



## RGP – RANKERS GENIUS PROGRAM

(Phase - 02)

(SCIENCE, MATH, MAT)

Set

**B**

Time: 1 Hour

Moving to 11<sup>th</sup> (MATH)

Marks: 120

### 1. General Instructions:

(Paper Code: 1102)

- \* This test paper consists of 60 questions in 3 sections (A, B, C)

#### Marking Scheme:

- Full marks: + 2 if answered correctly.
- Zero marks: 0 if not attempted or incorrect.

### 2. RGP College Grant Criteria:

- ✓ Students must score a minimum of 70% positive marks in RGP.
- ✓ Student must get under AIR 5,000 in JEE/NEET Examination.

### 3. Cash Reward Criteria:

- ✓ Exciting Cash Rewards for RGP Toppers

SENIOR WING (Student's Moving to Class XI <sup>th</sup> , XII <sup>th</sup> , Dropper JEE /NEET)	JUNIOR WING (Student's Moving to Class IX <sup>th</sup> & X <sup>th</sup> )
Overall 1 <sup>st</sup> Topper	Overall 1 <sup>st</sup> Topper
₹ 21,000/-	₹ 5,100/-
Overall 2 <sup>nd</sup> Topper	Overall 2 <sup>nd</sup> Topper
₹ 11,000/-	₹ 3,100/-
Overall 3 <sup>rd</sup> Topper	Overall 3 <sup>rd</sup> Topper
₹ 5,100/-	₹ 2,100/-
Overall 4 <sup>th</sup> – 8 <sup>th</sup> Topper	Overall 4 <sup>th</sup> – 8 <sup>th</sup> Topper
₹ 2,100/-	₹ 1,100/-
Overall 9 <sup>th</sup> – 15 <sup>th</sup> Topper	Overall 9 <sup>th</sup> – 15 <sup>th</sup> Topper
₹ 1,100/-	₹ 500/-

- ✓ Candidate who got 1<sup>st</sup> Rank in junior or senior wing in RGP (Phase – 01) will not be eligible for any cash Reward in RGP (Phase – 02).

\*\* Rankings from 1 to 20 are determined based on the specific criteria outlined in the FAQ section of our website, [www.myrankers.com](http://www.myrankers.com).

### 4. Scholarship Criteria in Rankers Offline Classroom Program:

- ✓ 100% Fee Waiver – Student Scoring 90% and Above
- ✓ 80% Fee Waiver – Student Scoring 85% to 89.999%
- ✓ 60% Fee Waiver – Student Scoring 75% to 84.999%
- ✓ 50% Fee Waiver – Student Scoring 70% to 74.999%
- ✓ 40% Fee Waiver – Student Scoring 60% to 69.999%
- ✓ 20% Fee Waiver – Student Scoring 40 % to 59.999%
- ✓ 10% Fee Waiver – Student Scoring 30% to 39.999%
- ✓ 5% Fee Waiver – All the Aspirants Appearing in RGP

### RGP RESULT & REWARD CEREMONY

Result Date: 26<sup>th</sup> March 2025

Check Your Result at: [www.myrankers.com](http://www.myrankers.com)

Reward Ceremony Date: 27<sup>th</sup> March 2025

Student's Name: - .....

**SCIENCE (SECTION – A)**

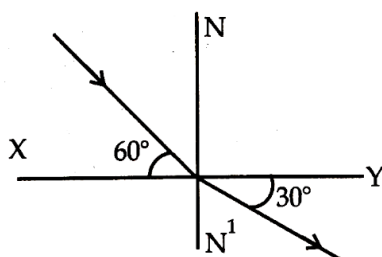
1. A certain household has consumed 100 units of energy during a November month. Its value in joules will be  
(A)  $3.6 \times 10^{10}$  (B)  $3.6 \times 10^8$  (C)  $7.2 \times 10^{10}$  (D)  $3.6 \times 10^6$
2. When four equal resistors are connected in series with a battery they dissipate power of 10 W. The power dissipated through any of the if connected across the same battery will be:  
(A) 40 W (B) 10/3 W (C) 90 W (D) 10 W
3. A heater coil is cut into two equal parts and only one part is used in the heater. The heat generated now will be  
(A) doubled (B) four times (C) one fourth (D) halved
4. In the balanced chemical equation:  
(a lead nitrated + b aluminium chloride  $\rightarrow$  aluminium c nitrate + d lead chloride)  
Which of the following alternative is correct?  
(A) a = 1, b = 2, c = 2, d = 1 (B) a = 4, b = 3, c = 3, d = 4  
(C) a = 2, b = 3, c = 2, d = 3 (D) a = 3, b = 2, c = 2, d = 3
5. In figure a ray of light undergoes refraction from medium A to medium B. If the speed of light in medium A is  $v$ , then the speed of light in medium B will be

(A)  $\sqrt{3}v$

(B)  $\frac{v}{\sqrt{3}}$

(C)  $2v$

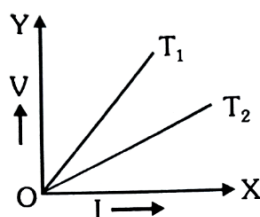
(D)  $\frac{v}{2}$



----- Rough Work -----

6. For a metallic conductor, current versus voltage graph is drawn at two different temperatures  $T_1$  and  $T_2$ . From the graph it follows: -

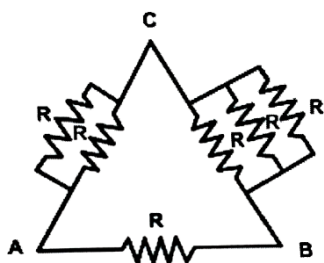
- (A)  $T_1 = T_2$   
 (B)  $T_1 > T_2$   
 (C)  $T_1 < T_2$   
 (D) None of these



7. Two lamps X and Y connected in series. The lamp X glows lighter than Y. Then

- (A) The resistance of X is greater than the resistance of Y.  
 (B) The resistance of X is lesser than the resistance of Y.  
 (C) The resistance of X is equal to the resistance of Y.  
 (D) There is no relation between the resistances

8. Six identical resistors connected between points A, B and C as shown in the diagram. The equivalent resistance would be maximum between.

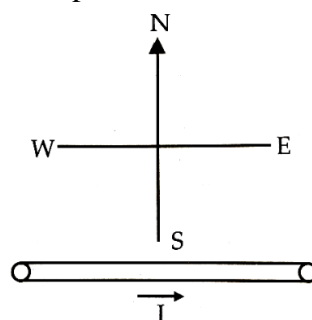


- (A) A & B  
 (C) A & C

- (B) B & C  
 (D) All options are correct

----- Rough Work -----

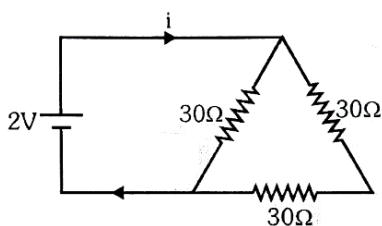
9. 'Lead pencil' contains  
 (A) Pb (B) FeS (C) Graphite (D) PbS
10. Which of the following does not give a positive test with alkaline solution of potassium permanganate  
 (A)  $C_{10}H_{22}$  (B)  $C_6H_{12}$  (C)  $C_{10}H_{18}$  (D)  $C_{10}H_{20}$
11. A small pencil of length 10 cm is kept along the axis of a concave mirror of radius of curvature 40 cm with its tip touching the mirror. The size of the pencil's image would appear to be:  
 (A) 5 cm (B) 10 cm (C) 20 cm (D) infinite
12. A constant current  $I$  flows in a horizontal wire in the plane of the paper from West to East as shown in the figure. The direction of magnetic field at a point will be South to North  
 (A) directly above the wire  
 (B) Directly below the wire  
 (C) At a point located in the plane of the paper, on the north side of the wire.  
 (D) At a point located in the plane of the paper, on the south side of the wire.



----- Rough Work -----

13. The current in the adjoining circuit will be-

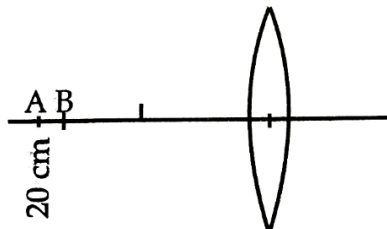
- (A)  $\frac{1}{45}$  A  
 (B)  $\frac{1}{15}$  A  
 (C)  $\frac{1}{10}$  A  
 (D)  $\frac{1}{5}$  A



14. A convex lens is in contact with concave lens. The magnitude of the ratio of their focal length is  $\frac{2}{3}$ . Their equivalent focal length is 30 cm. What are their individual focal lengths (in cm).  
 (A)  $-75, +50$                       (B)  $+10, -15$                       (C)  $+75, -50$                       (D)  $-15, -10$
15. Sulphur powder is heated on a spatula. A piece of both, moist blue and red litmus papers are brought one by one near the gas evolved during heating. The action of gas on the moist litmus papers will be:  
 (A) No change in colour in both the litmus papers.  
 (B) Blue litmus paper becomes red.  
 (C) Red litmus paper becomes blue.  
 (D) Blue litmus paper turns black.
16. Which of the following is a chemical change?  
 1. Bubbling of oxygen gas through water.  
 2. Burning of wax of a candle.  
 3. Emitting of light from an electric bulb on passing electric current.  
 4. Passing of carbon dioxide gas through lime water.  
 (A) 1 and 3                      (B) 3 and 4                      (C) 2 and 4                      (D) 1 and 4

----- Rough Work -----

17. Which of these salts will give acidic solution?  
 (A)  $\text{Na}_2\text{CO}_3$  (B)  $\text{NaCl}$  (C)  $\text{NH}_4\text{Cl}$  (D)  $\text{HCOONa}$
18. A pin AB of length 2 cm is kept on the axis of a convex lens between 18 cm and 20 cm as shown in figure. Focal length of convex lens is 10 cm. Find magnification produced for the image of the pin.



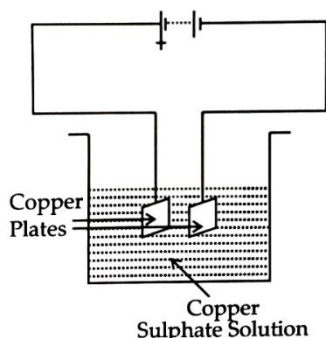
- (A) 0.83 (B) 1.00 (C) 1.25 (D) 6.78
19. To read a poster on a wall, a person with defective vision needs to stand at a distance of 0.4 m from the poster. A person with normal vision can read the poster from a distance of 2.0 m. Which one of the following lens may be used to correct the defective vision?  
 (A) A concave lens of 0.5 D (B) A concave lens of 1.0 D  
 (C) A concave lens of 2.0 D (D) A convex lens of 2.0 D
20. A mirror which can produce a magnification of +1 is  
 (A) Convex mirror (B) Concave mirror  
 (C) Plane mirror (D) Both concave mirror & plane mirror
21. Which of the following can produced a magnetic field?  
 (A) Electric charges at rest (B) Electric charges in motion  
 (C) Only by permanent magnets (D) Electric charges whether at rest or in motion

----- Rough Work -----

22. Which chemical substance is added to LPG to help in detection of its leakage?  
(A) Isobutane (B) Ethanethiol (C) Propane (D) Hydrogen sulphide
23.  $\text{H}_2\text{S}(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}(\text{g}) + \text{S}(\text{s})$  The reaction is interpreted as:  
(A)  $\text{H}_2\text{S}$  is getting oxidized and  $\text{Cl}_2$  is getting reduced.  
(B)  $\text{H}_2\text{S}$  is getting reduced and  $\text{Cl}_2$  is getting oxidized.  
(C) Only  $\text{H}_2\text{S}$  is oxidized.  
(D) Both  $\text{H}_2\text{S}$  and  $\text{Cl}_2$  are reduced.
24. A salt can be produced by reaction between  
1. A weak acid and weak base.  
2. Metal oxide and water.  
3. Metal and a mineral acid.  
4. Metal oxide and a mineral acid.  
(A) 1, 2 and 3 (B) 2, 3 and 4 (C) 3, 4 and 1 (D) 4, 1 and 2
25. Which salts are responsible for yellow colour of Taj Mahal in Agra due to Acid rain:  
(A)  $\text{CaCl}_2$  and  $\text{CaSO}_4$  (B)  $\text{Ca}(\text{NO}_3)_2$  and  $\text{CaSO}_4$   
(C)  $\text{Ca}(\text{NO}_3)_2$  and  $\text{BaSO}_4$  (D)  $\text{CaSO}_4$  and  $\text{BaCl}_2$
26. Which of the following is true about the two statements?  
**Statement I:** Reactivity of aluminium decreases when it is dipped in nitric acid  
**Statement II:** A protective layer of aluminium nitrate is formed when aluminium is dipped in nitric acid.  
(A) I is correct but II is incorrect.  
(B) I is incorrect but II is correct.  
(C) Both the statements are correct and II is also the correct explanation of I.  
(D) Both the statements are correct but II is not correct explanation of I.

----- Rough Work -----

27. Consider the given circuit carefully. What do you think would happen if the two copper plates are moved further apart from each other?



- (A) Larger amount of copper will be deposited on the plate connected to the negative electrode.  
 (B) Smaller amount of copper will be deposited on the plate connected to the negative electrode.  
 (C) Larger amount of copper will be deposited on the plate connected to the positive electrode.  
 (D) Smaller amount of copper will be deposited on the plate connected to the positive electrode.
28. Which elements are used for galvanization?  
 (A) Zn and Sn                      (B) Na and K                      (C) Cu and Fe                      (D) Ca and Mg
29. During preparation of soap, sodium is used for:  
 (A) Precipitate the soap                      (B) Dehydration of soap  
 (C) As a catalyst                      (D) for smoothness of soap
30. A hydrocarbon 'A' ( $C_3H_8$ ) on treatment with chlorine in presence of sunlight yielded compound 'B' as major product. Reaction of 'B' with aqueous KOH gave 'C' which on treatment with concentrated  $H_2SO_4$  yielded 'D'. Hydrogenation of 'D' gave back 'A'. The sequence of reactions involved in above conversion is:  
 (A) Substitution, Substitution, Addition, Dehydration.  
 (B) Substitution, Substitution, Dehydration, Addition.  
 (C) Substitution, Dehydration, Addition, Addition.  
 (D) Addition, Substitution, Dehydration, Substitution.

----- Rough Work -----



**MATH (SECTION – B)**

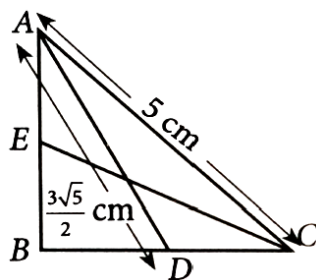
31. Someone is asked to choose a number from 1 to 100. The probability of its being a prime number is  
 (A)  $\frac{1}{5}$  (B)  $\frac{6}{25}$  (C)  $\frac{1}{4}$  (D)  $\frac{13}{50}$
32. A wheel has diameter 84 cm. To cover 792 metres, the number of complete revolutions made by it is  
 (A) 200 (B) 300 (C) 250 (D) 350
33. If  $\alpha, \beta$  are the roots of  $x^2 + x + 1 = 0$  and  $\gamma, \delta$  are the roots of  $x^2 + 3x + 1 = 0$ , then  $(\alpha - \gamma)(\beta + \delta)(\alpha + \delta)(\beta - \gamma) =$   
 (A) 2 (B) 4 (C) 6 (D) 8
34. The value of  $\frac{\tan^3 \theta}{1 + \tan^2 \theta} + \frac{\cot^3 \theta}{1 + \cot^2 \theta} =$   
 (A)  $\frac{1 + \sin^2 \theta \cos^2 \theta}{2 \sin \theta \cos \theta}$  (B)  $\frac{1 + 2 \sin^2 \theta \cos^2 \theta}{\sin \theta \cos \theta}$  (C)  $\frac{1 - 2 \sin^2 \theta \cos^2 \theta}{2 \sin \theta \cos \theta}$  (D)  $\frac{2 \sin^2 \theta \cos^2 \theta}{1 - \sin \theta \cos \theta}$
35. A right triangle with sides 3 cm, 4 cm and 5 cm is revolved about the side 3 cm, then the volume of cone so formed is  
 (A)  $12\pi \text{ cm}^3$  (B)  $15\pi \text{ cm}^3$  (C)  $16\pi \text{ cm}^3$  (D)  $20\pi \text{ cm}^3$

----- Rough Work -----

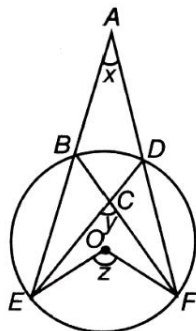
36. If the line segment joining the points  $(3, -4)$  and  $(1, 2)$  is trisected at points  $P(a, -2)$  and  $Q\left(\frac{5}{3}, b\right)$ , then the value of  $a$  and  $b$  is:  
 (A)  $a = \frac{8}{3}, b = \frac{2}{3}$  (B)  $a = \frac{7}{3}, b = 0$  (C)  $a = \frac{1}{3}, b = 0$  (D)  $a = \frac{2}{3}, b = \frac{1}{3}$
37. The value of  $\frac{p+p^2+p^3+p^4+p^5+p^6+p^7}{p^{-3}+p^{-4}+p^{-5}+p^{-6}+p^{-7}+p^{-8}+p^{-9}}$  is  
 (A)  $p^{10}$  (B) 1 (C) 0 (D)  $p^3$
38. If  $ax^3 + bx + c$  is divisible by  $x^2 + dx + 1$ , then  
 (A)  $a^2 + b^2 = ac$  (B)  $a^2 - c^2 = ab$  (C)  $a^2 - b^2 = ac$  (D)  $a^2 + c^2 = ab$
39. Mukesh has some goats and hens in his shed. Upon counting, Mukesh found that the total number of legs is 112 and the total number of heads is 40. Find the number of hens in his shed.  
 (A) 18 (B) 20 (C) 22 (D) 24
40. Let  $S_n$  denote the sum of the first ' $n$ ' terms of an A.P. and  $S_{2n} = 3S_n$ . Then, the ratio  $S_{3n} : S_n$  is equal to  
 (A) 4 : 1 (B) 6 : 1 (C) 8 : 1 (D) 10 : 1

----- Rough Work -----

41. In figure, ABC is a right triangle, right angled at B. AD and CE are the two medians drawn from A and C respectively. If AC = 5 cm and  $AD = \frac{3\sqrt{5}}{2}$  cm, find the length of CE.



- (A)  $2\sqrt{5}$  cm      (B) 2.5 cm      (C) 5 cm      (D)  $4\sqrt{2}$  cm
42. The value of  $\frac{(\sec \theta + \tan \theta)(1 - \sin \theta) \sec \theta}{(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta)}$  lies between  
 (A) 0.2 and 0.4      (B) 0.4 and 0.6      (C) 0.6 and 0.8      (D) 0.8 and 1
43. In the given figure, O is the centre of the circle, then  $\angle x + \angle y =$



- (A)  $2\angle z$       (B)  $3\angle z$       (C)  $\angle z/2$       (D)  $\angle z$

----- Rough Work -----

44. If  $x^2 - 3x + 1 = 0$ , then the value of  $x^5 + \frac{1}{x^5}$   
(A) 87 (B) 123 (C) 135 (D) 201
45. The average monthly income (in ₹) of certain agricultural workers is  $S$  and that of other workers is  $T$ . The number of agricultural workers are 11 times that of other workers. Then the average monthly income (in ₹) of all the workers is  
(A)  $\frac{S+T}{2}$  (B)  $\frac{S+11T}{2}$  (C)  $\frac{1}{11S}T$  (D)  $\frac{11S+T}{12}$

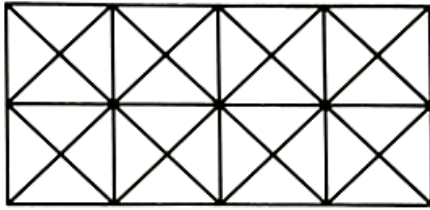
----- *Rough Work* -----

**MAT (SECTION – C)**

46. Darshan walked 4 meters in East, then he turned right and walked 7 meters, then he turned left and walked 5 meters again he turned left and walked 7 meters. Then finally before stopping he turned right and walked 3 meters. How far is Darshan from his initial point?  
(A) 10 meter                      (B) 11 meter                      (C) 12 meter                      (D) 13 meter
47. If the numerator of a fraction is increased by 240% and the denominator of the fraction is decreased by 50%, the resultant fraction is  $2\frac{5}{6}$ . What is the original fraction?  
(A)  $\frac{1}{4}$                                   (B)  $\frac{2}{3}$                                   (C)  $\frac{5}{12}$                                   (D)  $\frac{4}{11}$
48. On a table, the books of Physics, Mathematics, English and Hindi are arranged in such a way that the book of Hindi is just above the book of English and the book of Mathematics is just below that book of Physics. If the book of Physics is just kept below the book of English then which book is kept bottommost?  
(A) Physics                      (B) English                      (C) Mathematics                      (D) Hindi
49. Complete the following number/letter series by choosing the correct answer from the given alternatives.  
1, 4, 5, 10, 17, 28, 53, ?, ?  
(A) 58, 64                      (B) 64, 93                      (C) 78, 118                      (D) 82, 161

----- *Rough Work* -----

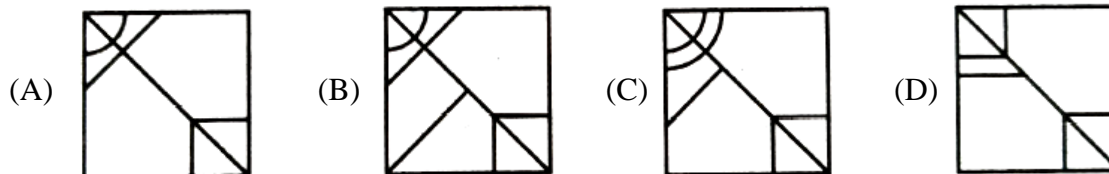
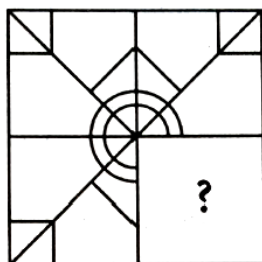
50. How many squares are there in the given figure?



- (A) 11                      (B) 21                      (C) 24                      (D) 26
51. Which set of number is like the given set?  
(80, 60, 45)  
(A) (16, 12, 9)              (B) (16, 12, 5)              (C) (20, 15, 11)              (D) (160, 120, 180)
52. If it was Saturday on 17<sup>th</sup> December, 2002, then what was the day on 22<sup>nd</sup> December, 2004?  
(A) Monday              (B) Sunday              (C) Friday              (D) Tuesday
53. A clock gains 15 minutes every day. If it is corrected at 12 O'clock in the afternoon, then what time will it show at 4 O'clock in the morning?  
(A) 4 : 10              (B) 4 : 15              (C) 4 : 20              (D) 4 : 30

----- *Rough Work* -----

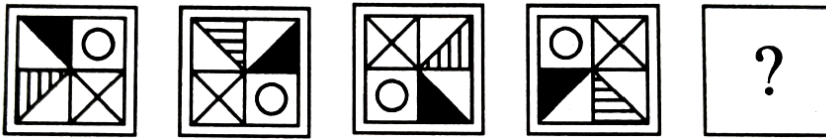
54. Select the figure from amongst the four alternatives which when placed in the blank space, would complete the pattern.



55. In a queue, Suneeta is at the tenth place from front. Subhash is at 25<sup>th</sup> place from behind. Gargi is standing at the central place between Suneeta and Subhash. There are 50 persons in the queue. Then Gargi is standing at which place from front?  
 (A) 20 (B) 19 (C) 18 (D) 17
56. A person was watching a photo, He said : 'I had neither brother nor sister but this person's father is the only son of my grand father'. Then whose photo was that person was watching?  
 (A) His son (B) His father (C) Himself (D) His uncle
57. If '×' means 'sum', '−' means 'division', '÷' means 'subtract' and '+' means multiplication, then which of the following equations is true?  
 (A)  $16 + 5 - 10 \times 4 \div 3 = 9$  (B)  $16 - 5 \times 10 \div 4 + 3 = 52$   
 (C)  $16 + 5 \div 10 \times 4 - 3 = 9$  (D)  $16 \times 5 \div 10 + 4 - 3 = 9$

----- Rough Work -----

58. Each of the following questions consists of four figures that form a series. Select a figure from the answer which will continue the same series as established by the four given figures.

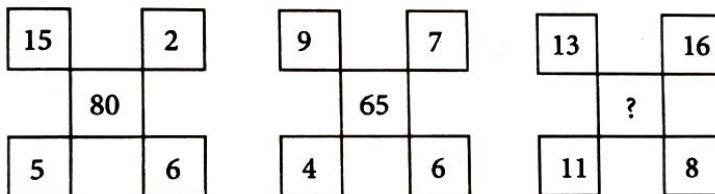


- (A) (B) (C) (D)

59. In a code language, DEFENCE is written as CDEDMBD, then in the same language, NEED will be written as

- (A) MDCC (B) ULDG (C) MCCD (D) MCDC

60. Find the missing character (?) in the following figures such that it follows rule.



- (A) 48 (B) 72 (C) 35 (D) 120

----- Rough Work -----