

## Diagnostic cum Scholarship Tests

### SAMPLE PAPER

### For Students of Class VIII

## Paper 3 - NSEJS & Mathematical Olympiad

Duration : 120 minutes

Paper Code: 78-3

Maximum Marks : 204

Please read the instructions and guidelines carefully :

**Important Note :** Please ensure to accurately input the details for the Question Paper Code as indicated at the top of this sheet (Side 2) into the corresponding columns / fields on the OMR sheet before proceeding with the paper. Incorrectly filled information regarding the class or paper may result in inaccurate outcomes or results.

*"This paper has been scientifically designed to evaluate your potential – manifested and hidden for the target examinations mentioned in various sections of the paper. Thus, your adherence to the instructions is critical in the evaluation of the same"*

1. This Question paper consists of 2 sections.
2. Student should devote allotted time for each section. If a section is easy, then it is easy for everyone & was meant to be like that with a goal in mind. Do not switch over to another section if you find the section to be easy. If a section is tough, then it is tough for everyone. Please note that each section has been allocated a time limit of 60 minutes. Dedicating the full 60 minutes to finish each section successfully is essential. Opening the next section before completing the allotted time for the preceding section is not permitted. This adherence is crucial for assessing your true potential, as each section is meticulously crafted to evaluate your potential for the corresponding competitive examinations.
3. Candidate should open the seal of Section-II only after completing 60 minutes of Section-I.
4. Sheets will be given to each candidate for rough work. Candidate must fill all details on the rough sheet and submit the same to invigilator along with OMR sheet. Candidate must mention the Question No. while doing the rough work in the sheet.
5. Please note candidates are not allowed to bring any prohibited items into the exam hall such as electronic devices, mobile phones, smart watch, earphones, calculators, books, notes, formula sheets, and bags.
6. Marking scheme is given in table below:

| Section   | Subject              | Question no. | Marking Scheme for each question                   |              |
|---|----------------------|--------------|--|--------------|
|   |                      |              | Correct answer                                     | Wrong answer |
| <b>SECTION – I<br/>(NSEJS)<br/>Time Allotted: 60 Minutes</b>                  | PHYSICS (PART-A)     | 1 to 8       | +3   | -1           |
|   | CHEMISTRY (PART-B)   | 9 to 16      | +3   | -1           |
|   | BIOLOGY (PART-C)     | 17 to 24     | +3   | -1           |
|   | PHYSICS (PART-D)     | 25 to 26     | +6<br>(if all the correct alternatives are marked) | 0            |
|   | CHEMISTRY (PART-E)   | 27 to 28     | +6<br>(if all the correct alternatives are marked) | 0            |
|   | BIOLOGY (PART-F)     | 29 to 30     | +6<br>(if all the correct alternatives are marked) | 0            |
| <b>SECTION – II<br/>(Mathematical Olympiad)<br/>Time Allotted: 60 Minutes</b> | MATHEMATICS (PART-A) | 31 to 46     | +3   | -1           |
|   | MATHEMATICS (PART-B) | 47 to 54     | +6 * Partial Making                                | 0            |

\* Partial Marking: (Q. No. 47 to 54):

|               |   |
|---------------|---|
| Full Marks    | : +6 If only (all) the correct option(s) is(are) chosen;  |
| Partial Marks | : +4.5 If all the four options are correct but ONLY three options are chosen;                         |
| Partial Marks | : +3 If three or more options are correct but ONLY two options are chosen, both of which are correct; |
| Partial Marks | : +1.5 If two or more options are correct but ONLY one option is chosen and it is a correct option;   |
| Zero Marks    | : 0 If unanswered/incorrect option(s) chosen  |

# Section - I

Time: 60 Minutes

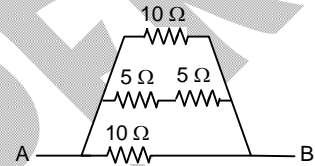
## PHYSICS (PART-A)

This part contains 8 Multiple Choice Questions number 1 to 8. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. The resultant resistance between point A and B is

(A)  $\frac{10}{3} \Omega$   
(C)  $\frac{10}{6} \Omega$

(B)  $\frac{10}{4} \Omega$   
(D)  $10 \Omega$



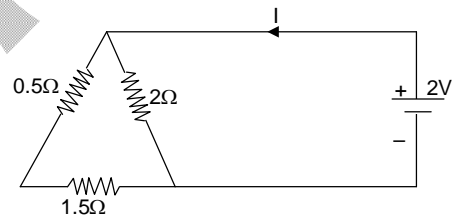
2. What mass of a liquid A of specific heat capacity  $0.84 \text{ J g}^{-1} \text{ K}^{-1}$  at a temperature  $40^\circ\text{C}$  must be mixed with 100 g of a liquid B of specific heat capacity  $2.1 \text{ J g}^{-1} \text{ K}^{-1}$  at  $20^\circ\text{C}$ , so that the final temperature of mixture becomes  $32^\circ\text{C}$ ?

(A) 400 g  
(C) 600 g

(B) 500 g  
(D) 375 g

3. Value of current

(A) in the circuit is  $\frac{1}{2} \text{ A}$   
(B) in the circuit is 2 A  
(C) through  $2 \Omega$  resistor is 1 A  
(D) both (B) and (C)



4. A polished silvery surface is

(A) Good absorber of heat  
(C) Poor reflector of heat

(B) Good reflector of heat  
(D) None of these

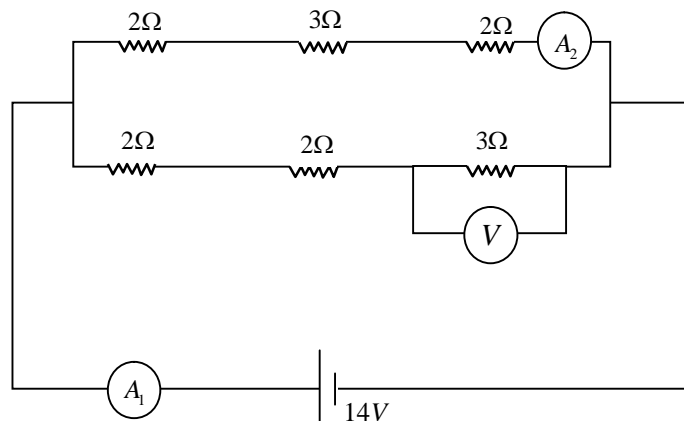
5. Rise in temperature by  $1498^\circ\text{C}$  in Kelvin is equal to

(A) Rise in temperature by 32 K  
(C) Rise in temperature by 273 K

(B) Same rise  
(D) Insufficient information

6. The reading of ammeter ( $A_1$ ) in the circuit shown below is

(A) 2A  
(B) 4A  
(C) 6A  
(D) zero



7. The shape of the cloud of the tornado is  
(A) cylindrical shaped (B) cone shaped  
(C) sphere shaped (D) linear
8. An object is placed at the centre of curvature of a concave mirror. The distance between its image and the pole is  
(A) equal to  $f$  (B) between  $f$  and  $2f$   
(C) equal to  $2f$  (D) greater than  $2f$

## CHEMISTRY (PART-B)

This part contains 8 Multiple Choice Questions number 9 to 16. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

9. Crystallisation is a:  
(A) chemical change (B) physical change  
(C) irreversible change (D) all of these
10. Which of the following methods is not used for the prevention of corrosion?  
(A) greasing (B) painting  
(C) plating (D) scratching
11. Which layer of soil prevents the minerals from being washed away by water?  
(A) Parent rock (B) Subsoil  
(C) Humus (D) Bed rock
12. Wasp stings can be treated with:  
(A) baking soda (B) vinegar  
(C) washing soda (D) milk of magnesia
13. Galvanization is a method to  
(A) protect the iron metal from corrosion  
(B) extract iron from its ore  
(C) protect food from rancidity  
(D) improve the ductility property of the metal
14. Caustic soda is the common name for:  
(A)  $Mg(OH)_2$  (B) KOH  
(C)  $Ca(OH)_2$  (D) NaOH
15. Which type of silk is most commonly used known as wild silk  
(A) Tassar silk (B) Mussel silk  
(C) Eri silk (D) Muga silk
16. The two gases generally dissolved in water are  
(A)  $H_2$  and  $O_2$  (B)  $H_2$  and  $CO_2$   
(C)  $CO_2$  and  $O_2$  (D)  $Cl_2$  and  $O_2$

## BIOLOGY (PART-C)

*This part contains 8 Multiple Choice Questions number 17 to 24. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.*

17. The main function of the lacteals of intestine is the absorption of  
 (A) Amino acids (B) Glucose and vitamins  
 (C) Lactic acid (D) Fatty acids and glycerol
18. Which of the following pair of teeth are used for chewing and grinding of food?  
 (A) Canines and incisors (B) Molars and premolars  
 (C) Incisors and molars (D) Premolars and canines
19. Blood platelets help in  
 (A) Formation of urine (B) Excretion of urine  
 (C) Sweating (D) Blood clotting
20. When breakdown of glucose occurs with the use of oxygen, it is called  
 (A) Anaerobic respiration (B) Aerobic respiration  
 (C) Regular respiration (D) All of these
21. Given below are some adaptive features of animals:  
 (i) Layer of fat under the skin (ii) Long, curved and sharp claws  
 (iii) Slippery body (iv) Thick white fur  
 Which of them are the adaptive features of a polar bear?  
 (A) (i) only (B) (i) and (ii) only  
 (C) (i), (ii) and (iii) only (D) (i), (ii) and (iv) only
22. Read the following environmental conditions of tropical rain forests:  
 (i) Hot and humid climate (ii) Unequal lengths of day and night  
 (iii) Abundant rain fall (iv) Abundant light and moisture  
 Identify the conditions from the above list that are responsible for the presence of large number of plants and animals in tropical rain forests.  
 (A) (i) and (ii) (B) (i) and (iii)  
 (C) (i), (iii) and (iv) (D) (ii) and (iv)
23. Which is the characteristic feature of tropical rainforests?  
 (A) Hot and humid climate (B) Enormous number and variety of animals  
 (C) Competition for food and shelter (D) All of these
24. Digestion starts from mouth. Choose the correct statement.  
 (A) Glucose is converted in maltose (B) Starch is converted in maltose  
 (C) Fat is converted into maltose (D) Proteins are converted into maltose

## PHYSICS (PART-D)

*This part contains 2 Multiple Choice Multi Correct Type Questions number 25 to 26. Each question has 4 choices (A), (B), (C) and (D), out of which ONE OR MORE THAN ONE is/are correct.*

25. Which of the following always diverge light rays?  
 (A) concave lens (B) concave mirror  
 (C) convex lens (D) convex mirror

26. The image of our face in a plane mirror is/are  
(A) virtual (B) same size  
(C) diminished (D) none of these

## CHEMISTRY (PART-E)

*This part contains 2 Multiple Choice Multi Correct Type Questions number 27 to 28. Each question has 4 choices (A), (B), (C) and (D), out of which ONE OR MORE THAN ONE is/are correct.*

27. The diseases caused by water pollution are  
(A) Cholera (B) Typhoid  
(C) Jaundice (D) Diarrhea
28. Which of the following represents a chemical change?  
(A) Burning of leaves (B) Digestion of food  
(C) Freezing of water (D) Spoiling of food

## BIOLOGY (PART-F)

*This part contains 2 Multiple Choice Multi Correct Type Questions number 29 to 30. Each question has 4 choices (A), (B), (C) and (D), out of which ONE OR MORE THAN ONE is/are correct.*

29. Circulatory system in human includes  
(A) Arteries (B) Veins  
(C) Capillaries (D) Lungs
30. Accumulation or increase in concentration of which gases in blood leads to suffocation.  
(A) Oxygen (B) Nitrogen  
(C) Carbon dioxide (D) Carbon monoxide

## Section - II

**Time: 60 Minutes**

## MATHEMATICS (PART-A)

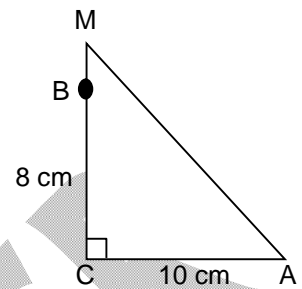
*This part contains 16 Multiple Choice Questions number 31 to 46. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.*

31. The ages of A and B are in the ratio 3 : 8, six years hence, their ages will be in the ratio 4 : 9. The present age of A is  
(A) 18 years (B) 15 years  
(C) 12 years (D) 21 years

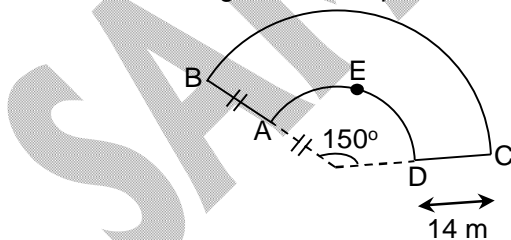
32. On increasing the salary of a man by 25%, it becomes Rs 20000. What was his original salary?  
 (A) Rs 15000 (B) Rs 16000  
 (C) Rs 18000 (D) Rs 25000

33. In the right-angle triangle shown in figure.  $MB + MA = BC + AC$ .  
 If  $BC = 8$  cm and  $AC = 10$  cm, then the value of  $MB$  is

- (A)  $\frac{10}{3}$  cm (B)  $\frac{8}{3}$  cm  
 (C)  $\frac{40}{13}$  cm (D) 10 cm

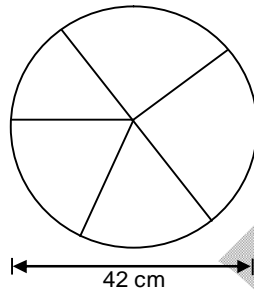


34. In an arranged discrete series in which total number of observations  $n$  is even, median is  
 (A)  $\frac{n}{2}$  th item (B)  $\left(\frac{n}{2} + 1\right)$  th item  
 (C) The mean of  $\frac{n}{2}$  th and  $\left(\frac{n}{2} + 1\right)$  th item (D) none of these
35. The sum of three numbers is 98. If the ratio of first to second is 2 : 3 and that of second to third is 5 : 8, then the second number is  
 (A) 20 (B) 30  
 (C) 48 (D) 58
36. If two angles  $a$  and  $b$  form a linear pair and also  $(a - b) = 80$ , find the values of  $a$  and  $b$ .  
 (A)  $130^\circ$  and  $50^\circ$  (B)  $150^\circ$  and  $30^\circ$   
 (C)  $120^\circ$  and  $40^\circ$  (D)  $110^\circ$  and  $50^\circ$
37. A bacterial cell is  $4.6 \times 10^{-7}$  m long. Behind it are tail like flagella, which are  $3.15 \times 10^{-6}$  m long, to allow the bacterium to move. Find the total length of the bacterium.  
 (A)  $3.61 \times 10^{-6}$  m (B)  $7.75 \times 10^{-7}$  m  
 (C)  $3.61 \times 10^{-7}$  m (D)  $7.75 \times 10^{-6}$  m
38. Find the length of the shape ABCDEA in the given figure.



- (A) 110 m (B) 264 m  
 (C) 138 m (D) 292 m
39. A ladder 25m long reaches a window of a building, 20m above the ground, the distance of the foot of the ladder from the building is  
 (A) 15m (B) 20m  
 (C) 30m (D) None

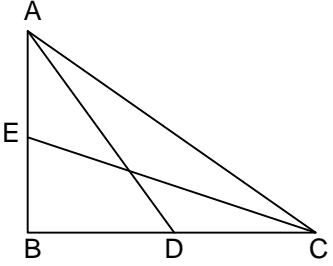
40. Find the value of  $(x^2 + x^{-1})(x^2 - x^{-1})$  for  $x = 5$ .
- (A)  $\frac{15624}{25}$  (B)  $\frac{624}{25}$   
 (C) 600 (D) 1225
41. The mean of five numbers is 27. If one of the numbers is excluded, the mean gets reduced by 2. The excluded number is
- (A) 35 (B) 27  
 (C) 25 (D) 40
42. If a circular pizza of 42 cm diameter is cut into six slices by an inexperienced maker such that the slices are not all equal. If the surface area of the five slices is  $1155 \text{ cm}^2$ , what is the central angle of the remaining sixth slice of that pizza?



- (A)  $30^\circ$  (B)  $60^\circ$   
 (C)  $45^\circ$  (D)  $50^\circ$
43. A bug climbs 3 inches up a tree each day and then slides down the tree 1 inch at night. After 6 days and 5 nights, how many inches will the bug move up from its starting point?
- (A) 14 inches (B) 13 inches  
 (C) 12 inches (D) 11 inches
44. The value of  $x$  in the given figure will be
- (A)  $15^\circ$  (B)  $10^\circ$   
 (C)  $20^\circ$  (D)  $5^\circ$
- 
45. One of the acute angles of a right  $\Delta$  is  $58^\circ$ , then the other acute angle is
- (A)  $60^\circ$  (B)  $20^\circ$   
 (C)  $32^\circ$  (D) None
46. Hamid has 3 boxes of different fruits. Box A weighs  $2\frac{1}{2}$  kg more than box B and box C weighs  $10\frac{1}{4}$  kg more than box B. The total weight of the boxes is  $48\frac{3}{4}$  kg. How many kg does box A weigh?
- (A) 12 kg (B) 13.5 kg  
 (C) 14 kg (D) 14.5 kg

## MATHEMATICS (PART-B)

This part contains **8 Multiple Choice Multi Correct Type Questions** number **47 to 54**. Each question has 4 choices (A), (B), (C) and (D), out of which **MORE THAN ONE** are correct.

47. What is the number of rational numbers present between two Integers on a number line?  
 (A) More than 100 (B) Only 1  
 (C) More than 200 (D) Infinite
48. For a polyhedron having 'F' number of faces, 'V' number of vertices, and 'E' number of edges, what is the value of  $F + V - E$ ?  
 (A) 1 (B) 2  
 (C)  $2^0$  (D)  $4^{\frac{1}{2}}$
49. In an equilateral triangle, the centre of rotational symmetry is the point known as  
 (A) Centroid (B) Orthocentre  
 (C) Circumcentre (D) All of these
50. What is the sum of all the exterior angles formed when each side of the triangle is extended in the order?  
 (A) 2 right angles (B)  $180^\circ$   
 (C)  $360^\circ$  (D) 4 right angles
51. If  $\left(\frac{z}{4} - \frac{3}{5}\right) \div \left(\frac{4}{3} - 7z\right) = \frac{-3}{20}$  then value of z is equal to  
 (A) 0 (B)  $-(2^{-1})$   
 (C)  $\frac{1}{2}$  (D)  $-\frac{1}{2}$
52. In the figure,  $\triangle ABC$  is a right  $\triangle$  and right angle at B. AD & CE are the two medians drawn from A and C respectively. If  $AC = 5$  cm and  $AD = \frac{3\sqrt{5}}{2}$  cm. Then the length of CE will be  
 (A)  $4\sqrt{5}$  cm (B)  $2\sqrt{5}$  cm  
 (C)  $\sqrt{20}$  cm (D)  $\sqrt{80}$  cm
- 
53. The value of a quantity decreases by 20% and again increases by 20%. At the end, by what % does the value of the quantity decrease?  
 (A) 1 (B) Number of single-digit prime numbers  
 (C)  $4^0$  (D) 4
54. The value of  $3\frac{1}{12} - \left[1 + \frac{3}{4} + \left\{2\frac{1}{2} - \left(1\frac{1}{2} - \frac{1}{3}\right)\right\}\right]$  is  
 (A) 0 (B)  $2^0 - 3^0$   
 (C)  $3^0$  (D)  $4^0$





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**ANSWER KEY**

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