

MENTORS EDUSERV TALENT REWARD EXAM (METRE) SAMPLE TEST PAPER

[For Students presently in Class 8 going to Class 9 in 2021]

Time : 2 hours

Maximum Marks: 300

INSTRUCTIONS

[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.

Name :

Registration No.:

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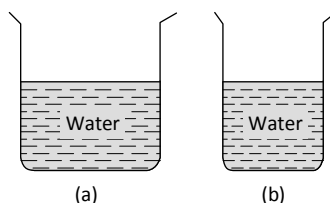
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SEAL

PART-A : PHYSICS

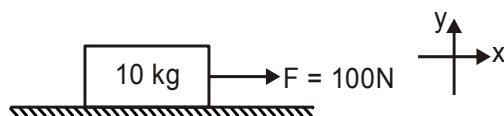
1. The vehicles generally slip on the road, when it rains, because
 - (A) friction between tyres and road is large
 - (B) friction between tyres and road is not sufficient
 - (C) inertia between tyres and road is large
 - (D) inertia between tyres and road is very less
2. A block of 10 kg is pulled by a constant speed on a rough horizontal surface by a force of 19.6 N. The coefficient of friction is
 - (A) 0.1
 - (B) 0.2
 - (C) 0.3
 - (D) 0.4
3. When a speeding car takes a sharp turn, the persons sitting in it experience outward pull. This happens due to
 - (A) inertia of direction
 - (B) change in momentum
 - (C) change in acceleration
 - (D) none of the above
4. Two balls having masses m_1 and m_2 are dropped from heights h_1 and h_2 respectively in the earth's gravitational field. The ratio of their acceleration is ($h_1, h_2 \ll R$)
 - (A) $m_1 : m_2$
 - (B) $h_1 : h_2$
 - (C) 1 : 1
 - (D) None of these
5. The pressure exerted by the weight of a cubical block of side 4 cm on the surface is 10 pascal. Calculate the weight of the block.
 - (A) 1.6×10^2 N.
 - (B) 1.6×10^{-3} N.
 - (C) 1.6×10^{-2} N.
 - (D) None of these
6. A person sitting in an open car moving at constant velocity throws a ball vertically up into air. The ball falls
 - (A) Outside the car
 - (B) In the car ahead of the person
 - (C) In the car to the side of the person
 - (D) Exactly in the hand which threw it up
7. An object will continue moving uniformly until
 - (A) The resultant force acting on it begins to decrease
 - (B) The resultant force on it is zero
 - (C) The resultant force is at right angle to its rotation
 - (D) The resultant force on it is increased continuously
8. A ball of mass 0.2 kg moves with a velocity of 20 m/sec and it stops in 0.1 sec, then the force on the ball is
 - (A) 40 N
 - (B) 20 N
 - (C) 4 N
 - (D) 2 N

9. The limiting friction is
(A) Always greater than the dynamic friction
(B) Always less than the dynamic friction
(C) Equal to the dynamic friction
(D) Sometimes greater and sometimes less than the dynamic friction
10. Which one of the following is not used to reduce friction ?
(A) Oil (B) Ball bearings (C) Sand (D) Graphite
11. From the adjacent figure, the correct observation is



- (A) The pressure on the bottom of tank (a) is greater than at the bottom of (b).
(B) The pressure on the bottom of the tank (a) is smaller than at the bottom of (b).
(C) The pressure depend on the shape of the container.
(D) The pressure on the bottom of (a) and (b) is the same.
12. Pressure at a point inside a liquid does not depend on
(A) the depth of the point below the surface of the liquid
(B) the nature of the liquid
(C) the acceleration due to gravity at that point
(D) the shape of the containing vessel
13. A spring balance is graduated on sea level. If a body is weighted at consecutively increased height from earth's surface, the weight indicated by the balance
(A) will go on increasing continuously
(B) will go on decreasing continuously
(C) will remain same
(D) will first increase and then decrease
14. A force acts on a body of mass 3 kg such that its velocity changes from 4 ms^{-1} to 10 ms^{-1} . The change in momentum of the body is
(A) 42 kg ms^{-1} (B) 2 kg ms^{-1} (C) 18 kg ms^{-1} (D) 14 kg ms^{-1}

15. Find acceleration of the body along x-axis if friction coefficient of the surface is $\mu = 0.1$



- (A) 1 m/s^2 (B) 9 m/s^2 (C) 0 m/s^2 (D) 10 m/s^2
16. A block of mass 3 kg which is at rest on a surface is pulled horizontally by a force. If the displacement of the block is 15 m in the first 3 s and the surface offers a resistance of 2 N, find the sequence of steps to calculate the magnitude of applied force.
- (a) Note down the values of s, u, t and frictional force.
 (b) The applied force on the block is the sum of frictional force and net force.
 (c) Substitute the values of s, u and t in the equation of motion and solve for 'a'
 (d) Using Newton's second law of motion, calculate the net force acting on the block.
- (A) a, d, b, c (B) a, c, b, d (C) a, c, d, b (D) a, b, d, c
17. **Assertion :** If the net external force on the body is zero, then its acceleration is zero.
Reason : Acceleration does not depend on force.
- (A) Both assertion and reason are CORRECT and reason is CORRECT explanation of the assertion.
 (B) Both assertion and reason are CORRECT but reason is NOT THE CORRECT explanation of the assertion.
 (C) Assertion is CORRECT but reason is INCORRECT.
 (D) Assertion is INCORRECT but reason is CORRECT.
18. An air bubble rises up in water because,
- (A) there is no gravity in water.
 (B) pressure inside the bubble is less than the pressure outside it.
 (C) the upthrust acting on the bubble is more than the weight of the bubble.
 (D) air cannot dissolve in water.
19. While opening a tap with two fingers, the forces applied are
- (A) equal in magnitude
 (B) parallel to each other
 (C) opposite in direction
 (D) All the above
20. A ship of mass $3 \times 10^7 \text{ kg}$ initially at rest is pulled by a force of $5 \times 10^4 \text{ N}$ through a distance of 3 m. Assuming resistance due to water is negligible. Then the speed of the ship is
- (A) 0.1 ms^{-1} (B) 0.2 ms^{-1} (C) 0.3 ms^{-1} (D) 0.4 ms^{-1}

PART-B : CHEMISTRY

21. Metals combine with oxygen to form _____ oxides.
(A) acidic (B) basic (C) amphoteric (D) none
22. Metals react with water to form oxides or hydroxides and _____.
(A) hydrogen (B) oxygen (C) carbon dioxide (D) carbon monoxide
23. Eating away of metals by water, oxygen and other chemicals is called :
(A) carbonisation (B) amalgamation (C) oxidation (D) corrosion
24. Rusting of iron requires the presence of :
(A) air and water (B) CO_2 and water (C) O_2 and H_2 (D) O_2 and N_2
25. Metal which does not react even with steam :
(A) potassium (B) iron (C) magnesium (D) silver
26. This is used for making parachutes and stockings :
(A) cotton (B) nylon (C) wool (D) bakelite
27. Which out of the following is used for making disposable cups ?
(A) LDPE (B) PS (C) PP (D) PVC
28. Which of the following is used in automobile battery casings ?
(A) HDPE (B) PP (C) PVC (D) Polyester
29. This is the synthetic fibre :
(A) wool (B) cotton (C) acrylic (D) polystyrene
30. Which of the following is a natural fabric ?
(A) Polythene (B) PVC (C) Nylon (D) Wool
31. Burning of plastic causes :
(A) water pollution (B) air pollution (C) sound pollution (D) all A, B, C
32. This is known as artificial silk :
(A) nylon (B) polythene (C) rayon (D) plastic

33. Raw materials for most of the natural fabrics are obtained from :
(A) water (B) earth
(C) petroleum (D) sky
34. Which of the following is a property of nonmetals ?
(A) Low densities (B) Low melting points
(C) Poor conductor of electricity (D) All the three
35. Mercury is used in thermometers because :
(A) it does not wet the glass (B) it expands on heating
(C) it is a liquid (D) all of these
36. The nonmetals used to treat rubber in the process of vulcanisation is :
(A) sulphur (B) phosphorus (C) carbon (D) chloride
37. Brass is an alloy of :
(A) Cu, Sn (B) Cu, Zn (C) Cu, Al (D) Sn, Pb
38. Which of the following is not a property of aluminium ?
(A) Good conductor of heat and electricity
(B) It is malleable
(C) It is heavy
(D) It is ductile
39. The metal which is soft ?
(A) Na (B) Pb (C) Al (D) Cu
40. Metals which is the best conductor of electricity :
(A) nickel (B) silver (C) gold (D) sodium

PART-C : MATHEMATICS

41. The expression $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \dots + \frac{1}{n(n+1)}$ for any natural number 'n' is
- (A) Always greater than 1 (B) Always less than 1
(C) Always equal to 1 (D) Can't say
42. If a and b are twin primes and $a^2 - b^2 = 120$, then their average is
- (A) 18 (B) 30 (C) 12 (D) 6
43. The roots of $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$ are
- (A) (5, 4) (B) (5, -4) (C) (1, 2) (D) (-1, 2)
44. The value of the expression $\frac{1}{1+x^{a-b}+x^{a-c}} + \frac{1}{1+x^{b-c}+x^{b-a}} + \frac{1}{1+x^{c-a}+x^{c-b}}$ is equal to
- (A) 0 (B) x^{a+b+c} (C) $\frac{1}{x^{a+b+c}}$ (D) 1
45. If $p = \sqrt[r]{\frac{9^{\left(r+\frac{1}{4}\right)} \times \sqrt{3 \times 3^{-r}}}{3 \times \sqrt{3^{-r}}}}$ then $\sqrt{p-1}$ is equal to
- (A) 2 (B) 3^2 (C) $2^{3/2}$ (D) $3^{1/r}$
46. $\frac{(x^{a+b})^2 (x^{b+c})^2 (x^{c+a})^2}{(x^a \times x^b \times x^c)^4}$ is equal to
- (A) -1 (B) 0 (C) 1 (D) 2
47. A boat goes 16 km upstream and 24 km downstream in 6 hours. Also it covers 12 km up stream and 36 km downstream in the same time. Find the speed of the boat in still water ?
- (A) 8 km/h (B) 4 km/h (C) $2\frac{1}{2}$ km/h (D) 12 km/h

48. The value of $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2\frac{1}{4}}}}$ is

- (A) $\frac{40}{31}$ (B) $\frac{4}{9}$ (C) $\frac{1}{8}$ (D) $\frac{31}{40}$

49. If $x = 7 + 4\sqrt{3}$, then the value of $\sqrt{x} + \frac{1}{\sqrt{x}}$ is

- (A) 8 (B) 6 (C) 5 (D) 4

50. The denominator of a fraction is greater than numerator by 6. If 3 is added to numerator and 2 is subtracted from denominator, the fraction becomes $\frac{6}{7}$, then the equation so formed is

- (A) $\frac{x+4}{x+3} = \frac{6}{7}$ (B) $\frac{x+3}{x+4} = \frac{6}{7}$ (C) $\frac{x}{x+6} + \frac{3}{-2} = \frac{6}{7}$ (D) $\frac{x}{x+6} + \frac{-2}{3} = \frac{6}{7}$

51. The value of $\sqrt{1\frac{1}{2} - [1\frac{1}{2} - 1\frac{1}{2} + (1\frac{1}{2} - 1\frac{1}{2} - 1\frac{1}{4})]}$ is

- (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{16}$ (D) $1\frac{1}{5}$

52. If $\frac{9^n \times 3^2 \times (3^{\frac{n}{2}})^{-2}}{3^{3m} \times 2^3} = \frac{1}{27}$ then $m - n$ is

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

53. A number lying between 10 and 100 is seven times the sum of its digits. If 9 is subtracted from it, the digits of the number are reversed. Then the number is

- (A) 63 (B) 54 (C) 21 (D) 42

54. What is the least number by which 8640 is divided, the quotient as a complete cube number?
(A) 6 (B) 7 (C) 5 (D) 8
55. If $\frac{x}{y} + \frac{y}{x} = -1$ ($x, y \neq 0$), the value of $x^3 - y^3$ is
(A) 1 (B) -1 (C) 0 (D) $\frac{1}{2}$
56. The sum of the present ages of a father and his son is 99 years. When the father was as old as his son is now, his age was four times age of the son at that time. The ratio of the present ages of the son and the father is
(A) 3 : 7 (B) 3 : 8 (C) 4 : 9 (D) 4 : 7
57. The simplified value of $\sqrt{\frac{(\sqrt{12} - \sqrt{8})(\sqrt{3} + \sqrt{2})}{5 + \sqrt{24}}}$ is
(A) $\sqrt{6} - 2$ (B) $2 - \sqrt{6}$ (C) 0 (D) 1
58. Four bells ring at intervals of 6, 7, 8 and 9 seconds respectively then all the bells ring together after
(A) 504 sec. (B) 516 sec. (C) 508 sec. (D) 512 sec.
59. The smallest number which when divided by 4, 6, 10, 15 leaves the same remainder 3 is
(A) 57 (B) 123 (C) 63 (D) 39
60. A farmer divides his herd of x cows among his 4 sons so, that first son gets one-half of the herd, the second son gets one-fourth, the third son gets one-fifth, and the fourth son gets 7 cows, then the value of ' x ' is
(A) 100 (B) 140 (C) 160 (D) 180

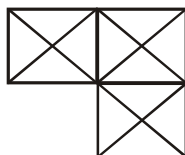
PART-D : BIOLOGY

61. Which among the following are kharif crops?
(A) Maize (B) Paddy (C) Cotton (D) All of the above
62. Carrier of dengue virus is
(A) House fly (B) Dragon fly
(C) Female aedes mosquito (D) Butterfly
63. Linseed is grown during the months of _____
(A) March to June (B) October to March
(C) June to September (D) March to March
64. Nitrates are converted into nitrogen by
(A) Denitrifying bacteria (B) Nitrifying bacteria
(C) Ammonifying bacteria (D) Nitrogen fixing bacteria
65. The organic substance obtained from dead plants and animal wastes is
(A) Manure (B) Fertilizer (C) Irrigation (D) Agriculture
66. In which of the following methods of irrigation rotating nozzles are used?
(A) Moat (B) Drip system (C) Chain Pump (D) Sprinkler system
67. Pathogens were discovered by
(A) Edward Jenner (B) William Harvey (C) Pasteur (D) Robert Koch
68. The following is an antibiotic
(A) Sodium bicarbonate (B) Streptomycin
(C) Alcohol (D) Yeast
69. The management and care of farm animals by humans for profit is known as
(A) Granary (B) Animal Husbandry
(C) Poultry farm (D) Warehouse
70. Vaccination was invented by
(A) Pasteur (B) Edward Jenner
(C) Robert Koch (D) Robert Hooke

71. Raising of fish in inland waters and coastal waters are called
(A) Pisciculture (B) Fishery
(C) fish culture (D) harvesting
72. Pasteurization means -
(A) Vaccination for a baby against smallpox.
(B) Sterilization in steam cooker at 100° C.
(C) Heating milk or other liquids to 60°C to 70°C for short duration.
(D) A technique of curing people bitten by mad dogs.
73. Combines are used for:
(A) sowing of seeds (B) harvesting the crops
(C) threshing (D) harvesting and threshing both.
74. The bacterial genome is called
(A) Nucleus (B) Nucleolus (C) Nucleoid (D) None
75. What is the use of phosphides ?
(A) Rodenticide (B) Insecticide (C) Fungicide (D) Weedicide
76. Which of the following tools would farmer use to remove weeds from the field
(A) Hoe (B) Plough (C) Axe (D) Cultivator
77. Operation flood is otherwise called
(A) Green revolution. (B) White revolution
(C) Black revolution. (D) Yellow revolution
78. Malaria is caused by
(A) Protozoa (B) Virus (C) Algae (D) Bacteria
79. The most common carrier of communicable diseases.
(A) Ant (B) Housefly (C) Dragonfly (D) Spider
80. Plant disease citrus canker is caused by
(A) Virus (B) Fungi (C) Bacteria (D) None of these

PART-E : MENTAL ABILITY

81. How many triangles and squares are there in the following figure ?



(A) 29 triangles, 5 squares

(B) 24 triangles, 4 squares

(C) 28 triangles, 4 squares

(D) 24 triangles, 5 squares

DIRECTIONS : How many triangles are there in the following figures ?

82.



(A) 21

(B) 10

(C) 6

(D) 12

DIRECTIONS : Each of the following questions has a matrix with a question mark in one block. Replace the question mark by choosing the correct response from amongst the alternatives given.

83. Find out the missing number in the following :

3	5	4	21
6	2	3	11
7	4	2	?

(A) 29

(B) 31

(C) 30

(D) 21

DIRECTIONS : The numbers in following questions have been arranged according to an identical pattern. Find out the missing numbers.

84.

7	5	6
4	9	8
31	48	?

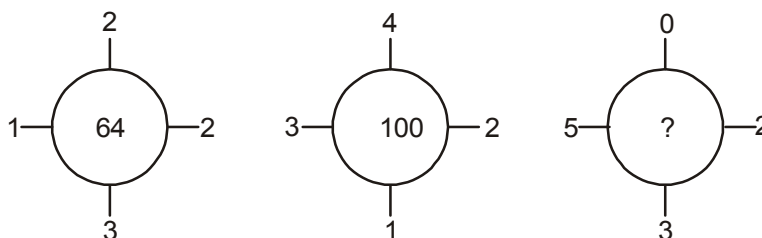
(A) 51

(B) 46

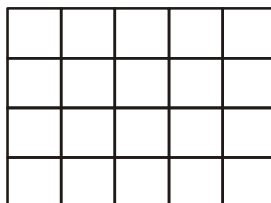
(C) 49

(D) 54

85. Find the missing number.



- (A) 76 (B) 100 (C) 124 (D) 96
86. How many squares are there in the following figure ?



- (A) 44 (B) 40 (C) 46 (D) 38
- DIRECTIONS:** In each of the questions given below, two signs in the equations given have been interchanged. Find out these two signs to make the equation correct.
87. $51 \div 3 + 17 \times 2 - 12 = 10$
 (A) + and $\times$ (B) + and $\div$ (C) $\times$ and $\div$ (D) – and $\times$
88. If '+' means ' $\times$ ', '-' means '+', ' $\times$ ' means ' $\div$ ', and ' $\div$ ' means '-', then
 $20 - 8 \times 4 \div 3 + 2 = ?$
 (A) 22 (B) 14 (C) 16 (D) 12
89. If + denotes $\div$, $\times$ denotes +, – denotes $\times$ and $\div$ denotes –, then which of the following statements is correct ?
 (A) $46 \times 6 \div 4 - 5 + 3 = 74$ (B) $46 \div 6 \times 4 - 5 + 3 = 75.5$
 (C) $46 - 6 + 4 \times 5 \div 3 = 71$ (D) $46 \times 6 - 4 + 5 \div 3 = 70.1$
90. Vinay starts walking towards South, After walking 5 m he turns Left. After walking 5 m, he turns towards South and walks 7 m. How far is he from his original position and in which direction?
 (A) 13 m, North (B) 13 m, South (C) 13 m, East (D) 13 m, North-East

91. Mukesh wants to go to the market, She starts from her home which is in North and comes to the crossing. The road to her left ends in a park and straight ahead is the office complex. In which direction is the market the crossing?
- (A) East (B) West (C) North (D) South
92. Jai left home and cycled 10 km towards North, turned right and cycled 5 km & turned right and cycled 10 km and turned right and cycled 10 km. How many kilometer will he have to cycle to reach his home straight ?
- (A) 10 km (B) 5 km (C) 20 km (D) 15 km
93. If $\div$ stands for greater than, $\times$ stands for addition, $+$ stands for division, $-$ stands for equal to, $>$ stands for multiplication, $=$ stands for less than, $<$ stands for minus, then which of the following alternatives is correct ?
- (A) $3 + 2 < 4 \div 6 > 3 \times 2$ (B) $4 \times 3 < 5 - 8 + 2 < 2$
(C) $3 > 2 < 4 - 6 \times 3 \times 2$ (D) $4 \times 3 \times 5 = 8 + 4 < 3$
94. Village Chimur is 8 km to the North of village Rewa. Village Rahate is 6 km to the East of village Rewa. Village Angne is 9 km to the West of Chimur. If Sanjay starts from village Rahate and goes to village Angne, find the distance and direction from starting point ?
- (A) 17 km North (B) 17 km North-West
(C) 17 km South (D) 17 km South-East
95. A man walks 30 m towards South. Then turning to his right he walks 30 m. They turning to his left he walks 20 m. Again turning to his left he walks 30 m. How far is he from his starting position?
- (A) 30 m (B) 20 m (C) 80 m (D) 50 m
96. If '20 - 10' means 200, '8 $\div$ 4' means 12, '6 $\times$ 2' means 4 and '12 + 3' means 4, then $100 - 10 \times 1000 \div 1000 + 100 \times 10 = ?$
- (A) 0 (B) 1090 (C) 1900 (D) 20
97. Manoj runs 10 m towards South and turns to right, runs 10 m and turns to right run 10 m and again turns to left, runs 10 m and then turns to left, runs 10 m and finally turns to left and runs 10 m. Now, which direction is the rat facing?
- (A) East (B) North (C) West (D) South

98. Find the wrong terms ?

3, 1.5, 1.5, 2.5, 4.5, 11.25

(A) 1.5

(B) 4.5

(C) 2.5

(D) 11.25

99. Direction [Qs. 99 to 100] : Find the Next terms ?

2, 3, 5, 7, 11, 13, 17, ?

(A) 21

(B) 23

(C) 19

(D) 25

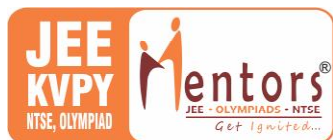
100. 77, 49, 36, 18, ?

(A) 9

(B) 7

(C) 3

(D) 8



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SAMPLE TEST PAPER

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Time : 2 hours

Maximum Marks: 300

PHYSICS

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

CHEMISTRY

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

MATHEMATICS

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

BIOLOGY

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

MENTAL ABILITY

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