Time : 2.00 Hrs.   **MM : 110**

RSAT

(REGIS SCHOLARSHIP CUM ADMISSION TEST)

for

CLASS IX

(Student Moving VIII to IX)

NAME OF CANDIDATE : _____

REGISTRATION NUMBER : _____

TEST CENTER : _____

MOBILE NUMBER : _____

## Regis Career Institute

INSTRUCTIONS :

Things NOT ALLOWED in EXAM HALL : Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these then keep them at a place specified by invigilator at your own risk.

1. This booklet is your Question Paper. **DO NOT** break seal of Booklet until the invigilator instructs to do so.

2. The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet (ORS). You have to mark your answers in the ORS by darkening bubble, as per your answer choice, by using black & blue ball point pen.

3. Total Questions to be Attempted 65.

4. After breaking the Question Paper seal, check the following:

   a. In the booklet containing question no. 1 to 80 under V Section i.e. Section-I, Section-II, Section-III, Section-IV and Section V.

   b. Section-V contains total 20 questions of IQ (Mental Ability).

   c. Section-I to Section-IV contains total 60 questions which are - Section-I : Physics, Section-II : Chemistry, Section-III : Mathematics and Section IV : Biology.

   d. IIT-JEE Students need to attempt from Section-I to Section-III and NEET Students need to attempt Section-I, Section-II & Section-IV.

   e. Section-V (Mental Ability) is compulsory for both Stream (IIT-JEE & NEET).

5. Marking Scheme:

   a. If darkened bubble is RIGHT answer : (Section-I to Section-IV) **2 Marks** & Section-V : **1 Marks**.

   b. If no bubble is darkened in any question: **No Mark**.

   c. **Negative Marking in Section-I to Section-IV: -0.50 & No negative Marking in Section-V**.

6. If you are found involved in cheating or disturbing others then your ORS will be cancelled.

7. Do not put any stain on ORS and hand it over back properly to the invigilator.

Section-I : PHYSICS

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

1. Which of the following statement is not correct for an object moving along a straight path in accelerated motion ?
   (A) Its speed keeps changing
   (B) Its velocity always changes
   (C) It always goes away from the earth
   (D) A force is always acting on it

2. According to the third law of motion, action and reaction
   (A) always act on the same body
   (B) always act on different bodies in opposite directions
   (C) have same magnitude and direction
   (D) act on either body at normal to each other

3. A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. This enables the goalkeeper to
   (A) exert larger force on the ball
   (B) increase the force exerted by the ball on hands
   (C) increase the rate of change of momentum
   (D) decrease the rate of change of momentum,

4. The inertia of an object tends to cause the object
   (A) to increase its speed
   (B) to decrease its speed
   (C) to resist any change in its state of motion
   (D) to decelerate due to friction

5. A passenger in a moving train tosses a coin which falls behind him. It means that motion of the train is
   (A) accelerated
   (B) uniform
   (C) retarded
   (D) along circular tracks

6. An object of mass 2 kg is sliding with a constant velocity of 4 ms^{-1} on a frictionless horizontal table. The force required to keep the object moving with the same velocity is
   (A) 32 N
   (B) 0 N
   (C) 2 N
   (D) 8 N

7. Rocket works on the principle of conservation of
   (A) mass
   (B) energy
   (C) momentum
   (D) velocity

8. A water tanker filled upto $\frac{2}{3}$ of its height is moving with a uniform speed. On sudden application of the brake, the water in the tank would
   (A) move backward
   (B) move forward
   (C) be unaffected
   (D) rise upwards

9. Which substance is liberated at the anode of simple voltaic cell ?
   (A) Zn
   (B) Cu
   (C) SO_4
   (D) H_2

10. Which material is deposited at the zinc electrode in a carbon-zinc cell?
    (A) $ZnCl_2$
    (B) MnO_2
    (C) NH_3
    (D) Mn_2O_3

11. Three cells are connected to an external resistance as shown in the figure. Each of the cell has emf 10 V and internal resistance 2Ω
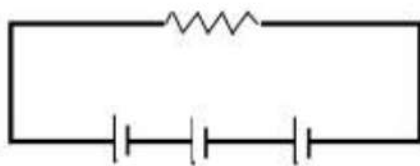
If the external resistance is 6 Ω. Find the current in the circuit.
   (A) 2 A
   (B) 2.5 A
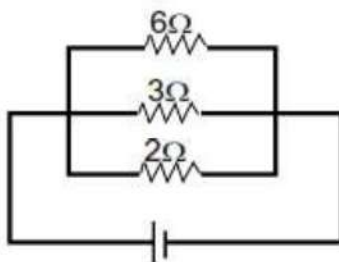   (C) 3 A
   (D) 3.5 A

12. Consider a circuit as shown below:
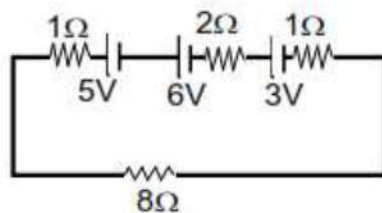
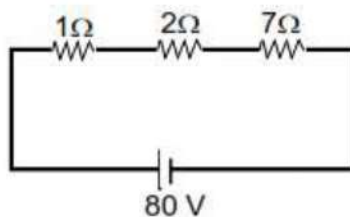What is the total emf in the circuit ?

(A) 2 V   (B) 4 V   (C) 6 V   (D) 14 V

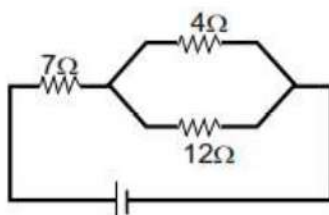**13.** In the circuit shown below, what is the equivalent resistance ?

(A) 11 Ω (B) 4 Ω (C) 1 Ω (D) 3 Ω

14. What is the potential difference across 2 Ω resistor in the given circuit ?

(A) 80 V   (B) 0 V   (C) 32 V   (D) 16 V

15. What is the equivalent resistance in the given circuit?

(A) 23 Ω (B) 10 Ω (C) 21 Ω (D) 75 Ω

Section-II : CHEMISTRY

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

16. The element with highest electron affinity in the periodic table is

(A) Iodine   (B) Chlorine   (C) Fluorine   (D) Oxygen

17. The element with atomic number 9 resembles with the element having atomic number

(A) 8   (B) 17   (C) 36   (D) 27

18. Which of the following is not a characteristic of synthetic fibers ?

(A) Synthetic fibers are very durable.   (B) Synthetic fibers absorb very little water.

(C) Synthetic fibers are wrinkle resistant.   (D) Synthetic fibers are extremely thick and strong.

19. Which of the following fiber threads is actually stronger than a steel wire of similar thickness ?

(A) Wool   (B) Rayon   (C) Nylon   (D) Silk

20. The non-metal which is liquid at room temperature is:

(A) Carbon   (B) Iodine   (C) Bromine   (D) Chlorine

21. All metals are solids except

(A) Sodium   (B) Calcium   (C) Mercury   (D) Aluminium

22. What does natural gas mainly consist of ?

(A) C_2H_6 (B) CH_4 (C) C_3H_8 (D) C_4H_{10}

23. What does gobar gas produced from animal and plant waste contain ?

(A) Ethane   (B) Methane   (C) Propane   (D) Acetylene

24. At what condition petroleum product formed under earth is ?

(A) High Temperature High Pressure   (B) Low Temperature Low Pressure

(C) High Temperature Low Pressure   (D) Low Temperature High Pressure

25. At what condition coal is formed under earth?

(A) High temperature low pressure   (B) Low temperature high pressure

(C) Low temperature low pressure   (D) High temperature high pressure

26. Which one of the following is used for Matalling the road ?

(A) Coke   (B) Bitumen   (C) Lubricating Oil   (D) Mercaptane

27. Which consists only one element

(A) Marble   (B) Sand   (C) Diamond   (D) Glass

28. The lightest metal is :

(A) Li   (B) Mg   (C) Ca   (D) Na

29. Froth floatation process for the concentration of ore is a particle application of :

(A) Adsorption   (B) Absorption   (C) Coagulation   (D) Sedimentation

30. Froth floatation process is based on:

(A) Wetting properties of ore particles   (B) Specific gravity of ore particles

(C) Magnetic properties of ore particles   (D) Electrical properties of ore particles

Section-III : MATHEMATICS

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

31. Factorise $x^2 - \dfrac{13}{24} x - \dfrac{1}{12}$

(A) $\dfrac{1}{24} (3x - 2)(8x + 1)$ (B) $\dfrac{1}{8} (3x - 2)(8x + 1)$

(C) $\dfrac{1}{24} (3x + 2)(8x + 1)$ (D) $\dfrac{1}{24} (3x - 2)(8x - 1)$

32. What is the remainder when $(x^4 + 1)$ is divided by $(x - 2)$?

(A) 17   (B) 15   (C) 7   (D) 1

33. If $\dfrac{(a^2 b^3 c)^4 . (abc)^3}{(a^3 bc^{-1})^2} = \sqrt{a^m b^n c^p}$ then m + n + p has the value equal to

(A) 24   (B) 54   (C) 27   (D) 34

34. The value of $\sqrt{27} - \dfrac{9}{\sqrt{3}} - 4\sqrt{\dfrac{1}{9}} + 4\sqrt[3]{\dfrac{1}{27}}$ will be –

(A) 3   (B) 2   (C) 0   (D) $3\sqrt{3}$

35. Find three consecutive integers such that four times the first plus one- half the second minus twice the third is equal to 24-

(A) 11, 12 and 13   (B) 12, 13 and 14   (C) 13, 14 and 15   (D) 10, 11 and 12

36. What is the difference between the biggest and the smallest fraction among $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}$ and $\frac{5}{6}$?

(A) $\frac{1}{6}$ (B) $\frac{1}{12}$ (C) $\frac{1}{20}$ (D) $\frac{1}{30}$

37. What number should be subtracted from – 5 to get $\frac{8}{9}$.

(A) $\frac{-53}{9}$ (B) $\frac{37}{9}$ (C) $\frac{9}{37}$ (D) $\frac{-9}{37}$

38. Let n be a 3 digit number such that n = sum of the squares of the digits of n. The number of such n is

(A) 0   (B) 1   (C) 2   (D) More than 2

39. The ratio of a two digit number and the sum of its digits is 4 : 1. IF the digit in the units place is 3 more than the digit in the tens place, then the number is.

(A) 24   (B) 36   (C) 27   (D) 34

40. If $\dfrac{p}{q} = 1 + \dfrac{5}{1 + \dfrac{4}{1 + \dfrac{3}{1 + \dfrac{1}{2}}}}$ where p, q have no common factors, then p + q

(A) 29   (B) 36   (C) 27   (D) 34

41. x is $1\frac{1}{6}$ of $3\frac{3}{4}$ and y is $2\frac{1}{3}$ of $2\frac{1}{6}$. Then

(A) 2x = y   (B) y < x   (C) x < y   (D) x = y

42. ABCD is a square ∠ABE = 2 ∠DAE= 30º . The sides of the square are 10 cm each. Then the length EB is
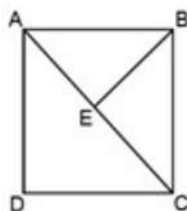

(A) greater than 10 cm.

(B) equal to 10 cm

(C) Less than 10 cm

(D) NOT possible to calculate with the given information

43. The number of acute angles formed by the rays at the vertex P is _____
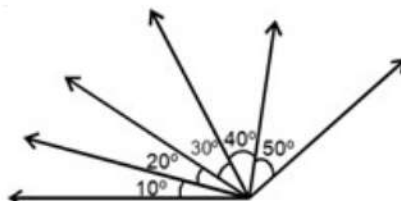
(A) 9   (B) 10   (C) 7   (D) 5

44. Find fraction form of rational number 0.37

(A) $\frac{37}{100}$ (B) $\frac{400}{95}$ (C) $\frac{433}{99}$ (D) $\frac{100}{33}$

45. In the adjoining figure ABCD is a parallelogram of perimeter 21. It is subdivided into smaller parallelograms by drawing lines parallel to the sides. The numbers shown are the respective perimeters of the parallelograms in which they are marked. (For example the perimeter of the parallelogram LMNP is 11). Find the perimeter of the shaded parallelogram.
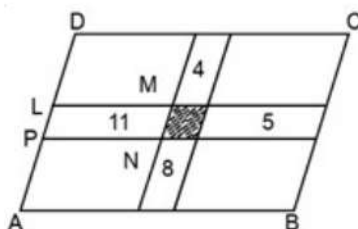

(A) 4   (B) 15   (C) 7   (D) 12

Section-IV : BIOLOGY

This section contains **15 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

46. Which of the following is not a vector borne disease ?

(A) Common cold   (B) Malaria   (C) Dengue   (D) Sleeping sickness

47. Factor not essential for photosynthesis is

(A) O_2 (B) CO_2 (C) H_2O (D) Chlorophyll

48. Which of the following structures present in a cell is/are not bounded by a membrane ?

(A) Nucleolus   (B) Ribosomes   (C) Centriole   (D) All of the above

49. Antibiotics can be obtained from

(A) Bacteria   (B) Fungi   (C) Protozoan   (D) Both A and B

50. Choose odd option from the following.

(A) Pitcher plant   (B) Sundew plant   (C) Venus fly trap   (D) Lichen

51. Protein coat of a virus enclosing its genetic material is known as

(A) Vector   (B) Capsid   (C) Gene   (D) None of the above

52. Which one of the following statement about mycoplasma is wrong ?

(A) They cause diseases in plants.   (B) They are also called PPLO.

(C) They are always aerobic.   (D) They are resistant to Penicillin.

53. Adjacent cells in a plant tissue are held together by middle lamella which is mainly made up of

(A) Cellulose   (B) Calcium & Magnesium pectate

(C) Hemicellulose   (D) Lignin & Suberin

54. Which of the following nutrient is essential for synthesis of chlorophyll in plants ?

(A) Na   (B) Ca   (C) Fe   (D) Mg

55. The Venn diagram given below shows plant and animal characteristics.
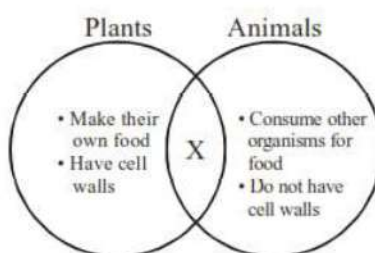
Which characteristic shared by plants and animals belongs in the space marked X ?

(A) Locomotion   (B) Multicellular   (C) Photosynthetic   (4) Producer

Comprehension for (Q.No. 56 to Q.No.58)

Viruses are microscopic entity. They however, reproduce only inside the cells of the host organism, which may be a bacterium, plant or animal. Common ailments like cold, influenza (flu) and most coughs are caused by viruses. They have characteristics of both living and non living.   Serious dis- eases like polio and chicken pox are also caused by viruses. Diseases like dysentery and malaria are caused by protozoans which are unicellular eukaryotic animals whereas typhoid and tuberculosis (TB) are caused by bacteria which are unicellular prokaryotic organisms.

56. Which among the following is considered as connecting link between living and non living ?

   (A) Bacteria   (B) Fungi   (C) Protozoa   (D) Virus

57. Malaria, Influenza and TB respectively are caused by

   (A) Protozoan,Virus and Fungi   (B) Protozoan,Virus and Bacteria

   (C) Bacteria, Virus and Protozoan   (D) Virus, Bacteria and Fungi

58. Unicellular eukaryotic cell is of

   (A) Bacteria   (B) Protozoan   (C) Virus   (D) Mushroom

Comprehension for (Q.No.59 & Q.No.60)

In any cell, nucleus control cellular activities and ribosomes are the sites of protein synthesis. Mito- chondria are called power house or ATP mills as they are sites for ATP formation which is used in various metabolic activities or functions of the cell. Lysosomes are bags of digestive enzymes which destroy worn out cells and foreign material.

59. Which cells are likely to possess the highest numbers of mitochondria ?

   (A) Hair cells   (B) Skin surface cells   (C) Red blood cells   (D) Muscle cells

60. Consider the following statements :

   (1) Lysosomes are called as 'suicide bags' of a cell

   (2) The fold of inner membrane of mitochondria increase the area for ATP generating chemical reactions.

   (3) Ribosome helps in formation of plasma membrane. Which of the following statements is/are correct ?

   (A) 1 & 2   (B) 2 & 3   (C) 1 only   (D) 1, 2 & 3

Section-V : MENTAL ABILITY

This section contains **20 Multiple Choice Questions.** Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

61. In the question, you are given a combination of letters followed by four alternatives (A), (B), (C) and (D). Choose the alternative which most closely resembles the water-image of the given combination. QUARREL

   (A) ǪИAЯЯEL   (B) ⅃ƎЯЯAUǪ   (C) ǪUAЯЯEL   (D) ⅃ƎЯЯAUǪ

62. In the question, you are given a figure (x) followed by four figures (A), (B), (C) and (D) such that (X) is embedded in one of them. Trace out the correct alternative.

(x)

(A)   (B)   (C)   (D)
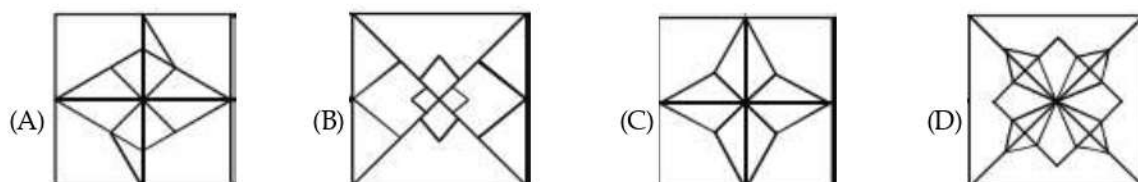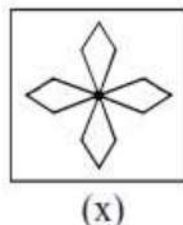
63. The next term in the sequence 1, 3, 6, 11, 20, 37, ?

(A) 65   (B) 67   (C) 70   (D) 60

64. If a certain code PERINATH is written as QFQHOBSG and POLE as QPKD, how will SYNDROME be written in that code ?

(A) RXONQNNF   (B) TZODQNLD

(C) TZMCSPKD   (D) TZMCSPLD

65. In the following question, there are two numbers to the left of the sign : : which are connected in some way. The same relationship is between the third number and one of the four alternatives given. Find the correct alternative.

11 : 17 : : 19 : ?

(A) 29   (B) 27   (C) 23   (D) 21

66. Anshul moves towards East a distance of 5 m, then he turns to his left and walks 20 metres, then again he turns left and walks 15 meters. Now he turns $45°$ towards his right and goes straight to cover $20\sqrt{2}$ m meters. How far is he from his starting point ?

(A) 40 m   (B) 30 m   (C) 50 m   (D) 55 m

67. Count each 1 in the following sequence of numbers that is immediately followed by 2, if 2 is not immediately followed by 3. How many such 1's are there ?

1 2 1 3 4 5 1 2 3 5 2 1 2 6 1 4 5 1 1 2 4 1 2 3 2 1 7 5 2 1 2 5

(A) 2   (B) 4   (C) 5   (D) 7

68. In the following question consists of two sets of figures. Figures 1, 2, 3 and 4 constitute the Problem Set while figures A, B, C and D constitute the Answer Set. There is a definite relationship between figures 1 and 2. Establish a similar relationship between figures 3 and 4 by choosing a suitable figure (4) from the Answer Set.

Problem Set
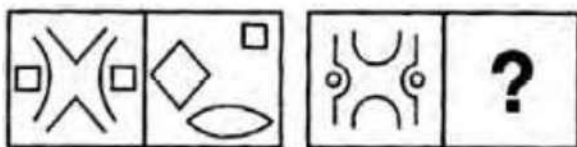
(1)   (2)   (3)   (4)

Answer Set

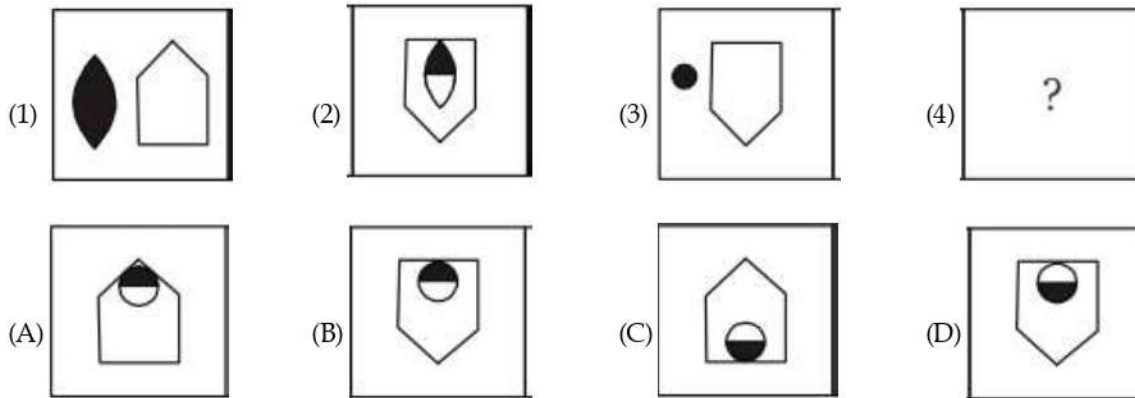(A)   (B)   (C)   (D)

69. In a certain code STATION is denoted by URCRKMP then BRING is denoted in the same code by

(A) CSKLH   (B) DSGLH

(C) KSKPH   (D) None of these

70. If at 12'O clock, minute hand and hour hand are facing towards North, then in which direction the minute hand is facing at 4 : 40 ?

(A) $30°$ West of South   (B) $60°$ West of South

(C) $30°$ East of South   (D) $60°$ East of South

71. In the following question consists of two sets of figures. Figures 1, 2, 3 and 4 constitute the Problem Set while figures A, B, C and D constitute the Answer Set. There is a definite relationship between figures 1 and 2. Establish a similar relationship between figures 3 and 4 by choosing a suitable figure (4) from the Answer Set.

(1)   (2)   (3)   (4) ?

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

72. In the given question, a part of the figure is missing. Find out from the given options (A, B, C, D) the right figure to fit in the missing figure.

(X)

(A)   (B)   (C)   (D)
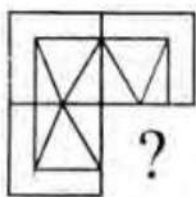
73. If 2 + 2 = 8, 3 + 5 = 24, 2 + 5 = 14, 3 + 4 = 21 then 5 + 7 is:

(A) 50   (B) 60   (C) 70   (D) 80

74. At 5'O clock, the hour hand of a wrist watch is towards North direction, find the direction of the minute hand at 7 : 17 : 30.

(A) West   (B) North – East

(C) North – West   (D) South - West

75. Find the missing term (?)

$11\dfrac{1}{9}, 12\dfrac{1}{2}, 14\dfrac{2}{7}, 16\dfrac{2}{3}, ?$

(A) $8\dfrac{1}{3}$ (B) $19\dfrac{1}{2}$ (C) 20   (D) $22\dfrac{1}{3}$

76. Which number should come in place of question mark (?)
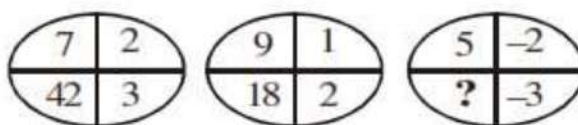
(A) 18   (B) 13   (C) 30   (D) –30

77. If each vowel of the word WEBPAGE is substituted with next letter of the English alphabetical series, and each consonant is substituted with the letter preceding it, which of the following letters will appear thrice ?

(A) G   (B) F   (C) Q   (D) V

78. is to as is to

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

79. How many numbers amongst the numbers 9 to 54 are there which are exactly divisible by 9 but not by 3?

    (A) 8   (B) 6   (C) 5   (D) Nil

80. In the question given below, use the following notations:

    A"B means 'add B to A'

    A'B means 'subtract B from A'.

    A @ B means 'divide A by B'.

    A * B means 'multiply A by B'.

    Now, answer the following question.

    The time taken by two running trains in crossing each other is calculated by dividing the sum of the lengths of two trains by the total speed of the two trains. If the length of the first train is L_1, the length of the second train is L_2, the speed of the first train is V_1 and the speed of the second trains is V_2, which of the following expressions would represent the time taken?

    (A) $(L_1" L_2)* (V_1"V_2)$ (B) $(L_1"L_2) @ (V_1"V_2)$ (C) $[(L_1"L_2)@(V_1"V_2)]*60$ (D) $(L_1' L_2) @ (V_1'V_2)$