



MENTORS EDUSERV TALENT REWARD EXAM (METRE) SAMPLE TEST PAPER

[For Students presently in Class 8 going to Class 9 in 2019]

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 **16 pages**.
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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DO NOT BREAK THE SEAL ON THIS BOOKLET, AWAIT INSTRUCTIONS FROM THE INVIGILATOR.

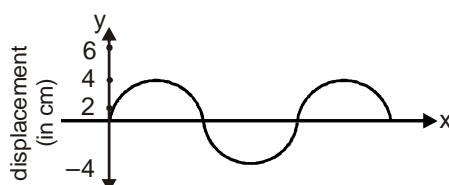
SEAL

PART-A : PHYSICS

1. What is the momentum of a man of mass 75 kg, when he walks with a uniform velocity of 2 m/s ?
(A) 150 kg m/s (B) 140 kg m/s (C) 130 kg m/s (D) 155 kg m/s
2. 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
3. Frictional force on a body kept on surface of the table depends on
(A) nature of surface in contact (B) area of contact
(C) velocity of a body (D) all of these
4. A block of mass M is pulled with a force F along a smooth horizontal surface with a rope of mass m. The acceleration of the block will be
(A) $\frac{F}{M}$ (B) $\frac{F}{m}$ (C) $\frac{F}{M+m}$ (D) $\frac{F}{M-m}$
5. On applying a constant force to a body, it moves with uniform
(A) momentum (B) speed (C) acceleration (D) velocity
6. Force measures rate of change of _____ of a body
(A) mass (B) inertia (C) velocity (D) momentum
7. The net force acting on a body of mass of 1 kg moving with a uniform velocity of 5 ms⁻¹ is
(A) 5 N (B) 0.2 N (C) 0 N (D) None of these

Space for rough work

8. Sound wave is an example of
(A) a longitudinal wave (B) an electromagnetic wave
(C) a transverse wave (D) a mechanical wave
9. The loudness of sound is measured in the units of
(A) joule (B) watt (C) decibel (D) none of these
10. The amplitude of the sound wave describes its
(A) speed (B) pitch (C) loudness (D) source
11. The frequency of a sound wave is 20 Hz. Time period of the sound wave is
(A) 0.05 s (B) 0.04 s (C) 0.02 s (D) None of these
12. A sound wave travels at a speed of 330 ms^{-1} . If its wavelength is 1.5 cm, what is the frequency of the wave ?
(A) 220 Hz (B) 22,000 Hz (C) 2000 Hz (D) None of these
13. For hearing distinct echoes, the minimum distance of the obstacle from the source of sound must be (Given velocity of sound = 344 m/s)
(A) 17.2 m (B) 34.4 m (C) 172 m (D) 344 m
14. A pandubbi sends a sonar signal to locate a body and receives the echo after 5 s. If the velocity of sound is 340 m/s. What is the distance of the body?
(A) 0.85km (B) 1.7km (C) 0.425km (D) 4.25km
15. What is the amplitude of the wave shown in the figure?



- (A) 8cm (B) 6 cm (C) 4 cm (D) 2 cm

Space for rough work

16. A force of 50 N is applied perpendicular on a nail of area 0.01 sq. cm. Then the value of pressure developed is
(A) $15 \times 10^5 \text{ Pa}$ (B) $50 \times 10^6 \text{ Pa}$ (C) $50 \times 10^{-6} \text{ Pa}$ (D) $15 \times 10^{-5} \text{ Pa}$
17. The total force exerted by the body perpendicular to the surface is called
(A) pressure (B) thrust (C) impulse (D) none of these
18. The atmosphere exerts a pressure of P on the surface of earth, then P equals :
(A) $1.01 \times 10^5 \text{ Nm}^{-2}$ (B) $1.01 \times 10^{-5} \text{ Nm}^{-2}$
(C) $1.01 \times 10^7 \text{ Nm}^{-2}$ (D) $1.01 \times 10^{-7} \text{ Nm}^{-2}$
19. The speed of sound is maximum in
(A) Air (B) Hydrogen (C) Water (D) Iron
20. 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) $1.6 \times 10^2 \text{ N}$. (B) $1.6 \times 10^{-3} \text{ N}$. (C) $1.6 \times 10^{-2} \text{ N}$. (D) None of these

PART-B : CHEMISTRY

21. Which of the following is thermosetting polymer?
(A) Nylon-6 (B) Bakelite (C) Nylon-66 (D) SBR
22. Which of the following is biodegradable polymer?
(A) Polythene (B) Bakelite (C) PHBV (D) PVC
23. Among the following, a natural polymer is
(A) cellulose (B) PVC (C) polyethylene (D) teflon

Space for rough work

24. German silver is a mixture of
(A) copper and zinc
(B) copper and tin
(C) copper, nickel and zinc
(D) aluminium, copper and traces of Mg and Mn
25. The reducing agent in thermite process is
(A) Mg (B) Al (C) Cr (D) Fe
26. The constituent of haemoglobin is
(A) iron (B) sodium (C) copper (D) magnesium
27. Natural rubber is which type of polymer ?
(A) Condensation polymer (B) Addition polymer
(C) Coordination polymer (D) None of these
28. Formation of terylene is an example of
(A) condensation polymerisation (B) addition polymerisation
(C) esterification (D) saponification
29. Nylon is not a
(A) condensation polymer (B) polyamide
(C) copolymer (D) homopolymer
30. Polyethylene is
(A) random copolymer (B) homopolymer
(C) alternate copolymer (D) cross-linked copolymer

Space for rough work

31. Which of the following metal reacts vigorously with oxygen?
(A) Zinc (B) Magnesium (C) Sodium (D) Copper
32. Which metal is used for making foils in packing of food materials?
(A) Copper (B) Platinum (C) Aluminium (D) Sodium
33. The lustre of a metal is due to
(A) its high density (B) its high polishing
(C) its chemical inertness (D) presence of free electrons
34. An alloy which does not contain copper is
(A) solder (B) bronze (C) brass (D) bell metal
35. Some crystals of copper sulphate were dissolved in water. The colour of the solution obtained would be
(A) green (B) red (C) blue (D) brown
36. The incorrect statement about metals is
(A) metals have a lustre (B) metals are malleable
(C) metals are non-ductile (D) metals form positive ions
37. An alloy of zinc and copper is dissolved in dilute hydrochloric acid. Hydrogen gas is evolved. In this evolution of gas
(A) only zinc reacts with dilute hydrochloric acid
(B) only copper reacts with dilute hydrochloric acid
(C) both zinc and copper react with dilute hydrochloric acid
(D) only copper reacts with water.

Space for rough work

38. Colour of basic copper carbonate is
(A) blue (B) yellow (C) red (D) green
39. Complete the reaction : $\text{Zn} + 2\text{NaOH} \rightarrow$
(A) $\text{Zn(OH)}_2 + \text{H}_2$ (B) $\text{Na}_2\text{ZnO}_2 + \text{H}_2$
(C) $\text{Zn(OH)}_2 + \text{Na}_2\text{O}$ (D) $\text{Na}_2\text{ZnO}_2 + \text{Na}_2\text{O}$
40. Non-metals generally contain.....electrons in their outer most shell
(A) 1, 2, or 3 (B) 5, 6, 7 or 8 (C) 10 to 18 (D) 8, 9 or 10

PART-C : MATHEMATICS

41. If $\frac{9^n \times 3^2 \times \left(3^{-\frac{n}{2}}\right)^{-2} - (27)^n}{3^{3m} \times 2^3} = \frac{1}{27}$ then $m - n$ is
(A) 1 (B) 2 (C) 3 (D) 4
42. 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) $1\frac{1}{5}$
43. If the difference of the squares of two numbers is 45, the square of the smaller number is 4 times the larger number, then the numbers are
(A) 9, 6 or 9, -6 (B) 5, 6 or 5, -6 (C) 9, 5 or 9, -5 (D) None of these

Space for rough work

44. The age of a father is twice that of the elder son. Ten years hence the age of the father will be three times that of the younger son. If the difference of ages of the two sons is 15 years, the age of the father is
 (A) 100 years (B) 70 years (C) 60 years (D) 50 years
45. The roots of the equation $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{13}{6}$ are
 (A) $\frac{3}{13}, \frac{2}{13}$ (B) $\frac{13}{6}, \frac{11}{6}$ (C) $\frac{9}{13}, \frac{4}{13}$ (D) None of these
46. The value of $\frac{2^{m+3} \times 3^{2m-n} \times 5^{m+n+3} \times 6^{n+1}}{6^{m+1} \times 10^{n+3} \times 15^m}$ is equal to
 (A) 0 (B) 1 (C) 2^m (D) 2
47. The value of $\frac{2^{1/2} \times 3^{1/3} \times 4^{1/4}}{10^{-1/5} \times 5^{3/5}} \div \frac{4^{-2/3} \times 5^{-7/5}}{4^{-3/5} \times 6^{-1/3}}$ is
 (A) 10 (B) 1 (C) 6 (D) 18
48. $1^{13} + 2^{13} + 3^{13} + \dots + 60^{13}$ is divisible by
 (A) 61 (B) 64 (C) 63 (D) 60
49. If $2^x = 4^y = 8^z$ and $xyz = 288$ then $\frac{1}{2x} + \frac{1}{4y} + \frac{1}{8z}$ equals
 (A) $\frac{7}{96}$ (B) $\frac{11}{96}$ (C) $\frac{13}{96}$ (D) $\frac{15}{96}$
50. If $a^m \cdot a^n = a^{mn}$ then $m(n-2) + n(m-2)$ is equal to
 (A) 1 (B) -1 (C) 0 (D) $\frac{1}{2}$

Space for rough work

51. The fraction $\left(\frac{a^{-2}-b^{-2}}{a^{-1}-b^{-1}}\right)^{-1}$ is equal to
- (A) $a^{-1}-b^{-1}$ (B) $a^{-1}+b^{-1}$ (C) $\frac{ab}{a+b}$ (D) $\frac{ab}{a-b}$
52. If $2^{5x} \times 2^x = \sqrt[5]{2^{20}}$ then 'x' is equal to
- (A) 0 (B) -1 (C) $\frac{1}{2}$ (D) $\frac{2}{3}$
53. If a and b are natural numbers such that $\left(\frac{1}{a}\right)^b = 0.\overline{3}$, then the value of ab is :
- (A) 81 (B) 24 (C) 192 (D) 375
54. The value of the expression $\frac{0.777... \times 0.33... \times 0.222}{0.777... + 0.333... + 0.222...}$ is equal to
- (A) $\frac{7}{162}$ (B) $\frac{162}{7}$ (C) $\frac{163}{7}$ (D) $\frac{7}{163}$
55. 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
56. The rational form of $2.74\overline{35}$ is
- (A) $\frac{27161}{9999}$ (B) $\frac{27}{99}$ (C) $\frac{27161}{9900}$ (D) $\frac{27161}{9000}$

Space for rough work

57. If $x = 3 + \sqrt{8}$ and $y = 3 - \sqrt{8}$ then $\frac{1}{x^2} + \frac{1}{y^2}$ is equal to
- (A) -34 (B) 34 (C) $12\sqrt{8}$ (D) $-12\sqrt{8}$
58. $\frac{(x^{a+b})^2(x^{b+c})^2(x^{c+a})^2}{(x^a \times x^b \times x^c)^4}$ is equal to
- (A) -1 (B) 0 (C) 1 (D) 2
59. $\sqrt[3]{\sqrt{0.000064}}$ is equal to
- (A) 0.02 (B) 0.2 (C) 2 (D) 0.002
60. If $x * y = \sqrt{x^2 + y^2}$, the value of $(1 * 2\sqrt{2}) (1 * -2\sqrt{2})$ is :
- (A) -7 (B) 0 (C) 2 (D) 9

PART-D : BIOLOGY

61. Which of the following machines would you use to harvest a crop as well as to beat out the grains from the chaff ?
- (A) Mechanical harvester (B) Combine harvester
(C) Thresher (D) Harrow
62. Transplantation is
- (A) Process of scattering the seed.
(B) Process of loosening and turning of soil
(C) Process of shifting of tiny saplings from the nursery to a field
(D) None of these

Space for rough work

63. Chemical substances which are used to kill insects
(A) Fungicide (B) Insecticide (C) Weedicide (D) All of these
64. Bacteria in an example of
(A) Prokaryotic cell (B) Eukaryotic cell (C) Virus (D) Protozoa
65. Rearing and breeding of fish in pond and tank is called
(A) Aquaculture (B) Fishing (C) Pisciculture (D) Apiculture
66. Virus possess
(A) DNA only (B) Nucleic acid either DNA or RNA
(C) Protein only (D) Nucleic acid and protein
67. Carrier of malaria-causing protozoan is
(A) Female Anopheles mosquito (B) Cockroach
(C) Housefly (D) Butterfly
68. Who discovered vaccination against small pox.
(A) Jenner (B) Pasteur (C) Lister (D) Mayer
69. Bacteriophage is
(A) Virus, attacking bacteria (B) Virus attacking virus
(C) Bacterium, attacking virus (D) Stage in bacterial life cycle
70. Yeast are economically important because they
(A) Spread plant diseases (B) Spread animal diseases
(C) Are used in tea and tobacco industry (D) Are used in wine and baking industry

Space for rough work

71. Asiatic lion protected in
(A) Gir Forest National Park, Gujarat
(B) Sunderban National Park, Westbengal
(C) Kanha National Park, Madhya Pradesh
(D) All the above
72. Tuberculosis caused by
(A) Virus (B) Protoza (C) Helminth (D) Bacteria
73. Which of the following is killed for oil and blubber?
(A) Tiger (B) Blue whale (C) Chiru (D) All of them
74. Which of the following is a wildlife sanctuary in Rajasthan?
(A) Ranthambore (B) Periyar (C) Kaziranga (D) Bandhavgarh
75. Aim of conservation is
(A) To preserve the quality of environment i.e. maintain a pollution - free environment.
(B) To ensure a continuous yield of useful plants, animals and materials for generations to come
(C) 1 and 2 both
(D) None of the above
76. A threatened species is
(A) Rare (B) Endangered (C) Vulnerable (D) All of the above
77. Elephantiasis is caused by
(A) *Anopheles* mosquito (B) *Culex* mosquito
(C) tsetse fly (D) *Plasmodium*

Space for rough work

78. Yeast contains maximum amount of
(A) Vitamin C (B) Riboflavin (C) Protein (D) Carbohydrate
79. The crop that requires more irrigation is
(A) wheat (B) rice (C) maize (D) jowar
80. To prevent seed-borne diseases the seeds must be
(A) sown at right depth (B) spaced at right depth
(C) sown in highly wet soil (D) treated with fungicide solutions

PART-E : MENTAL ABILITY

DIRECTIONS (Q.Nos. 81-83) : In the following questions, select the related word/letters/number from the given alternatives.

81. Optimist : Cheerful :: Pessimist : ?
(A) Petty (B) Selfish (C) Gloomy (D) Mean
82. YTOJ : XSNI :: WRMH : ?
(A) VQLG (B) TOJE (C) RMHC (D) UPKF
83. 720 : 840 :: 60 : ?
(A) 76 (B) 80 (C) 70 (D) 74

DIRECTIONS (Q Nos. 84-86) : Select the one which is different from other three alternatives.

84. (A) Rival (B) Opponent (C) Foe (D) Ally
85. (A) 27 (B) 35 (C) 18 (D) 9
86. (A) 9 – 72 (B) 8 – 56 (C) 11 – 115 (D) 10 – 90

Space for rough work

87. Which one of the given responses would be a meaningful order of the following ?

- | | | | |
|-----------|----------|----------------|-----------|
| 1. Seed | 2. Plant | 3. Germination | 4. Embryo |
| 5. Flower | 6. Fruit | | |

- | | |
|----------------------|----------------------|
| (A) 1, 5, 3, 4, 2, 6 | (B) 1, 4, 3, 2, 5, 6 |
| (C) 6, 5, 4, 3, 1, 2 | (D) 1, 5, 6, 4, 2, 3 |

88. Arrange the following words as per order in the English dictionary.

- | | | | |
|-----------|-----------|-----------|-------------|
| 1. Live | 2. Litter | 3. Little | 4. Literacy |
| 5. Living | | | |

- | | | | |
|-------------------|-------------------|-------------------|-------------------|
| (A) 3, 4, 2, 1, 5 | (B) 3, 2, 4, 5, 1 | (C) 4, 3, 5, 2, 1 | (D) 4, 2, 3, 1, 5 |
|-------------------|-------------------|-------------------|-------------------|

DIRECTIONS (Q.Nos.89-90) : In the following questions, a series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

89. 1, 0, 3, 2, 5, 6, ?, 12, 9, 20

- | | | | |
|-------|--------|-------|-------|
| (A) 9 | (B) 10 | (C) 7 | (D) 8 |
|-------|--------|-------|-------|

90. SHG, RIF, QJE, PKD, ?

- | | | | |
|---------|---------|---------|---------|
| (A) NME | (B) NLB | (C) OLE | (D) OLC |
|---------|---------|---------|---------|

91. There are five friends — Sachin, Kamal, Mohan, Arun and Ram. Sachin is shorter than Kamal, but taller than Ram. Mohan is the tallest. Arun is a little shorter than Kamal and a little taller than Sachin. Who is the second tallest ?

- | | | | |
|---------|------------|-----------|----------|
| (A) Ram | (B) Sachin | (C) Kamal | (D) Arun |
|---------|------------|-----------|----------|

92. From the given alternative words, select the word which cannot be formed using the letters of the given word INCARCERATION

- | | | | |
|--------------|-------------|--------------|--------------|
| (A) RELATION | (B) TERRAIN | (C) INACTION | (D) CREATION |
|--------------|-------------|--------------|--------------|

Space for rough work

93. If in a certain code 'CHARACTER' is written as '241612376' and CHILDREN' is written as '24859670', then how can 'HIRALAL' be written in the same code?
- (A) 4861551 (B) 4861515 (C) 4685151 (D) 4685511
94. In an examination, 78% of the total students who appeared were successful. If the total number of failures was 176 and 34% got first class, then how many students got first class?
- (A) 272 (B) 112 (C) 210 (D) 254

DIRECTIONS (Q.Nos. 95) : In these questions, select the missing number from the given responses.

95.

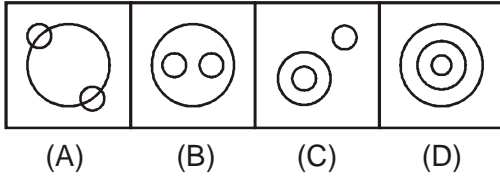
9	7	4
5	4	3
6	8	?
49	52	25

- (A) 6 (B) 7 (C) 4 (D) 5
96. Pratap starts from school and walks 7 km towards East. He takes a left and walks 4 km, then takes a right and walks 2 km, again takes a right and walks 3 km. Which direction is he facing now?
- (A) South (B) North (C) East (D) West
97. Selected the correct number that is missing in the number series given below.
- 214, 265, 367, ? , 724
- (A) 520 (B) 501 (C) 525 (D) 571

Space for rough work

DIRECTIONS (Q.No. 98) : In the following questions, identify the diagram that best represents the relationship among the classes given below.

98. Factory, Machinery, Product



DIRECTION (Q Nos. 99-100) : Select the related word/letters/number from the given alternative :

99. Kidneys : Nephron :: Central Nervous System ?

- (A) Cerebrum (B) Brain (C) Neurons (D) Spinal cord

100. 4 : 17 :: 7 : ?

- (A) 48 (B) 50 (C) 51 (D) 49

Space for rough work

ANSWER - KEY**PART-A : PHYSICS**

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

PART-B : CHEMISTRY

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

PART-C : MATHEMATICS

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

PART-D : BIOLOGY

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

PART-E : MENTAL ABILITY

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