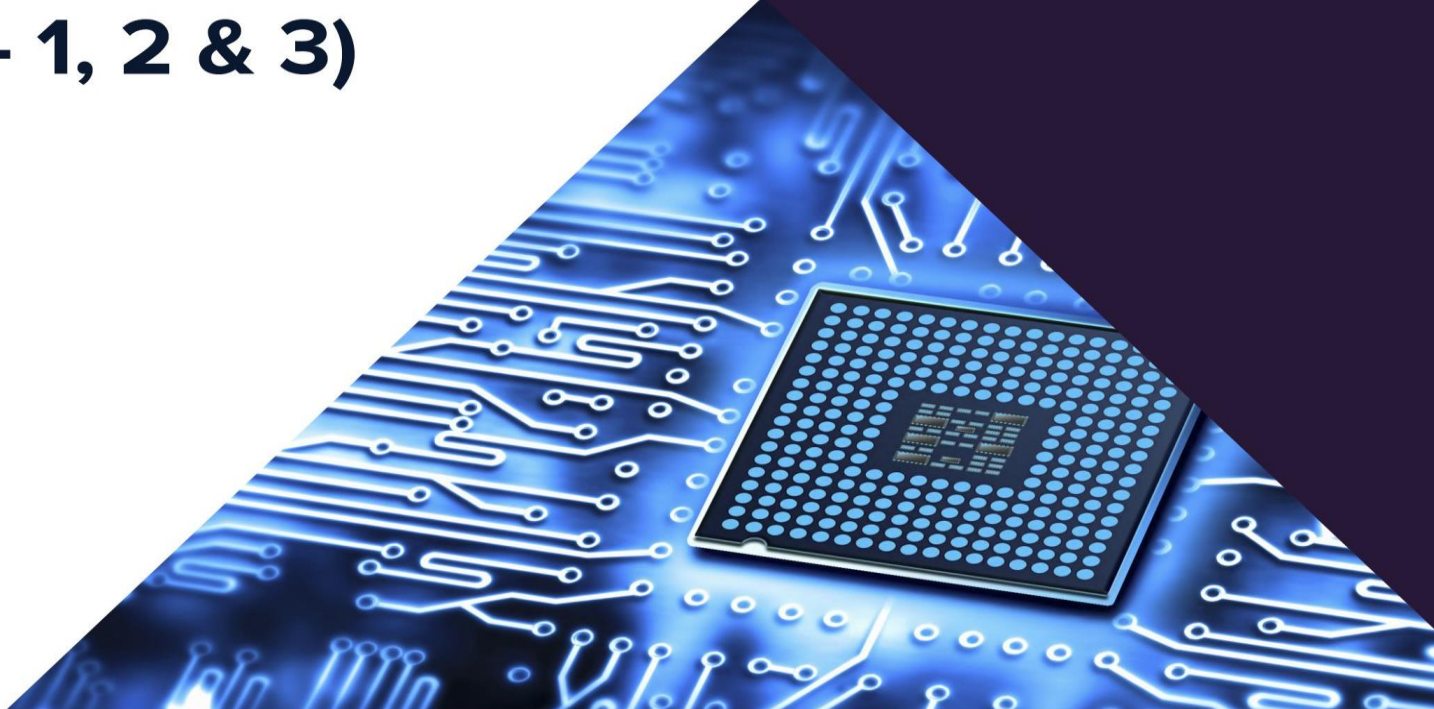


GATE 2016

Electronics
& Communication
Engineering

► **General Aptitude
Questions & Solutions
(Set - 1, 2 & 3)**



Set-1

1. Despite the new medicine's _____ in treating diabetes, it is not _____ widely.
- A. Effectiveness ---- prescribed
 - B. Availability ---- used
 - C. prescription--- available
 - D. Acceptance -----proscribed

Ans. A

Sol. 'effectiveness' is noun and 'prescribed' is verb. These words are apt and befitting with the word 'medicine.'

2. A person moving through a tuberculosis prone zone has a 50% probability of becoming infected.

However, only 30% of infected people develop the disease. What percentage of people moving through a tuberculosis prone zone remains infected but does not show symptoms of disease?

- A. 15
- B. 33
- C. 35
- D. 37

Ans. C

Sol.



P (a person infected but does not show symptoms) = $0.50 \times 0.70 = 0.35$

The percentage is 35%

3. Which of the following is CORRECT with respect to grammar and usage?

Mount Everest is _____.

- A. the highest peak in the world
- B. highest peak in the world

- C. One of highest peak in the world
- D. one of the highest peak in the world

Ans. A

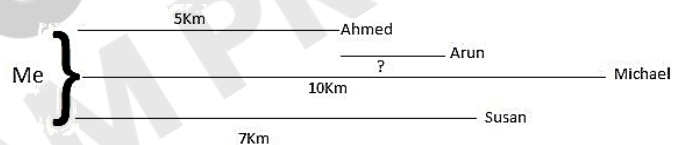
Sol. Before superlative article 'the' has to be used. 'one of' the expression should take plural noun and so option 'C' and 'D' can't be the answer.

4. Michael lives 10 km away from where I live. Ahmed lives 5 km away and Susan lives 7 km away from where I live. Arun is farther away than Ahmed but closer than Susan from where I live. From the information provided here, what is one possible distance (in km) at which I live from Arun's place?

- A. 3.00
- B. 4.99
- C. 6.02
- D. 7.01

Ans. C

Sol.



It's Obvious from the figure that the distance between Me and Arun would be lying in a range from 5Km to 7Km and from the given options, C would be correct answer.

5. Leela is older than her cousin Pavithra. Pavithra's brother Shiva is older than Leela. When Pavithra and Shiva are visiting Leela, all three like to play chess. Pavithra wins more often than Leela does. Which one of the following statements must be TRUE based on the above?

- A. When Shiva plays chess with Leela and Pavithra, he often loses.
- B. Leela is the oldest of the three.
- C. Shiva is a better chess player than Pavithra.
- D. Pavithra is the youngest of the three.

Ans. D

Sol. 1) Leela is older than her cousin Pavithra.

Leela age > Pavithra age

2) Pavithra's brother Shiva is older than Leela.

Shiva age > Leela age > Pavithra age

3) When Pavithra and Shiva are visiting Leela, all three like to play chess.

4) Pavithra wins more often than Leela does.

Now let's check each option,

A) When Shiva plays chess with Leela and Pavithra, he often loses-any information about Shiva's play is not given

B) Leela is the oldest of the three- this is false as Shiva is the oldest.

C) Shiva is a better chess player than Pavithra - any information about Shiva's play is not given.

D) Pavithra is the youngest of the three This is true

6. The policeman asked the victim of a theft, "What did you _____?"

- A. loose B. lose
C. loss D. louse

Ans. B

Sol. 'lose' is verb.

7. If $q^{-a} = \frac{1}{r}$, $r^{-b} = \frac{1}{s}$ and $s^{-c} = \frac{1}{q}$, the value of

abc is _____

- A. $(rqs)^{-1}$ B. 0
C. 1 D. $r + q + s$

Ans. C

Sol. $q^{-a} = \frac{1}{r}$, $r^{-b} = \frac{1}{s}$, $s^{-c} = \frac{1}{q}$

$$q^a = r, r^b = s, s^c = q$$

$$r = q^a = (s^c)^a = s^{ac}$$

$$s = r^b = (s^{ac})^b = s^{abc} \Rightarrow abc = 1$$

8. In a world filled with uncertainty, he was glad to have many good friends. He had always assisted them in times of need and was confident that they would reciprocate. However, the events of the last week proved him wrong.

Which of the following inference(s) is/are logically valid and can be inferred from the above passage?

- (i) His friends were always asking him to help them.
(ii) He felt that when in need of help, his friends would let him down.
(iii) He was sure that his friends would help him when in need.
(iv) His friends did not help him last week.

- A. (i) and (ii) B. (iii) and (iv)
C. (iii) only D. (iv) only

Ans. B

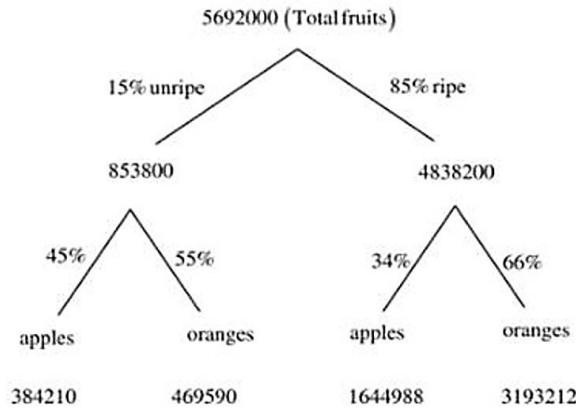
Sol. The words 'was confident that they would reciprocate' and 'last week proved him wrong' lead to statements iii and iv as logically valid inferences.

9. In a huge pile of apples and oranges, both ripe and unripe mixed together, 15% are unripe fruits. Of the unripe fruits, 45% are apples. Of the ripe ones, 66% are oranges. If the pile contains a total of 5692000 fruits, how many of them are apples?

- A. 2029198 B. 2467482
C. 2789080 D. 3577422

Ans. A

Sol.



Total number of apples = 384210 + 1644988
= 2029198

- 10.** P, Q, R and S are working on a project. Q can finish the task in 25 days, working alone for 12 hours a day. R can finish the task in 50 days, working alone for 12 hours per day. Q worked 12 hours a day but took sick leave in the beginning for two days. R worked 18 hours a day on all days. What is the ratio of work done by Q and R after 7 days from the start of the project?
- A. 10:11 B. 11:10
C. 20:21 D. 21:20

Ans. C

Sol. Q's one hour work = $\frac{1}{25 \times 12}$

R's one hour work = $\frac{1}{50 \times 12}$

Since Q has taken 2 days sick leave, he has worked only 5 days on the end of seventh day.

Work completed by Q on 7th day = (5x12)

$$\frac{1}{25 \times 12}$$

Work completed by R on 7th day = (7x18)

$$\frac{1}{50 \times 12}$$

Ratio of their work

$$= \frac{5 \times 12}{25 \times 12} / \frac{7 \times 12}{50 \times 12} \Rightarrow 20 : 21$$

Set-2

- 11.** A wire of length 340 mm is to be cut into two parts. One of the parts is to be made into a square and the other into a rectangle where sides are in the ratio of 1:2. What is the length of the side of the square (in mm) such that the combined area of the square and the rectangle is a MINIMUM?

- A. 30 B. 40
C. 120 D. 180

Ans. B

Sol. Perimeter of rectangle

$$= 2 \left[\frac{x}{3} + \frac{2x}{3} \right] = 2x$$

Perimeter of square = 340 - 2x

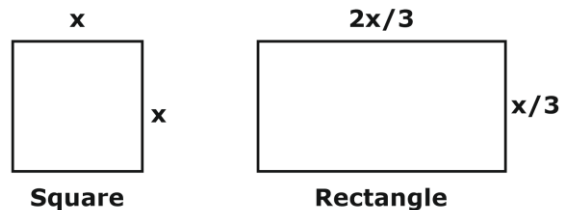
$$\text{Length of square} = \frac{340 - 2x}{4}$$

$$\text{Total area} = \left(\frac{340 - 2x}{4} \right)^2 + \frac{2}{9}x^2 = f(x)$$

$$f'(x) = \frac{4}{9}x - \frac{2x - 340}{4} = 0$$

$$\Rightarrow \frac{4}{9}x = \frac{1}{4}(340 - 2x) \Rightarrow x = 90$$

$$\text{Length of square} = \frac{340 - 2x}{4} = 40 \text{ mm}$$



- 12.** Based on the given statements, select the appropriate option with respect to grammar and usage.

Statements

- (i) The height of Mr. X is 6 feet.
(ii) The height of Mr. Y is 5 feet.

- A. Mr. X is longer than Mr. Y.
- B. Mr. X is more elongated than Mr. Y
- C. Mr. X is taller than Mr. Y.
- D. Mr. X is lengthier than Mr. Y

Ans. C

Sol. In degrees of comparison Mr. X is taller than Mr. Y is apt.

Positive degree – tall

Comparative degree – taller

Superlative degree – tallest

13. S, M, E and F are working in shifts in a team to finish a project. M works with twice the efficiency of others but for half as many days as E worked. S and M have 6 hour shifts in a day, whereas E and F have 12 hours shifts. What is the ratio of contribution of M to contribution of E in the project?

- A. 1:1
- B. 1:2
- C. 1:4
- D. 2:1

Ans. B

Sol. M efficiency = 2 [efficiency of S, E, and F]

Contribution of M in the project = x days × 6 hrs. × 2

Contribution of E in the project = 2x days × 12 hrs. × 1

Contribution of M: Contribution of E

$$x \times 6 \times 2 : 2x \times 12 \times 1$$

$$1 : 2$$

14. After India's cricket world cup victory in 1985, Shrotria who was playing both tennis and cricket till then, decided to concentrate only on cricket. And the rest is history. What does the underlined phrase mean in this context?

- A. History will rest in peace
- B. rest is recorded in history books
- C. Rest is well known
- D. rest is archaic

Ans. C

Sol. 'rest is history' is an idiomatic expression which means 'rest is well known'

15. The student's _____ the teacher on teachers' day for twenty years of dedicated teaching.

- A. facilitated
- B. felicitated
- C. fantasized
- D. fabricated

Ans. B

Sol. Let us look at the meanings of the words:

1. Facilitated: Helps improve something
2. Felicitated: Congratulate
3. Fantasize: Dream about something

The other option is not a word. Thus, the correct word to be used in the blank is 'felicitated' that will give the meaning of the teacher being congratulated.

16. Social science disciplines were in existence in an amorphous form until the colonial period when they were institutionalized. In varying degrees, they were intended to further the colonial interest. In the time of globalization and the economic rise of postcolonial countries like India, conventional ways of knowledge production have become obsolete. Which of the following can be logically inferred from the above statements?

- (i) Social science disciplines have become obsolete.
- (ii) Social science disciplines had a pre-colonial origin.
- (iii) Social science disciplines always promote colonialism.
- (iv) Social science must maintain disciplinary boundaries.

- A. (ii) only
- B. (i) and (iii) only
- C. (ii) and (iv) only
- D. (iii) and (iv) only

Ans. A

Sol. Until the colonial period means pre-colonial origin. Other options can't be inferred.

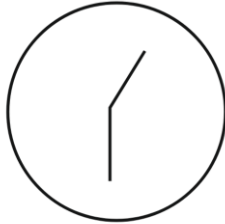
17. Two and a quarter hours back, when seen in a mirror, the reflection of a wall clock without number markings seemed to show 1:30. What is the actual current time shown by the clock?

- A. 8:15 B. 11:15
C. 12:15 D. 12:45

Ans. D

Sol. Time back = $2[1/2] = 2$ hrs 15 min

If reflection is seen as



1:30

Actual Will Be



10:30

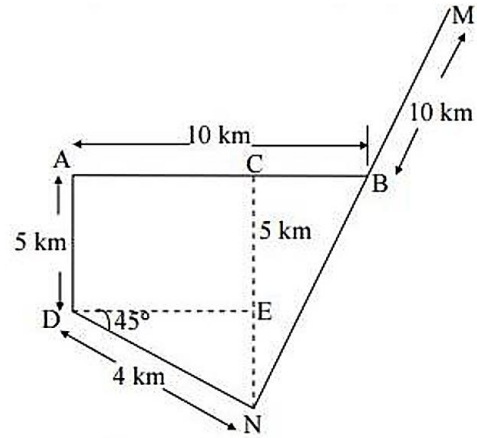
Thus, present time will be $10:30 + 2:15 = 12:45$

18. M and N start from the same location. M travels 10 km East and then 10 km North-East. N travels 5 km South and then 4 km South-East. What is the shortest distance (in km) between M and N at the end of their travel?

- A. 18.60 B. 22.50
C. 20.61 D. 25.00

Ans. C

Sol.



$$\cos 45^\circ = \frac{DE}{4}$$

$$DE = \cos 45^\circ \times 4 = 2.828 \text{ km}$$

$$\sin 45^\circ = \frac{EN}{4}$$

$$EN = \sin 45^\circ \times 4 = 2.828 \text{ km}$$

$$CN = NE + CE = 2.828 + 5 = 7.828 \text{ km}$$

$$CB = AB - AC = 10 - 2.828 = 7.171 \text{ km}$$

$$(NB)^2 = (NC)^2 + (BC)^2 = (7.828)^2 + (7.171)^2$$

$$\therefore NB = \sqrt{(7.828)^2 + (7.171)^2} = 10.616 \text{ km}$$

$$\therefore NM = NB + BN = 10.616 + 10 = 20.61 \text{ km}$$

19. Given $(9 \text{ inches})^{1/2} = (0.25 \text{ yards})^{1/2}$, which one of the following statements is TRUE?

- A. 3 inches = 0.15 yards
B. 9 inches = 1.5 yards
C. 9 inches = 0.25 yards
D. 81 inches = 0.0625 yards

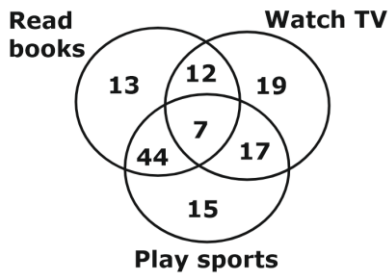
Ans. C

Sol. $(9 \text{ inches})^{1/2} = (0.25 \text{ yards})^{1/2}$

Squaring on both sides

$$9 \text{ inches} = 0.25 \text{ yards}$$

20. The Venn diagram shows the preference of the student population for leisure activities.



From the data given, the number of students who like to read books or play sports is _____

- A. 44
- B. 51
- C. 79
- D. 108

Ans. D

Sol. From Venn diagram

$$n(A) = \text{no of persons reading books} = 13 + 44 + 12 + 7 = 76$$

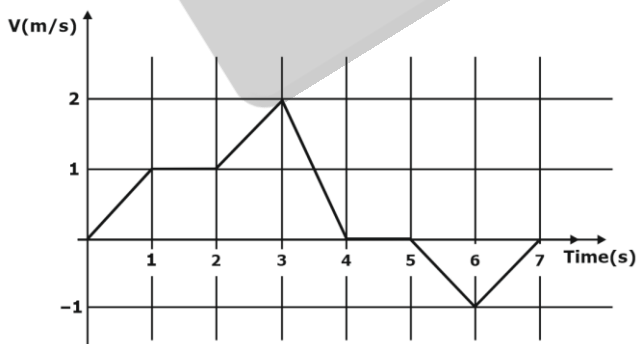
$$n(B) = \text{no of persons playing} = 15 + 44 + 7 + 17 = 83$$

$$n(A \cap B) = 51$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B) = 76 + 83 - 51 = 108$$

Set-3

21. The velocity V of a vehicle along a straight line is measured in m/s and plotted as shown with respect to time in seconds. At the end of the 7 seconds, how much will the odometer reading increase by (in m)?



- A. 0
- B. 3
- C. 4
- D. 5

Ans. D

Sol. The odometer reading increases from starting point to end because odometer measures distance and not displacement.

So, all the areas should be counted positive only.

Area of the given diagram = Odometer reading

Area of the velocity and time graph per second

$$1^{\text{st}} \text{ sec triangle} = \frac{1}{2} \times 1 \times 1 = \frac{1}{2}$$

$$2^{\text{nd}} \text{ sec square} = 1 \times 1 = 1$$

$$3^{\text{rd}} \text{ sec square} + \text{triangle} = 1 \times 1 + \frac{1}{2} \times 1 \times 1 = \frac{3}{2}$$

$$4^{\text{th}} \text{ sec triangle} = \frac{1}{2} \times 1 \times 2 = 1$$

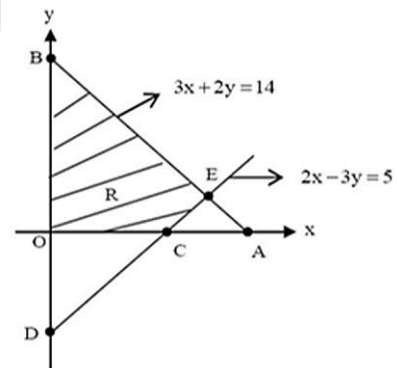
$$5^{\text{th}} \text{ sec straight line} = 0$$

$$6^{\text{th}} \text{ sec triangle} = \frac{1}{2} \times 1 \times 1 = \frac{1}{2}$$

$$7^{\text{th}} \text{ sec triangle} = \frac{1}{2} \times 1 \times 1 = \frac{1}{2}$$

$$\text{Total Odometer reading at 7 seconds} = \frac{1}{2} + 1 + \frac{3}{2} + 1 + 0 + \frac{1}{2} + \frac{1}{2} = 5$$

22. Find the area bounded by the lines $3x + 2y = 14$, $2x - 3y = 5$ in the first quadrant.



- A. 14.95
- B. 15.25
- C. 15.70
- D. 20.35

Ans. B

Sol. $A = \left(\frac{14}{3}, 0\right)$

$$B = (0, 7)$$

$$C = \left(\frac{5}{2}, 0\right)$$

$$D = \left(0, \frac{-5}{3}\right)$$

$$E = (4, 1)$$

Required area is area of

ΔOAB - area of ΔCEA

$$\frac{1}{2} \left(\frac{14}{3}\right)(7) - \frac{1}{2} \left(\frac{13}{6}\right)(1) = 15.25 \text{ sq. units}$$

23. The number that least fits this set: (324, 441, 97 and 64) is _____.

- A. 324 B. 441
C. 97 D. 64

Ans. C

Sol. $324 = 18^2$; $441 = 21^2$; $64 = 8^2$

but $97 \neq x^2$ for any positive integer, i.e. 97 is odd man out

24. A straight line is fit to a data set (ln x, y). This line intercepts the abscissa at $\ln x = 0.1$ and has a slope of -0.02 . What is the value of y at $x = 5$ from the fit?

- A. -0.030 B. -0.014
C. 0.014 D. 0.030

Ans. A

Sol. $y = a + bx$, where $x = \ln x$ and

$$-\frac{a}{b} = 0.1, b = -0.02$$

$$= a - 0.02(x)$$

$$\Rightarrow a = 0.002$$

$$= 0.002 - 0.02(x)$$

$$\text{at } x = 5, y = 0.002 - 0.02(1.609) = -0.03018$$

$$= -0.030$$

25. It takes 10s and 15s, respectively, for two trains travelling at different constant speeds to completely pass a telegraph post. The length of the first train is 120 m and that of the second train is 150 m. The magnitude of the difference in the speeds of the two trains (in m/s) is _____.

- A. 2.0 B. 10.0
C. 12.0 D. 22.0

Ans. A

Sol. $\text{Speed} = \frac{\text{length}}{\text{time}} \Rightarrow \text{length} = \text{speed} \times \text{time}$

$$120 = 10 \times s_1 \Rightarrow s_1 = 12$$

$$150 = 15 \times s_2 \Rightarrow s_2 = 10$$

$$|s_1 - s_2| = 2$$

26. The Buddha said, "Holding on to anger is like grasping a hot coal with the intent of throwing it at someone else; you are the one who gets burnt."

Select the word below which is closest in meaning to the word underlined above.

- A. burning B. igniting
C. clutching D. flinging

Ans. C

Sol. Clutching means grasp (something) tightly, so it would be correct answer.

27. M has a son Q and a daughter R. He has no other children. E is the mother of P and daughter-in-law of M. How is P related to M?

- A. P is the son-in-law of M
B. P is the grandchild of M
C. P is the daughter-in law of M
D. P is the grandfather of M

Ans. B

Sol. Q and R are the son and Daughter of M, E is the mother of P and daughter-in-law of M Means Q and E are married couples in the family

\therefore P is the grandchild of M

28. The overwhelming number of people infected with rabies in India has been flagged by the World Health Organization as a source of concern. It is estimated that inoculating 70% of pets and stray dogs against rabies can

significantly reduce the number of people infected with rabies.

Which of the following can be logically inferred from the above sentences?

- A. The number of people in India infected with rabies is high.
- B. The number of people in other parts of the world infected with rabies is low.
- C. Rabies can be eradicated in India by vaccinating 70% of stray dogs
- D. Stray dogs are the main sources of rabies worldwide.

Ans. A

Sol. The overwhelming number of people infected with rabies in India has been flagged by the world Health Organization as a source of concern. It is estimated that inoculating 70% of pets and stray dogs against rabies can lead to a significant reduction in the number people infected with rabies. Which of the following can be logically inferred from the above sentences? The information given in the passage does not help us conclude whether stray dogs are the main source of rabies globally. Thus option 4 cannot be inferred.

It is said that 70% of both pets and stray dogs need to be inoculated to reduce the number of people infected with rabies. Thus option 3 also cannot be inferred

No information about the number of people infected in other parts of the world has been given. Thus option 2 is also eliminated. The passage states that WHO is concerned because of the huge number of rabies patients in India. This means that the number is quite

high otherwise the WHO would not have been concerned. Thus option 1 is the correct inference.

29. An apple costs Rs. 10. An onion costs Rs. 8. Select the most suitable sentence with respect to grammar and usage.

- A. The price of an apple is greater than an onion
- B. The price of an apple is more than onion
- C. The price of an apple is greater than that of an onion
- D. Apples are more costlier than onions

Ans. C

Sol. Based on the given sentences option 'C' is the correct sentence which is in the comparative degree. Option 'A' and 'B' convey the wrong comparison and 'D' has double comparative and so they are wrong.

30. Four first-year undergraduate students share a flat. They agreed to allow the oldest to enjoy some extra space in the flat. Manu is two months older than Sravan, who is three months younger than Trideep, and Pavan is one month older than Sravan. Who should occupy the extra space in the flat?

- A. Manu
- B. Sravan
- C. Trideep
- D. Pavan

Ans. C

Sol. Manu is two months older than Sravan
 $\Rightarrow M = 2 + S$
Sravan, is three months younger than Trideep
 $\Rightarrow T = 3 + S = M + 1$
Pavan is one month older than Sravan
 $\Rightarrow P = 1 + S = M - 1 = T - 2$
So, $S < P < M < T$.
Option C. Trideep is the oldest.
