REASONING

SOL.1

(1) The series is formed by moving each letter two steps forward from one group to the next.

(The series restarts from A on reaching Z)

SOL.2 (3) Add the number to the reverse of its digits.
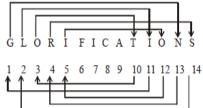For example: 163 + 361 = 524, etc.

Sol.3 (4) Practical, Praise, Prank, Prayer

Sol. 4 (1) Narrate, Nascent, Native, Nature

Sol.5 (4) The new series is

A 3 C 5 E 7 G 9 I 11 K 13 M 15 O 17 Q 19 S 21 U 23 W 25Y 27

Counting from the right, the tenth character is Q, and the third character to the right of Q is 21.

Sol.6 (4)

The new letter sequence is NITSOFICAOLIGR.

The twelfth letter from the right is T.

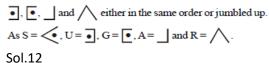Sol.7 (4) All except Beethoven were scientists, while Beethoven was a musician.

Sol.8 (2) All other months have 31 days

Sol. 9 (1) Gallons of water is needed to fill a swimming pool and large number of spectators can be admitted into an auditorium .

Sol. 10 (3) Each letter of the word RECTANGLE is moved two steps forward to obtain the corresponding letters of the code,i.e.,
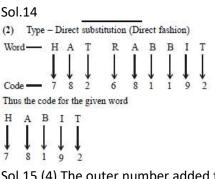

Similarly, we have :

Sol 11.

(3) Following the examples given, the code for SUGAR should be a combination of the following symbols ⟨•⟩, ⌐•, ⌐•, ⌐ and ∧ either in the same order or jumbled up.

As S = ⟨•, U = ⌐•, G = ⌐•, A = ⌐ and R = ∧.

Sol.12

(1) Similarly, SPICE is coded as ⟨• •⟩⊓L⌐

Sol. 13

(2) Similarly PATCH is coded as •⟩⌐□L⟨

Sol.14

(2) Type – Direct substitution (Direct fashion)

Word	H	A	T	R	A	B	B	I	T
Code	7	8	2	6	8	1	1	9	2

Thus the code for the given word

H	A	B	I	T
7	8	1	9	2

Sol.15 (4) The outer number added to its two connected numbers always total 20. For example :
3 + 7 + 10 = 20, 7 + 4 + 9 = 20, etc

SCIENCE

SOL.16 (2)

SOL.17 (4) Slope of the line indicates decreasing velocity or deceleration

SOL.18 (2) No, in order for the velocity to be constant, the speed has to be constant. Speed is scalar whereas velocity is a vector, which indicates that it needs a measure of its displacement and a direction

SOL. 19

(1) Here, $u = 36 \text{ km/hr} = 36 \times \dfrac{5}{18} \text{ m/s} = 10 \text{ m/s}$

$v = 0, t = 5s$

Using $v = u + at$, we have

$a = \dfrac{v-u}{t} = \dfrac{(0-10) \text{ ms}^{-1}}{5s} = -2 \text{ ms}^{-2}$

SOL. 20

(2) Using $s = ut + \dfrac{1}{2}at^2$, we have

$s = 10 \text{ ms}^{-1} \times 5s + \dfrac{1}{2}(-2 \text{ ms}^{-2})(25 \text{ s}^2)$

$= 50m - 25m = 25m$

SOL.21 (2)

SOL.22 (1)

SOL. 23 (4)

SOL.24 (4)

SOL.25.

(2) By work-energy theorem,

Work done by all the forces = Change in K.E

or $-\mu mg\, x - \dfrac{1}{2}kx^2 = -\dfrac{1}{2}mu^2$ (x = non. compression)

or $\dfrac{1}{2}kx^2 + \mu mgx - \dfrac{1}{2}mu^2 = 0$

or $50x^2 + 4x - 0.9 = 0$ or $x = 0.1 \text{ m} = 10 \text{ cm}$

SOL. 26

(1) $\dfrac{1}{2}mv^2 = \dfrac{1}{2}mu^2 - 2\mu mgx$ or $v = 10 \text{ cms}^{-1}$

SOL. 27

(2) Work done by friction in round trip,

$W = -2\,\mu mgx = -2 \times 0.2 \times 2 \times 10 \times 0.1 = 0.8 \text{ J}$

SOL. 28 (1)
SOL. 29 (3)
SOL. 30 (4)

MATHMETICES

SOL. 31 (1)
SOL. 32 (3) $0 \pounds r < b$
SOL. 33 (4)
Sol. 34 (1)
Sol. 35

(2) **Hint.** $\dfrac{AE}{EC} = \dfrac{AD}{BD} \Rightarrow \dfrac{AE}{3\,cm} = \dfrac{3}{4}$

Sol. 36 (4)
Sol. 37 (4)
Sol. 38

(3) Volume of sphere $= \dfrac{4}{3}\pi r^3$ and it's surface area $= 4\pi r^2$.

Ratio $= \dfrac{4}{3}\pi r^3 : 4\pi r^2 = \dfrac{r}{3} : 1$

But $r = 1$ unit (unit radius)

∴ ratio $= \dfrac{1}{3} : 1$ or $1 : 3$.

Sol. 39.

(1) $\angle AOB = 60°$

Area of the sector $A'OB' = \dfrac{60}{360}\pi(6)^2 = 6\pi\ cm^2$

Sol. 40

(2) Area of shaded region

= area of circle + area of ΔOAB – area of sector $A'OB'$

$= \pi(6)^2 + \dfrac{\sqrt{3}}{4}(12)^2 - 6\pi = 36\pi + \dfrac{\sqrt{3}}{4}(144) - 6\pi$

$= 94.2 + 62.352 = 156.552\ cm^2$.

Sol. 41 (3)
Sol. 42

(2) **Hint :** $\cos 30° = \dfrac{AC}{AB} \Rightarrow \dfrac{\sqrt{3}}{2} = \dfrac{10\ m}{AB} \Rightarrow AB = \dfrac{20}{\sqrt{3}}$ m.

Sol. 43

(1) By defination. $\sec A = \dfrac{1}{\cos A}$

∴ $\cos A \sec A = 1$

Sol. 44(3)
Sol. 45 (2)

English

Sol. 46 PASSAGE - 1
(3) is the right answer. (4) can be eliminated because it is incorrect factually, the passage suggests the opposite. (1) and (2) could be vaguely inferred from the passage but not clearly so. On the other hand (3) can be inferred with more certainty if we consider the lines, "The best diamonds are noted for their cleavage, their translucence and their colour" and "the value of a jewel diamond depends.... blue white".From both these lines, we can reach the conclusion that (3) is the most appropriate statement. Tip - In questions such as these, more than one statement may appear correct. To clear the ambiguity, choose true statement which is most certain and more explicitly stated or inferred through the passage.

Sol. 47 (1) is the right answer. Since the first sentence of the given passage is about Scarce diamond but immediately after the discussion moves to another topic. The previous paragraph must have been about scarce diamond. Only then can the paragraph end talking about scares diamond and move to the next topic.

Sol. 48 (1) is the right answer. Translucence of a diamond is the clarity with which are can see through it and it depends on the natural cleavage because if only a diamond is properly cut by the cleavage, it will be translucent. This relationship is most similar to a car's relation with its colour because both include vision. Translucence of a diamond decides its colour also.

Sol. 49 (3) is the right answer. (1) And (2) can be eliminated because they do not mean anything near genuine. Of (2) and (4), (2) is the more appropriate answer because genuinely is not so much about accuracy. 'Genuine' means real, not fake.

Sol. 50 (3) is the right answer. The passage consists of statements and illustrations. There are statements about diamonds, types of diamond, their value and characteristic. And there are illustrations about retrieving of diamonds from mines and the process of cutting and polishing them.

Sol. 51 PASSAGE - 7
. This is 'synonym' type question. 'Anthology' means a chronological collection. (1), (3) & (4) could easily be eliminated from the first read of line 'Anthology of poetry. It can only mean collection of poetry. Thus, (2) is the right answer.

Sol 52 . This is a factual question. First, locate the relevant lines in the passage. In this case, they are "She begin composing verse at the age of eleven. (1) Christina Rosetti started publishing her poetry when her brother urged her to do so but she had started writing much earlier. The question asks us about her 'writing' poetry and not 'publishing' poetry this is not right answer, therefore. (2) This is factually incorrect according to passage and hence not the answer.(3) This is true. The passage says she stated writing when she was 11 years of age, which is quite young. This is a probable answer. (4) This cannot be.

Her genius was recognize only after she had written poetry. This not the answer. Thus, (2) is the right answer

Sol. 53 This is an inference question. The statement are not directly picked from the passage so the accuracy will be judged through inference elimination. (1) This cannot be the right answer as t passage does not link D.G. Rossetti's 10 for his sister with his judgments of h poetry. (2) Though he published poems but it is n suggested anywhere that this is the reas why Dante Gabriel Rossetti was able judge the poetic genius of his sister. Thu this cannot be the right answer (3) If we refer to the line 'Dante Rosseti, himself a poet and a painter soon recognized her genius ... 'then we can infer that Dante could judge the genius of his sister because h himself was a poet and could, therefore recognize the abilities in his sister. (4) This, obviously, is wrong. His being painter has nothing to do with his judging: Christina Rossetti's Poetic genius.

Sol. 54 This is a factual question. So, locate the relevant line in the passage before answering. "By the time of her death in 1894, Christina had written more than 1100 poems ...." (1) This is incorrect since Christina published 900 of the 1100 poems she had written. (2) This is untrue because according to the passage, about 200 of her poems remained unpublished (3) This is untrue again, she published over 900 poems, she had written over I 100 poems although (4) This is true. Hence, this is the right answer.

Sol. 55. This is a factual question but not focused on a sing line. Each statement will have to be individually confirmed from the given passage. (1) This is untrue since the very first sentence of the passage establishes that Christina Rossetti's poetry is included in all major "anthologies of 19th century poetry. This is not the answer. (2) This, also, is wrong for reasons same as above. (3) This statement is factually incorrect that Christina Rossetti lived and wrote poetry in the 19th century and not the 18th century. This is, then, not the answer. (4) This is the right answer because the last sentence of the passage says that "there is still no authoritative edition of her poetry".

Sol. 56 (2) Exonerate means declared free from blame, to implicate means to show that someone is involved in something especially a crime, to appease means to pacify, to adore means to love deeply and respect highly.

Sol. 57 (4) Fascinating means charming, fanaticism means madness, especially in religious or political matters, indolence means laziness.

Sol. 58 (4) A clever way to tackle this question would be to see the second as a prepositional usage. You go on foot. So, our choices narrow down to (3) and (4). Now, would you be utilising time if you go on foot? Perhaps not. So, (3) is eliminated. If you do something in order to gain time you do it in order to give yourself enough time. For what? To think of an excuse or a way out of a difficult situation.

Sol. 59 (2) Note that the paralytic attack was mild, which gives us the clue that its effect would be slight. This is further substantiated by the second part of the sentence:" ...otherwise he is still very active" means there is some (slight) trouble but not much.

Sol. 60 (4) If something contributes to an event or situation, it is one of the causes of it. Here factors has been used in the sense of causes. If you contribute money or resources to something, you give them to help achieve a particular purpose