



# Aakash

Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Ltd.)

Regd. Office : Aakash Tower, Plot No.-4, Sec-11, MLU, Dwarka, New Delhi-110075

Ph.: 011-47623456 Fax : 011-47623472

## Admission-cum-Scholarship Test

### (Sample Paper)

(Nurture X cum NTSE Classroom Course-2015)

(Syllabus of the Test : Science & Mathematics of Class IX)

Roll No.: \_\_\_\_\_

Test Booklet Code : **A**

Time : 1½ Hrs.

Max.Marks : 240

### INSTRUCTIONS TO THE CANDIDATES

1. The initial 10 minutes are earmarked for the candidates to carefully read the instructions. (Note : The candidates are not allowed to either look inside the question booklet or start answering during these initial 10 minutes.)
2. The question booklet and answer sheet are issued separately at the start of the examination.
3. This question booklet contains 60 questions.
4. Read each question carefully.
5. Determine the correct answer, one out of the four available choices given under each question.
6. It is mandatory to use Ball Point Pen to darken to appropriate circle in the answer sheet.
7. For each correct answer, **four** marks will be awarded. There is no negative marking.

#### For Example

Q. 12 : In the Question Booklet is : Which one is known as 'black gold'?

#### (Answer Sheet)

(1) Old gold

Q.12. ① ② ③ ④

(2) Petroleum

(3) Silver

(4) Coal

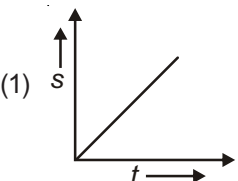
Thus as the correct answer is choice 2, the candidate should darken completely (with a blue/black Ball point pen only) the circle corresponding to choice 2 against Question No. 12 on the Answer Sheet. If more than one circle is darkened for a given question such answer will be rejected.

8. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked is allowed. Before handing over the answer sheet to the invigilator, candidate should check that **Roll No.** and **Test-Booklet code** have been filled and marked correctly.
9. Rough work should be done only on the space provided in the question booklet.
10. Immediately after the prescribed examination time is over, the **Answer sheet and Question booklet are to be returned to the invigilator.** If the candidate wants to leave the examination hall before time, he/she should hand over the question paper and answer sheet to the invigilator. However, no student can leave the examination hall before half time.

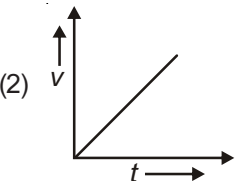
## SCIENCE

Choose the correct answer :

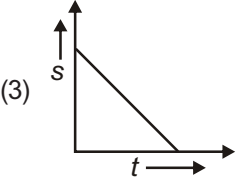
1. The distance and displacement of a moving object are equal only when it
  - (1) Moves in a circle
  - (2) Slows down
  - (3) Speeds up
  - (4) Moves straight without turning back
2. An object is thrown up with a speed of 50 m/s. Its height from the ground after 7 s is [Take  $g = 10 \text{ m/s}^2$ ]
  - (1) 125 m
  - (2) 20 m
  - (3) 105 m
  - (4) 100 m
3. The momentum of a body is always in the direction of
  - (1) Its motion
  - (2) Its acceleration
  - (3) Force acting on it
  - (4) Its weight
4. Which of the following graphs represents an object slowing down at a constant rate?
 



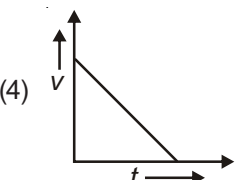
(1)



(2)



(3)



(4)
5. A net force of 20 N acts on a 5 kg mass kept at rest. Distance travelled by the mass in 6 s is
  - (1) 72 m
  - (2) 36 m
  - (3) 24 m
  - (4) 12 m
6. Universal gravitational constant is measured in
  - (1)  $\text{N kg}^2/\text{m}^2$
  - (2)  $(\text{Nm})^2/\text{kg}^2$
  - (3)  $\frac{\text{Nm}^2}{\text{kg}^2}$
  - (4)  $\frac{(\text{N kg})^2}{\text{m}^2}$
7. An object of mass 5 kg occupies a volume of  $500 \text{ cm}^3$ . The relative density of the mass is
  - (1) 0.1
  - (2) 10
  - (3) 0.01
  - (4) 1
8. An object weighs 29.4 N on moon. Its mass is about
  - (1) 54 kg
  - (2) 2.94 kg
  - (3) 18 kg
  - (4) 32 kg
9. Maximum acceleration that can act on a 2.5 kg mass under the action of a 16 N and a 4 N force is
  - (1)  $8 \text{ m/s}^2$
  - (2)  $4.8 \text{ m/s}^2$
  - (3)  $5 \text{ m/s}^2$
  - (4)  $6.5 \text{ m/s}^2$
10. A ball of mass 500 g kept near the earth's surface will attract the earth with a force of
  - (1) 9.8 N
  - (2) 19.6 N
  - (3) 4.9 N
  - (4) 29.4 N
11. The rate of diffusion of liquids is higher than that of solids because
  - (1) Particles of liquid have more forces of attraction between them than that of solids
  - (2) Particles of liquid have less spaces between them and hence they stick to each other and move freely
  - (3) Particles of liquid have more inter-particle spaces between them and they can move freely
  - (4) Particles of solid have more inter-particle spaces between them
12. Which of the following gases is essential for the survival of aquatic animals and plants?
  - (1) Oxygen
  - (2) Carbon dioxide
  - (3) Carbon monoxide
  - (4) Both oxygen and carbon dioxide

Space For Rough Work

13. Which of the following is an example of homogeneous mixture?  
 (1) Cloud (2) Sugar solution  
 (3) Distilled water (4) Milk
14. The dispersed phase of foam is  
 (1) Gas (2) Solid  
 (3) Liquid (4) Water
15. Which of the following techniques can be used to separate a mixture of two miscible liquids A and B having boiling points 63 K and 78 K respectively?  
 (1) Separating funnel  
 (2) Fractional distillation  
 (3) Simple distillation  
 (4) Chromatography
16. The ratio by mass of calcium to oxygen in quick lime is  
 (1) 4 : 1 (2) 2 : 3  
 (3) 5 : 2 (4) 5 : 1
17. Number of atoms of carbon in 4.4 g of carbon dioxide is  
 (1)  $6.022 \times 10^{23}$  (2)  $12.044 \times 10^{23}$   
 (3)  $6.022 \times 10^{25}$  (4)  $6.022 \times 10^{22}$
18. The ratio by mass of carbon to oxygen in carbon dioxide is always 3 : 8. Which chemical law is followed by carbon dioxide molecule?  
 (1) Law of conservation of mass  
 (2) Bohr Bury rule  
 (3) Law of constant proportions  
 (4) Dalton's law
19. Find the incorrect pair:  
 (1) Diamond – Element  
 (2) Brass – Mixture  
 (3) Sugar – Compound  
 (4) Blood – Suspension
20. Which of the following is not a polyatomic ion?  
 (1) Ammonium (2) Sulphite  
 (3) Sulphate (4) Sulphide



A student observed the above change in the cell size when the cell is kept in

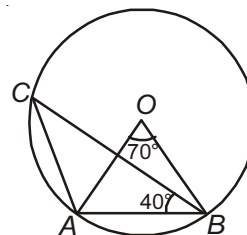
- (1) Both isotonic and hypotonic solution  
 (2) Hypotonic solution  
 (3) Hypertonic solution  
 (4) Isotonic solution
22. All bacteria are kept in  
 (1) Monera (2) Protista  
 (3) Fungi (4) Plantae
23. How many characters are common in pisces and amphibians?  
 a. They are cold blooded animals  
 b. Heart is three chambered  
 c. Respiration is through gills only  
 d. They have scales  
 (1) One (2) Three  
 (3) Two (4) Four
24. **Statement-1:** The inner membrane of mitochondria is deeply folded.  
**Statement-2:** Mitochondria help in detoxification of drugs.  
 (1) Statement-1 is false and 2 is true  
 (2) Statement-1 is true and 2 is false  
 (3) Both the statements are false  
 (4) Both the statements are true
25. Which of the following nutrients require in large quantities by plants?  
 (1) Iron, Calcium and Boron  
 (2) Nitrogen, Copper and Zinc  
 (3) Phosphorus, Manganese and Magnesium  
 (4) Potassium, Calcium and Sulphur
26. Which of the following tissues contains haversian canal?  
 (1) Adipose (2) Bone  
 (3) Cartilage (4) Blood

Space For Rough Work

27. Identify the plant tissue on the basis of given information.
- It provides strength
  - It is present in the hard covering of seeds
- Parenchyma
  - Chlorenchyma
  - Sclerenchyma
  - Collenchyma
28. The cell organelle found in both prokaryotes and eukaryotes is
- Lysosome
  - ER
  - Golgi apparatus
  - Ribosome
29. Find the incorrect match.
- Sycon* – Porifera
  - Echinus* – Echinodermata
  - Antedon* – Arthropoda
  - Chiton* – Mollusca
30. Which of the following epithelial tissues forms the lining of kidney tubules?
- Columnar epithelium
  - Simple squamous epithelium
  - Stratified squamous epithelium
  - Cuboidal epithelium

## MATHEMATICS

31. A rational number between  $\sqrt{3}$  and  $\sqrt{5}$  is
- $\frac{\sqrt{3} + \sqrt{5}}{2}$
  - $\frac{\sqrt{3} \cdot \sqrt{5}}{2}$
  - 1.9
  - 2.5
32. If  $x^{3001} + 71$  is divided by  $x + 1$ , then the remainder is
- 72
  - 0
  - 1
  - 70
33. The graph of  $y = 7$  is a line
- Parallel to x-axis at a distance of 7 units above the origin
  - Parallel to y-axis at a distance of 7 units on the left of the origin
  - Making an intercept of 7 cm on the x-axis
  - Making an intercept of 7 cm on both the axes
34. 'Lines are parallel if they do not intersect' is stated in the form of a/an
- Axiom
  - Definition
  - Postulate
  - Proof
35. If one of the angles of a triangle is  $140^\circ$ , then the angle between the bisectors of the other two angles is
- $160^\circ$
  - $70^\circ$
  - $20^\circ$
  - $150^\circ$
36. If the radius of a sphere is increased by 20%, then the volume will increase by
- 64.71%
  - 60.04%
  - 72.8%
  - 71.4%
37. If an isosceles right triangle has an area of  $32 \text{ cm}^2$ , then the length of its hypotenuse is
- $\sqrt{128} \text{ cm}$
  - $\sqrt{64} \text{ cm}$
  - $\sqrt{96} \text{ cm}$
  - $\sqrt{160} \text{ cm}$
38. With the help of a ruler and a compass, it is not possible to construct an angle of
- $15^\circ$
  - $11.25^\circ$
  - $18.75^\circ$
  - $20^\circ$
39. In the given figure, if  $O$  is the centre of circle, then the measure of  $\angle CAB$  is

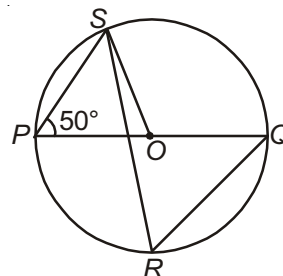


- $100^\circ$
- $40^\circ$
- $70^\circ$
- $105^\circ$

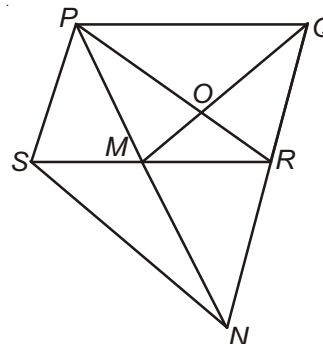
**Space For Rough Work**

40. The figure obtained by joining the mid-points of the adjacent sides of a rectangle of sides 48 cm and 14 cm is a
- Rectangle of area  $336 \text{ cm}^2$
  - Square of area  $324 \text{ cm}^2$
  - Rhombus of area  $336 \text{ cm}^2$
  - Trapezium of area  $330 \text{ cm}^2$
41. If  $DEF$  and  $UVW$  are two parallel lines, then the bisectors of the angles  $DEV$ ,  $FEV$ ,  $UVE$  and  $WVE$  form a
- Square
  - Rhombus
  - Rectangle
  - Kite
42. If two sides of a triangle are of lengths 6 cm and 1.2 cm, then the length of the third side of the triangle cannot be
- 4.9 cm
  - 7.1 cm
  - 4.8 cm
  - 6.9 cm
43. The value of  $2.\bar{9} + 2.1\bar{9}$  in the form  $\frac{p}{q}$ , where  $p$  and  $q$  are integers and  $q \neq 0$  is
- $\frac{21}{5}$
  - $\frac{26}{5}$
  - $\frac{17}{5}$
  - $\frac{14}{5}$
44. Which of the following expressions is a polynomial?
- $\frac{1}{3x^{-1}} + \frac{5}{x}$
  - $1 - \sqrt{3x}$
  - $\frac{(x-3)(x-5)}{x}$
  - $\frac{9\sqrt{x} + 2x^{7/2}}{5\sqrt{x}}$
45. The coordinates of a point on the graph of the linear equation  $3x + 4y = 11$ , whose abscissa is  $2\frac{1}{3}$  times its ordinate are
- $\left(\frac{7}{3}, 1\right)$
  - $\left(\frac{28}{3}, 4\right)$
  - $\left(\frac{7}{6}, \frac{1}{2}\right)$
  - $\left(\frac{7}{9}, \frac{1}{3}\right)$

46. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 1 : 5, then the smaller of the two angles is
- $60^\circ$
  - $150^\circ$
  - $30^\circ$
  - $120^\circ$
47. A right triangle with sides 8 cm, 15 cm, 17 cm is revolved about the side 15 cm. The curved surface area of the solid so formed is
- $255\pi \text{ cm}^2$
  - $120\pi \text{ cm}^2$
  - $136\pi \text{ cm}^2$
  - $122\pi \text{ cm}^2$
48. If the sides of a triangle are 11 cm, 60 cm and 61 cm, then the length of its longest altitude is
- 60 cm
  - 10.8 cm
  - 50 cm
  - 12.4 cm
49. In the given figure, if  $PQ$  is the diameter of the circle, then the measure of  $\angle SRQ$  is



- $60^\circ$
  - $40^\circ$
  - $100^\circ$
  - $50^\circ$
50. In the given figure, if  $PQRS$  is a parallelogram, then which of the following alternatives is not true?



- $\text{ar}(\triangle POM) = \text{ar}(\triangle QOR)$
- $\text{ar}(\triangle QRM) = \text{ar}(\triangle SMN)$
- $\text{ar}(\triangle PSM) = \text{ar}(\triangle SMN)$
- $\text{ar}(\triangle PRS) = \text{ar}(\triangle PNS)$

Space For Rough Work

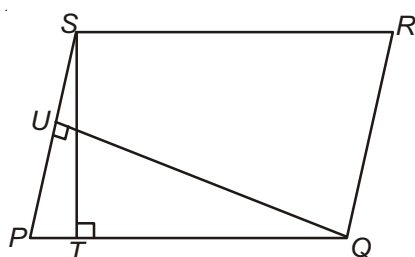
51. If  $S$  is a point on the side  $QR$  of  $\triangle PQR$  such that  $PS$  bisects  $\angle QPR$ , then

(1)  $QS = RS$   
 (2)  $QP > QS$   
 (3)  $QS > QP$   
 (4)  $RS > RP$

52. In a parallelogram  $PQRS$ , if  $\angle P = 70^\circ$ , then the measure of  $\angle S$  is

(1)  $120^\circ$  (2)  $60^\circ$   
 (3)  $110^\circ$  (4)  $70^\circ$

53. In the given figure, if  $SR = 7$  cm,  $RQ = 10$  cm and  $QU = 8$  cm, then the approximate length of  $ST$  is

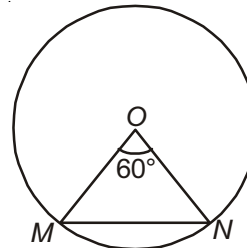


(1) 8 cm (2) 10 cm  
 (3) 11 cm (4) 12 cm

54. Which of the following numbers has a terminating decimal representation?

(1)  $\frac{10}{9}$  (2)  $\frac{7}{5}$   
 (3)  $\frac{5}{7}$  (4)  $\frac{15}{11}$

55. In the given figure, if  $O$  is the centre of the circle such that  $OM = 7$  cm, then the length of  $MN$  is



(1) 0.007 m (2) 7 m  
 (3) 0.07 m (4) 0.07 c m

56. A cylinder of base diameter 42 cm and height 14 cm is dipped vertically one third in a bucket full of paint. How much area gets painted?

(1)  $2002 \text{ cm}^2$  (2)  $6776 \text{ cm}^2$   
 (3)  $1001 \text{ cm}^2$  (4)  $4224 \text{ cm}^2$

57. The point of the form  $(b, b)$  always lies on the line

(1)  $y = 0$  (2)  $x = 0$   
 (3)  $x - y = 0$  (4)  $y + x = 0$

58. If one angle of a triangle is equal to the sum of the other two angles, then the triangle must be a/an

(1) Isosceles triangle  
 (2) Obtuse triangle  
 (3) Equilateral triangle  
 (4) Right triangle

59.  $x + 1$  is a factor of the polynomial

(1)  $x^3 - x^2 + x + 1$  (2)  $x^3 - x^2 - x + 1$   
 (3)  $x^4 + 1$  (4)  $x^5 - 1$

60. Every rational number is a/an

(1) Natural number (2) Integer  
 (3) Real number (4) Whole number



Space For Rough Work



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## Answers

- |         |         |         |         |         |
|---------|---------|---------|---------|---------|
| 1. (4)  | 13. (2) | 25. (4) | 37. (1) | 49. (4) |
| 2. (3)  | 14. (1) | 26. (2) | 38. (4) | 50. (3) |
| 3. (1)  | 15. (2) | 27. (3) | 39. (4) | 51. (2) |
| 4. (4)  | 16. (3) | 28. (4) | 40. (3) | 52. (3) |
| 5. (1)  | 17. (4) | 29. (3) | 41. (3) | 53. (3) |
| 6. (3)  | 18. (3) | 30. (4) | 42. (3) | 54. (2) |
| 7. (2)  | 19. (4) | 31. (3) | 43. (2) | 55. (3) |
| 8. (3)  | 20. (3) | 32. (4) | 44. (4) | 56. (1) |
| 9. (1)  | 21. (3) | 33. (1) | 45. (1) | 57. (3) |
| 10. (3) | 22. (1) | 34. (2) | 46. (3) | 58. (4) |
| 11. (3) | 23. (1) | 35. (1) | 47. (3) | 59. (2) |
| 12. (4) | 24. (2) | 36. (3) | 48. (1) | 60. (3) |