

MENTORS EDUSERV

SCHOLASTIC APTITUDE TEST [ME-SAT]

SAMPLE TEST PAPER

[For Students going to Class 8 in 2021]

Time : 2 hours

Maximum Marks: 300

INSTRUCTIONS

DO NOT BREAK THE SEALS ON THIS BOOKLET, AWAIT INSTRUCTIONS FROM THE INVIGILATOR.

[A] General

1. This Question paper contains **FIVE** Parts, **A to E** (Physics, Chemistry, Mathematics, Biology & Mental Ability).
2. This Question Paper contains **15 pages** including cover page.
3. This question paper contains total **100 questions** (**20** questions each in Physics, Chemistry, Mathematics, Biology and Mental Ability).
4. The Question Paper has blank spaces at the bottom of each page for rough work. No additional sheets will be provided for rough work.
5. Blank papers, clip boards, log tables, slide rule, calculators, cellular phones, pagers and electronic gadgets, in any form, are **NOT** allowed.
6. The **OMR** (Optical Mark Recognition) sheet shall be provided separately.

[B] Answering on the OMR

7. In all the parts, each question will have **4 choices** out of which **only one choice is correct**.
8. Darken the bubble with **Ball Pen (Blue or Black) ONLY**.

[C] Filling OMR

9. On the **OMR sheet**, fill all the details properly and completely, otherwise your OMR will not be checked.
10. Do not write anything or tamper the barcode in the registration no. box.

[D] Marking Scheme:

11. For each question you will be awarded **3 marks** if you darken the bubble corresponding to the correct answer **ONLY** and **zero (0) marks** if no bubble is darkened. In all other cases, **minus one (-1) mark** will be awarded.

SEAL

Name :

Registration No.:

PART-A : PHYSICS

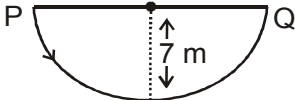
1. Which of the following statements is/are correct ?
 - (A) The level of expansion of mercury is used to measure the temperature of a substance using a thermometer.
 - (B) A clinical thermometer measures temperature more accurately than laboratory thermometer.
 - (C) The normal temperature of a human is the average body temperature of a large number of healthy persons.
 - (D) All of these.

2. By which mode of transmission of heat does air gets heated up ?
 - (A) Conduction (B) Convection (C) Radiation (D) Diffusion

3. The temperature at which no more energy can be removed from matter is called
 - (A) Absolute zero (B) Boiling point (C) 32°F (D) 32°C

4. A car driver accelerates the car to increase its speed from 30 km h⁻¹ to 60 km h⁻¹ in 5 min. Arrange the following steps in a sequence to obtain the acceleration of the car.
 - (a) Use the formula, rate of change of velocity = $\frac{\text{Total change in velocity}}{\text{Total time required for change}}$
 - (b) Obtain the final final velocity (v) of the car.
 - (c) Find the time taken to increase the speed of the car from u to v. Let it be 't'.
 - (d) Find the initial velocity (u) of the car.
 - (e) Substitute the values in the formula and calculate the acceleration of the car.
 - (A) eabcd (B) abcde (C) dbcae (D) edcba

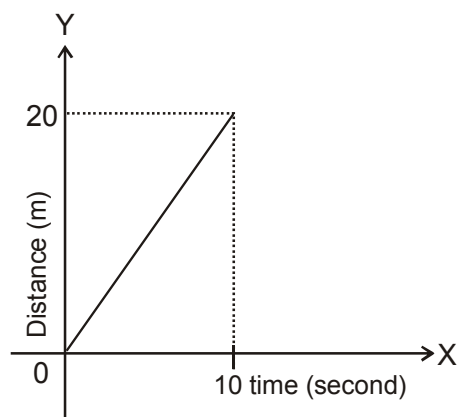
5. A car is moving along a semicircular track as shown in the figure in a duration of 2π second from P to Q, then choose the correct statement(s).



The diagram shows a semicircular track with a diameter PQ. A vertical dashed line from the center of the diameter to the lowest point of the arc is labeled 7 m.

 - (A) The distance covered by the car is 14 m.
 - (B) The average velocity of the car is 2.23 m s⁻¹.
 - (C) The average speed of the car is 3.5 m s⁻¹.
 - (D) Both (B) and (C)

6. Usha participated in a marathan walk and completes the journey in 10 hours. If she travels half the distance with a speed of 10 km/hr and remaining half distance with a speed of 15 km/hr. Then calculate the total distance of the marathan walk.
 (A) 16 km (B) 120 km (C) 90 km (D) 150 km
7. An electric fan rotates 100 times in 50 s. If the length of its wing from its axis of rotation is 0.5 m, then the speed of particle at the edge of the wing is
 (A) 2π m/s (B) 0.5π m/s (C) π m/s (D) 2 m/s
8. An object moves the first half of the total distance with a speed of 2 m s^{-1} . If the average speed of the body is 3 m s^{-1} , the speed of the body when it travelled the remaining distance is _____ m s^{-1} .
 (A) 3 (B) 6 (C) 4 (D) 2
9. The motion of a body is depicted graphically as shown in the given figure. Then the average speed of the body is



- (A) 2 m/s (B) zero (C) 5 m/s (D) 0.5 m/s
10. During the day time, mid day is hotter than early morning or late evening. It is
 (A) due to the sun's rays that fall normally on the surface of earth during mid day.
 (B) due to the sun's rays that fall obliquely during the early morning (or) late evening.
 (C) not concerned with how the light rays fall.
 (D) Both (A) and (B)
11. Choose the correct statements.
 (a) Boiling of a given substance takes place at all temperatures.
 (b) Evaporation of a substance takes place at a constant temperature.
 (c) Boiling takes place at every part of the liquid.
 (d) Evaporation takes place only on the surface of liquid.
 (A) Both (a) and (c) (B) (b), (c) and (d)
 (C) Both (c) and (d) (D) All the above

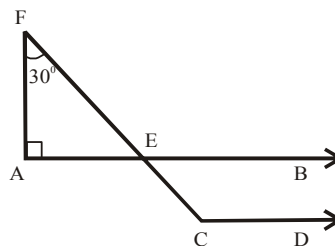
PART-B : CHEMISTRY

21. Which materials were used for clothes in ancient times ?
(A) Animal skins (B) Grass (C) Vines (D) All of these
22. Which among these member countries produce high quality wool ?
(A) International wool supply (B) International wool secretariat
(C) Indian wool status (D) None of these
23. Which of the following animals does not yield wool ?
(A) Camel (B) Yak (C) Dog (D) Goat
24. Wool can dissolve in -
(A) acid (B) base (C) Both a and b (D) None of these
25. Flax is a kind of
(A) animal skin (B) synthetic fibre (C) plant (D) None of these
26. Acidic soil which is not good for healthy growth of plants, is neutralized by
(A) ammonium hydroxide (NH_4OH) (B) calcium oxide (CaO)
(C) sodium hydroxide (NaOH) (D) magnesium hydroxide [$\text{Mg}(\text{OH})_2$]
27. The acid present in our stomach which helps in digestion of food -
(A) sulphuric acid (H_2SO_4) (B) nitric acid (HNO_3)
(C) hydrochloric acid (HCl) (D) phosphoric acid (H_3PO_4)
28. When turmeric stain on white clothes is washed with soap it turns red in colour because-
(A) soap solution is acidic (B) soap solution is neutral
(C) soap solution is basic (D) both a and b
29. Acids are in taste while bases are in taste.
(A) sweet, salty (B) sweet, sour
(C) sour, salty (D) sour, bitter
30. A base which dissolves in water is called -
(A) a soluble base (B) an alkali
(C) an acid (D) an oxide

31. Cotton is obtained from -
(A) larva of silkworm (B) hairs of sheep
(C) bolls of flowers (D) patsun
32. The wools of Arabian camels is used to make _____.
(A) Sweaters (B) Carpets
(C) Shawls (D) None of these
33. Which disease is most common among the workers of sericulture industry ?
(A) Cancer & Skin (B) Respiratory & Skin
(C) Cancer & T.B. (D) None of these
34. Silk thread woven by silkworm around its larva is made up of -
(A) carbohydrates (B) proteins
(C) fat (D) None of these
35. Jute is obtained from which part of patsun ?
(A) Leaves (B) Root
(C) Stem (D) Both leaves and stem
36. Lime water is -
(A) dilute solution of Ca(OH)_2 (B) Mg(OH)_2 solution
(C) NaOH solution (D) KOH solution
37. Which of the following is a base and not an alkali ?
(A) NaOH (B) KOH
(C) Fe(OH)_3 (D) None of these
38. Nature of aqueous solution of Ammonia is -
(A) acidic (B) basic (C) neutral (D) None
39. Neutralization reaction is an example of -
(A) Exothermic reaction (B) Endothermic reaction
(C) Oxidation (D) None of these
40. An indicator that turns reddish brown when dissolved in soap solution is -
(A) litmus (B) china rose
(C) turmeric powder (D) None of these

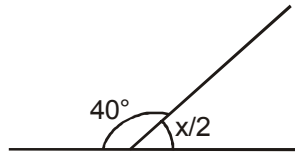
PART-C : MATHEMATICS

41. In a quiz, positive marks are given for correct answers and negative marks are given for incorrect answers. If Jack's scores in five successive rounds were 25, - 5, - 10, 15 and 10, what was his total at the end?
- (A) 30 (B) 35 (C) 40 (D) 45
42. Use the appropriate sign in the box
- $(-8) + (-4) \square (-8) - (-4)$
- (A) > (B) < (C) \leq (D) =
43. Evaluate $\frac{7}{10} + \frac{2}{5} + \frac{3}{2}$
- (A) $\frac{13}{5}$ (B) $\frac{14}{5}$ (C) $\frac{17}{5}$ (D) $\frac{16}{5}$
44. $\left(\frac{1}{64}\right)^0 + (64)^{-1/2} - (-32)^{4/5}$ is equal to
- (A) $-15\frac{7}{8}$ (B) $16\frac{1}{8}$ (C) $-14\frac{7}{8}$ (D) $17\frac{1}{8}$
45. Lipika reads a book for $1\frac{3}{4}$ hours every day. She reads the entire book in 6 days. How many hours in all were required by her to read the book?
- (A) $11\frac{1}{2}$ h (B) $10\frac{1}{2}$ h (C) $9\frac{1}{2}$ h (D) $8\frac{1}{2}$ h
46. In the figure given below $AB \parallel CD$ and $\angle F = 30^\circ$ then $\angle ECD$ is

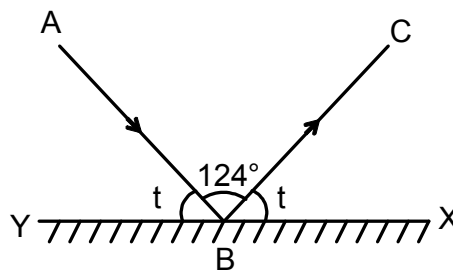


- (A) 130° (B) 120° (C) 150° (D) 60°

47. Find the mode of the data : 13, 16, 12, 14, 19, 12, 14, 13, 14
 (A) 14 (B) 15 (C) 16 (D) 17
48. If $A = B \times C + R$ where $A = x^3 + 9x^2 + 3x + 4$, $B = x^2 + 3x - 4$ and $C = x + 2$, then the value of 'R' is
 (A) $4x^2 - x + 12$ (B) $4x^2 + x + 12$ (C) $4x^2 - x - 12$ (D) $4x^2 + x - 12$
49. Find the mean of the first five whole numbers.
 (A) 1 (B) 2 (C) 3 (D) 4
50. If $4 + 5(P - 1) = 34$ then the value of 'P' is
 (A) 5 (B) 6 (C) 7 (D) 8
51. A number 351 is divided into two parts in the ratio 2 : 7 find the parts of number
 (A) 20, 294 (B) 78, 273 (C) 25, 295 (D) 31, 294
52. When $2^{x+4} \cdot 3^{x+1} = 288$ then the value of 'x' is
 (A) 1 (B) -1 (C) 0 (D) 2
53. Find 'x' in the given figure

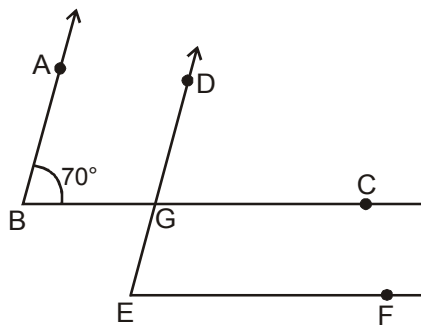


- (A) 140° (B) 280° (C) 300° (D) 360°
54. In the figure AB is an incident ray and BC the reflected ray, if $\angle ABC = 124^\circ$, $\angle CBX$ is equal to



- (A) 28° (B) 45° (C) 60° (D) 120°
55. How many line segments can be drawn by using three different points which are not in a straight line?
 (A) 2 (B) 3 (C) 4 (D) 5

56. In the given figure the arms of two angles are parallel. If $\angle ABC = 70^\circ$, then find $\angle DGC$

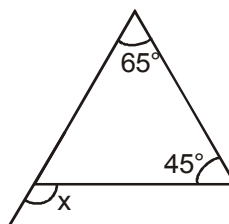


- (A) 60° (B) 70° (C) 80° (D) 90°

57. If $\frac{4 + 3\sqrt{3}}{\sqrt{7 + 4\sqrt{3}}} = a + \sqrt{b}$ then (a, b) equals

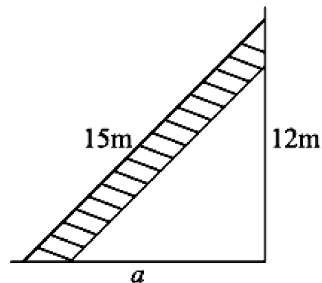
- (A) (12, -1) (B) (1, 12) (C) (-1, 12) (D) (-12, 1)

58. Find 'x' in the given figure



- (A) 110° (B) 100° (C) 120° (D) 130°

59. A 15 m long ladder reached a window 12 m high from the ground on placing it against a wall at a distance 'a' then the distance of the foot of the ladder from the wall is



- (A) 5 m (B) 6 m (C) 7 m (D) 9 m

60. If $x = 2\left(t + \frac{1}{t}\right)$, $y = 3\left(t - \frac{1}{t}\right)$, then $\frac{x^2}{4} - \frac{y^2}{9}$ is equal to

- (A) -4 (B) 3 (C) -3 (D) 4

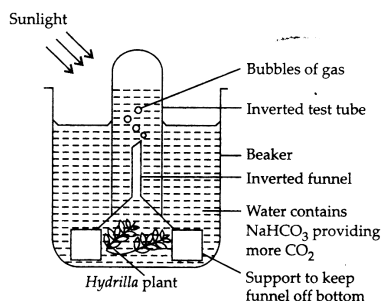
PART-D : BIOLOGY

61. Which of the following statements is true regarding insectivorous plants?
- (A) They are called as partial heterotrophs.
(B) They exhibit both autotrophic and heterotrophic modes of nutrition.
(C) They trap and digest insects to obtain N_2 - nutrition.
(D) All of these
62. The maximum temperature of the day generally occurs in the _____ while the minimum temperature occurs generally in the ..
- (A) Afternoon, early morning (B) Afternoon, night
(C) Early morning, afternoon (D) Night, early morning
63. Lichen is an association between
- (A) An alga and a fungus (B) An alga and a tree
(C) A fungus and a tree (D) Bacteria and legume plant.
64. Which secretion does not contain digestive enzymes?
- (A) Bile (B) Gastric juice (C) Intestinal juice (D) Pancreatic juice
65. Nitrogen (N_2) present in the atmosphere is directly absorbed by
- (A) Autotrophs (B) Leguminous plants
(C) Insectivorous plants (D) None of these
66. Match the animals in Column-I with the type of climate they are adapted to in Column-II and select the correct option.
- | Column-I | Column-II |
|----------------------------------|----------------------------------|
| A. Polar bear, arctic fox | (i) Hot and humid climate |
| B. Camel, kangaroo rat | (ii) Extremely cold climate |
| C. Indian elephants | (iii) Hot and dry climate |
| (A) A - (i), B - (iii), C - (ii) | (B) A - (iii), B - (ii), C - (i) |
| (C) A - (ii), B - (iii), C - (i) | (D) A - (ii), B - (i), C - (iii) |
67. Leaves of a plant can be destarched by
- (A) Putting them in boiled alcohol
(B) Boiling them in water
(C) Placing the plant in a dark place for 2-3 days
(D) Exposing the plant to sunlight for 5-6 hours.

68. In *Nepenthes* (pitcher plant) _____ is modified to form pitcher.
- (A) Root (B) Stem (C) Leaf (D) Flower
69. In humans, the process of digestion begins in the (i) where food is broken into small pieces by the teeth. The (ii) in the mouth secrete saliva which contains an enzyme called (iii). This enzyme changes (iv) to sugars.

Read the above paragraph and select the correct option for (I), (II), (III) and (IV).

- | (I) | (II) | (III) | (IV) |
|--------------------|-----------------|------------------|----------|
| (A) Mouth | Tongue | Salivary amylase | Starch |
| (B) Buccal cavity | Salivary glands | Salivary amylase | Starch |
| (C) Mouth | Salivary glands | Pepsin | Proteins |
| (D) Stomach glands | Gastric | Pepsin | Proteins |
70. Study the given experimental set-up carefully.



The bubbles produced in the water within test tube are mainly of which gas?

- (A) Hydrogen (B) Oxygen (C) Nitrogen (D) Ammonia
71. The given table illustrates the food components and their digested products.

Food components	Digested products
<u>P</u>	Amino acids
Carbohydrates	<u>Q</u>

- (A) P → Fats; Q → glycerol (B) P → Proteins; Q → glucose
- (C) P → Fats; Q → glucose (D) P → Proteins; Q → glycerol
72. Camouflaging is the phenomenon of
- (A) Having bright colours
- (B) Having dull skin colour
- (C) Having skin colour that merges with the surroundings
- (D) Having skin colour that frightens the enemy.

73. Which of the following statements is not true?
(A) Mode of taking food into the body varies in different organisms.
(B) Bees and humming birds suck the nectar of flowers.
(C) Hydra catches food with the help of its tentacles.
(D) Lice and mosquitoes chew their food by grinding with teeth.
74. The dental formula for adult human beings is
(A) 2123/2123 (B) 3142/3143 (C) 2120/2120 (D) 3131/3121
75. Which of the following structures closes the wind pipe to prevent the entry of food into it during eating?
(A) Pharynx (B) Food pipe (C) Epiglottis (D) Tongue
76. Which of these processes is not a part of nutrition?
(A) Digestion (B) Absorption (C) Egestion (D) Locomotion
77. Which of the following countries belong to polar regions?
(A) Canada, Greenland, Iceland
(B) Norway, Sweden, Finland
(C) Alaska in USA, Siberian region of Russia
(D) All of these
78. The earth gets heated by the rays of the sun falling on it. Near the equator, the rays fall P. As the latitude increases, the rays become more and more Q.
Select the correct option for P and Q.
(A) P = Vertically, Q = Slanting (B) P = Slanting, Q = Vertically
(C) P = Slanting, Q = Slanting (D) P = Vertically, Q = Vertically
79. Select the correct statement(s) out of the following.
(A) The timing of migration in birds is primarily controlled by the changes in day length.
(B) Arctic tern is the bird which records for the longest migratory route.
(C) Siberian cranes migrate from Russia to India as the winters approach.
(D) All of these
80. The animals which remain inactive during the day and become active at night are called as animals.
(A) Diurnal (B) Nocturnal (C) Tropical (D) Polar

PART-E : MENTAL ABILITY

DIRECTION : In the following question, there is a certain relationship between two given words on one side of (::) and one word is given on another side of (::) while another word is to be found from the given alternatives having the same relation with this word as the words of the given pair bear. Choose the correct alternative.

81. Swimming : River :: Trekking : ?
(A) Road (B) Pond (C) Mountain (D) Sea
82. Heart is related to cardiology then soil is related to ?
(A) Pathology (B) Mycology (C) Padology (D) Phycology
83. 72 : 18 :: 56 : _____ ?
(A) 22 (B) 24 (C) 20 (D) 13
84. Find the letter that comes 7th to the left of Q in the English alphabet.
(A) J (B) N (C) V (D) T
85. If in a certain code language 'nik ka pa' means 'who are you', 'ka na to da' means 'you may come here', 'ho ta sa' means 'come and go'. What does 'nik' means in that language ?
(A) who (B) are (C) who or are (D) None of these

DIRECTION : In the following series, replace the question mark (?) with the suitable option.

86. 2, 6, 21, 88, _____ ?
(A) 442 (B) 455 (C) 475 (D) 445
87. 19, 16, 17, 14, 15, _____, _____ ?
(A) 12, 13 (B) 14, 11 (C) 11, 13 (D) 12, 15
88. 0, 2, 6, 12, 20, _____ ?
(A) 24 (B) 28 (C) 30 (D) 22
89. 2, 9, 28, 65, 217, _____ ?
(A) 436 (B) 2195 (C) 9 (D) 344

DIRECTION : What comes in place of question mark(s) in the following letter series ?

90. XWA, VTC, SPF, OKJ, ?
(A) JDN (B) JEO (C) LPN (D) JDP
91. AQR, BSU, CUX, _____ ?
(A) DWA (B) MQR (C) NRQ (D) LST

DIRECTION : In the following letter series, some of the letters are missing which are given in that order as one of the alternatives below it. Select the correct alternative.

92. abc ___ ab ___ a ___ bbcaab ___ c

- (A) acab (B) abca (C) aaaa (D) bbbb

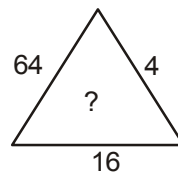
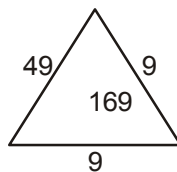
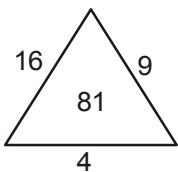
DIRECTION : In each of the following questions, a set of figures carrying certain characters is given. Assuming that the characters in each set follow a similar pattern, find the missing character in each case.

93.

1	1	2	61
3	4	1	46
2	3	6	?

- (A) 96 (B) 125 (C) 117 (D) 121

94.



- (A) 196 (B) 176 (C) 148 (D) 132

95. Alakh correctly remembers that his mother's birthday is before 29th April but after 25th April, whereas his sister correctly remembers that their mother's birthday is not on or after 28th April. On which day in April is definitely their's mother's birthday ?

- (A) 26th (B) 27th (C) 26th or 27th (D) Cannot be determined

96. If '+' means 'minus', '-' means 'multiply', '÷' means 'plus' and '×' means 'divide', then

$$36 \times 4 - 3 + 12 \div 6 = ?$$

- (A) 21 (B) $\frac{53}{3}$ (C) 5 (D) 36

97. If '÷' means addition and '×' means subtraction, then $(17 \times 8) \div (13 \times 2) \times (6 \div 6)$ is equal to

- (A) 96 (B) 8 (C) $\frac{3}{128}$ (D) $\frac{143}{8}$

DIRECTION : Each of the questions (98-99) given below contains some items. These items may or may not have some relation one another. Each group of the items may fit into one of the diagrams (a), (b), (c), (d). You have to indicate that the group of items in each of these questions correctly fits into which of the diagram.

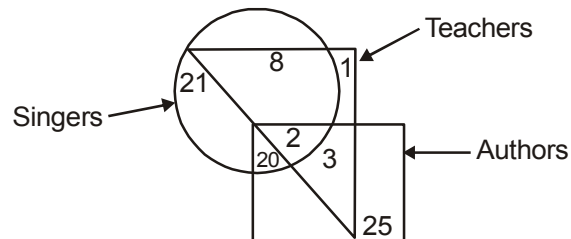
98. Which of the following diagrams represents Crane and Bird ?



99. Which of the following diagrams best represents a relationship among Kitchen, House and Garden ?

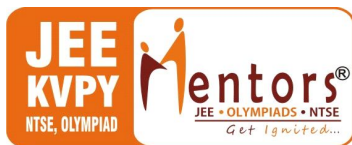


100. Study the following diagram and answer the question given below :



How many teachers are neither authros nor singers ?

- (A) 1 (B) 8 (C) 2 (D) 3



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SAMPLE TEST PAPER

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PHYSICS

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|---------|---------|---------|---------|---------|
| 1. (D) | 2. (B) | 3. (A) | 4. (C) | 5. (D) |
| 6. (B) | 7. (A) | 8. (B) | 9. (A) | 10. (D) |
| 11. (C) | 12. (A) | 13. (D) | 14. (C) | 15. (D) |
| 16. (C) | 17. (A) | 18. (C) | 19. (B) | 20. (A) |

CHEMISTRY

- | | | | | |
|---------|---------|---------|---------|---------|
| 21. (D) | 22. (B) | 23. (C) | 24. (B) | 25. (C) |
| 26. (B) | 27. (C) | 28. (C) | 29. (D) | 30. (B) |
| 31. (C) | 32. (B) | 33. (B) | 34. (B) | 35. (C) |
| 36. (A) | 37. (C) | 38. (B) | 39. (A) | 40. (C) |

MATHEMATICS

- | | | | | |
|---------|---------|---------|---------|---------|
| 41. (B) | 42. (B) | 43. (A) | 44. (C) | 45. (B) |
| 46. (B) | 47. (A) | 48. (B) | 49. (B) | 50. (C) |
| 51. (B) | 52. (A) | 53. (B) | 54. (A) | 55. (B) |
| 56. (B) | 57. (C) | 58. (A) | 59. (D) | 60. (D) |

BIOLOGY

- | | | | | |
|---------|---------|---------|---------|---------|
| 61. (D) | 62. (A) | 63. (A) | 64. (A) | 65. (D) |
| 66. (C) | 67. (C) | 68. (C) | 69. (B) | 70. (B) |
| 71. (B) | 72. (C) | 73. (D) | 74. (A) | 75. (C) |
| 76. (D) | 77. (D) | 78. (A) | 79. (D) | 80. (B) |

MENTAL ABILITY

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|---------|---------|---------|---------|----------|
| 81. (C) | 82. (C) | 83. (A) | 84. (A) | 85. (C) |
| 86. (D) | 87. (A) | 88. (C) | 89. (D) | 90. (B) |
| 91. (A) | 92. (A) | 93. (D) | 94. (A) | 95. (C) |
| 96. (A) | 97. (B) | 98. (B) | 99. (B) | 100. (A) |