



# **VMC MEDICAL**

**Sample Paper**

**2 Year (Medical)**

**Duration: 2.5 Hrs**

**Maximum Marks: 360**

**For Students Presently in Class 10<sup>th</sup> (Stream: Medical)**

## **GENERAL INSTRUCTIONS:**

- The paper contains 90 Objective Type Questions divided into four sections: **Section - I (Physics), Section - II (Chemistry), Section - III (Biology) and Section - IV (Mental Ability)**.
- **Section-I, II and III contain 25 Multiple Choice Questions each and Section-IV contains 15 Multiple Choice Questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct.**

## **MARKING SCHEME:**

- For each question in Section-I, II, III and IV, **4 marks** will be awarded for correct answer and **-1 negative marking** for incorrect answers.

**SUGGESTIONS:**

- Before starting the paper, spend 2-3 minutes to check whether all the pages are in order and report any issue to the invigilator immediately.
- Try to attempt the Sections in their respective order.
- Do not get stuck on a particular question for more than 1.5 - 2 minutes. Move on to a new question as there are 120 questions to solve.

**SECTION – I [PHYSICS]**

1.  $v_1$  is velocity of light in first medium,  $v_2$  is velocity of light in second medium, then refractive index of second medium with respect to first medium is:  
(A)  $v_1 / v_2$       (B)  $v_2 / v_1$       (C)  $\sqrt{v_1 / v_2}$       (D)  $\sqrt{v_2 / v_1}$
2. The refractive index of glass and water with respect to air are  $3/2$  and  $4/3$  respectively. The refractive index of glass with respect to water is:  
(A)  $8/9$       (B)  $9/8$       (C)  $2$       (D)  $1/2$
3. If  ${}_i\mu_j$  represents refractive index when a light ray goes from medium  $i$  to medium  $j$ , then the product  ${}_2\mu_1 \times {}_3\mu_2 \times {}_4\mu_3$  is equal to:  
(A)  ${}_3\mu_1$       (B)  ${}_3\mu_2$       (C)  $\frac{1}{{}_1\mu_4}$       (D)  ${}_4\mu_2$
4. What is the basic reason for the shining of a diamond?  
(A) Reflection      (B) Refraction  
(C) Dispersion of light      (D) Total internal reflection
5. Total internal reflection of a ray of light is possible when the ( $i_c$  = critical angle,  $i$  = angle of incidence)  
(A) Ray goes from denser medium to rarer medium and  $i < i_c$   
(B) Ray goes from denser medium to rarer medium and  $i > i_c$   
(C) Ray goes from rarer medium to denser medium and  $i > i_c$   
(D) Ray goes from rarer medium to denser medium and  $i < i_c$
6. A convex lens of focal length  $A$  and a concave lens of focal length  $B$  are placed in contact. The focal length of the combination is:  
(A)  $A + B$       (B)  $(A - B)$       (C)  $\frac{AB}{(A + B)}$       (D)  $\frac{AB}{(B - A)}$
7. Near and far points of a human eye are:  
(A) zero and 25 cm      (B) 25 cm and 50 cm  
(C) 50 cm and 100 cm      (D) 25 cm and infinite
8. Which of the following is used in optical fibres?  
(A) Total internal reflection      (B) Scattering  
(C) Diffraction      (D) Refraction

9. A convex lens is making full image of an object. If half of lens is covered by an opaque object, then:  
(A) half image is not seen (B) full image of same intensity is seen  
(C) full image of decreased intensity is seen (D) half image of same intensity is seen
10. When a thin convex lens is put in contact with a thin concave lens of the same focal length ( $f$ ), the resultant combination has a focal length equal to:  
(A)  $f/2$  (B)  $2f$  (C) 0 (D)  $\infty$
11. Myopia is the defect of vision due to which a person finds difficulty in seeing.  
(A) distant objects (B) near objects  
(C) objects at all distances (D) colours
12. Loss of the ability of eye to focus on near and far objects with advancing age is called:  
(A) Presbyopia (B) Astigmatism (C) Hypermetropia (D) Myopia
13. Astigmatism can be corrected by:  
(A) Bifocal lenses (B) Cylindrical lenses  
(C) Concave lenses (D) Plano-convex lenses
14. A normal eye is not able to see objects closer than 25 cm because:  
(A) The focal length of the eye is 25 cm  
(B) The distance of the retina from the eye lens is 25 cm  
(C) The eye is not able to decrease the distance between the eye lens and the retina beyond a limit  
(D) The eye is not able to decrease the focal length beyond a limit
15. Myopia can be removed by using a lens of:  
(A) concave lens (B) convex lens (C) cylindrical lens (D) by surgical removal
16. 'Mirage' is a phenomenon due to:  
(A) reflection of light (B) refraction of light  
(C) total internal reflection of light (D) diffraction of light
17. When a ray of light enters a glass slab from air:  
(A) Its wavelength decreases. (B) Its wavelength increases.  
(C) Its frequency increases. (D) Neither wavelength nor frequency changes.
18. A person is looking at the image of his face in a mirror by holding it close to his face. The image is virtual. When he moves the mirror away from his face, the image is inverted. What type of mirror is he using?  
(A) Plane mirror (B) Convex mirror (C) Concave mirror (D) None of these
19. A lens of power +2.0D is placed in contact with another lens of power -1.0D, the combination will behave like:  
(A) A converging lens of focal length 100 cm  
(B) A diverging lens of focal length 100 cm  
(C) A converging lens of focal length 50 cm  
(D) A diverging lens of focal length 50 cm
20. A concave mirror produces a real image twice the size of the object when placed at a distance of 22.5 cm from it. At what distance from the mirror should the object be placed so that the image becomes three times the size of the object?  
(A) 20 cm (B) 25 cm (C) 30 cm (D) 40 cm

21. The angle between incident ray and reflected ray is  $70^\circ$ . What is the angle of incidence?  
(A)  $45^\circ$  (B)  $30^\circ$  (C)  $55^\circ$  (D)  $35^\circ$
22. The diameter of spherical mirror in which reflection takes place is called:  
(A) radius of curvature (B) centre of curvature  
(C) linear aperture. (D) focal length.
23. A person cannot see distinctly objects kept beyond 2 m. This defect can be corrected by using a lens of power:  
(A)  $+0.5\text{ D}$  (B)  $-0.5\text{ D}$  (C)  $+0.2\text{ D}$  (D)  $-0.2\text{ D}$
24. A student sitting on the last bench can read the letters written on the blackboard but is not able to read the letters written in his text book. Which of the following statements is correct?  
(A) The near point of his eyes has receded away  
(B) The near point of his eyes has come closer to him  
(C) The far point of his eyes has come closer to him  
(D) The far point of his eyes has receded away
25. At noon the sun appears white as:  
(A) light is least scattered  
(B) all the colours of the white light are scattered away  
(C) blue colour is scattered the most  
(D) red colour is scattered the most

**SECTION – II [CHEMISTRY]**

26. Which of the following represents a double displacement reaction?  
(A)  $2\text{H}_2 + \text{O}_2 \longrightarrow 2\text{H}_2\text{O}$  (B)  $2\text{Mg} + \text{O}_2 \longrightarrow 2\text{MgO}$   
(C)  $\text{AgNO}_3 + \text{NaCl} \longrightarrow \text{AgCl} \downarrow + \text{NaNO}_3$  (D)  $\text{H}_2 + \text{Cl}_2 \longrightarrow 2\text{HCl}$
27. The reaction  $\text{H}_2 + \text{Cl}_2 \longrightarrow 2\text{HCl}$  is a:  
(A) Decomposition reaction (B) Combination reaction  
(C) Double displacement reaction (D) Displacement reaction
28. Which of the following is a redox reaction?  
(A)  $\text{CaCO}_3 \longrightarrow \text{CaO} + \text{CO}_2$  (B)  $\text{H}_2 + \text{Cl}_2 \longrightarrow 2\text{HCl}$   
(C)  $\text{CaO} + 2\text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{O}$  (D)  $\text{NaOH} + \text{HCl} \longrightarrow \text{NaCl} + \text{H}_2\text{O}$
29.  $\text{Fe}_2\text{O}_3 + 2\text{Al} \longrightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$ . This reaction is an example of:  
(A) Combination reaction (B) Double displacement reaction  
(C) Decomposition reaction (D) Displacement reaction
30. When Iron nails are added to an aqueous solution of copper sulphate, a chemical change occurs. Which of the following is not true about this reaction?  
(A) Blue colour of the solution fades (B) Iron nails become brownish in colour  
(C) It is a displacement reaction (D) Iron nails dissolve completely
31. 10 ml of a solution of NaOH is found to be completely neutralised by 8mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount HCl solution (the same solution as before) required to neutralize it will be:  
(A) 4 mL (B) 8 mL (C) 12 mL (D) 16 mL

32. According to Arrhenius concept, an acid gives:  
(A)  $H^+$  in water (B)  $OH^-$  in water (C) Both (A) & (B) (D)  $OH^-$  in acid medium
33. Soda ash is:  
(A)  $NaNO_3$  (B)  $Na_2CO_3$  (C)  $NaOH$  (D)  $NaHCO_3$
34. Which of the following is a basic salt?  
(A)  $SnCl_2$  (B)  $NaCl$  (C)  $NH_4Cl$  (D)  $CH_3COONa$
35. Potash alum is a:  
(A) Simple salt (B) Complex salt (C) Acid salt (D) Double salt
36. What happens when copper rod is dipped in iron sulphate solution?  
(A) Copper displaces iron  
(B) Blue colour of copper sulphate solution is obtained  
(C) No reaction takes place  
(D) reaction is exothermic
37. Which of the following is not true for Washing Soda?  
(A) It is the sodium salt of carbonic acid synthesized by a process known as Solvay's process  
(B) It is used as a bleach for fabrics such as cotton and linen  
(C) In its manufacture, ammonia is regenerated from ammonium chloride by treating it with lime  
(D) Used for softening hard water
38. Some stale food gives a bad taste and a bad smell because of:  
(A) Corrosion (B) Displacement (C) Heating (D) Rancidity
39. Quick lime ( $CaO$ -calcium oxide) reaction with water is regarded as exothermic. A student mixes these two products in a test tube and touches its side surface. Which of the following statement correctly describes the student's observation?  
(A) the test tube becomes cold due to release of heat.  
(B) the test tube becomes hot due to release of heat.  
(C) the test tube becomes hot due to absorption of heat.  
(D) the test tube becomes cold due to absorption of heat.
40. In the balanced equation  
$$a Fe_2O_3 + b H_2 \rightarrow c Fe + d H_2O$$
  
The values of  $a$ ,  $b$ ,  $c$  and  $d$  are the respectively:  
(A) 1, 1, 2, 3 (B) 1, 1, 1, 1 (C) 1, 3, 2, 3 (D) 1, 2, 2, 3
41. Identify the element which is most reactive.  
$$A_2O_3 + 2B \rightarrow B_2O_3 + 2A$$
  
$$3CSO_4 + 2B \rightarrow B_2(SO_4) + 3C$$
  
$$3DO + 2A \rightarrow A_2O + 3D$$
  
(A) A (B) B (C) D (D) None of these
42. The chemical reaction between quicklime and water is characterized by:  
(A) evolution of hydrogen gas (B) formation of slaked lime precipitate  
(C) lowering in temperature of mixture (D) change in colour of the product

43. Which one of the following is an endothermic reaction?  
(A) combustion of carbon (B) adding ammonium chloride to water  
(C) reaction between NaOH and HCl (D) reaction between  $\text{Ca(OH)}_2$  and  $\text{H}_2\text{SO}_4$
44. One of the following does not happen during a chemical reaction. This is:  
(A) breaking of old chemical bonds and formation of new chemical bonds  
(B) formation of new substance with different properties  
(C) atoms of one element change into those of another element to form new products  
(D) a rearrangement of atoms takes place to form new products.
45. Barium chloride on reacting with ammonium sulphate forms barium sulphate and ammonium chloride. Which of the following correctly represents the type of reaction involved?  
(i) Displacement reaction (ii) Precipitation reaction  
(iii) Combination reaction (iv) Double displacement reaction  
(A) (i) only (B) (ii) only (C) (iv) only (D) (ii) & (iv)
46. In which of the following reaction 'Zn' undergo oxidation?  
(A)  $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$  (B)  $\text{H}_2 \rightarrow 2\text{H}^+ + 2\text{e}^-$   
(C)  $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$  (D)  $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$
47. In the reaction  $\text{PbO} + \text{C} \rightarrow \text{Pb} + \text{CO}$   
(A) PbO is oxidized (B) C acts as an oxidizing agent  
(C) C acts as a reducing agent. (D) This reaction does not represent redox reaction
48. When copper wire is put in a solution of  $\text{AgNO}_3$  :  
(A) copper metal is displaced  
(B) the colourless solution turns blue  
(C) the copper metal is deposited on the silver  
(D) all the above
49. Following reaction represents a redox reaction in this process  $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$  :  
(A) Na get oxidized (B)  $\text{Cl}_2$  get oxidized  
(C)  $\text{Cl}_2$  is oxidizing agent (D) Both (A) and (C)
50. According to electronic concept:  
(A) Oxidation is gain of electron(s)  
(B) Electron donating species is called oxidizing agent  
(C) Reduction is gain of electron(s)  
(D) Electron accepting species is called reducing agent

**SECTION – III [BIOLOGY]**

51. Which of the following is a preferred source of energy for living organism?  
(A) Carbohydrate (B) protein (C) fat (D) Minerals
52. Fats are preferred for storage by animals because:  
(A) It has high oxygen content and get oxidized easily  
(B) Require very less amount of oxygen for its oxidation.  
(C) Require  $\text{CO}_2$  for its oxidation  
(D) It has low  $\text{O}_2$  content and require amount of  $\text{O}_2$  for its oxidation.

53. Find the odd one with respect to autotrophic nutrition:
- (A) require CO<sub>2</sub> as source of carbon  
 (B) require organic compound as source of carbon  
 (C) H<sub>2</sub>O can be used as source of electron  
 (D) require sunlight for energy
54. Which one of the following is parasitic plant?
- (A) Dodder (B) Lotus (C) Trypanosoma (D) Plasmodium
55. What is correct regarding photosynthesis?
- (A) Conversion of CO<sub>2</sub> into Glucose in presence of sunlight  
 (B) Fixation of inorganic carbon into organic carbon with the help of solar energy.  
 (C) Fixation of organic compound into more complex organic compound  
 (D) Both (A) and (B)
56. In given following reaction find the source of oxygen
- $$\text{CO}_2 + \text{H}_2\text{O} \xrightarrow[\text{Sun light}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + \text{H}_2\text{O} + \text{O}_2 \uparrow$$
- (A) CO<sub>2</sub> (B) H<sub>2</sub>O  
 (C) Both CO<sub>2</sub> and H<sub>2</sub>O (D) Chlorophyll
57. Which of the products of light dependent reaction?
- (A) NADPH<sub>2</sub> only (B) NADH<sub>2</sub> + ATP  
 (C) NADPH<sub>2</sub> + ATP (D) ATP only
58. Find the correct sequence of process in light reaction:
- (A) Absorption of sunlight by chlorophyll → Photolysis of water → Production of Assimilatory power.  
 (B) Photolysis of water → Absorption of sunlight by chlorophyll → Production of NADPH<sub>2</sub> + ATP  
 (C) Breaking up of water → Production of Assimilatory power → Producing of Glucose  
 (D) Photolysis → Calvin cycle → Respiration
59. Which reaction correctly represents photolysis of water during light reaction?
- (A) H<sub>2</sub>O → H<sup>+</sup> + OH<sup>-</sup> (B) 2H<sub>2</sub>O + 4H<sup>+</sup> + 4e<sup>-</sup> + O<sub>2</sub>  
 (C) H<sub>2</sub>O → H<sub>2</sub> + [O<sub>2</sub><sup>-</sup>] (D) H<sub>2</sub>O → 2H<sup>+</sup> + [O<sup>-</sup>]
60. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?
- (A) Starch breaking down into sugars.  
 (B) Proteins breaking down into amino acids.  
 (C) Absorption of vitamins.  
 (D) Fats breaking down into fatty acids and glycerol.
61. One cell-thick vessels are called:
- (A) Arteries (B) Veins (C) Capillaries (D) Pulmonary artery
62. Which of the following enzyme helps in digestion of sugars in buccal cavity?
- (A) Pepsin (B) Rennin (C) Amylase (D) Lipase
63. The longest part of the large intestine is known as:
- (A) Duodenum (B) Jejunum (C) Rectum (D) Colon

64. The Bile juice is released in small intestine from gall bladder, which part of food does it helps to digest?  
(A) Sugars (B) Nucelic Acids  
(D) Vitamin C (D) Fats
65. Which of the following disorders is caused due to deficiency of vitamin A?  
(A) Cataract (B) Scurvy  
(C) Night Blindness (D) Color blindness
66. Rhythmic contraction of which muscles associated with ribs help in respiration?  
(A) Muscles of Diaphragm (B) Inter Costal Muscles  
(C) Muscles of stomach (D) Both (A) and (B)
67. In which organelle does the 3 carbon compound pyruvic acid breaks to form Carbon-dioxide, water and ATP?  
(A) Endoplasmic reticulum (B) Golgi Body  
(C) Mitochondria (D) Lysosome
68. When ATP is hydrolysed into ADP and Pi in presence of water, how much energy is released?  
(A) 15.5kJ (B) 30.5kJ (C) 60.5kJ (D) 90.5kJ
69. Why CO<sub>2</sub> is transported in dissolved state in plasma more as compared to O<sub>2</sub> dissolved in plasma?  
(A) O<sub>2</sub> has higher molecular weight than CO<sub>2</sub>  
(B) CO<sub>2</sub> has more affinity for hemoglobin than O<sub>2</sub>  
(C) CO<sub>2</sub> is more soluble in blood plasma than O<sub>2</sub>  
(D) CO<sub>2</sub> being higher in Inspired air is dissolved more
70. Which animal among the following has more number of auricles than adult Frog?  
(A) Fishes (B) Man (C) Crocodile (D) None
71. Which blood vessel transports deoxygenated blood collected from body into the right chamber of heart?  
(A) Venacava (B) Pulmonary Vein  
(C) Pulmonary Artery (D) Aorta
72. The value of Systolic Pressure in a healthy human Being is:  
(A) 80mmHg (B) 120mm Hg (C) 80 Pascal (D) 20 Pascal
73. Which of the following structure is not the part of human excretory system?  
(A) Uriniferous tubule (B) Uterus  
(C) Ureter (D) Urethra
74. Which of the following structure is responsible for reabsorption of water?  
(A) Ureter (B) Tubular part of nephron  
(C) Bowman's Capsule (D) Glomerulus
75. In which of the following animals, blood goes only once through the heart in one cycle of passage through the body?  
(A) Birds (B) Amphibians (C) Fishes (D) Mammals

## SECTION – IV [MENTAL ABILITY]

Directions for Q. Nos. 76 to 78:

Raju is a carpenter. He has five tools with which he works. They are A, B, C, D and E. Each of them has a different weight as given below:

- (i) A weighs twice as much as B
- (ii) B weighs four and half as much as D
- (iii) C weighs half as much as D
- (iv) D weighs half as much as E
- (v) E weighs less than A but more than C

76. Which of the following is the most light in weight?

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

77. Which of the following is most heavy in weight?

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

78. Which of the following represents the descending order of weights of tools?

- (A) B, D, E, A, C    (B) A, B, E, D, C    (C) B, D, E, C, A    (D) E, C, D, A, B

79. Nisha returned home three days earlier than the time she had told her mother, her sister Joya reached five days later than the day Nisha was supposed to return. If Joya returned on Thursday on what day did Nisha return?

- (A) Tuesday            (B) Wednesday        (C) Saturday            (D) Friday

80. Bablu has Rs. 480 in the denominations of one rupee notes, five rupee notes and ten rupee notes. The number of notes of each denomination is equal. What is the total no. of notes that he has?

- (A) 45                      (B) 90                      (C) 60                      (D) 75

81. Five boys took part in a race. Raj finished before Mohit but behind Gaurav. Ashish finished before Sanchit but behind Mohit. Who won the race?

- (A) Raj                      (B) Gaurav                (C) Mohit                      (D) Ashish

82. Leela's score is higher than Madhu. Shabnam's score is lower than Seema. Nisha's score is higher than Seema but lower than Madhu. Who among them scores the highest?

- (A) Leela                      (B) Madhu                      (C) Shabnam                (D) Seema

83. Ravi's age is just double to the age of Mohan. Shyam is 3 years younger to Ravi. If Mohan's age is 5 years, then the age of Shyam will be:

- (A) 5 years                      (B) 7 years                      (C) 8 years                      (D) 6 years

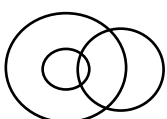

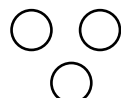
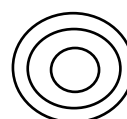
84. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son". Whose photograph was it?

- (A) His nephews    (B) His father's    (C) His son's    (D) His own

85. Ram is the brother of Deepak, Sunita is sister of Rajesh, Deepak is the son of Sunita. How is Ram related to Sunita?

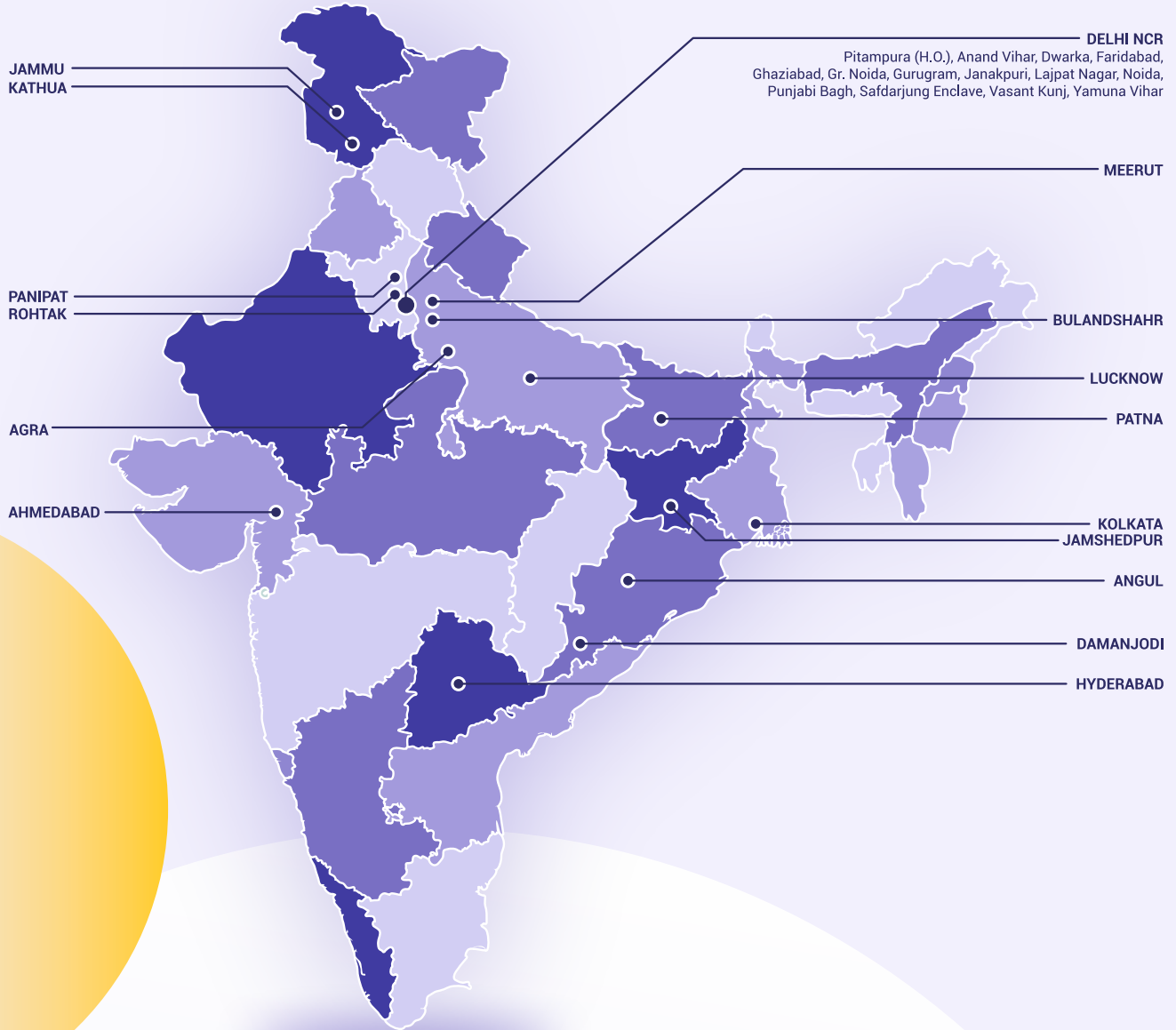
- (A) Son                      (B) Brother                      (C) Nephew                      (D) Father

86. Which of the following diagrams indicates the best relation between Mercury, Zinc and Metal?

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

87. A girl is facing south. She turns  $60^\circ$  in the clockwise direction and then turns  $105^\circ$  in the anticlockwise direction. In which direction is she now facing?  
(A) South – East (B) East (C) North – East (D) South–West
88. A watch reads 4 : 30. If the minute-hand points to East, in which direction does the hour-hand point?  
(A) North – East (B) South – East (C) North – West (D) North
89. A man walked 3 metre towards north, turned west and walked 2 metre then turned north and walked 1 metre and finally turned east and walked 5 metre. How far is he from the starting point?  
(A) 5 metre (B) 8 metre (C) 10 metre (D) 12 metre
90. A friend of mine came to meet me every Sunday. The first time he came at 12 : 30; the next time at 1 : 20, then at 2 : 30, then at 4.00 when did he turn up the time after that?  
(A) 4.30 (B) 5.50 (C) 5.30 (D) 5.20

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