

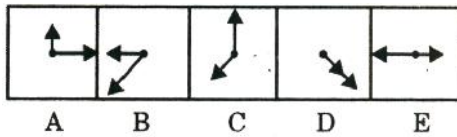
PART-I

IQ (MENTAL ABILITY)

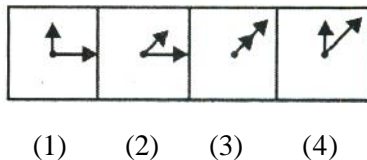
This section contains **20 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

Direction (Q. 1 & Q. 2) : Each of the following questions consists of five figures marked A, B, C, D and E called the Problem Figures followed by five other figures marked I, 2, 3 and 4 called the Answer Figures. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures.

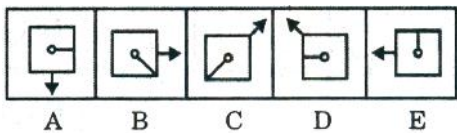
1. PROBLEM FIGURES



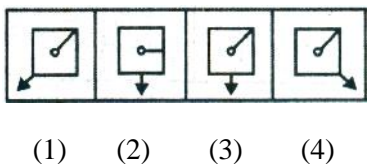
ANSWER FIGURES



2. PROBLEM FIGURES



ANSWER FIGURES



Direction (Q. 3 & Q. 4) : In each of the following questions, you are given a combination of alphabets and/or numbers followed by four alternatives (a), (b), (c) and (d). Choose the alternative which most closely resembles the mirror image of the given combination

3. SUPERVISOR

- (1) ROSIVREQU2
- (2) SUPREVIZOB
- (3) PZOUPSEBIV
- (4) SUPREVIO2P

4. JUDGEMENT

- (1) TNEMEGDUJ
- (2) TNEMEGDUL
- (3) TNEMEGDUL
- (4) LUDGEMNT

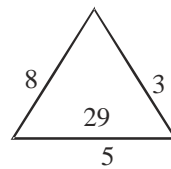
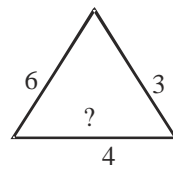
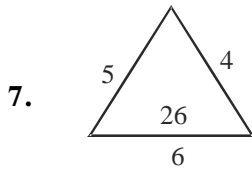
Direction (Q. 5 & Q. 6) : Find the missing term.

5. 8, 11, 15, 22, 33, 51, ?, 127, 203

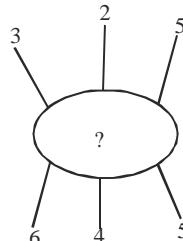
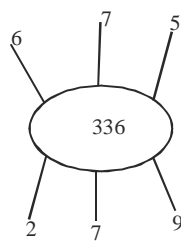
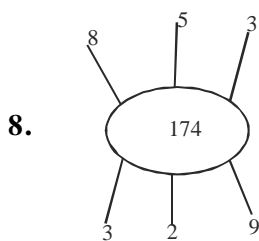
- (1) 80 (2) 53 (3) 58 (4) 69

6. 94, 166, 258, ?, 4912

- (1) 2610 (2) 3810 (3) 4610 (4) 3610



- (1) 32 (2) 22 (3) 18 (4) 27



- (1) 140 (2) 150 (3) 200 (4) 180

9. If in any code language NATIONAL is written as MZGRLMZO than how is JAIPUR written in that language.

- (1) QZRKFI (2) PZRKFI (3) QZRIFK (4) QARKFI

10. If MENTAL is written LNDFMOSUZBKM, then how would TEST be written in that code ?

- (1) UVFGTIIV (2) RSCDQRRS (3) SUDFRQRSM (4) SUDFRTSU

11. A man starts from his house and walks 10 km in South direction, then he turns right and goes 6 km, again he turns right and goes 10 km and finally turns right and goes 6 km. At what distance is he from the starting point and in which direction ?

- (1) 2 km, North (2) 3 km, South
(3) At the starting point (4) 4 km, East

12. How many 5s are there in the following number sequence which are immediately preceded by 7 and immediately followed by 6 ?

7 5 5 9 4 5 7 6 4 5 9 8 7 5 6 7 6 4 3 2 5 6 7 8

- (1) One (2) Two (3) Three (4) Four

13. Pointing to a lady, a man said. "The son of her only brother is the brother of my wife." How is the lady related to that man ?

- (1) Mother's sister (2) Grandmother
(3) Sister of father-in-law (4) Mother-in-law

14. If P means 'division', T means 'addition', M means 'subtraction' and D means 'multiplication', then what will be the value of the expression 12 M 3 D 28 P 7 T 15 ?

- (1) - 30 (2) - 15 (3) 15 (4) None of these

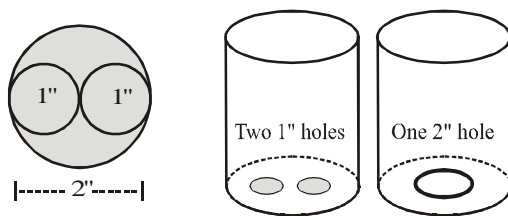
Direction (Q.15 & Q. 16) : In each of the following questions, four pairs of words are given, out of which the words in three pairs bear a certain common relationship. Choose the pair in which the words are differently related.

15. (1) Shoe : Leather (2) Iron : Axe
(3) Table : Wood (4) Jewellery : Gold
16. (1) Iran: Asia (2) Canberra : Australia
(3) Norway: Europe (4) Algeria : Africa
17. A bag contains 4 pink and 4 blue socks. If you are blindfolded, what is the fewest number of socks you must remove to guarantee you have 1 of each color ?



- (1) 1 (2) 2 (3) 3 (4) 5

18. Which Jar will empty faster, if filled with water : A jar with two 1" holes or a Jar with one 2" hole?

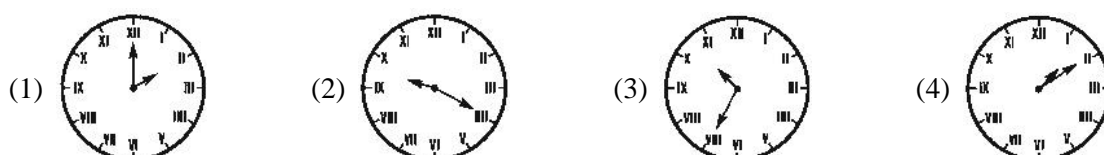


- (1) Jar with two 1" holes (2) Jar with one 2" hole
(3) Both empty at same rate (4) Data incomplete

19. Which of these contains the most triangles?



20. Which clock is the odd one out?

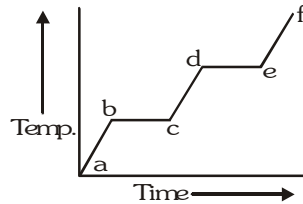


PART-II**SECTION-A : PHYSICS**

This section contains **15 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

21. An object becomes positively charged when, which of the following occurs ?
- (1) Loses electrons (2) Loses protons
(3) Gains electrons (4) Gains neutrons
22. When a light ray is reflected repeatedly by a set of parallel plane mirrors, the intensity of light rays decreases after some reflections. This is because of
- (1) Poor reflection from mirror
(2) Absorption of some amount of light by mirrors.
(3) Dispersion of light when the rays travel through the atmosphere
(4) Scattering of light by the mirror
23. In case of longitudinal waves, the particles of medium vibrate
- (1) In the direction of wave propagation
(2) Opposite to the direction of wave propagation
(3) At right angles to the direction of wave propagation
(4) None of these
24. What must be true about two given objects for energy to be transferred as heat between them ?
- (1) The objects must be large.
(2) The objects must be hot.
(3) The objects must contain a large amount of energy.
(4) The objects must have different temperatures.
25. The boiling point of liquid hydrogen is -252.87°C . What is the value of this temperature in kelvins ?
- (1) 273K (2) 20.13 K (3) - 525.87 K (4) 0 K
26. The expansion of one of the following liquids is used for measuring the temperature in ordinary thermometers. This liquid is :
- (1) alcohol (2) water (3) glycerol (4) mercury
27. The specific heat of a substance is
- (1) The amount of heat energy to change the state of one gram of the substance
(2) The amount of heat energy per unit mass emitted by oxidizing the substance
(3) The amount of heat energy per unit mass to raise the substance from its freezing to its boiling point
(4) The amount of heat energy required to raise the temperature of 1 gram of the substance by 1°C .

28. Steam burns are more painful than those caused by boiling water at the same temperature because
- (1) Steam contains more heat than the same amount of water at the same temperature. When steam condenses it gives out this extra latent heat
 - (2) Hot air is also mixed up with steam
 - (3) Steam produces some chemical effect on the skin to cause pain
 - (4) The question is irrelevant as steam burns are equally painful as those caused by boiling water
29. The following figure represents the temperature versus time plot for a given amount of a substance when heat is supplied at a fixed rate and at a constant pressure. Which part of this plot represent a phase change ?



- (1) a to b and e to f
 - (2) d to e and e to f
 - (3) b to c and c to d
 - (4) b to c and d to e
30. Four forces are acting on a body, if the body does not change its position or shape, the forces
- (1) Must be of equal Magnitude
 - (2) Must be parallel and opposite
 - (3) Must add up to zero when taken as vectors
 - (4) must be in a single line
31. If we go at higher altitudes or walk up on a mountain,
- (1) Atmospheric pressure will decrease
 - (2) Atmospheric pressure will increase
 - (3) It will not change
 - (4) Can't say
32. Gravitational force acts
- (1) Only between the sun and the planets moving around it
 - (2) Only between the earth and the bodies on it.
 - (3) Between all bodies in the universe
 - (4) Only between the sun and the earth.
33. Why does a sharp knife enable us to cut through things more easily?
- (1) The pressure exerted is lesser when the same force is used
 - (2) The pressure exerted is greater when the same force is used
 - (3) The sharp edge can pass through the material slowly
 - (4) The sharp edge is not felt when cutting through the material
34. A parallel beam of light in air is incident on a plane mirror. The beam after reflection,
- (1) remains parallel
 - (2) becomes diverging
 - (3) follows a parabolic path
 - (4) becomes converging
35. What type of charge is developed on an ebonite rod when it is rubbed with a fur ?
- (1) Positive
 - (2) Negative
 - (3) May be positive or negative
 - (4) No charge at all

SECTION-B : CHEMISTRY

This section contains **15 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

36. When diamond is heated to 1500°C , in the absence of air, it forms :
- (1) graphite (2) carbon black (3) soot (4) coke
37. We should not wear polyester while working in kitchen because _____ .
- (1) it produces heat and we feel hot.
(2) it feels uncomfortable, as it does not allow air to pass through.
(3) its fabric melts and sticks to the body, in case of fire.
(4) it is not hygienic to wear synthetic fibre clothes.
38. A mixture having uniform properties is known as
- (1) colloids (2) suspension (3) heterogeneous (4) homogeneous
39. Hardness of water is due to soluble salts.
- (1) bicarbonates (2) sulphates (3) chlorides (4) all
40. Which of the following statements is not true ?
- (1) Among all the naturally occurring elements around eighty percent are metals.
(2) Non metals are more abundant than metals.
(3) Sodium and potassium are soft like wax.
(4) Bromine is a reddish brown liquid at room temperature.
41. At _____ $^{\circ}\text{C}$ water has its maximum density and its minimum volume
- (1) 40°C (2) 4°C (3) 14°C (4) 24°C
42. Choose the reactions which are not feasible.
- I. Iron + Zinc sulphate \rightarrow Iron sulphate + Zinc
II. Magnesium + Silver nitrate \rightarrow Magnesium nitrate + Silver
III. Copper + dil. sulphuric acid \rightarrow Copper sulphate + H_2
IV. Zinc + Ferrous sulphate \rightarrow Iron + Zinc sulphate
- (1) I, II & III (2) III & IV only (3) I and III only (4) All of these
43. A neutral atom has 12 electrons and 13 neutrons. Its mass number is.
- (1) 12 (2) 24 (3) 13 (4) 25
44. Process of conversion of wood into coal by biochemical process, taking over millions of years is called
- (1) catenation (2) carbonation (3) pyrolysis (4) destructive distillation
45. Which of the following statements is correct?
- (1) A pure substance must contain only one type of atom.
(2) A mixture containing two compounds must be heterogeneous.
(3) A heterogeneous mixture must contain at least three elements.
(4) A homogeneous mixture must be uniform.
46. The necessary conditions for combustion process to occur are
- (i) non-availability of air/oxygen
(ii) availability of air/oxygen
(iii) temperature of fuel below ignition temperature
(iv) temperature of fuel above ignition temperature
- Select the correct alternative
- (1) (i) & (ii) (2) (ii) & (iv) (3) (iii) & (i) (4) (iv) & (i)

47. A particle X deflects towards negative plate in the presence of electric field. Identify the particle X?
 (1) Neutron (2) Electron (3) X - ray (4) Proton
48. Two elements A and B on burning in air give corresponding oxides. Oxides of both A and B are soluble in water. The aqueous solutions of oxide of A is alkaline and reacts with aqueous solution of oxide of B to give another compound. Identify A and B.
 (1) A and B both are metals (2) A and B both are non metals
 (3) A is metal and B is non metal (4) A is non metal and B is metal
49. Match the following.
- | | |
|-----------------|--|
| (i) Acrylic | (p) Contains repeating ester units |
| (ii) Cellulose | (q) Used for making sweaters |
| (iii) Polythene | (r) Made up of large number of glucose units |
| (iv) Terylene | (s) Used for making electrical switches |
| | (t) Used for manufacturing toys |

Which of the following is the correct matching?

- | | |
|--|--|
| (1) (i) - (q), (ii) - (p), (iii) - (s), (iv) - (r) | (2) (i) - (q), (ii) - (r), (iii) - (t), (iv) - (p) |
| (3) (i) - (s), (ii) - (q), (iii) - (t), (iv) - (p) | (4) (i) - (s), (ii) - (r), (iii) - (q), (iv) - (t) |
50. Read the following statements.
 (i) Water is the best extinguisher for fires involving inflammable materials
 (ii) Carbon dioxide is used to extinguish fires involving oil and petrol
 (iii) Water is not suitable for fires involving electrical equipments.
 (iv) Fires caused by short circuit should be immediately put off by sprinkling water on it.

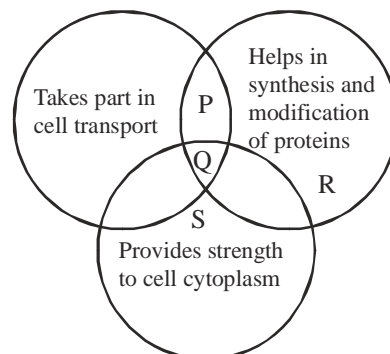
Which alternatives has the correct statements ?

- | | | | |
|------------------|------------------|----------------|-----------------|
| (1) (ii) & (iii) | (2) (iii) & (iv) | (3) (i) & (ii) | (4) (ii) & (iv) |
|------------------|------------------|----------------|-----------------|

SECTION-C : BIOLOGY

This section contains **15 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

51. Which two organelles are thought to have originated from free-living prokaryotic cells?
 (1) Mitochondria and ribosomes (2) Chloroplast and nucleus
 (3) Chloroplast and mitochondria (4) Lysosomes and mitochondria
52. Refer the given Venn diagram and select the correct option.



- | | |
|---|--|
| (1) P - Golgi apparatus; R - Microtubules | (2) Q - Endoplasmic reticulum; R - Ribosomes |
| (3) S - Microtubules; Q - Ribosomes | (4) S - Golgi apparatus; P - Lysosomes |

53. Match Column I with Column II and select the correct option from the codes given below.

Column I

- (a) Suicide bag of the cell
- (b) Power house of the cell
- (c) Protein factory of the cell
- (d) Kitchen of the cell
- (e) Circulatory system of the cell
- (1) a-(iii), b-(i), c-(ii), d-(iv), e-(v)
- (3) a-(iii), b-(i), c-(ii), d-(v), e-(iv)

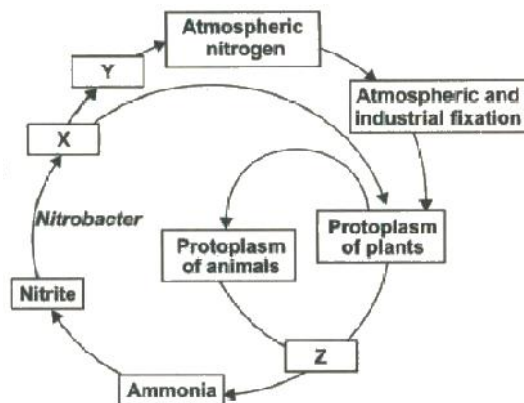
Column II

- (i) Mitochondria
- (ii) Ribosome
- (iii) Lysosome
- (iv) Endoplasmic reticulum
- (v) Chloroplast
- (2) a-(iii), b-(i), c-(iv), d-(v), e-(ii)
- (4) a-(i), b-(iii), c-(ii), d-(v), e-(iv)

54. The similarity between bacterium and cyanobacterium is in the presence of
 (1) Flagella (2) Nucleoid (3) Size (4) 80S ribosomes

55. Mycorrhizae are
 (1) Symbiotic association of fungi with Lichens
 (2) Symbiotic association of fungi with roots of higher plants.
 (3) Symbiotic association of fungi with termites.
 (4) None of the above.

56. The given cycle represents circulation of nitrogen in the environment. Identify X, Y and Z in the cycle and select the correct option.



- (1) X - Denitrification, Y - Ammonification, Z - Nitrogen fixation
- (2) X - Nitrate, Y - Denitrification, Z- Ammonification
- (3) X - Nitrate, Y - Nitrogen fixation, Z - Ammonification
- (4) X - Nitrification, Y - Ammonification, Z - Denitrification

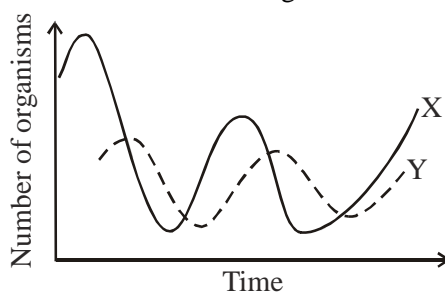
57. Match Column I with Column II and select the correct option from the codes given below.

| Column-I | | Column-II | |
|----------|--------------------|-----------|---|
| (a) | Endemic species | (i) | Species that exist in very small number |
| (b) | Endangered species | (ii) | Species found exclusively in a particular area |
| (c) | Vulnerable species | (iii) | Species that are likely to become endangered |
| (d) | Rare species | (iv) | Species that are likely to get extinct in the near future |

- (1) a-(ii), b-(iii), c-(i) d-(iv)
- (2) a-(iv), b-(ii), c-(iii), d-(i)
- (3) a-(iii), b-(i), c-(ii), d-(iv)
- (4) a-(ii), b-(iv), c-(iii), d-(i)

58. Cutting down forests and using the land for other purposes is known as deforestation. It has adverse effects on the environment. Which of the following are correct regarding these effects ?
- (i) Decrease in soil erosion (ii) Increase in temperature
(iii) Ground water level gets lowered (iv) Droughts and floods
(v) Increase in water holding capacity of the soil
- (1) (i), (ii), (iii) & (iv) (2) (ii), (iv) & (v)
(3) (ii), (iii) & (iv) (4) (i), (ii), (iv) & (v)

59. The change in number of two species X and Y belonging to the same food chain over a period of time is shown in the given graph. Which of the following best identifies the organisms?



X

Y

- | | |
|-------------|--------|
| (1) Chicken | Corn |
| (2) Fox | Hen |
| (3) Grass | Rabbit |
| (4) Lion | Deer |
60. Arrange the following agricultural practices in the correct order :-
Sowing, manuring, irrigation, harvesting, ploughing and levelling.
- (1) Ploughing, sowing, levelling, harvesting, manuring and irrigation
(2) Ploughing, levelling, irrigation, sowing, manuring and harvesting
(3) Ploughing, irrigation, sowing, manuring, harvesting and levelling
(4) Ploughing, levelling, manuring, sowing, irrigation and harvesting
61. Which of the following is explained in the given information ?
- I. It is the science of growing crops
II. It covers all the activities connected with cultivation
III. It covers all the activities of animals for food and for doing useful work
- (1) Animal husbandry (2) Horticulture (3) Agriculture (4) Nurseries
62. Animal husbandry deals with :-
- (1) increase in milk production (2) proper utilisation of animal wastes
(3) protection of animals against diseases (4) all of the above
63. The use of machinery in agriculture helps to :-
- I. increase the quantity of crop yield
II. get the job done faster
III. reduce the dependency on human and animal labour
- (1) I and II only (2) I and III only (3) II and III only (4) I, II and III
64. Which of the following hormone is not a reproductive hormone?
- (1) Progesterone (2) Estrogen (3) Thyroxin (4) Testosterone
65. Which type of cell division is involved in sexual reproduction?
- (1) Meiosis (2) Mitosis (3) Amitosis (4) Both (1) & (2)

SECTION-D : MATHEMATICS

This section contains **15 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

66. If $\frac{(1-2x)}{7} - \frac{(2-3x)}{8} = \frac{3}{2} + \frac{x}{4}$, then $x =$

- (1) 9 (2) 10 (3) 11 (4) 12

67. Evaluate $(x + 2y)(2x - 3y)$ at $x = 2, y = -1$

- (1) 28 (2) 0 (3) 2 (4) 3

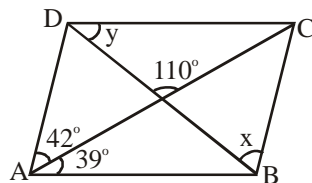
68. The area of a square field is $10\frac{6}{25}$ m². Therefore the length of the side of the square is

- (1) $\sqrt{10\frac{6}{25}}$ m (2) $3\frac{1}{5}$ m (3) $\frac{16}{25}$ m (4) $\frac{256}{5}$ m

69. A student buys a pen for Rs. 80 & sells it for Rs. 50. Find his loss percent

- (1) $62\frac{1}{4}\%$ (2) $62\frac{1}{2}\%$ (3) $37\frac{1}{4}\%$ (4) $37\frac{1}{2}\%$

70. In the given parallelogram ABCD, find $x + y$



- (1) 42° (2) 99° (3) 70° (4) 39°

71. Subtract $3x^2y + 4y - x^2yz$ from $12x^2yz - 3xyz + 2x^2y$ then result will be

- (1) $11x^2yz - 3xyz + 5x^2y + 4y$ (2) $3xyz - 5x^2y - 4y - 11x^2yz$
(3) $13x^2yz - 3xyz - x^2y - 4y$ (4) $13x^2yz - 3xyz - x^2y + 4y$

72. $(2x+3y)(3x-2y)$ is the factorization of

- (1) $4x^2 - 9y^2$ (2) $9x^2 - 4y^2$ (3) $4x^2 + 12xy + 9y^2$ (4) $6x^2 + 5xy - 6y^2$

73. The numerator of a fraction is 6 less than the denominator. If 3 is subtracted from the numerator, the fraction is equal to $\frac{2}{3}$. Original fraction is equal to

- (1) $\frac{20}{26}$ (2) $\frac{21}{27}$ (3) $\frac{15}{21}$ (4) $\frac{13}{19}$

74. $a^4 - 16b^4 =$

(1) $(a + 2b)(a - 2b)(a^2 + 4b^2)$

(2) $(a + 2b)(a + 2b)(a^2 + 4b^2)$

(3) $(a + 2b)(a - 2b)(a^2 - 4b^2)$

(4) None of these

75. If $x + \frac{1}{x} = 3$, then $x^2 + \frac{1}{x^2} =$

(1) 11

(2) 7

(3) 9

(4) 2

76. Find the area of right angled triangle, whose smallest side is 14 cm (sides are in integer form)

(1) 336 cm^2

(2) 350 cm^2

(3) 322 cm^2

(4) 308 cm^2

77. Find the average of all the distinct prime factors of 7744.

(1) 23

(2) 11.5

(3) 6.5

(4) 13

78. 5 men can complete a job in 8 days. How many days will it take if 12 men do the job ?

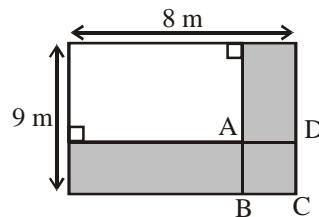
(1) $5\frac{1}{3}$

(2) $3\frac{1}{4}$

(3) $3\frac{1}{3}$

(4) None of these

79. In the given rectangle area of the shaded portion is 36.25 m^2 , then find the area of square ABCD



(1) 2.5 m^2

(2) 6.25 m^2

(3) can't be determined

(4) None of these

80. Mr. Jain had 'n' chocolates. He distributed them among 4 children in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{5} : \frac{1}{8}$. If he gave them each one a complete chocolate, the minimum no. of chocolates that he had :

(1) 139

(2) 240

(3) 278

(4) None of these

SPACE FOR ROUGH WORK