EXPLORE SOME INTRIGUING SCIENTIFIC PHENOMENON

SOLAR FLARE

A solar flare is a violent explosion in the Sun's atmosphere with an energy equivalent to tens of millions of hydrogen bombs. Solar flares take place in the solar corona and chromosphere, heating plasma to tens of millions of kelvins and accelerating the resulting electrons, protons and heavier ions to near the speed of light. They produce electromagnetic radiation across the electromagnetic spectrum at all wavelengths from long-wave radio to the shortest wavelength gamma rays. Most flares occur around sunspots, where intense magnetic fields emerge from the Sun's surface into the corona. The energy efficiency associated with solar flares may take several hours or even days to build up, but most flares take only a matter of minutes to release their energy.

Q1.) Which statement is true regarding the wavelength of gamma rays?
a.)Lie in the visible region
b.)Shorter than wavength of visible region
c.)Larger than wavelength of visible region
d.)can't be determined

Q2.)   In an atomic explosion, enormous energy is released which is due to
a.) conversion of chemical energy into heat energy
b.) conversion of mechanical energy into nuclear energy
c.) conversion of mass into energy
d.) conversion of neutrons into protons

DIRTY THUNDERSTORM

A series of astounding images of a 'dirty thunderstorm', captured by volcano film-maker Marc Szeglat , show the earth's power at its most terrifying and breath-taking.

A dirty thunderstorm (also volcanic lightning, thunder volcano) is a weather phenomenon that is related to the production of lightning in a volcanic plume.They are a rare phenomenon, associated with large volcanic eruptions.Volcanic eruptions are sometimes accompanied by flashes of lightning. However, this lightning doesn't descend from storm clouds in the sky. It is generated within the ash cloud spewing from the volcano, in a process called charge separation.

But unusually and perhaps uniquely, they occur regularly at Sakurajima volcano in Japan, one of the most active volcanoes in the world.Although volcanic lightning is a rare phenomenon, the event occurs relatively frequently at Sakurajima, says Mr Szeglat.

On his latest filming expedition, Mr Szeglat was thrilled to witness one of the volcano's dramatic eruptions and lightning displays.

"Sakurajima is the only volcano I know that has frequent lightning in daily eruptions," he says. But why that happens so often here is unclear.

Q3.) In a normal thunderstorm ice crystals collide and generate electric charges, which results in lightning. In an eruption what collides to produce lightening?
a.)water vapours
b.)ice crystals
c.)ash particles
d.)Both B and C

Q4.) Magma which is forced onto Earth's surface is known as
a.)Vent
b.)Cone
c.)Lava
d.)Magma Chamber

FLAMMABLE ICE BUBBLES

These frozen bubbles under Alberta's Lake Abraham might look like winter jewels, but you wouldn't want to be too close to one if it popped: the bubbles are actually frozen pockets of methane, a highly flammable gas. Most of the time, methane escaping from the surface of water is relatively harmless—but if you happen to be lighting a match at the time one of these bubbles explodes, watch out.

Methane bubbles form in bodies of water when dead organic matter (leaves and animals) falls into the water and sinks to the bottom, to the delight of bacteria waiting below. The bacteria munches on the matter and poops out methane, which turns to white floating blobs when it comes into contact with frozen water. Methane is formed in thousands of lakes around the arctic, but decreasing permafrost means more and more of this methane is being released into the atmosphere, a worrying trend for climate scientists.

Q5.)Why are methane bubbles formed in water bodies?
a.)The plants release methane while respiration under the water.
b.)Methane is released from the dead organic matter after being decayed by bacteria.
c.)Methane is trapped because of the lightening and thunderstorm when strikes onto the lake.
d.)Both A and B

Q6.) Why is decreasing permafrost a problem?
a.) Methane is a more potent greenhouse gas than carbon dioxide.
b.) It might cause fire if struck by even a spark.
c.) It might decrease the nutrient content of the soil.
d.)Both A and B

TEST YOUR QUANTITATIVE REASONING

Q7.) Kiran starts a shop of his own but being a fan of the barter system, he does business using the following conversion.
10 mangoes = 2 Guava

1 Guava = 2 Peach
4 Peach = 1 Apple

On the basis of the above rates, to buy an apple, how many mangoes should I give Kiran?

a.   4
b.   8
c.   10
d.   12

Q8.) In a US constituency of 100 households, 75 have at least one car, 80 have at least one bike, and 55 have at least one chopper. If a and b are respectively the greatest and lowest possible number of households that have all three of these devices, a – b is:
a.   65
b.   55
c.   45
d.   35

Q9.) If a=1/2, b=3/4 what is sqrt(a^2+8a+16)-sqrt(b^2-4b+4)?
a.   -23/4
b.   23/4
c.   15/4
d.   Both a and b

Q10.) On an average, Ajay comes out of his home for air once every two minutes; Dikshant, his neighbour, comes out for air on an average once every five minutes. The number of times Ajay would come out for air in a 24 hour period is approximately what percent greater than the number of times Dikshant would come out for air in that same period?
a.   50%
b.   100%
c.   150%
d.   200%

Q11.) Usain Bolt starts at point X and sprints clockwise around a circular track at a constant rate of approximately 2 mph. Ten hours later, his closest rival Justin Gatlin starts from point X and sprints counter-clockwise around the same circular track at a constant rate of approximately 3 mph. If the radius of the track is 10 miles, for how many hours will Usain Bolt have been running if both of them have passed each other for the first time and put another 12 miles between them (measured around the curve of the track)?
a.   4pi-1.6
b.   4pi+8.4
c.   4pi+10.4
d.   2pi-1.6

Q12.)A certain business produced m rakes each month form November through February and shipped m/2 rakes at the beginning of each month from March through October. The business paid no storage costs for the rakes from November through February, but it paid storage costs of $0.10 per rake each month from March through October for the rakes that had not been shipped. In terms of m, what was the total storage cost, in dollars, that the business paid for the rakes for the 12 months form November through October?

a.   0.40m
b.   1.20m
c.   3.20m
d.   1.40m

Q13.)In a certain bathtub, both the cold-water and the hot-water fixtures leak. The cold-water leak alone would fill an empty bucket in c hours and the hot-water leak alone would fill the same bucket in h hours, where c<h. If both fixtures began to leak at the same time into the empty bucket at their respective constant rates and consequently it took t hours to fill the bucket, which of the following must be true?

I. 0 < t < h
II. c < t < h
III. c/2 < t < h/2

a.   I only
b.   II only
c.   I and II
d.   I and III

Q14.) AB + CD = AAA, where AB and CD are two-digit numbers and AAA is a three digit number; A, B, C, and D are distinct positive integers. In the addition problem above, what is the value of C?

a.   3
b.   7
c.   9
d.   Cannot be determined

KNOWLEDGE TESTER

Q15.) A simple one to begin with. What is the 8th digit to the right of the decimal point of $(1/5)^9$?

a.   1
b.   2
c.   0
d.   4

Q16.) If the sum of the consecutive integers from –43 to n inclusive is 539, what is the value of n?

a.   50
b.   49
c.   54
d.   52

Q17.)If a>b^2>c^4, which of the following statements could be true?

I. a>b>c

II. C>b>a

III. A>c>b

a.   I and II only
b.   I and III only
c.   All the three
d.   II and III only

Q18.) Coach Valverde is filling out the starting lineup for his junior Barcelona soccer team. There are 10 boys on the team, and he must assign 6 starters to the following positions: 1 goalkeeper, 2 on defence, 2 in midfield, and 1 forward. Only 2 of the boys can play goalkeeper, and they cannot play any other positions. The other boys can each play any of the other positions. How many different groupings are possible?
a.   60
b.   210
c.   2580
d.   3360

Q19.) In 1986, the city of Los Diablos had 20 days on which air pollution reached unhealthful amounts and a smog alert was put into effect. In early 1987, new air pollution control measures were enacted, but the city had smog alerts on 31 days that year and on 39 days the following year. In 1989, however, the number of smog alerts in Los Diablos dropped to sixteen. The main air pollutants in Los Diablos are ozone and carbon monoxide, and since 1986 the levels of both have been monitored by gas spectrography.

Which of the following statements, assuming that each is true, would be LEAST helpful in explaining the air pollution levels in Los Diablos between 1986 and 1989?

(A) The 1987 air pollution control measures enacted in Los Diablos were put into effect in November of 1988.
(B) In December of 1988 a new and far more accurate gas spectrometer was invented.
(C) In February of 1989, the Pollution Control Board of Los Diablos revised the scale used to determine the amount of air pollution considered unhealthful.
(D) In 1988 the mayor of Los Diablos was found to have accepted large campaign donations from local industries and to have exempted those same industries from air pollution control measures.

Q20.) The average of temperatures at noontime from Monday to Friday is 50; the lowest one is 45, what is the possible maximum range of the temperatures?
a.   20
b.   25
c.   40

d.   45

Q21.) In Patton City, days are categorized as having heavy rainfall (more than two inches), moderate rainfall (more than one inch, but no more than two inches), light rainfall (at least a trace, but no more than one inch), or no rainfall. In 1990, there were fewer days with light rainfall than in 1910 and fewer with moderate rainfall, yet total rainfall for the year was 20 percent higher in 1990 than in 1910.

If the statements above are true, then it is also possible that in Patton City

(A) the number of days with heavy rainfall was lower in 1990 than in 1910
(B) the number of days with some rainfall, but no more than two inches, was the same in 1990 as in 1910
(C) the number of days with some rainfall, but no more than two inches, was higher in 1990 than in 1910
(D) the total number of inches of rain that fell on days with moderate rainfall in 1990 was more than twice what it had been in 1910

Q22.) The water level in a rectangular pool measuring 60 feet by 25 feet is to be lowered by 6 inches. How many gallons of water must be removed? (1 cu ft = 7.5 gallons)
a.   5400
b.   5675
c.   5625
d.   5700

PSYCHOMETRIC SUCCESS

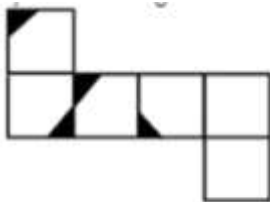Q23.) Choose the correct option:
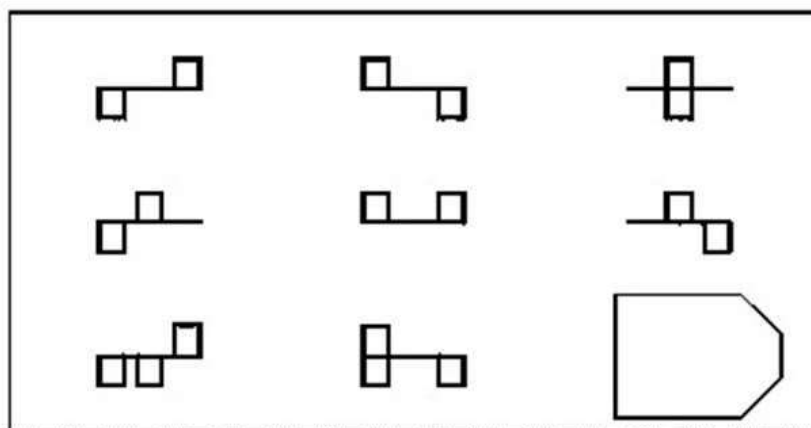
Q24.) How many triangles are there in the given figure.

a.)23
b.)24
c.)27
d.)22

Q25.) The cube folds in which of the following options:

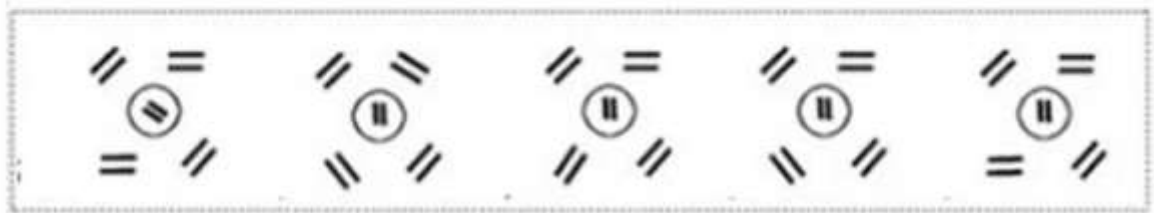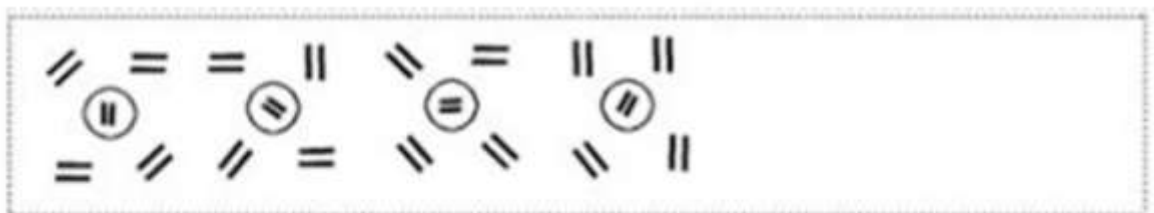a.)   b.)   c.)   d.)

Q26.) Complete the pattern:
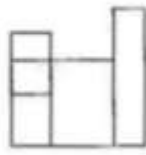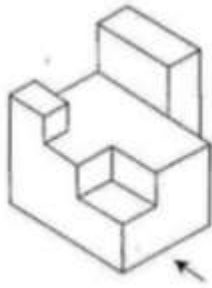

a.)   b.)   c.)   d.)   e.)
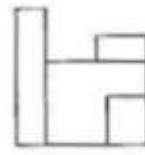
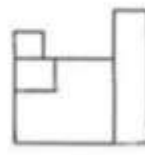Q27.) Find the correct option that relates to the correct view as seen from the side directed by the arrow.

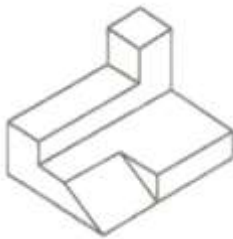a.)   b.)   c.)   d.)

Q28.) How many faces does the given fiure have:

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

Q29.) Traitor : Disloyalty

a.) Executioner : Reliability
b.) Rebel: defiance
c.) Manager : Administration
d.) hope : pessimism

Q30.) If 'tee see pee' means 'Drink fruit juice'; 'see kee lee' means 'Juice is sweet ; ' and 'lee ree mee' means 'He is intelligent' which word in that language means 'sweet' ?

(a) see
(b) kee
(c) lee
(d) pee

Q31.) Pointing out to a lady, Rajan said, "She is the daughter of the woman who is the mother of the husband of my mother." Who is the lady to Rajan ?

 (a) Aunt
(b) Grand daughter
(c) Daughter
(d) Sister-in-law

Q32.) Eight books are kept one over the other. Counting from the top, the second, fifth and sixth books are on Plays. Two books on Plays are between two books on Composition. One book of Plays is between two books on Poetry while the book at the top of the book of Literature is a book of Composition. Which book is fourth from the top ?

 (a) Plays
(b) Poetry
(c) Composition
(d) Literature

Q33. to Q35.) Read the following information and answer the questions that follow :

(i) Six friends A, B, C, D,E and F are sitting in a closed circle facing the centre,
(ii) E is to the left of D.
(iii) C is between A and B.
(iv) F is between E and A.

Q33.) Who is to the left of B ?
(a) A
(6) C
(c) D
(d) E
(e) None of these

Q34.) Who is to the right of C ?
(a) A
(b) B
(c) D
(d) E
(e) F

Q35.) Which of the above given statements is superfluous ?
(a) (i)
(b) (ii)
(c) (iii)
(d) (iv)
(e) None of these

Directions (Questions 36 to 40): Read the following information to answer the questions given below it : (S.B.I.P.0.199S) (i) In a family of six persons, there are people from three generations. Each person has separate profession and also they like different colours. There are two couples in the family. (ii) Rohan is a CA and his wife neither is a doctor nor likes green colour. (iii) Engineer likes red colour and his wife is a teacher. (iv) Mohini is mother-in-law of Sunita and she likes orange colour. , (v) Vinod is grandfather of Tanmay and Tanmay, who is a principal, likes black colour. (t;i) Nanu is grand-daughter of Mohini and she likes blue colour. Nanu's mother likes white colour.

36. Who is an Engineer ?
(a) Nanu
(b) Mohini

(c) Sunita
(d) Cannot be determined

37. What is the profession of Sunita ?
(a) Engineer
(b) Doctor
(c) Teacher
(d) Cannot be determined

38. Which of the following is the correct pair of two couples ?
(a) Mohini-Vinod and Rohan-Sunita
(b) Vinod-Mohini and Rohan-Nanu
(c) Rohan-Sunita and Tanmay-Nanu
(d) Cannot be determined

39. How many ladies are there in the family ?
(a) Two
(b) Three
(c) Four
(d) Cannot be determined

40. Which colour is liked by CA ?
(a) Green
(b) White
(c) Either White or Green
(d) Cannot be determined

Q41.) Six roads lead to a country. They may be indicated by letters X, Y, Z and digits 1, 2, 3. When there is storm, Y is blocked. When there are floods, X, 1 and 2 will be affected. When road 1 is blocked, Z also is blocked. At a time when there are floods and a storm also blows, which road(s) can be used ?

(a) Only Y
(b) Only Z
(c) Only 3
(d) Z and 2
Directions : For the Assertions (A) and Reasons (R) below, choose the correct alternative from the following : (a) Both A and R are true and R is the correct explanation of A. (6) Both A and R are true but R is NOT the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true. (e) Both A and R are false

Q44.). Assertion (A) : Ventilators are provided near the roof.

Reason (R) : Conduction takes place better near the roof.

Q45.) Assertion (A) : Moon cannot be used as a satellite for communication.

Reason (R) : Moon does not move in the equatorial plane of the earth.

Q46.) Assertion (A) : Salt is added to cook food at higher altitudes.

Reason (R) : Temperature is lower at higher altitudes.

Q47.) A man is facing west. He turns 45° in the clockwise direction and then another 180c in the same direction and then 270° in the anticlockwise direction. Which direction is he facing now ?

(a) South
(b) North-west
(c) West
(d) South-west

TEST YOUR VERBAL REASONING

COMPREHENSION 1:
Both carbon monoxide and carbon dioxide are colorless, odorless gases. Carbon monoxide occurs naturally in animal metabolism, plant photosynthesis, volcano eruption, forest fires and other combustion. It also comes from man-made processes like operating a stove. When carbon mono-oxide accumulates in a contained area, it can become lethal to humans. People who directly inhale enough carbon mono-oxide will lose consciousness and eventually die.

Q48.) The creation of carbon monoxide is an effect. What is one cause?

a.) the regrouping of the atoms in table salt
b.) the burning of fossil fuels
c.) cleaning swimming pools
d.) operating a stove

Q49.) Operating a stove in a is harmful for humans.

a.) True in case of closed environment
b.) False in case of closed environment
c.) Insufficient information
d.) True even in case of open environment

COMPREHENSION 2:
Inflammation is a process by which the body's white blood cells and chemicals protect us from infection and foreign substances such as bacteria and viruses. In some diseases, however, the body's defense system (immune system) inappropriately triggers an inflammatory response when there are no foreign substances to fight off. In these diseases, called autoimmune diseases, the body's normally protective immune system causes damage to its own tissues. The body responds as if normal tissues are infected or somehow abnormal. Some, but not all, types of arthritis are the results of misdirected inflammation. Arthritis is a general term that describes inflammation in joints. Inflammation is characterized by: Redness, Swollen joint that is warm to touch, Joint pain, Joint stiffness, Loss of joint function. Often, only a few of these symptoms are present. Inflammation may also be associated with general "flu-like" symptoms including: Fever, Chills, Fatigue/loss of energy, Headaches, Loss of appetite, Muscle stiffness. When inflammation occurs, chemicals from the body's white blood cells are released into the blood or affected tissues in an attempt to rid the body of

foreign substances. This release of chemicals increases the blood flow to the area and may result in redness and warmth. Some of the chemicals cause leakage of fluid into the tissues, resulting in swelling. 'The inflammatory process may stimulate nerves and cause pain.

Q50.) Statement: All types of arthritis are a result of misdirected inflammation.
a.) False
b.) not available
c.) insufficient information
d.) true

Q51.) Statement- Inflammation is beneficial for our body.
a.) Always true
b.) Always false
c.) Sometimes false
d.) Insufficient information

Q52.) Statement: There are several symptoms to indicate inflammation, and not all occur at every patient.
a.) False
b.) True
c.) Insufficient information
d.) Not available

FIGURE OUT THE ANALOGY

(Q.53 to Q55.)The following questions are hosed on the alphabets written along the figure given below. In each question, the relationship between the two terms written left of:: is retained in the two terms written to the right of it. Out of these four terms, one term is missing. Choose this term out of the given alternatives.
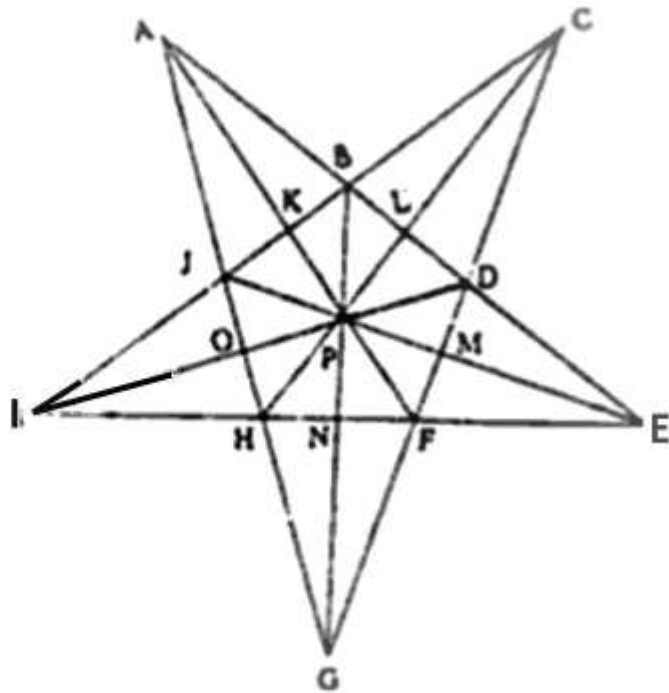
Q53.) AKJ : GNH : : EMD : ?

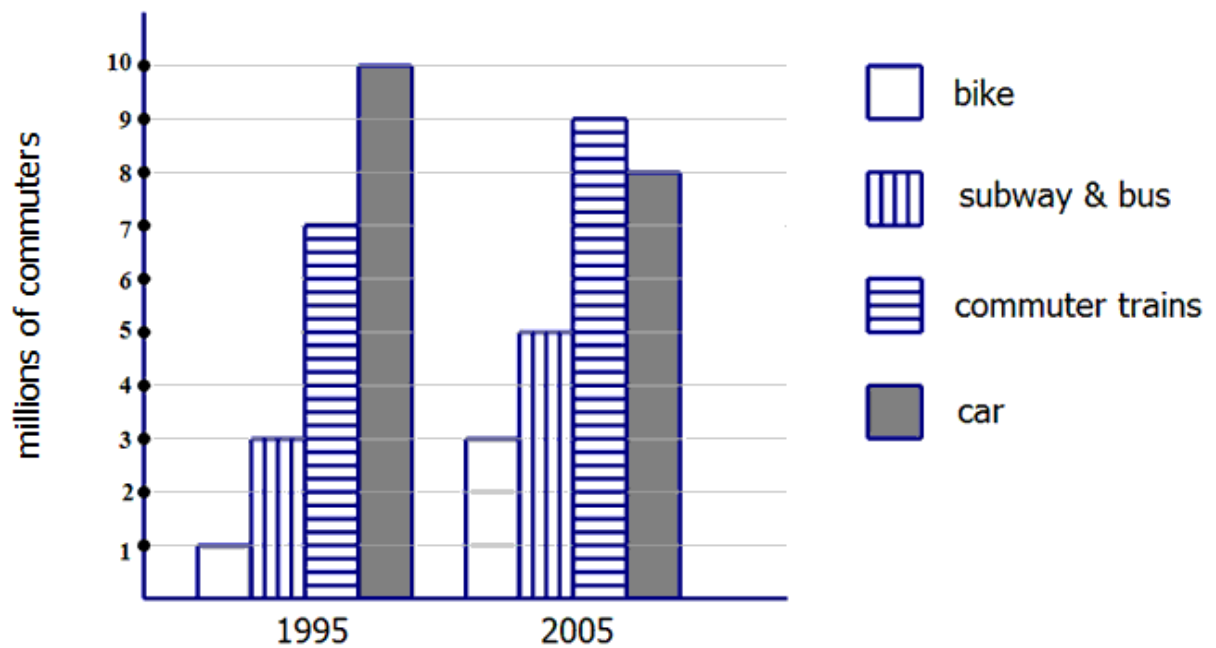(a) CLB (b) CLD (c) ARB (d) EMF (e) CDB

Q54.)AFHO : GBDM : : CHFM :?

(a) GBLD (b) GBJO (c) GPLD (d) GBDM (e) IBDE

Q55.) AOE:?::GMA : NKM

(a) KLM (b) KLF (c) OBM (d) KLO (e) KMN

INTERPRET THE GRAPH

Commuters in Farview City

Q42.) The commuting mode whose ridership increased by approximately 29% from 1995 to 2005 is
_____.
a.)bike
b.)subway & bus
c.)commuter trains
d.)car

Q43.) Assume the graph above shows all commuters in the two relevant years. In 2005, the car commuters were _____ percent of all commuters.
a.)25
b.)32
c.)48
d.)60