SPECTRA
PATH TO SUCCESS

NEET | JEE | FOUNDATIONS

PART – A: SCIENCE

1. A 5 kg block slides down a rough inclined plane at constant velocity. If the plane makes an angle of 30° with the horizontal, find the coefficient of kinetic friction.
   a) 0.577   b) 0.5   c) 0.866   d) 0.333

2. A body weighs 100 N on Earth. What will be its weight on a planet where acceleration due to gravity is 3.2 m/s²?
   a) 32 N   b) 100 N   c) 320 N   d) 9.8 N

3. A current of 2 A flows through a resistor of 4 Ω for 2 minutes. What is the total heat produced?
   a) 32 J   b) 960 J   c) 1280 J   d) 1920 J

4. Two plane mirrors are inclined at 45°. How many images of an object placed between them will be formed?
   a) 8   b) 7   c) 6   d) 5

5. Which of the following materials can be magnetized?
   a) Copper   b) Aluminium   c) Iron   d) Zinc

6. A solution turns blue litmus red. It is likely to contain:
   a) NaOH   b) HCl   c) NH_4OH d) Na_2CO_3

7. Which among the following is a biodegradable material?
   a) Plastic   b) Aluminium foil   c) Cotton   d) Thermocol

8. The SI unit of power is:
   a) Watt   b) Joule   c) Newton   d) Coulomb

9. Which pair is correctly matched?
   a) Mitochondria – Protein synthesis   b) Ribosomes – Energy production
   c) Nucleus – Genetic material   d) Golgi body – Respiration

10. Assertion (A): The pressure inside a soap bubble is greater than the outside air pressure.
    Reason (R): Surface tension tries to decrease the surface area of the bubble.
    a) Both A and R are true, and R is the correct explanation of A
    b) Both A and R are true, but R is not the correct explanation of A
    c) A is true, R is false
    d) A is false, R is true

PART – B : MATHEMATICS (40 Marks)

11. If $\sqrt{3} + \sqrt{2} = x$, then the value of $1/x$ is:

    a) $\sqrt{3} - \sqrt{2}$ b) $\sqrt{2} - \sqrt{3}$ c) $1/(\sqrt{3} + \sqrt{2})$ d) None

12. If $2x + 3 = 11$, find $4x + 6$.

    a) 11   b) 22   c) 44   d) 12

13. The diagonals of a rhombus are 12 cm and 16 cm. Find its perimeter.

    a) 40 cm   b) 50 cm   c) 60 cm   d) 80 cm

14. Simplify: $(3/4) \div (9/16) \times (8/27) = ?$

    a) 16/81   b) 4/9   c) 2/3   d) 8/9

15. Find the smallest number which, when divided by 12, 18, and 21, leaves a remainder 3 in each case.

    a) 123   b) 129   c) 147   d) 153

16. A sum of ₹8000 amounts to ₹9240 in 2 years under simple interest. Find the rate of interest.

    a) 6%   b) 7.5%   c) 8%   d) 10%

17. If the difference between a number and its reciprocal is 9/10, then the number is:

    a) 10   b) 5   c) 2   d) 1/5

18. The perimeter of a semicircle of radius 7 cm is:

    a) 22 cm   b) 36 cm   c) 44 cm   d) 25 cm

19. If $x = 2 + \sqrt{3}$, find the value of $1/x$.

    a) $2 - \sqrt{3}$ b) $\sqrt{3} - 2$ c) $1/(2 + \sqrt{3})$ d) None

20. The ratio of the areas of two similar triangles is 9:16. Find the ratio of their corresponding sides.

    a) 3:4   b) 2:3   c) 4:5   d) 9:16

PART – C : MENTAL ABILITY (20 Marks)

21. Find the missing term in the series:

    2, 6, 12, 20, 30, ?

    a) 40   b) 42   c) 48   d) 50

22. If CAT = 24 and DOG = 26, what is BAT?

    a) 23   b) 24   c) 25   d) 26

23. In a code language, FLOWER is written as EKNVDS. How is GARDEN written in that code?

    a) FZQCEM   b) HBSFDO   c) FZQDCL   d) None

24. Which figure completes the pattern?

    (Provide pattern question in printed version)

25. A clock shows 3:15. What is the angle between the hour and minute hands?
    a) 7.5°   b) 15°   c) 37.5°   d) 45°

26. If 12 × 12 = 9, 8 × 8 = 4, then 6 × 6 = ?
    a) 2   b) 3   c) 4   d) 6

27. Which one of the following is different?
    3, 9, 27, 64, 81, 243
    a) 3   b) 64   c) 81   d) 243

28. Find the next term in the pattern:
    5, 11, 23, 47, ?
    a) 94   b) 95   c) 97   d) 99

29. Identify the odd one out:
    Iron, Gold, Copper, Wood
    a) Iron   b) Gold   c) Copper   d) Wood

30. If A = 1, B = 2, … Z = 26, find the sum of letters in the word "STAARS".
    a) 86   b) 89   c) 90   d) 91

Note to Parents and Students:

This is a **model paper** designed to help students and parents understand the **question pattern and difficulty level** of the STAARS Scholarship Test.
The **actual exam pattern and standard may vary slightly** depending on syllabus coverage and academic discretion.