

TEST # VIII - 03, Aug 2023

NAME: _____

Total. Time: 1:30 Hr

M.M: 150

INSTRUCTIONS

1. The paper consists of two sections A & B. Section A – Mathematics & Section B - Science.
2. The objective paper is designed by considering School Exam, NTSE & IIT Foundation.
3. The marking system is given just before the start of the Part in each section.
4. Blank papers, clipboards, log tables, slide rules, calculators, cameras, cellular phones, pagers and electronic gadgets are NOT allowed during exam.
5. The maximum mark allotted to the paper is 150.
6. Total time allotted for the exam is 1:30 Hours.
7. SECTION – A (MATHEMATICS) Questions No's: 1 – 15.
SECTION – B (SCIENCE) Questions No's 16 – 45.

Mathsarc Test Series

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Office Work

Registered Office

2nd Floor Axis Vertiga

Mohammad wadi, Near DPS, Pune MH- 411060

Contact: +91- 8484948623 / 8007267089

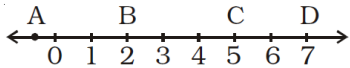
Invigilator Sign

Test is just a crosscheck of our learning during the month! So, be honest with thyself!

SECTION - A (MATHEMATICS)

PART - I

SINGLE OPTION CORRECT (+ 4, - 1, 0)

- The value of $\sqrt[3]{-125 \times (-1000)}$ is
 (A) $(5 \times 10)^{1/3}$ (B) $(5^3 \times 10^3)^{1/3}$ (C) $(5 \times 10)^3$ (D) $(5 \times 10)^{3/2}$
- Which letter best represents the location of $\sqrt{25}$ on a number line?


 (A) A (B) B (C) C (D) D
- If $a + b = 4$ and $ab = 3$, then the value of $a^3 + b^3$, is
 (A) 64 (B) 36 (C) 28 (D) 26
- In a mixture of 6 litres Ratio of Milk and Water is 2:1, if the ratio is to be 1:2, then the quantity of water to be further added is
 (A) 4 litres (B) 5 litres (C) 6 litres (D) 7 litres
- What must be added to 24136 to make it a perfect square?
 (A) 100 (B) 200 (C) 111 (D) None of these
- The value of $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$ is _____
 (A) 7 (B) 5 (C) 3 (D) 4

ROUGH SPACE

←~■: ☺ ☺ Best of Luck! ☺ ☺ :■~→

7. If $a = 2b$ and $b = 4c$ then the value of $\sqrt[3]{\frac{a^2}{16 \cdot bc}}$ is
(A) -1 (B) 1 (C) 2 (D) 4
8. If $m = 3^{n-1}$ & $3^{4n-1} = 27$, what is the value of $m + n$?
(A) 3 (B) 2 (C) 0 (D) 1
9. Let x and y be positive integers such that x is prime and y is composite, then
(A) $y - x$ cannot be an even integer (B) xy cannot be an even integer
(C) $\frac{x+y}{x}$ Cannot be an even integer (D) none of these
10. Compound Interest on Rs 25000 at 20% per annum for $2\frac{1}{2}$ years, if interest is compounded annually, is
(A) Rs 39600 (B) Rs 14600 (C) Rs 37500 (D) Rs 12500

ROUGH SPACE

←~■: ☺☺ Best of Luck! ☺☺ :■~→

PART - II

MULTI OPTION CORRECT (+ 4, -1, 0).

11. Select the correct option(s)

(A) If $a : b = 2 : 3$ then $\frac{3a + 4b}{4a - b} = \frac{18}{5}$

(B) 20% in terms of fraction = $\frac{1}{5}$

(C) fraction $\frac{4}{5}$ is 80%

(D) If x% of a is b then $x = \frac{100a}{b}$

12. Select the correct option(s)

(A) If $\sqrt[3]{\frac{a^6 \times b^3 \times c^{21}}{c^9 \times a^{12}}} = \frac{b \cdot c^k}{a^{k/2}}$ then $k = 4$

(B) If $\sqrt[3]{0.125} + \sqrt[3]{0.729} = n \times 0.7$ then $n = 2$

(C) Value of $\sqrt[3]{\sqrt{0.000064}} = 0.02$

(D) $\sqrt[3]{a} \div \sqrt[3]{b} = \sqrt[3]{\frac{a}{b}}$

13. Select the correct option(s)

(A) $(x - 4)(2x + 3) = 2x^2 - 5x - 12$

(B) $(a^2) \times (2a^{22}) \times (4a^{26}) = 8a^{50}$

(C) $(a + b + c)(a + b - c) = a^2 + b^2 - c^2$

(D) $(a + b)(a - b) = a^2 + b^2$

14. Select the correct options

(A) $\sqrt{2} - 1 = \sqrt{3 - 2\sqrt{2}}$

(B) $2^4\sqrt{2} > \sqrt{5}$

(C) $2\sqrt[3]{3} > 3\sqrt{7}$

(D) $\sqrt{4} = \sqrt{(-2)(-2)} = \sqrt{2 \times 2} = \pm 2$

15. Consider the following Identities:

(i) $(x + a)(x + b) = x^2 + (a + b)x + ab$

(ii) $(a - b)(a + b) = a^2 - b^2$

Then select the correct statement(s)

(A) $95 \times 103 = (100 + 5) \times (100 + 3)$

(B) $2016 \times 2018 = 2017^2 - 1$

(C) $(3x + 7)^2 - 84x = (3x - 7)^2$

(D) $(a - b)^2 = a^2 - 2ab + b^2$

ROUGH SPACE

←~■: ☺ ☺ Best of Luck! ☺ ☺ :■~→

SECTION – B (SCIENCE)

PART – I (PHYSICS)

SINGLE OPTION CORRECT (+ 3, - 1, 0)

16. Calculate the pressure in Pascal exerted by a force of 300 N acting normally on an area of 30 cm².
(A) 10⁵ Pa (B) 10⁴ Pa (C) 10⁶ Pa (D) None of these
17. There is one force which is exerted by all matter on all other matter. Which force is this?
(A) Gravitational force (B) Magnetic force
(C) Electrostatic force (D) Frictional Force
18. It is easier to pull boxes fitted with rollers because of _____
(A) rolling friction (B) sliding friction (C) lubricants (D) viscous force
19. A brick of weight 2kgf and dimensions 20 cm × 10 cm × 5 cm lying on the ground. Find the maximum pressure that the brick can exert on the ground.
(A) 0.01 kgf cm⁻² (B) 0.04 kgf cm⁻² (C) 0.4 kgf cm⁻² (D) 0.02 kgf cm⁻²
20. Ball rolling on the floor stops due to
(A) gravitational force (B) magnetic force (C) muscular force (D) frictional force
21. At sea level, atmospheric pressure is
(A) 76 cm of Hg column (B) 0.76 cm of Hg column
(C) 76 m of Hg column (D) 76 cm of Water column
22. A body weighing 5kgf, placed on a surface of area 0.1 m², exerts a thrust on the surface equal to:
(A) 50 kgf (B) 5 kgf (C) 50 kgf m⁻² (D) 5 kgf m⁻²
23. The force of friction between two bodies is
(A) parallel to the contact surface (B) perpendicular to the contact surface
(C) inclined at 10° to the contact surface (D) inclined at 30° to the contact surface
24. Which of the following forces is needed to pick up your school bag?
(A) Muscular force (B) Gravitational force (C) Magnetic force (D) Electrostatic force
25. The force required to keep an object moving with the same speed is a measure of
(A) static friction (B) sliding friction (C) rolling friction (D) limiting friction

PART - II (CHEMISTRY)

SINGLE OPTION CORRECT (+ 3, - 1, 0)

26. Which type of plastic is commonly used for making water bottles?

- (A) PVC (B) PET (C) LDPE (D) PS

27. Nylon is an example of a synthetic:

- (A) Fibre (B) Plastic (C) Rubber (D) Metal

28. Which fossil fuel is often referred to as "black gold"?

- (A) Natural gas (B) Coal (C) Petroleum (D) Peat

29. The process of separating different components of petroleum is called:

- (A) Combustion (B) Fractional distillation (C) Cracking (D) Fermentation

30. Which of the following is a non-metal?

- (A) Iron (B) Calcium (C) Oxygen (D) Sodium

31. Which property is NOT typically associated with metals?

- (A) Malleability (B) Ductility (C) Non-conductivity (D) Luster

32. The rapid oxidation of a substance, usually accompanied by heat and light, is called:

- (A) Sublimation (B) Combustion (C) Evaporation (D) Condensation

33. In a flame, the innermost zone is characterized by:

- (A) Complete combustion (B) Incomplete combustion
(C) No combustion (D) Explosion

34. The main constituent of natural gas is:

- (A) Methane (B) Ethane (C) Propane (D) Butane

35. Which natural fibre is obtained from the flax plant?

- (A) Jute (B) Cotton (C) Wool (D) Linen

PART – III (BIOLOGY)

SINGLE OPTION CORRECT (+ 3, - 1, 0)

36. Sets of reproductive terms are given below. Choose the set that has an incorrect combination.

- (A) Sperm, testis, sperm duct, penis
(B) Menstruation, egg, oviduct, uterus
(C) Sperm, oviduct, egg, uterus
(D) Ovulation, egg, oviduct, uterus

37. In humans, the development of fertilized egg takes place in the

- (A) Ovary (B) Testis (C) Oviduct (D) Uterus

38. In the list of animals given below, hen is the odd one out.

Human being, cow, dog, hen

The reason for this is

- (A) It undergoes internal fertilization (B) It is oviparous
(C) It is viviparous (D) It undergoes external fertilization

39. Animals exhibiting external fertilization produce a large number of gametes. Pick the appropriate reason from the following.

- (A) The animals are small in size and want to produce more off springs.
(B) Food is available in plenty in water.
(C) To ensure better chance of fertilization.
(D) Water promotes production of large number of gametes.

40. Reproduction by budding takes place in

- (A) Hydra (B) Amoeba (C) Paramecium (D) Bacteria

41. Which of the following statements about reproduction in humans is correct?

- (A) Fertilization takes place externally
(B) Fertilization takes place in the testes
(C) During fertilization egg moves towards the sperm
(D) Fertilization takes place in the human female.

42. In human beings, after fertilization, the structure which gets embedded in the wall of uterus is

- (A) Ovum (B) Embryo (C) Foetus (D) Zygote

43. Aquatic animals in which fertilization occurs in water are said to be

- (A) Viviparous without fertilization (B) Oviparous with external fertilization
(C) Viviparous with internal fertilization (D) Oviparous with internal fertilization

44. After fertilization, the resulting cell which gives rise to a new individual is the
(A) Embryo (B) Ovum (C) Foetus (D) Zygote
45. In human beings, the correct sequence of events during reproduction is
(A) gamete formation, fertilization, zygote, embryo (B) embryo, zygote, fertilization, gamete formation
(C) fertilization, gamete formation, embryo, zygote (D) gamete formation, fertilization, embryo, zygote



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ANSWER KEY

- | | | | |
|----------|----------|-------------|-------------|
| 1. B | 2. C | 3. C | 4. C |
| 5. B | 6. D | 7. B | 8. B |
| 9. D | 10. B | 11. A, B, C | 12. A, B, D |
| 13. A, B | 14. A, B | 15. B, C, D | 16. A |
| 17. A | 18. A | 19. B | 20. D |
| 21. A | 22. B | 23. A | 24. A |
| 25. D | 26. B | 27. A | 28. C |
| 29. B | 30. C | 31. C | 32. B |
| 33. A | 34. A | 35. D | 36. C |
| 37. D | 38. B | 39. C | 40. A |
| 41. D | 42. B | 43. B | 44. D |
| 45. A | | | |