}=322$ then the value of $\left(x-\frac{1}{x}\right)$ is

(A) 4 (B) 6 (C) 2 (D) 8

6. a, b and c are three consecutive positive integer. If $c^2-a^2=176$. Then the value of b is

(A) 41 (B) 43 (C) 42 (D) 44

7. $\frac{a^2+b^2+2(ab+bc+ca)}{a+b+2c}=?$

(A) a + b + 2c (B) a + b + c (C) a + b (D) c (a + b)

8. The value of

$$\frac{\left(\frac{4}{3}\times\left(-\frac{25}{2}\right)\right)+\left(\left(-\frac{10}{3}\right)\times\frac{5}{2}\right)-\left(\left(-\frac{16}{3}\right)\times\left(\frac{-45}{32}\right)\right)}{\frac{3}{4}\times\left(\frac{9}{14}\times\left(-\frac{2}{18}\right)\right)}$$ is

(A) $13\frac{11}{27}$ (B) $606\frac{2}{3}$ (C) $-133\frac{7}{4}$ (D) $606\frac{7}{3}$

9. If the product of any four consecutive natural numbers, increased by a natural number p, is a perfect square then the value of p is

(A) 1 (B) 2 (C) 4 (D) 8

10. What is the probability of getting at least one head when a coin is tossed twice?

(A) $\frac{1}{4}$ (B) $\frac{3}{4}$ (C) $\frac{1}{2}$ (D) $\frac{4}{3}$

11. A company packages its milk powder in cylindrical containers whose base has a diameter of 16.8 cm and height 20.5 cm. Company places a label around the curved surface of the container. If the label is placed 1.5 cm from the top and the bottom, what is the surface area of the label?

(A) 923 (B) 924 (C) 920 (D) 921

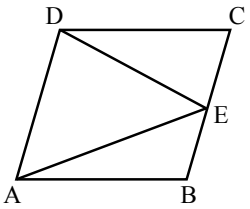
12. A well of diameter 7 m is dug 22.5 m deep. Then cost of plastering the inner curved surface at ₹ 3 per square metre.

(A) ₹ 1481 (B) ₹ 1483 (C) ₹ 1485 (D) ₹ 1400

13. $\frac{2}{5}$ of total number of students of a school come by car while $\frac{1}{4}$ of students come by bus to school. All the other students walk to school of which $\frac{1}{3}$ walk on their own and the rest are escorted by their parents. If 224 students come to school walking on their own, how many students study in that school?

(A) 1920 (B) 1919 (C) 1921 (D) 1922

14. In the given figure (not to scale), AB||CD, ∠EAB = 20° and ∠EDC = 35°. Find the measure of ∠DEA.



(A) 35° (B) 45° (C) 55° (D) 105°

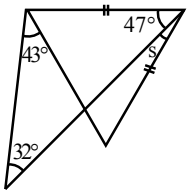
15. Radha takes some flowers in a basket and visits three temples one by one. At each temple, she offers one half of the flowers from the basket. If she is left with 3 flowers at the end, find the number of flowers she had in the beginning.

(A) 21 (B) 22 (C) 24 (D) 23

16. A man was engaged as typist for the month of February in 2008. He was paid ₹ 500 per day but ₹ 100 per day were deducted for the days he remained absent. He received ₹ 9,100 as salary for the month. For how many days did he work?

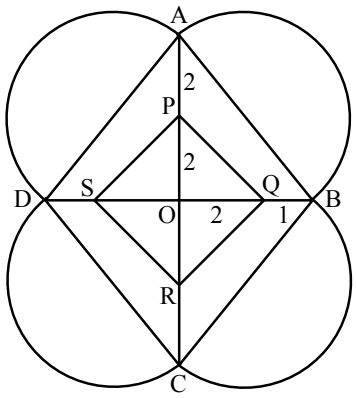
(A) 20 (B) 21 (C) 22 (D) 19

17. In the figure below, the value of ∠s is



(A) 27° (B) 17° (C) 37° (D) 47°

18. A Rangoli has been drawn on a floor of a house. ABCD and PQRS both are in the shape of a rhombus. If AP = PO = OQ = 2 and QB = 1, then the radius of semicircle drawn on each side of rhombus ABCD is



(A) $\frac{3}{2}$ (B) $\frac{5}{2}$ (C) $\frac{7}{2}$ (D) $\frac{1}{2}$

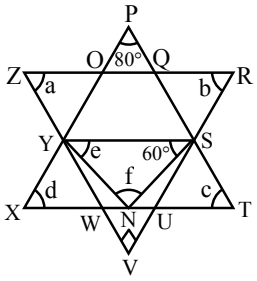
19. Find the value of $\left(\sqrt{\frac{625}{4356}}+\sqrt{\frac{576}{1089}}\right)\times\left(\frac{66}{\sqrt{19600}+\sqrt{36}}\right)$.

(A) $\frac{7}{15}$ (B) $\frac{9}{53}$ (C) $\frac{1}{2}$ (D) $\frac{79}{33}$

20. A group of students decided to collect as many paise from each member of the group as is the number of members in the group. If the total collection amounts to ₹ 59.29, the number of members in the group is

(A) 57 (B) 67 (C) 77 (D) 87

21. Find the value of (a + b) – (e + f) + (c + d), if ∠WVU = 90°.



(A) 90° (B) 70° (C) 200° (D) 210°

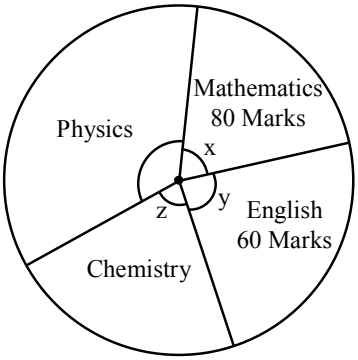
22. The length of a diagonal of a square is $\frac{(33333)^2}{123454321}$ cm then the area of square is

(A) 27.5 cm^2 (B) 39.5 cm^2 (C) 41.5 cm^2 (D) 40.5 cm^2

23. A certain sum triples in 2 years under compound interest, compounded annually at a certain rate of interest. In how many years would the sum become 9 times itself at the same rate

(A) 6 years (B) 9 years (C) 4 years (D) 8 years

24. A pie diagram of the marks scored by a student in Mathematic, English, Physics and Chemistry is shown here. In which x, y, z are central angles of sectors corresponding to Mathematics, English and Chemistry respectively.



If $x + y = 175°$

$x = z + 15°$

Read the graph and find the marks in Physics secured by the student.

(A) 60 (B) 80 (C) 70 (D) 100

25. If $\frac{154}{69}$ is expressed as $a + \cfrac{1}{b + \cfrac{1}{c + \cfrac{1}{d}}}$ then the value of $(c + d) - (a + b) = ?$, where a, b, c, d are integers.

(A) 4 (B) 5 (C) 6 (D) 2

CHEMISTRY

26. Mg is present in

(A) chlorophyll (B) haemoglobin (C) vitamin-D (D) ascorbic acid

27. Which of the following **metals** and **nonmetals** are found in the liquid state at room temperature?

(A) Gallium and Iodine respectively (B) Gallium and Bromine respectively

(C) Mercury and Bromine respectively (D) Mercury and Sulphur respectively

28. A piece of charcoal was heated over the flame of the burner. When it starts burning it is immediately dipped into a boiling tube containing water. Now this solution is transferred to another tube and a piece of litmus paper is dipped into it. What will be the observation?

(A) blue litmus turns to red (B) Red litmus turns to blue

(C) no change in the colour of litmus (D) none of the above

29. Which of these is not a fossil fuel?

(A) Coal (B) LPG (C) Bio gas (D) Natural gas

30. Melamine is

(A) thermoplastic polymer (B) thermosetting polymer

(C) fibre (D) elastomer

31. Magnesium ribbon on burning in air produces:

(A) magnesium oxide, water and light only (B) magnesium oxide and heat only

(C) magnesium oxide, heat and light only (D) magnesium oxide, water and heat only

32. Which of the following groups contains all synthetic substances?

(A) Nylon, terylene, wool (B) Cotton, polycot, rayon

(C) PVC, polythene, bakelite (D) Acrylic, silk, wool

33. Coal is processed in industries to get some useful products. Which of the following is not obtained from coal?

(A) Coke (B) Coal tar (C) Coal gas (D) CNG

PHYSICS

34. Which of the following represent correct values for the normal atmospheric pressure?

A. 101.3 kilopascals

B. 76 mm of mercury

C. 101.3 pascals

D. 76 cm of mercury

(A) A and B (B) B and C (C) A and D (D) B and D

35. Some mustard oil is kept in a beaker. It will exert pressure :

(A) downwards only (B) sideways only (C) upwards only (D) in all directions

36. What force acting on an area of 0.5 m^2 will produce a pressure of 500 Pa?

(A) 200 N (B) 250 N (C) 300 N (D) 350 N

37. If the sliding friction between two surface is found to be 7N, then the static friction between these two surfaces is most likely to be:

(A) 5 N (B) 10 N (C) 4 N (D) 2 N

38. A person has applied some mustard oil on his hands. Which of the following objects will become most difficult for him to hold in his hand?

(A) Earthen cup (*kulhar*) (B) thermocol tumbler

(C) glass tumbler (D) wooden cup

39. Sound can travel through :

(A) gases only (B) solids only (C) liquids only (D) solids, liquids and gases

40. Which of the following effects is not produced by the chemical reactions brought about by an electric current?

(A) bubbles of gases on electrodes (B) deposits of metals on electrodes

(C) change in colour of solution (D) formation of a precipitate

41. The image formed by a plane mirror is:

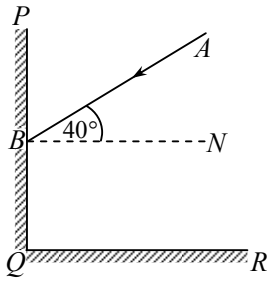
(A) virtual, behind the mirror and enlarged

(B) virtual, behind the mirror and of the same size as the object

(C) real, at the surface of the mirror and enlarged

(D) real, behind the mirror and of the same size as the object

42. Find angle of reflection for the mirror QR.



(A) 30° (B) 40° (C) 45° (D) 50°

BIOLOGY

43. This question contains four statements.

Statement (P) → Yellow vein mosaic of *bhindi* is a viral disease and is transmitted through air.

Statement (Q) → Rust of wheat is a bacterial disease and is transmitted through insects.

Statement (R) → Citrus canker is a viral disease and is transmitted through seeds.

Statement (S) → Rust of wheat is a viral disease and is transmitted through air.

Choose the correct option.

(A) P, Q, R is correct statement and S is incorrect statement.

(B) P, Q, S is correct statement and R is incorrect statement.

(C) P, S, R is correct statement and Q is incorrect statement.

(D) P, Q, R and S all statements are incorrect.

44. Sexually reproducing individual begins their life from–

(A) a single celled and single nuclei structure.

(B) structure formed by repeated division of single celled and single nuclei structure.

(C) the stage of embryo in which all the body parts can be identified.

(D) the reproductive organs.

45. Read the statement P, Q, R, S and choose the correct option.

(P) → Internal fertilization takes place in cows, humans, dogs, hens etc.

(Q) → Internal fertilization takes place in cows, humans, frogs etc.

(R) → External fertilization takes place in fish, starfish, dogs, hens etc.

(S) → External fertilization takes place in fish, starfish, frogs etc.

(A) P and Q are correct. (B) R and S are correct.

(C) P and S are correct. (D) Q and S are correct.

46. Identify a prokaryote–

(A) muscle cell (B) rhizobium (C) penicillium (D) paramecium

47. Read the statement P, Q, R, S and choose the correct option.

(P) → Zygote is a single celled and single nuclei structure and is formed by the repeated division of embryo.

(Q) → Zygote is a single celled and two nuclei structure and is formed by the fusion of sperm and ova.

(R) → Zygote is a single celled and single nuclei structure and is formed by the fusion of sperm and ova.

(S) → Embryo is a single celled structure formed the repeated division of the foetus.

(A) R is correct and P, Q, S are incorrect. (B) P is correct and R, Q, S are incorrect.

(C) Q is correct and P, R, S are incorrect. (D) S is correct and P, Q, R are incorrect.

48. Choose the correct one.

(A) WBC is multi celled and can change its shape.

(B) WBC is a branched cell which can change its shape.

(C) RBC is spherical in shape and transfers messages.

(D) WBC is single celled and can change its shape.

49. In given statements which one is incorrect?

(A) Endangered species are those which are facing the danger of extinction.

(B) Endemic species are found only in a particular area.

(C) Red Data Book contains a record of endemic species.

(D) Red Data Book contains a record of endangered species.

50. This question contains four statements:

(P) → Sprinkler system is more useful on the uneven land where sufficient water is available.

(Q) → Sprinkler system is more useful on the uneven land where sufficient water is not available and is best technique for watering fruit plants, gardens and trees.

(R) → Sprinkler system is more useful on the uneven land where sufficient water is not available and is very useful for sandy soil.

(S) → Sprinkler system is a boon in regions where huge amount of water is available.

Identify the correct option:

(A) Statement P is correct while Q, R and S are incorrect.

(B) Statement Q is correct while P, R and S are incorrect.

(C) Statement R is correct while P, Q and S are incorrect.

(D) Statement S is correct while Q, R and P are incorrect.

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CLASS 8th MOVING TO CLASS 9th

ANSWER-KEY

SET-A

MATHEMATICS

1. (C)
2. (A)
3. (B)
4. (D)
5. (A)
6. (D)
7. (C)
8. (B)
9. (A)
10. (B)
11. (B)
12. (C)
13. (A)
14. (C)
15. (C)
16. (A)
17. (B)
18. (B)
19. (C)
20. (C)
21. (B)
22. (D)
23. (C)
24. (B)
25. (D)

CHEMISTRY

26. (A)
27. (C)
28. (A)
29. (C)
30. (B)
31. (C)
32. (C)
33. (D)

PHYSICS

34. (C)
35. (D)
36. (B)
37. (B)
38. (C)
39. (D)
40. (D)
41. (B)
42. (D)

BIOLOGY

43. (D)
44. (A)
45. (C)
46. (B)
47. (A)
48. (D)
49. (C)
50. (C)

SOLUTION

MATHEMATICS

1. (C)

Initial discount = x – 20% of x

$$= x - \frac{x}{5} = \left(\frac{4x}{5}\right)$$

Additional discount on the discounted price

$$= \frac{4x}{5} - 12\% \text{ of } \frac{4x}{5}$$

$$= \frac{4x}{5} - \frac{12}{100} \times \frac{4x}{5}$$

$$= \frac{4x}{5}\left(1 - \frac{12}{100}\right) = \frac{4x}{5} \times \frac{88}{100}$$

According to the question,

$$\frac{4x}{5} \times \frac{88}{100} = 704$$

$$\Rightarrow \quad x = \frac{500 \times 704}{4 \times 88}$$

$$\Rightarrow \quad x = ₹\ 1000$$

2. (A)

$$\frac{\left(\frac{pq+1}{q}\right)^{p-q}\left(\frac{pq-1}{q}\right)^{p+q}}{\left(\frac{pq+1}{p}\right)^{p-q}\left(\frac{pq-1}{p}\right)^{p+q}}$$

$$= \left(\frac{p}{q}\right)^{p-q}\left(\frac{p}{q}\right)^{p+q} = \left(\frac{p}{q}\right)^{2p}$$

3. (B)

EC||GF

Hence $\angle GFD = \angle ECF = 42°$ (Corresponding angles)

$\Rightarrow \quad \angle GFD = 42°$

$\angle EGF$ is an exterior angle of ΔGDF

$\Rightarrow \quad \angle EGF = \angle GDF + \angle GFD$

$\Rightarrow \quad 101° = \angle GDF + 42°$

$\Rightarrow \quad \angle GDF = 59°$

Since AB||ED

Hence $\angle ABC = \angle EDF$

$\Rightarrow \quad \angle ABC = 59°$

4. (D)

Sum of all interior angles of a polygon of n sides = $(n - 2) \times 180°$

Sum of all interior angles of given hexagonal polygon = $(6 - 2) \times 180° = 720°$

$\Rightarrow \quad (360° - a°) + (360° - b°) + (360° - c°) + (360° - d°) + (360° - e°) + (360° - f°) = 720°$

$\Rightarrow \quad 2160° - (a° + b° + c° + d° + e° + f°) = 720°$

$\Rightarrow \quad a° + b° + c° + d° + e° + f° = 1440°$

5. (A)

$$\left(x - \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} - 2 \qquad \ldots(i)$$

$$\left(x^2 + \frac{1}{x^2}\right)^2 = x^4 + \frac{1}{x^4} + 2$$

$$\Rightarrow \quad \left(x^2 + \frac{1}{x^2}\right)^2 = 322 + 2 \qquad \left(\because x^4 + \frac{1}{x^4} = 322\right)$$

$$\Rightarrow \quad \left(x^2 + \frac{1}{x^2}\right)^2 = 324$$

$$x^2 + \frac{1}{x^2} = 18$$

From (i)

$$\left(x - \frac{1}{x}\right)^2 = 18 - 2$$

$$\left(x - \frac{1}{x}\right)^2 = 16$$

$$x - \frac{1}{x} = \pm 4$$

6. (D)

Since a, b and c are consecutive positive integer, therefore b = a + 1 and c = a + 2

Now $c^2 - a^2 = 176$

$$(a + 2)^2 - (a)^2 = 176$$

$$(a + 2 + a)(a + 2 - a) = 176$$

$$2(a + 1) = 88$$

$a + 1 = 44 \qquad \Rightarrow b = 44$

7. (C)

$$\frac{(a^2 + b^2 + 2ab) + 2(bc + ca)}{(a + b + 2c)}$$

$$= \frac{(a + b)^2 + 2c(a + b)}{(a + b + 2c)}$$

$$= \frac{(a+b)(a+b+2c)}{(a+b+2c)}$$

$= a + b$

8. (B)

$$\frac{\left(\frac{4}{3}\times\left(-\frac{25}{2}\right)\right)+\left(\left(-\frac{10}{3}\right)\times\frac{5}{2}\right)-\left(\left(-\frac{16}{3}\right)\times\left(\frac{-45}{32}\right)\right)}{\frac{3}{4}\times\left(\frac{9}{14}\times\left(-\frac{2}{18}\right)\right)}$$

$$= \frac{\left(-\frac{50}{3}\right)+\left(-\frac{25}{3}\right)-\left(\frac{45}{6}\right)}{\left(-\frac{3}{56}\right)}$$

$$= \frac{-\frac{75}{3}-\frac{45}{6}}{\left(-\frac{3}{56}\right)} = \frac{-\frac{150}{6}-\frac{45}{6}}{\left(-\frac{3}{56}\right)} = \left(-\frac{195}{6}\right)\times\left(-\frac{56}{3}\right) = 606\frac{2}{3}$$

9. (A)

We have

$1 \times 2 \times 3 \times 4 = 24$ and $24 + 1 = 25 = (5)^2$

$2 \times 3 \times 4 \times 5 = 120$ and $120 + 1 = 121 = (11)^2$

$3 \times 4 \times 5 \times 6 = 360$ and $360 + 1 = 361 = (19)^2$

$\therefore \quad p = 1$

10. (B)

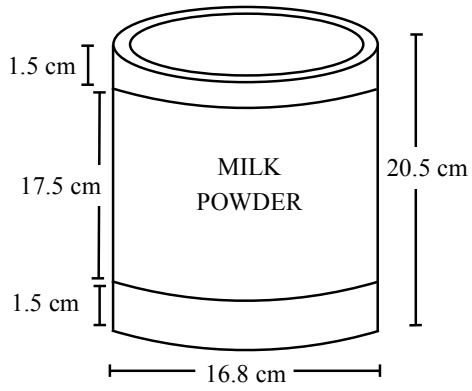
Total number of outcomes = 4 (HH, HT, TH, TT)

Number of favourable outcomes = 3 (HH, HT, TH)

P(of getting at least one head) = $\frac{3}{4}$

11. (B)

Clearly, surface area of the label is equal to the curved surface area of a cylinder of base radius $r = \frac{16.8}{2}\text{cm} = 8.4\text{cm}$ and, height h = (20.5 – 1.5 – 1.5) cm = 17.5 cm.



$\therefore$ Surface area of the label = $2\pi rh = 2 \times \frac{22}{7} \times 8.4 \times 17.5\ cm^2$

$= 2 \times 22 \times 1.2 \times 17.5\ cm^2 = 924\ cm^2$

12. (C)

Area of the inner curved surface $= 2\pi rh = 2 \times \frac{22}{7} \times \frac{7}{2} \times 22.5\ m^2 = 495\ m^2$

$\therefore$ Cost of plastering the inner curved surface = ₹ (495 × 3) = ₹ 1485.

13. (A)

Students walking to school on their own = 224

Let the total number of students in the school be x.

Number of students walk to school = $x - \left(\frac{2}{5} \text{ of } x + \frac{1}{4} \text{ of } x\right)$

$= x - \left(\frac{2x}{5} + \frac{x}{4}\right)$

$= x - \left(\frac{8x + 5x}{20}\right) = x - \frac{13}{20}x = \frac{7x}{20}$

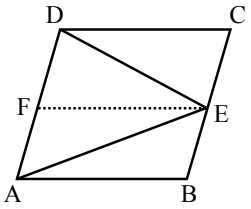
Students walking to school on their own $= \frac{1}{3} \text{ of } \frac{7x}{20}$

$\Rightarrow \quad 224 = \frac{1}{3} \times \frac{7x}{20} \quad \Rightarrow \quad x = \frac{224 \times 20 \times 3}{7}$

$\Rightarrow \quad x = 32 \times 20 \times 3 = 1920$

Hence, total number of students in the school is 1920.

14. (C)



Method I: Draw a line parallel AB through E meet line DA at F

Since DC||FE

$\therefore$ $\angle DEF = \angle EDC = 20°$ (alternate interior angle)

Since FE||AB

$\therefore$ $\angle FEA = \angle EAB = 35°$ (alternate interior angle)

Now $\angle DEA = \angle DEF + \angle FEA = 20° + 35° = 55°$

Method II: Let $\angle ADE = x$ and $\angle DAE = y$

Since AB||CD

$\therefore$ $\angle ADC + \angle DAB = 180°$ (supplementary angles)

$(x + 20°) + (y + 35°) = 180°$

$\Rightarrow$ $x + y = 180° - 55°$ …(i)

Now in ΔADE

$x + y + \angle DEA = 180°$

$180° - 55° + \angle DEA = 180°$ $(\because x + y = 180° - 55°)$

$\Rightarrow \quad \angle DEA = 55°$

15. (C)

Let the total number of flowers be x.

At reach first temple = $x - \frac{x}{2} = \frac{x}{2}$

At reach second temple = $\frac{x}{2} - \frac{x}{2} \times \frac{1}{2}$

$= \frac{x}{2} - \frac{x}{4} = \frac{x}{4}$

At reach third temple $= \frac{x}{4} - \frac{x}{4} \times \frac{1}{2}$

$= \frac{x}{4} - \frac{x}{8} = \frac{x}{8}$

According to given question,

$\frac{x}{8} = 3 \Rightarrow x = 24$

Hence, total number of flowers she had in the beginning is 24.

16. (A)

Let typist worked for x days in the month of February 2008.

$\therefore$ Total absent = (29 – x) days [$\because$ February 2008 had 29 days]

Amount of salary = 500 x – 100 (29 – x)

9,100 = 500 x – 2900 + 100 x (given)

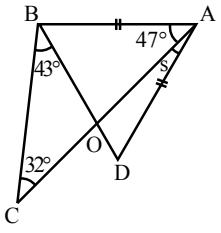
$\Rightarrow$ 9,100 = 600 x – 2900

$\Rightarrow$ 9,100 + 2900 = 600 x

$\Rightarrow$ $x = \frac{12000}{600} = 20$

Hence, he worked for 20 days only.

17. (B)



$\angle ABC = 180° - (32° + 47°)$

$= 180° - (79°)$

$= 101°$

$\angle ABD = 101° - 43°$

$= 58°$

$\angle ADB = \angle ABD = 58°$

$\angle BOC = \angle AOD = 180° - (43° + 32°)$

$= 180° - 75°$

$= 105°$

$\angle s = 180° - (105° + 58°)$

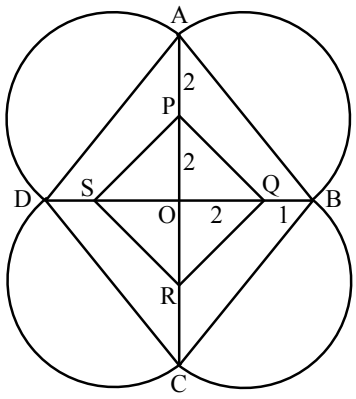
$= 180° - (163°)$

$= 17°$

18. (B)

From the given figure ABCD is a rhombus. [Given]

We know that diagonals of a rhombus bisect each other at right angles and sides are equal.



Now in ΔAOB

$\angle AOB = 90°$

$\therefore \quad AB^2 = AO^2 + BO^2$ [Using Pythagoras theorem]

$\Rightarrow \quad AB^2 = (AP + PO)^2 + (OQ + QB)^2$

$\Rightarrow \quad AB^2 = (2+2)^2 + (2+1)^2$

$\Rightarrow \quad AB^2 = 4^2 + 3^2$

$\Rightarrow \quad AB = \sqrt{16+9}$

$\Rightarrow \quad AB = \sqrt{25} = 5$

$\text{Radius} = \frac{AB}{2} = \frac{5}{2}$

$\because$ Sides of a rhombus are equal.

Hence, radius of each semicircle is $\frac{5}{2}$

19. (C)

$$\left(\sqrt{\frac{625}{4356}} + \sqrt{\frac{576}{1089}}\right) \times \left(\frac{66}{\sqrt{19600} + \sqrt{36}}\right)$$

$$= \left(\frac{25}{66} + \frac{24}{33}\right) \times \left(\frac{66}{140+6}\right)$$

$$= \left(\frac{25}{66} + \frac{48}{66}\right) \times \frac{66}{146}$$

$$= \frac{73}{66} \times \frac{66}{146} = \frac{73}{146} = \frac{1}{2}$$

20. (C)

Let the total number of members = x

So, money collected from each member = x paise = ₹ $\frac{x}{100}$

Total money collected = ₹ $x \times \frac{x}{100}$

According to given question,

$$\frac{x^2}{100} = 59.29$$

$$\Rightarrow \quad \frac{x^2}{100} = \frac{5929}{100}$$

$$\Rightarrow \quad x^2 = 5929$$

$$\Rightarrow \quad x = \sqrt{5929}$$

$$x = 77$$

so there are 77 members in the group

21. (B)

In ΔZRV

$$a + b = 180° - 90° = 90°$$

In ΔYNS

$$e + f = 180° - 60° = 120°$$

In ΔPXT

$$c + d = 180° - 80° = 100°$$

Hence $(a + b) - (e + f) + (c + d)$

$$= 90° - 120° + 100°$$

$$= 90° - 20° = 70°$$

22. (D)

Length of diagonal of a square = $\frac{(33333)^2}{123454321} = \frac{3^2(11111)^2}{(11111)^2} = 9 \text{ cm}$

Hence area of square = $\frac{(\text{Diagonal})^2}{2} = \frac{(9)^2}{2} = 40.5$

23. (C)

Let P be the sum. Then amount at the end of 2 years is 3 P

Therefore, $P\left(1 + \frac{r}{100}\right)^2 = 3P$

$$\Rightarrow \quad \left(1 + \frac{r}{100}\right)^2 = 3$$

$\Rightarrow \quad 1+\frac{r}{100}=\sqrt{(3)} \qquad \ldots(i)$

Now, since the sum has to become 9 times the amount should be

$= 9P$

$\therefore \quad P\left(1+\frac{r}{100}\right)^n = 9P$

$\Rightarrow \quad \left(1+\frac{r}{100}\right)^n = 9$

$\Rightarrow \quad \left(\sqrt{3}\right)^n = 9 \qquad$ (from (i))

$\Rightarrow \quad \left(\sqrt{3}\right)^n = \left(\sqrt{3}\right)^4$

$\Rightarrow \quad n = 4$

Thus the sum will become 9 times itself in 4 years.

24. (B)

Let the central angle of the sector corresponding to Physics subject be w.

Now, $x + y + z + w = 360°$

$175° + x - 15° + w = 360° \qquad (\because x + y = 175° \ \& \ x = x - 15°)$

$x + w = 200 \qquad \ldots(i)$

We know that the angles at the centre are in proportion to the value of each component.

Since marks of Mathematics and English are in the ratio 4 : 3.

Hence their central angles x and y will be in ratio of 4 : 3

$x + y = 175°$

$\Rightarrow \quad 4K + 3K = 175$

$\Rightarrow \quad K = \frac{175}{7}$

Central angle for Mathematics subject $x = 4K = \frac{4 \times 175}{7}$

$x = 100°$

Now $x + w = 200° \qquad$ (from (i))

$w = 200° - 100° = 100°$

Now, A sector of 100° represents 80 marks (Mathematics as well as Physics)

25. (D)

$$\frac{154}{69} = 2\frac{16}{69} = 2 + \frac{1}{\frac{69}{16}}$$

$$= 2 + \frac{1}{4 + \frac{5}{16}}$$

$$= 2 + \frac{1}{4 + \frac{1}{\frac{16}{5}}}$$

$$= 2 + \cfrac{1}{4 + \cfrac{1}{3 + \cfrac{1}{5}}}$$

Thus a = 2, b = 4, c = 3, d = 5

Now (c + d) – (a + b)

= (3 + 5) – (2 + 4) = 8 – 6 = 2

CHEMISTRY

26. (A)

Chlorophyll is the green pigment present in plants. It contains magnesium and is essential for photosynthesis.

27. (C)

Mercury and bromine both are present in liquid state at room temperature but mercury is metal and bromine is non-metal. So, liquid non-metal at room temperature is bromine.

28. (A)

Carbon dioxide gas is released on burning charcoal which on dissolving in water forms an acidic solution. Due to the presence of acid the blue litmus turns red.

29. (C)

LPG, Coal, Natural gas are examples of fossil fuels.

Biogas is a mixture of methane, carbon dioxide, hydrogen and hydrogen sulphide. It is produced by anaerobic degradation of animal waste such as cow dunk in presence of water.

30. (B)

Melamine is an example of thermosetting polymer.

31. (C)

Magnesium reacts with atmospheric oxygen to get magnesium oxide by liberating heat and light.

The chemical reaction is

$Mg + O_2 \rightarrow MgO + Heat + Light.$

32. (C)

PVC, polythene and bakelite are synthetic substances.

33. (D)

CNG (Compressed Natural Gas) is not obtained from coal.

PHYSICS

34. (C)

Normal atmospheric pressure is 101.3 kilopascals and 76 cm of mercury.

35. (D)

Pressure exerted by liquid is in all the direction

36. (B)

$P = {}^{F}\!/_{A} \Rightarrow F = PA = 500 \times 0.5 = 250N$

37. (B)

An static friction is greater than sliding friction.

38. (C)

Glass tumbler is much smoother than the other.

39. (D)

Sound needs a medium to travel. It can be solid, liquid and gas.

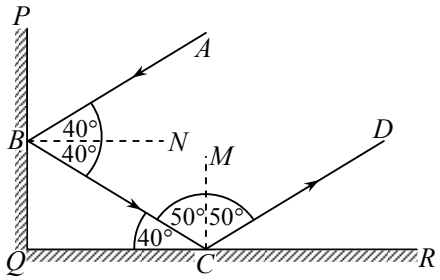
40. (D)

Formation of precipitate does not happen when chemical reaction is brought about by an electric current.

41. (B)

Plane mirror is always virtual, erect, same size as object and behind the mirror.

42. (D)



BIOLOGY

43. (D)

- Yellow vein mosaic of *bhindi* is a viral disease and is transmitted through insect.
- Rust of wheat is a fungal disease and is transmitted through air and seeds.
- Citrus canker is a bacterial disease and is transmitted through air.

44. (A)

Zygote is a single celled and single nuclei structure formed by fusion of sperm and ova.

45. (C)

- When fertilization takes place inside the female body is called internal fertilization e.g., humans, cows, dogs, hens etc..
- When fertilization takes place outside the female body is called external fertilization e.g., fish, starfish, frogs etc..

46. (B)

Rhizobium is a bacteria and it belongs to prokaryote because they do not have nucleus.

47. (A)

- Zygote is a single celled and single nuclei structure and is formed by the fusion of sperm and ova.
- Embryo is a multi celled structure and formed by repeated division of zygote.

48. (D)

- WBC is single celled and can change its shape.
- RBC is a spherical in shape and is not involved in transferring messages.

49. (C)

Red Data Book contains a record of endangered species.

50. (C)

Sprinkler system is more useful on the uneven land where sufficient water is not available. This system is very useful for sandy soil as water gets sprinkled on the crops as it is raining.

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