VMC MEDICAL

Lifeline of NEET Aspirants

SAMPLE PAPERS

NAT National Admission Test

For Students

Going to Class 12th

1 Year Program

NEET

Head Office: Aggarwal Corporate Heights, 1st Floor, Netaji Subhash Place, Opp. Wazirpur Depot, Pitampura, Delhi.

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VMC MEDICAL

CODE A

Sample Paper – 1 Year Medical Program

NATIONAL ADMISSION TEST

Duration: 2.5 Hrs **Maximum Marks: 320**

PAPER SCHEME :

- The paper contains **80** Objective Type Questions divided into three sections: **Section - I (Physics), Section - II(Chemistry) and Section - III (Biology)**.
- **Section I and II** contain **20** Multiple Choice Questions each and **Section III** contains **40** questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLYONE CHOICE is correct**.

MARKING SCHEME:

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

GENERAL INSTRUCTIONS:

- For answering a question, an **ANSWER SHEET (OMR SHEET)** is provided separately. Please fill your **Name, Roll Number, Seat ID, Date of Birth** and the **PAPER CODE** properly in the space provided in the **ANSWER SHEET.** IT IS YOUR OWN RESPONSIBILITY TO FILL THE OMR SHEET CORRECTLY.
- The use of log tables, calculator and any other electronic device is strictly prohibited.
- Violating the examination room discipline will immediately lead to the cancellation of your paper and no excuses will be entertained.
- No one will be permitted to leave the examination hall before the end of the test.
- **Please submit both the question paper and the answer sheet to the invigilator before leaving the examination hall.**

SUGGESTIONS:

- *Before starting the paper, spend 2-2.5 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 1-1.5 minutes. Move on to a new question as there are 80 questions to solve.

SECTION – I [PHYSICS]

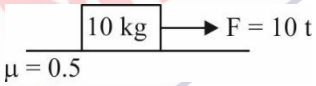
1. Suppose the kinetic energy of a body oscillating with amplitude A and at a distance x is given by $K = \frac{Bx}{x^2 + A^2}$. The dimensions of B are the same as that of:

(A) work/time **(B)** work × distance **(C)** work/distance **(D)** work × time

2. An experiment measures quantities a, b, c and then x is calculated as $x = ab^2/c^3$. If the percentage errors in a, b, c are $\pm 1\%, \pm 3\%$ and $\pm 2\%$ respectively, the percentage error in x can be:

(A) $\pm 13\%$ **(B)** $\pm 7\%$ **(C)** $\pm 4\%$ **(D)** $\pm 1\%$

3. A block is initially at rest. The friction force acting on the block at time t = 4 sec will be:



(A) 50 N **(B)** 30 N **(C)** 25 N **(D)** 40 N

4. A spring of spring constant k is broken in the length of ratio 1: 3. The spring constant of larger part will be:

(A) $\frac{4k}{3}$ **(B)** $\frac{2k}{3}$ **(C)** $\frac{k}{3}$ **(D)** $\frac{5k}{3}$

5. The adjacent sides of a parallelogram is represented by vectors $2\hat{i} + 3\hat{j}$ and $\hat{i} + 4\hat{j}$. The area of the parallelogram is:

(A) 5 units **(B)** 3 units **(C)** 8 units **(D)** 11 units

6. A wire has a mass (0.3 ± 0.003) g, radius (0.5 ± 0.005) mm and length (6 ± 0.06) cm. The maximum percentage error in the measurement of density is:

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

7. A body is released from the top of a tower of height H metre. After 2 seconds it is stopped and then instantaneously released. What will be its height after next 2 seconds?

(A) (H – 5) metre **(B)** (H – 10) metre **(C)** (H – 20) metre **(D)** (H – 40) metre

8. A metal ball falls from a height of 32 metre on a steel plate. If the coefficient of restitution is 0.5, to what height will the ball rise after second bounce?

(A) 2m **(B)** 4m **(C)** 8m **(D)** 16m

9. A ball of mass m_1 makes a head on elastic collision with a ball of mass m_2 which is initially at rest. The transfer of kinetic energy to the second ball is maximum when:

(A) $m_1 >> m_2$ **(B)** $m_1 = m_2$ **(C)** $m_1 << m_2$ **(D)** $m_1 \begin{matrix} \leq \\ > \end{matrix} m_2$

10. If θ be the angle between two vectors $\vec{P}$ and $\vec{Q}$, then $\vec{P}\cdot(\vec{Q}\times\vec{P})$ is equal to

(A) zero **(B)** $P^2Q\cos\theta$ **(C)** $PQ^2\sin\theta$ **(D)** PQ^2

11. If a vector $\vec{P}$ making angles α,β and γ respectively with the X, Y and Z axes respectively. Then $\sin^2\alpha+\sin^2\beta+\sin^2\gamma=$

(A) 0 **(B)** 1 **(C)** 2 **(D)** 3

12. The displacement-time graph for two bodies P and Q are straight lines inclined at angles of 30° and 60° with the time-axis. Then the ratio of their velocities is respectively equal to

(A) $1:\sqrt{3}$ **(B)** 1 : 2 **(C)** $\sqrt{3}:1$ **(D)** 1 : 3

13. A car accelerates from rest at a constant rate 'A' for some time, after which it decelerates at a constant rate 'B' and comes to rest. If the total time elapsed is T, then the maximum velocity acquired by the car is:

(A) $\left(\frac{A^2+B^2}{AB}\right)$ **(B)** $\left(\frac{A^2-B^2}{AB}\right)T$ **(C)** $\left(\frac{A+B}{AB}\right)T$ **(D)** $\frac{ABT}{A+B}$

14. A reference frame attached to the earth:

(A) is an inertial frame by definition

(B) cannot be an inertial frame because the earth is revolving round the sun

(C) is an inertial frame because Newton's law are applicable in this frame

(D) is an inertial frame because the earth is rotating about its own axis

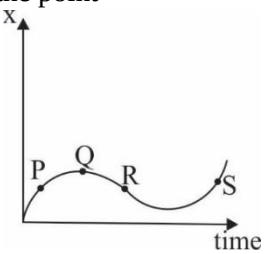
15. The time (t) is expressed as a function of distance (x) as, $t=\alpha x^2+\beta x$, where α and β are constants. Then the retardation is given by

(A) $2\alpha\beta v^2$ **(B)** $2\alpha v^3$ **(C)** $2\beta v^3$ **(D)** none of these

16. A stone is dropped into a well in which the level of water is H below the top of the well. If u is velocity of sound, the time t after which the splash is heard is given by

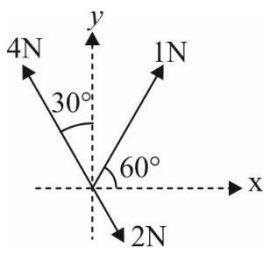
(A) $t=\frac{2H}{u}$ **(B)** $t=\sqrt{\frac{2H}{g}}+\frac{H}{u}$ **(C)** $t=\sqrt{\frac{2H}{u}}+\frac{H}{g}$ **(D)** None of these

17. The displacement (x) versus time (t) graph of a moving particle is shown below. The instantaneous velocity of the particle is negative at the point



(A) P **(B)** Q **(C)** R **(D)** S

18. Three forces acting on a body are shown in figure. To have the resultant force only along the y-direction, the magnitude of the minimum additional force needed is:



(A) $\frac{\sqrt{3}}{4}$ N **(B)** $\sqrt{3}$ N

(C) 0.5 N **(D)** 1.5 N

19. A cylinder of height h is placed on an inclined plane, the angle of inclination of which is slowly increased. It begins to topple when the angle of inclination is 45°. What is the radius of the cylinder?

(A) h **(B)** $\frac{3}{4}h$ **(C)** $\frac{1}{2}h$ **(D)** $\frac{1}{4}h$

20. A particle of mass 4 *m* at rest explodes into three fragments. Two of the fragments each of mass *m* each move with speed v at right angles to each other. The kinetic energy released in the process is:

(A) $2\,mv^2$ **(B)** $\frac{3}{2}mv^2$ **(C)** $\frac{1}{2}mv^2$ **(D)** $3\,mv^2$

SECTION – II [CHEMISTRY]

21. Ce (58) is a member of:

(A) *s*-block **(B)** *p*-block **(C)** *d*-block **(D)** *f*-block

22. Which of these is the best oxidizing agent?

(A) F_2 **(B)** O_2 **(C)** Cl_2 **(D)** O_3

23. Which of these is linear?

(A) ICl_3 **(B)** I_3^- **(C)** ICl_5 **(D)** SF_6

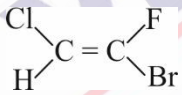
24. Which of the following shows geometrical isomerism?

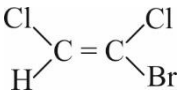
(A) 1–Butene **(B)** 2–Butene **(C)** Propene **(D)** 1–Pentene

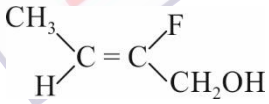
25. Which of the following elements are bridge elements?

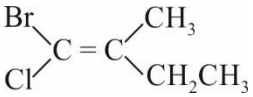
(A) Li **(B)** C **(C)** B **(D)** All of these

26. Which of these is has Z–configuration?

(A) 

(B) 

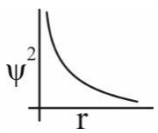
(C) 

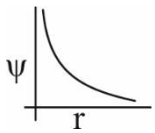
(D) 

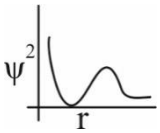
27. Electron affinity is numerically the greatest for:

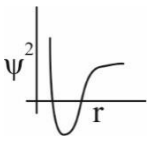
(A) O **(B)** Cl **(C)** F **(D)** Na

28. Which of these radial probability density plots is correct for 2s-orbital?

(A) 

(B) 

(C) 

(D) 

29. Out of the following which is correct?

(A) Molecular orbitals are more stable than atomic orbitals

(B) Molecular orbitals have different shape than atomic orbitals

(C) Electron cloud extends all around the nuclei of bonded atoms in the molecules

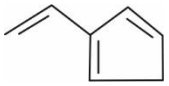
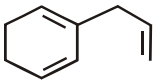
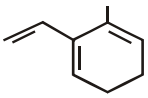
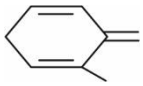
(D) All are correct

30. Ionic hydrides are formed by:

(A) transition metals **(B)** elements of very high electro-positivity

(C) elements of very low electro-positivity **(D)** metalloids

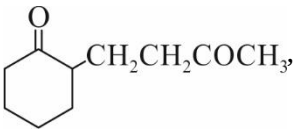
31. 2-ethenyl-3-methyl-cyclohexa-1,3-diene will be

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

32. Number of moles of $K_2Cr_2O_7$ reduced by one mole of Sn^{+2} will be:

(A) 1/3 **(B)** 3 **(C)** 1/2 **(D)** 6

33. The correct IUPAC name of



(A) 1–(2–cyclohexanone–enyl)–2–butanone **(B)** 1–(2–oxobutyl)–cyclohexanone
(C) 1–(2–cyclohex–2–one–1–enyl)butanone **(D)** 2–(3–oxobutyl)–cyclohexanone

34. One fermi is:

(A) $10^{-13}\,cm$ **(B)** $10^{-15}\,cm$ **(C)** $10^{-10}\,cm$ **(D)** $10^{-12}\,cm$

35. A picometre is written as:

(A) $10^{-9}\,m$ **(B)** $10^{-10}\,m$ **(C)** $10^{-11}\,m$ **(D)** $10^{-12}\,m$

36. One atmosphere is equal to:

(A) 101.325 K *pa* **(B)** 1013.25 *K pa* **(C)** $10^5\,Nm$ **(D)** None of these

37. The violet colour obtained with sodium nitroprusside in the test of sulphur in organic compounds is due to the formation of:

(A) $Na_3[Fe(CN)_6]$ **(B)** $Na_4[Fe(CN)_5NOS]$
(C) $Na_2[Fe(CN)_5S]$ **(D)** $Na_4[Fe(CN)_6]$

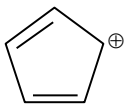
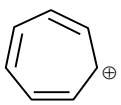
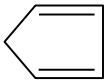
38. The maximum number of stereoisomers possible for 3-hydroxy-2-methyl butanoic acid is:

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

39. Which one of the following compounds is the most acidic?

(A) $HO-CH_2-COOH$ **(B)** O_2N-CH_2-COOH
(C) $Cl-CH_2-COOH$ **(D)** $NC-CH_2-COOH$

40. According to the Huckel's rule, which of the following species will be aromatic?

(I)  (II)  (III)  (IV) 

(A) (I) **(B)** (II) **(C)** (III) **(D)** (IV)

SECTION – III [BIOLOGY]

41. Which of the following represents characteristic feature but not defining property of living organisms?

(A) Cellular organization **(B)** metabolism
(C) reproduction **(D)** consciousness

42. Scientific name of any organism consist of _____ words:

(A) one **(B)** two **(C)** three **(D)** none

43. Houseflies are included in family

(A) Musca **(B)** Muscidae **(C)** Diptera **(D)** Insecta

44. Artificial system of classification is based on:

(A) anatomy and cytology **(B)** Visible morphological characters

(C) chemical composition **(D)** evolution

45. Glycocalyx capsule in bacteria:

(1) is required for virulence

(2) is absolutely essential for survival of bacteria

(3) hides bacteria from host immunity

Find the correct option regarding above statements

(A) Only Statement 1 is correct **(B)** Only statement 3 is incorrect

(C) Only statement 2 is incorrect **(D)** All statements are correct

46. Which statement correctly represents kingdom Protista?

(A) its boundaries are not well defined

(B) it includes both unicellular eukaryotes and prokaryotes

(C) all members of this kingdom are of animal in nature

(D) this kingdom does not include saprophytes

47. In which of the following group of plants have invisible sex organs?

(A) gymnosperms **(B)** angiosperms

(C) phanerogams **(D)** pteridophyte

48. Find the correct statement regarding Rhodophyta:

(A) reproductive stage is represented by motile spore

(B) main plant body is flagellated

(C) they are motile in there embryonic stage only

(D) motile or flagellated stage in the life cycle is absent

49. Bryophytes are also considered as amphibians of plant kingdom because:

(A) They are exclusively aquatic in nature

(B) They live in water during day and on land during night

(C) They need water for fertilization of gametes

(D) They live in water and becomes during reproductive period

50. Identify the first embryophytes:

(A) algae **(B)** fungi **(C)** gymnosperms **(D)** bryophytes

51. Which of the following represent first vascular cryptogamae?

(A) Pteridophytes **(B)** angiosperms **(C)** gymnosperms **(D)** bryophyte

52. Which of the following is a false fruit?

(A) pea **(B)** papaver **(C)** apple **(D)** mango

53. Which part of apple is edible?

(A) ovary **(B)** thalamus **(C)** ovule **(D)** testa

54. Banana is a kind of _____ fruit.

(A) parthenocarpic **(B)** pome **(C)** pepo **(D)** balausta

55. Tap root system in dicots develops from of embryo:
(A) plumule **(B)** radicle **(C)** epicotyl **(D)** hypocotyl

56. The number of species that are known and described range between _____. Fill in the blanks with the correct option from the following.
(A) 1.4 to 1.5 million **(B)** 1.6 to 1.7 million
(C) 1.7 to 1.8 million **(D)** 1.9 to 2 million

57. Growth in living organisms is from:
(A) outside **(B)** inside **(C)** both a and b **(D)** none of these

58. Growth cannot be taken as a defining property or feature of living organisms because:
(A) all living organisms do not show growth
(B) non-living things grow from inside
(C) non-living things also grow
(D) some living organisms do not show the process of reproduction

59. Which of the following group of organisms can be present in deep sea water?
(A) Eubacteria **(B)** Blue-green algae
(C) Saprophytic fungi **(D)** Red Algal

60. Read the following statements and identify the correct option regarding fungi.
(A) They are autotrophic **(B)** They lack a rigid cell wall
(C) They are heterotrophs **(D)** They lack a nuclear membrane

61. Which of the following organism show true Coelom?
(A) Platyhelminthes **(B)** Aschelminthes **(C)** Annelids **(D)** Coelenterates

62. Which of the following exhibit bilateral symmetry?
(A) Jelly fish, Comb jelly **(B)** Earthworm, Round worm
(C) Tape worm, star fish **(D)** sponge, sea anemone

63. Which of the following organisms have flame cells as excretory cells?
(A) Platyhelminthes **(B)** Annelids **(C)** Mollusca **(D)** Arthropoda

64. Which of the following animal is a vertebrate but lacks jaws?
(A) *Petromyzon* **(B)** Dog fish **(C)** Seals **(D)** Snakes

65. Which of the following is a correct difference between cartilaginous and bony fishes?
(A) Bony fish have placoid scales, but cartilaginous fish do not
(B) Bony fishes are marine but cartilaginous fish are not
(C) Bony fishes have separate sexes but cartilaginous fish do not
(D) Bony fishes gills are covered by operculum but gills of cartilaginous fish are exposed.

66. Which of the following is a property only of mammals?
(A) Presence of ear for hearing **(B)** Warm blooded
(C) Hair on body **(D)** Viviparity

67. Which of the following structure has ciliated epithelia?
(A) fallopian tube only **(B)** Bronchioles and fallopian tube
(C) fallopian tube and Bowman's capsule **(D)** Bowman's capsule only

68. Which of the following tissue stores fat?
(A) Adipose tissue **(B)** Epithelial tissue
(C) Dense regular connective tissue **(D)** Muscular tissue

69. Which of the following junctions prevent leakage from one cell to another?
(A) Gap Junction **(B)** Plasmodesmata **(C)** Tight Junction **(D)** Adhering Junction

70. Which of the following muscles are involuntary with cylindrical shape?
(A) Muscles of Jaws **(B)** Muscles of Heart **(C)** Muscles of Intestine **(D)** Muscles of Shoulder

71. Which of the following is not function of a neuron?
(A) Inhibiting another neuron **(B)** Stimulating another neuron
(C) Forming myelin sheath on another neuron **(D)** Both **(A)** and **(C)**

72. Which of the following structure joins bone to muscle?
(A) Ligament **(B)** Tendon
(C) Loose connective tissue **(D)** Both **(B)** and **(C)**

73. Which of the following phylum show alternation of generation?
(A) Mollusca **(B)** Echinodermata **(C)** Coelenterate **(D)** Platyhelminthes

74. Which of the following is also known as saw fish?
(A) *Octopus* **(B)** *Lepisma* **(C)** *Trygon* **(D)** *Pristis*

75. Which cell organelle is responsible for packaging of secretory proteins?
(A) Ribosome **(B)** Nucleus **(C)** Golgi body **(D)** Mitochondria

76. An enzyme is
(A) Biological catalyst **(B)** Mostly protein in nature
(C) Mostly heat labile **(D)** All of these

77. The small unit of eukaryotic ribosome is:
(A) 30 s **(B)** 40 s **(C)** 60 s **(D)** 80 s

78. Glucose is not:
(A) A monosaccharide **(B)** monomer of Glycogen
(C) sweet sugar **(D)** a pentose

79. According to Singer and Nicholson the structure of plasma membrane is:
(A) Fluid **(B)** solid
(C) Quasi fluid **(D)** Liquid of very low viscosity

80. Which of the following is a double walled structure in an animal cell?
(A) Mitochondria **(B)** Chloroplast **(C)** Ribosome **(D)** Both **(A)** and **(B)**

End of NAT Sample Paper | 1 Year Medical

1Year Medical Sample Paper | Answer Key

S.No	Code - A Answer	Code A Difficulty	Code-A Subject	Topics	Code-A Skill	Code-A +ve marks	Code-A -ve marks
1	C	Moderate	Physics	Units and measurement	Numerical	4	1
2	A	Moderate	Physics	Units and measurement	Application	4	1
3	D	Moderate	Physics	Laws of Motion	Numerical	4	1
4	A	Moderate	Physics	Laws of Motion	Application	4	1
5	A	Easy	Physics	Vectors	Memory	4	1
6	D	Moderate	Physics	Units and measurement	Numerical	4	1
7	A	Moderate	Physics	Motion in a straight line	Numerical	4	1
8	A	Moderate	Physics	Work, Energy and Power	Numerical	4	1
9	B	Difficult	Physics	Work, Energy and Power	Application	4	1
10	A	Easy	Physics	Vectors	Application	4	1
11	C	Difficult	Physics	Vectors	Application	4	1
12	D	Difficult	Physics	Motion in a straight line	Application	4	1
13	D	Moderate	Physics	Motion in a straight line	Application	4	1
14	B	Easy	Physics	Laws of Motion	Conceptual	4	1
15	B	Difficult	Physics	Motion in a straight line	Numerical	4	1
16	B	Moderate	Physics	Motion in a straight line	Numerical	4	1
17	C	Moderate	Physics	Motion in a straight line	Numerical	4	1
18	C	Moderate	Physics	Laws of Motion	Numerical	4	1
19	C	Moderate	Physics	Laws of Motion	Numerical	4	1
20	B	Moderate	Physics	Work, Energy and Power	Numerical	4	1
21	D	Easy	Chemistry	Periodic Properties	Memory	4	1
22	A	Easy	Chemistry	Redox reactions	Memory	4	1
23	B	Easy	Chemistry	Chemical Bonding	Application	4	1
24	B	Easy	Chemistry	GOC (Isomerism)	Application	4	1
25	D	Easy	Chemistry	Periodic Properties	Conceptual	4	1
26	C	Easy	Chemistry	GOC (Isomerism)	Application	4	1
27	B	Easy	Chemistry	Periodic Properties	Memory	4	1
28	C	Moderate	Chemistry	Structure of atom	Conceptual	4	1
29	D	Easy	Chemistry	Chemical Bonding	Memory	4	1
30	B	Moderate	Chemistry	Chemical Bonding	Calculation	4	1
31	C	Easy	Chemistry	GOC (Nomenclature)	Application	4	1
32	A	Easy	Chemistry	Redox reactions	Application	4	1
33	D	Easy	Chemistry	GOC (Nomenclature)	Application	4	1
34	A	Moderate	Chemistry	Some Basic Concept of Chemistry	Conceptual	4	1
35	D	Easy	Chemistry	Some Basic Concept of Chemistry	Memory	4	1
36	A	Easy	Chemistry	Some Basic Concept of Chemistry	Calculation	4	1
37	B	Easy	Chemistry	GOC (Purification)	Memory	4	1
38	D	Easy	Chemistry	GOC (Isomerism)	Application	4	1
39	B	Moderate	Chemistry	GOC	Memory	4	1
40	B	Easy	Chemistry	GOC	Memory	4	1
41	C	Easy	Biology	Living World	Memory	4	1
42	B	Easy	Biology	Living World	Conceptual	4	1
43	B	Easy	Biology	Living World	Memory	4	1
44	B	Moderate	Biology	Plant Kingdom	Memory	4	1
45	C	Difficulty	Biology	Biological Classification	Memory	4	1
46	A	Moderate	Biology	Biological Classification	Memory	4	1
47	D	Easy	Biology	Plant Kingdom	Memory	4	1
48	D	Moderate	Biology	Plant Kingdom	Memory	4	1
49	C	Easy	Biology	Plant Kingdom	Concptual	4	1
50	D	Easy	Biology	Plant Kingdom	Concptual	4	1

S.No	Code - A Answer	Code A Difficulty	Code-A Subject	Topics	Code-A Skill	Code-A +ve marks	Code-A -ve marks
51	A	Easy	Biology	Plant Kingdom	Memory	4	1
52	C	Easy	Biology	Morphology of Flowering Plants	Memory	4	1
53	B	Easy	Biology	Morphology of Flowering Plants	Memory	4	1
54	A	Easy	Biology	Morphology of Flowering Plants	Memory	4	1
55	B	Easy	Biology	Morphology of Flowering Plants	Concptual	4	1
56	C	Easy	Biology	Living World	Concptual	4	1
57	B	Easy	Biology	Living World	Concptual	4	1
58	C	Moderate	Biology	Living World	Concptual	4	1
59	D	Moderate	Biology	Biological Classification	Memory	4	1
60	C	Easy	Biology	Biological Classification	Memory	4	1
61	C	Easy	Biology	Animal Kingdom	Application	4	1
62	B	Easy	Biology	Animal Kingdom	Conceptual	4	1
63	A	Easy	Biology	Animal Kingdom	Memory	4	1
64	A	Easy	Biology	Animal Kingdom	Conceptual	4	1
65	D	Easy	Biology	Animal Kingdom	Memory	4	1
66	C	Moderate	Biology	Animal Kingdom	Conceptual	4	1
67	B	Easy	Biology	Structure Organism in Animal	Memory	4	1
68	A	Easy	Biology	Structure Organism in Animal	Memory	4	1
69	C	Easy	Biology	Structure Organism in Animal	Memory	4	1
70	B	Moderate	Biology	Structure Organism in Animal	Memory	4	1
71	C	Easy	Biology	Structure Organism in Animal	Conceptual	4	1
72	B	Easy	Biology	Structure Organism in Animal	Memory	4	1
73	C	Moderate	Biology	Animal Kingdom	Conceptual	4	1
74	D	Moderate	Biology	Animal Kingdom	Conceptual	4	1
75	C	Moderate	Biology	Cell – The unit of life	Application	4	1
76	D	Easy	Biology	Cell – The unit of life	Conceptual	4	1
77	B	Easy	Biology	Cell – The unit of life	Conceptual	4	1
78	D	Easy	Biology	Bio Molecule	Conceptual	4	1
79	C	Easy	Biology	Cell – The unit of life	Memory	4	1
80	A	Easy	Biology	Cell – The unit of life	Memory	4	1

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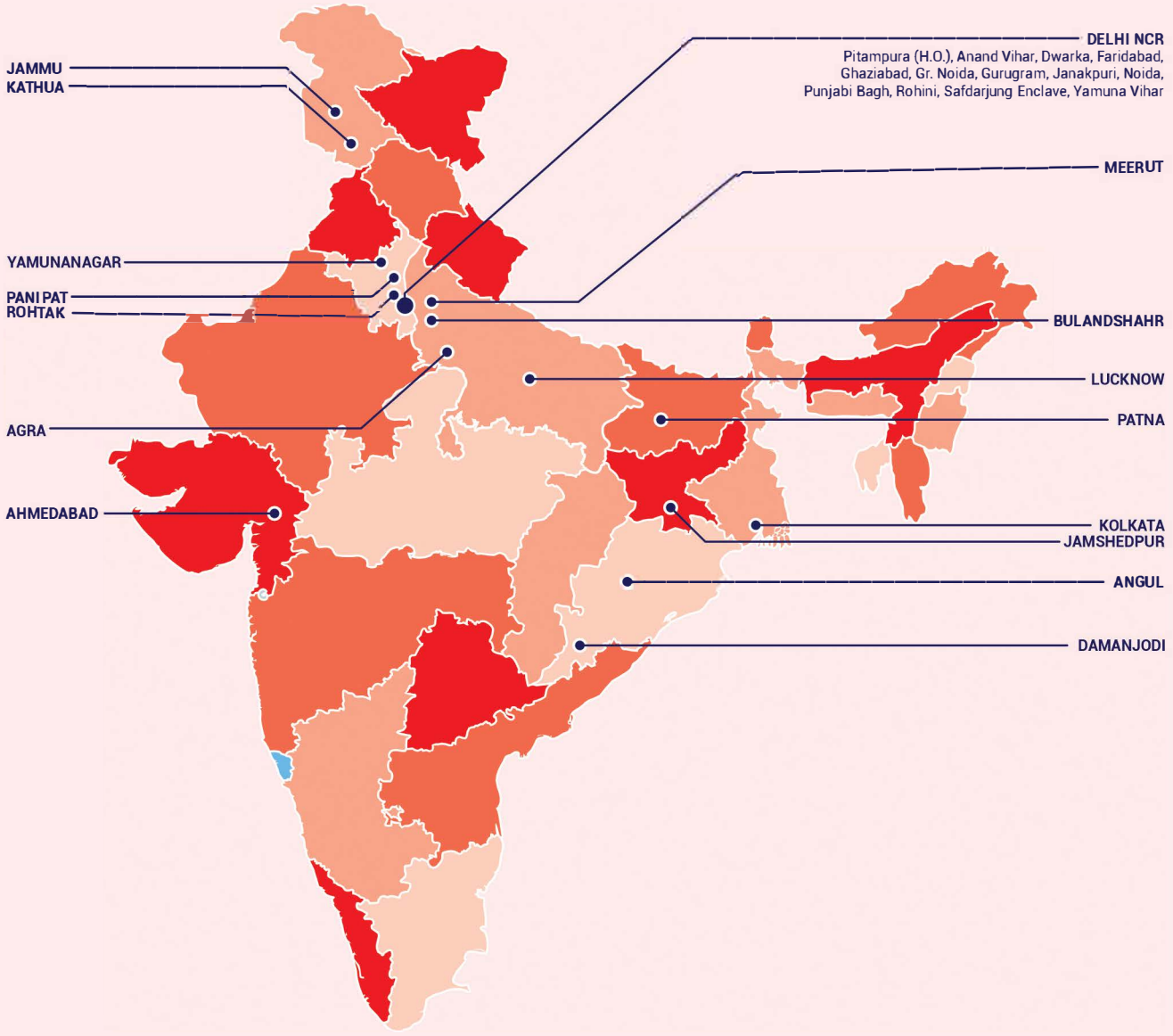

Head Office: Aggarwal Corporate Heights,
1st Floor, Netaji Subhash Place,
Opp. Wazirpur Depot, Pitampura, Delhi.
Ph.: (011) 45221191 - 93

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