**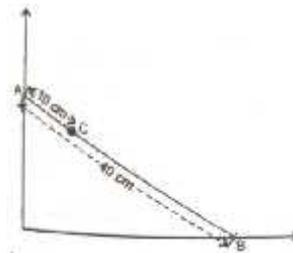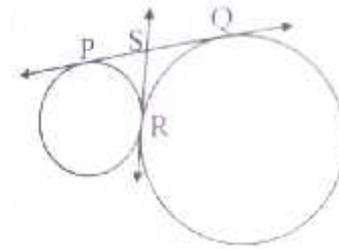Q 1)** Two wires of same material and length have the radii of their cross section as r and 2r respectively. The ratio of their resistance
(a) 2 : 1           (b) 4 : 1           (c) 1 : 4           (d) 3 : 2

**Q 2)** In Fleming's right hand rule
(a) Middle figure indicates the motion of the conductor
(b) Thumb indicates direction of magnetic field
(c) Fore figure indicates direction of induced current
(d) None of the above is true

**Q 3)** To obtain an image of the same size as that of an object with the help of a convex lens. The object should be placed …….
(a) at infinity                               (b) beyond $F_1$
(c) Between $F_1$ and $2F_1$              (d) At $2F_1$

**Q 4)** When a ray of light passes from a denser medium to a rarer medium the angle of incidence ….
(a) equal to the angle of refraction         (b) greater than the angle of refraction
(c) smaller than the angle of refraction      (d) greater than $90^0$

**Q 5)** Which one is the example of rest as well as motion at the same time
(a) A paper weight lying on a table       (b) A bird flying high in the sky
(c) A person sitting in a stationary train    (d) A person sitting in a moving car

**Q 6)** When a body is in equilibrium under the action of two or more forces, the algebraic sum of the moments about the turning point is :
(a) positive integer                     (b) negative integer
(c) zero                               (d) none of the above

**Q 7)** The density of air decreases rapidly :
(a) With the rise in temperature         (b) With the fall in temperature
(c) With the decrease in water vapour    (d) With the increase in polluting gas

**Q 8)** The flow of heat energy from one body to another body is determined by difference in their :
(a) Heat energy                      (b) Temperature
(c) Heat energy as well as temperature    (d) None of the above

**Q 9)** AB is a frictionless inclined plane 40 cm long. If a body slides down it in 4 s then the time in which it sides from A to C is :



(a) 1 s           (b) 2 s           (c) 1.6 s           (d) 0.5 s

**Q 10)** Two identical charges, each of magnitude 5C are placed at distance of 5 km from each other. The force of repulsion between them is :
(a) 9 N           (b) 90 N           (c) 900 N           (d) 9000 N

**Q 11)** A substance which has large difference in number of electrons spinning in the opposite direction is called :
(a) paramagnetic substance          (b) non-magnetic substance
(c) diamagnetic substance            (d) ferromagnetic substance

**Q 12)** A boy sitting in a boat fires a gun. An observer P is at a distance of 50 m from the boat. Another observer Q is a diver, who is 50 m under water. Both hear the sound of the gun :
(a) P hears the sound first
(b) Q hears the sound first
(c) Both P and Q hear the sound at the same time
(d) None of the above

**Q 13)** Which of the following is not a transition metal?
(a) Silver        (b) Lead        (c) Tungsten        (d) Manganese

**Q 14)** In the reaction $SO_2 + 2H_2S \quad 3S + 2H_2O$
(a) Sulphur is oxidized and Hydrogen is reduced
(b) Hydrogen is oxidized and reduced
(c) Sulphur is both oxidized and reduced
(d) Sulphur is reduced and oxygen is oxidized

**Q 15)** In which of the following colorless aqueous solution of salt if copper strip is immersed turn the solution blue
(a) $Ag\ NO_3$      (b) $Cd\ (NO_3)_2$      (c) $Pb\ (NO_3)_2$      (d) $Zn\ (NO_3)_2$

**Q 16)** Nobel metals like platinum and gold get dissolved in aquaregia. The composition of aquaregia is
(a) $3\ HCl + HNO_3$            (b) $3\ HNO_3 + H_2SO_4$
(c) $HCl + 3HNO_3$            (d) $HNO_3 + 3H_2SO_4$

**Q 17)** The ratio of number of electrons in N shell of A and M shell of B with atomic numbers 40 and 32 respectively is
(a) 5 : 3        (b) 9 : 5        (c) 5 : 9        (d) 5 : 4

**Q 18)** Which of the following reactions is a synthesis reaction?
(a) When steam is passed over red hot coke, a mixture of carbon monoxide and hydrogen is formed
(b) Sodium reacts with water to form sodium hydroxide and hydrogen
(c) When the milk of lime (calcium hydroxide) is added to hot sodium carbonate solution, sodium hydroxide is obtained and calcium carbonate separates out as mud.
(d) Stannic chloride is prepared by passing chlorine into molten tin.

**Q 19)** A gas which is combustible and can support combustion is
(a) oxygen            (b) nitrous oxide
(c) nitric oxide            (d) carbon monoxide

**Q 20)** Tyndal effect cannot be shown by
(a) smoke            (b) dust particles present in air
(c) fog            (d) iron powder in hydrochloric acid

**Q 21)** A small amount of salt is dissolved in water. The solution is, then frozen to form ice. The freezing point of this would be _____
(a) less than $0^0C$            (b) greater than $0^0C$
(c) equal to $0^0C$            (d) much greater than $25^0C$

**Q 22)** What is the total number of electrons in an atom of an element with an atomic number of 18 and a mass number of 40?
(a) 22        (b) 40        (c) 18        (d) 58

**Q 23)** Elements that have properties of both metals and non-metals are called _____
(a) metalloids            (b) halogens
(c) alkali metals            (d) transition elements

**Q 24)** Which one of the following does not have the hydrogen bond?
(a) phenol      (b) liquid $NH_3$      (c) water      (d) Liquid HCl

**Q 25)** Find the next two terms in the sequence
1, 3, 7, 15, 31, …….
(a) (63, 127)      (b) (46, 77)      (c) (77, 127)      (d) (63, 121)

**Q 26)** Find the point of intersection of X-axis and line $2x - y = -4$
(a) (–2, 0)      (b) (2, 0)      (c) (0, 2)      (d) (–1, 1)

**Q 27)** A latter is chosen at random from the letters of the word 'LOGARITHM' then what is the probability that the letter chosen is constant?
(a) $\dfrac{2}{3}$      (b) $\dfrac{2}{5}$      (c) $\dfrac{4}{5}$      (d) 2

**Q 28)** If $2 - \sqrt{7}$ is one of the roots of the equation $y^2 - 4y + k = 0$, find value of k.
(a) 3        (b) 19        (c) –3        (d) 2

**Q 29)** Two tangents PQ and RS are drawn to two circles which are touching externally. If RS – 5 cm then find PQ.



    (a) 5 cm         (b) 15 cm         (c) 10 cm         (d) 5.5 cm

**Q 30)** If $\sin = \dfrac{1}{2}$ then find the value of acute angle .

    (a) $30^0$         (b) $60^0$         (c) $45^0$         (d) $15^0$

**Q 31)** Find the angle of inclination of the line $5x – 5y + 17 = 0$

    (a) $30^0$         (b) $60^0$         (c) $45^0$         (d) $15^0$

**Q 32)** If the volume of a cube is divided by its surface area then the result is 5 cm. what is the length of the edge of the cube?

    (a) 30 cm         (b) 65 cm         (c) 53 cm         (d) 16 cm

**Q 33)** The minimum value of $3x^2 – 2x + 4$ is :

    (a) $4\dfrac{2}{3}$         (b) $3\dfrac{1}{2}$         (c) $3\dfrac{2}{3}$         (d) $4\dfrac{3}{2}$

**Q 34)** Iso profit lines of different objective functions are parallel

    (a) True         (b) False         (c) Doubtful         (d) None of these

**Q 35)** The mean of 13 observations is 8. One observation equal to 20 is dropped. What will be the new mean?

    (a) 7         (b) 5         (c) 21         (d) 12

**Q 36)** When 4 unbiased coins are tossed, the probability of getting all heads is _____

    (a) $\dfrac{1}{4}$         (b) $\dfrac{1}{2}$         (c) $\dfrac{1}{16}$         (d) $\dfrac{1}{8}$

**Q 37)** The roll of chlorophyll in photosynthesis is

    (a) Absorption of water         (b) Absorption of light

    (c) Absorption of carbon dioxide         (d) Absorption of oxygen

**Q 38)** Involuntary movement in human body is co-ordinate by

    (a) Cerebellum         (b) Cerebrum         (c) Medulla oblongata     (d) Thyroid

**Q 39)** When two individuals are similar in external appearance but different in this genetic makeup, they are called as

    (a) Genotype         (b) Phenotype         (c) Homozygous         (d) Heterozygous

**Q 40)** The bye-product of photosynthesis is

    (a) $O_2$         (b) $H_2O$         (c) $CO_2$         (d) Energy

**Q 41)** For active transport to occur, the following must be present

    (a) Carries proteins, ATP, and cell membrane     (b) Carries proteins, ADP, and cell membrane

    (c) ATP, cell membrane, and vacuole         (d) Cell membrane, water, and ATP

**Q 42)** Weeds affect the crop plants by

    (a) Killing of plants in field before they grow

    (b) Dominating over the crop plants

    (c) Competing for various resources of crops (plants) causing low availability of nutrients

    (d) Helping the crops to get proper nutrients

**Q 43)** In fast-swimming fishes, propulsion is mainly due to

    (a) pelvic fins         (b) caudal fins

    (c) dorsal fins         (d) pectoral fins

**Q 44)** Proteins function as

    (a) structural elements         (b) biocatalysts

    (c) main energy source         (d) genetic material

**Q 45)** Examples of vaccines include
    (a) BCG                                     (b) tetracycline
    (c) penicillin                                  (d) DPT

**Q 46)** Which of the following is NOT true concerning cytoskeletal elements?
    (a) Cilia are small extensions of membrane surrounded microtubules
    (b) Microtubules are made up of a globular protein called tubulin
    (c) Intermediate filaments compose flagella
    (d) Basal bodies are located at the base of cilia and flagella

**Q 47)** Which of the following are produced from pancreas?
    (a) Three digestive enzymes and three hormones
    (b) Two digestive enzymes and one hormones
    (c) Three digestive enzymes and two hormones
    (d) Three digestive enzymes and one hormones

**Q 48)** Which of the following helped Charles Darwin to explain the principle of overproduction of organisms leading to a struggle for existence?
    (a) Mendel's principles of inheritance         (b) Hugo de Vries theory of mutation
    (c) T.R. Malthus's essay on population         (d) Lamarck's theory of evolution

**Passage For Q No. 49 to 52**

"Uncle" said Luke to the old Sean "You seem to be well fed, though I know no one looks after you. Nor have I seen you leave your residence at any time. Tell me how you manage it?"
"Because" Sean replied, "I have a good feed every night at Emperor's orchard. After dark, I go there myself and pick out enough fruits to last a fortnight."
Luke proposed to accompany his uncle to the orchard. Though reluctant because of Luke's habit of euphoric exhibition of extreme excitement, Sean agreed to take him along. At the orchard while Sean hurriedly collected the fruits and left, Luke on the other hand at the sight of unlimited supply of fruits was excited and lifted his voice which brought Emperor's men immediately to his side. They seized him and mistook him as the sole cause of damage to the orchard. Although Luke reiterated that he was a bird of passage, they pounded him mercilessly before setting him free

**Q 49)** What does "bird of passage"; mean in the context of the given passage?
    (a) There was a bird in the orchard         (b) Other people stole from the orchard
    (c) Emperor knew him personally          (d) He did not visit orchard regularly

**Q 50)** Which of the following can be inferred from the passage?
    (a) Luke did not take good care of his uncle
    (b) Emperor was a wicked man
    (c) Lack of self-control had put Luke into trouble
    (d) Luke had a habit of speaking loudly

**Q 51)** How often did Sean visit the orchard?
    (a) Daily                                (b) Weekly
    (c) Once in a month                      (d) Every day after midnight

**Q 52)** Choose the word which is most nearly the same in meaning as the word "Reluctant" used in the passage.
    (a) Against         (b) Resistant         (c) Opposed         (d) Disinclined

The assault on the purity of the environment is the price that we pay for many of the benefits of modern technology. For the advantage of automotive transportation we pay a price in smog-induced diseases; for the powerful effects of new insecticides, we pay a price in dwindling wildlife and disturbances in the relation of living things and their surroundings; for nuclear power, we risk the biological hazards of radiation. By increasing agricultural production with fertilizers, we worsen water population.
The highly developed nations of the world are not only the immediate beneficiaries of the good that technology can do, that are also the first victims of environmental diseases that technology breeds. In the past, the environmental effects which accompanied technological progress were restricted to a small ans relatively short time. the new hazards neither local nor brief. Modern air pollutions covers vast areas of continents: Radioactive fallout from the nuclear explosion is

worldwide. Radioactive pollutants now on the earth surface will be found there for generations, and in case of Carbon-14, for thousands of years.

**Q 53)** The widespread use of insecticides has
(a) reduced the number of wild animals
(b) caused imbalance in the relationship between living beings and their environment
(c) eliminated diseases by killing mosquitoes and flies
(d) caused biological hazards

Speech is great blessings but it can also be great curse, for while it helps us to make our intentions and desires known to our fellows, it can also if we use it carelessly, make our attitude completely misunderstood. A slip of the tongue, the use of unusual word, or of an ambiguous word, and so on, may create an enemy where we had hoped to win a friend. Again, different classes of people use different vocabularies, and the ordinary speech of an educated may strike an uneducated listener as pompous. Unwittingly, we may use a word which bears a different meaning to our listener from what it does to men of our own class. Thus speech is not a gift to use lightly without thought, but one which demands careful handling. Only a fool will express himself alike to all kinds and conditions to men.

**Q 54)** The best way to win a friend is to avoid
(a) irony in speech                                    (b) pomposity in speech
(c) verbosity in speech                               (d) ambiguity in speech

But I did not want to shoot the elephant. I watched him beating his bunch of grass against his knees, with the *preoccupied grandmotherly* air that elephants have. It seemed to me that it would be murder to shoot him. I had never shot an elephant and never wanted to. (Somehow it always seems worse to kill large animal.) Besides, there was the beast's owner to be considered. But I had got to act quickly. I turned to some experienced-looking Burmans who had been there when we arrived, and asked them how the elephants had been behaving. They all said the same thing; he took no notice of you if you left him alone, but he might charge if you went too close to him.

**Q 55)** The phrase 'Preoccupied grandmotherly air' signifies
(a) being totally unconcerned                        (b) pretending to be very busy
(c) a very superior attitude                          (d) calm, dignified and affectionate disposition

It is up to our government and planners to devise ways and means for the mobilisation of about ten crore workers whose families total up about forty crore men, women and children. Our agriculture is over-manned. A lesser number of agriculturists would mean more purchasing or spending power to every agriculturist. This will result in the shortage of man-power for many commodities to be produced for which there will be a new demand from a prosperous agrarian class. This shortage will be removed by surplus man-power released from agriculture as suggested above.

**Q 56)** The passage best supports the statement that:
(a) employment in production is more fruitful than employment in agriculture.
(b) Indian economy is in a poor shape basically due to improper mobilisation of man-power.
(c) a shift of labour from agricultural sector to the industrial sector would uplift the living standard.
(d) the industrial sector is labour-deficient while the agricultural sector is over-manned in our country.

**Directions (Question 57 to 58): Read the following carefully and answer the questions given below it.**

'A + B' means 'A is the father of B'; 'A – B' means 'A is the wife of B'; 'A × B' means 'A is the brother of B'; 'A ÷ B' means 'A is the daughter of B'.

**Q 57)** If P ÷ R + S + Q, which of the following is true?
(a) P is the daughter of Q                            (b) Q is the aunt of P3
(c) P is the aunt of Q                                (d) P is the mother of Q

**Q 58)** If P – R + Q, which of the following statements is true?
(a) P is the mother of Q                              (b) Q is the daughter of P
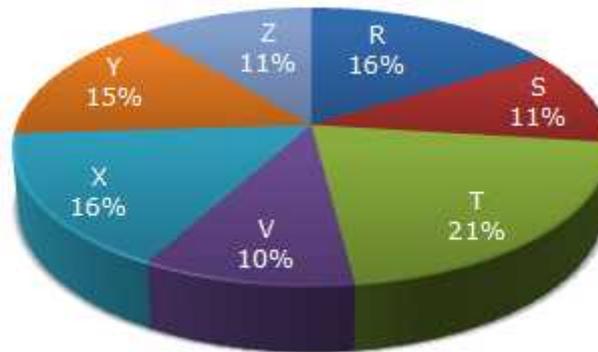(c) P is the aunt of Q                                (d) P is the sister of Q

**Q 59)** $1035 \div [(3/4)$ of $(71 + 65) - 15\ 3/4] = ?$

    (a) 12             (b) 24             (c) 18             (d) 26

**Q 60)** $(7 \times 7)^3 \div (49 \times 7)^3 \times (2401)^2 = 7^?$

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

**Q 61)** $\sqrt{13225} + \sqrt[3]{205379} + 52\%$ of $700 = 408 + ?$

    (a) 156            (b) 218           (c) 189           (d) 130

**Q 62)** $\sqrt{((27 \div 5 \times ?) \div 15)} = 5.4 \div 6 + 0.3$

    (a) 12             (b) 4              (c) 9             (d) 15

**Q 63)** The bar graph given below shows the foreign exchange reserves of a country (in million US $) from 1991 - 1992 to 1998 - 1999.



The ratio of the number of years, in which the foreign exchange reserves are above the average reserves, to those in which the reserves are below the average reserves is?

    (a) 2 : 6          (b) 3 : 4          (c) 3 : 5          (d) 4 : 4

**Q 64)** Study the following pie-chart and the table and answer the questions based on them.

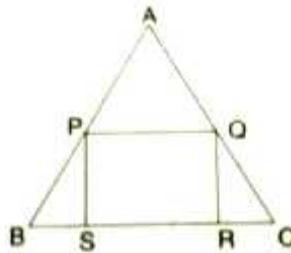**Proportion of Population of Seven Villages in 1997**



| Village | % Population Below Poverty Line |
|---------|--------------------------------|
| X | 38 |
| Y | 52 |
| Z | 42 |
| R | 51 |
| S | 49 |
| T | 46 |
| V | 58 |

If the population of village R in 1997 is 32000, then what will be the population of village Y below poverty line in that year?
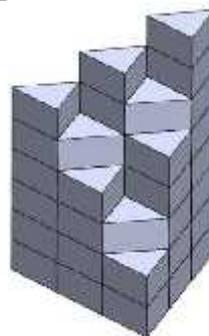
    (a) 14100        (b) 15600        (c) 16500        (d) 17000

**Directions (Question 65 >66):** Read the following information and answer the questions:

**Q 65)** If 'We are reaching Chandigarh' means 'zik pik lik hik', 'Chandigarh is really beautiful' means 'hik dik mik nik, 'Is Mohit reaching there' means 'lik tik cik dik' and 'we really need mohit' means 'mik wik tik pik', what is the code for Chandigarh?

(a) tik        (b) pik        (c) lik        (d) hik

**Q 66)** If you used the above coding procedure, how would you code 'cik'?

(a) is        (b) Mohit        (c) there        (d) reaching

**Q 67)** 225, 336, 447, 558,….,7710

(a) 690        (b) 660        (c) 689        (d) 669

**Q 68)** DE : 10 : : HI : ?

(a) 10        (b) 18        (c) 20        (d) 14

**Q 69)** AB, DEF, HIJK, ?, STUVWX

(a) LMNO        (b) LMNOP        (c) MNOPQ        (d) QRSTU

**Q 70)** 23, 48, 99, 203, 413,…..

(a) 927        (b) 837        (c) 937        (d) 437

**Q 71)** If $a - b = 3$ and $a^2 + b^2 = 29$, find the value of $ab$.

(a) 10        (b) 12        (c) 15        (d) 18

**Q 72)** $\dfrac{(469+174)^2 - (469-174)^2}{(469 \times 174)} = ?$

(a) 2        (b) 4        (c) 295        (d) 643

**Q 73)** In the figure given below, ABC is an equilateral triangle and PQRS is a square of side 6 cm. By how many cm$^2$ is the area of the triangle more than that of the square?
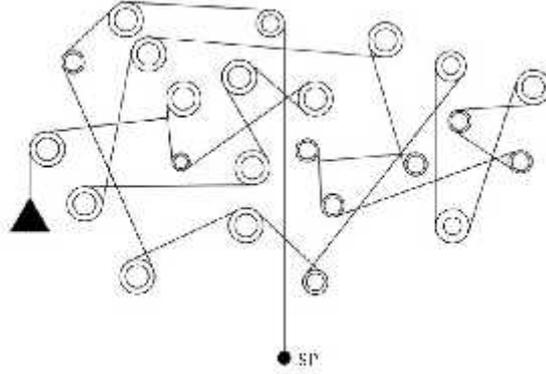


(a) $\dfrac{21}{\sqrt{3}}$        (b) 21        (c) $21\sqrt{3}$        (d) 63

**Q 74)** Count the number of stacked triangular pieces in the image shown below.
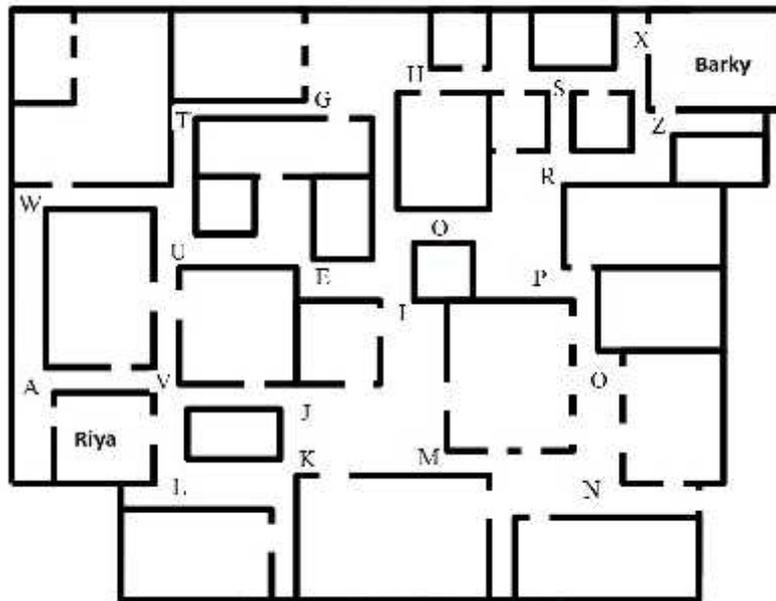


(a) 49        (b) 50        (c) 46        (d) 52

**Q 75)** Shown below is a combination of fixed pulleys. If the triangular load moves down, how many pulleys will rotate in the same direction as the smallest pulley (SP) (including itself)? The overlapping paths do not interfere with each other.
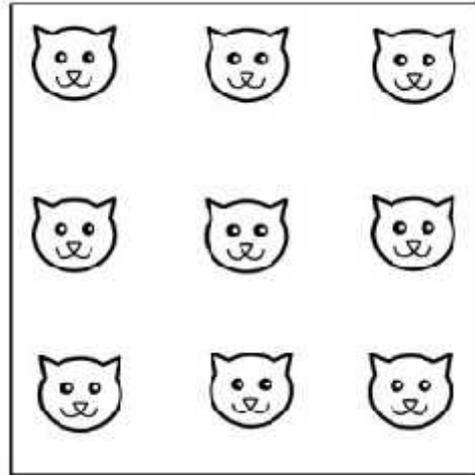


(a) 13            (b) 11            (c) 10            (d) 15

**Q 76)** The figure below shows the layout plan of the conservative Themmalwadi village which consists of a cluster of houses. Black lines represent walls and the openings in those walls represent either windows or doors. Also marked are the houses of Riya (who lives with her family) and Barkya. Hidden from the eyes of the villagers, they regularly meet at night in Barkya's house. Themmalwadi is so conservative that even the sight of women on the street at night raises eyebrows. If Riya takes the path that has the least number of openings, what is the number of openings that she will have to pass by to get to Barkya's house?
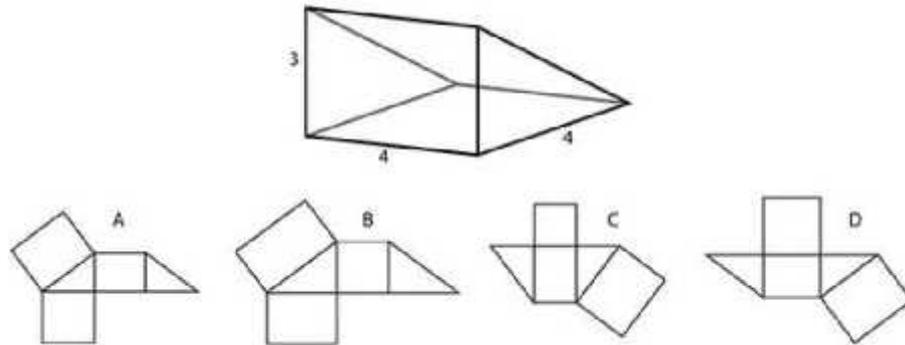


(a) 3            (b) 4            (c) 5            (d) 2

**Q 77)** Atul has nine cats that always fight with each other. He puts all of them into a square box. What is the least number of square partitions he must use to keep all the cats separated from each other? You may use any size of square partitions, the partition can overlap each other
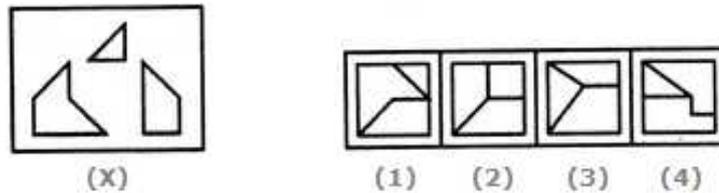


(a) 9        (b) 3        (c) 6        (d) 4

**Q 78)** Which of the options represent(s) correctly the opened up surfaces of the solid shown?
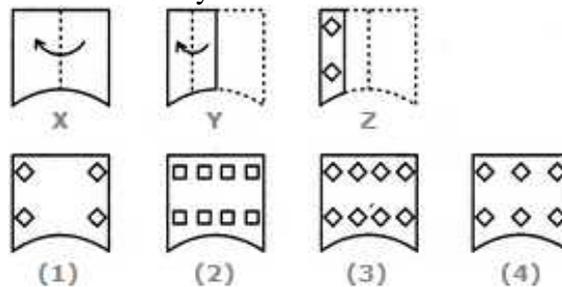


(a) A, D        (b) A, B        (c) C, D        (d) A, C

**Q 79)** Find out which of the figures (1), (2), (3) and (4) can be formed from the pieces given in figure (X).



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

**Q 80)** Choose a figure which would most closely resemble the unfolded form of Figure (Z).



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