

## National Level Science Talent Search Examination

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### CLASS VIII

Please fill the following details immediately

Name \_\_\_\_\_

Hall Ticket No.\_\_\_\_\_

**Questions : 60**

**Time : 60 minutes**

#### INSTRUCTIONS

**Read all instructions carefully before attempting any question.**

- Ensure that the 'Class' printed here and inside, is the same as the test you are appearing for.
- You must complete the paper within the time allotted.
- Do not open this question paper until you are permitted to.
- You are not allowed to use a calculator.
- Figures herein are not to scale. Hence, you cannot depend on the estimate of size or measurement. Use your knowledge of the subject.
- Rough work shall be carried out only in the space provided for the same throughout this booklet. No separate sheets are allowed for the same.
- Return your answer sheet to the invigilator soon after completion and before leaving the examination hall. Take the question paper with you.
- There is no negative marking.
- Results would be made available on [www.unifiedcouncil.com](http://www.unifiedcouncil.com)

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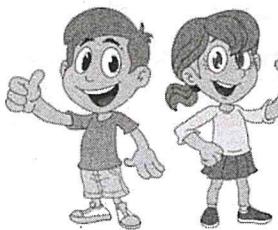
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**UCN/QP-VIII/02**



Dear student,

Ready for the test? Take a deep breath and relax. Don't forget to read the questions very carefully. Some questions that look tough, will be quite easy after you have read them properly. Do not spend too much time on any question. Go to the next question and later come back to the ones you felt were tough. Be cool, give your best and have fun. Good luck!

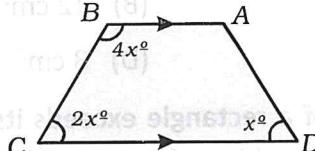
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(Space for Rough Work)

01  $\pi$  is a \_\_\_\_\_ number.

- (A) Rational      (B) Whole  
(C) Natural      (D) Irrational

02 In the given figure, ABCD is a trapezium. Find the value of  $\angle BAD$ .



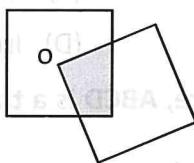
- (A)  $30^\circ$  (B)  $40^\circ$  (C)  $60^\circ$  (D)  $150^\circ$

03 If  $\frac{6x+7}{3x+2} = \frac{4x+5}{2x+3}$  then  $x = \underline{\hspace{2cm}}$

- (A)  $-\frac{7}{9}$  (B)  $-1$  (C)  $-\frac{11}{9}$  (D)  $-\frac{11}{7}$

SPACE FOR ROUGH WORK

- 04 Shown below are two congruent squares of  $24 \text{ cm}^2$  area each. If 'O' is the centre of one square, then area of shaded region is \_\_\_\_\_



- (A)  $18 \text{ cm}^2$       (B)  $12 \text{ cm}^2$   
(C)  $6 \text{ cm}^2$       (D)  $8 \text{ cm}^2$

- 05 The length of a rectangle exceeds its breadth by 9 cm. If the length and breadth are each increased by 3 cm, the area of the new rectangle will be  $84 \text{ cm}^2$  more than that of the given rectangle. Find the length of the given rectangle.

- (A) 9 cm      (B) 13 cm  
(C) 17 cm      (D) 19 cm

SPACE FOR ROUGH WORK

**06** If  $(x + 1)$  is a factor of  $x^4 + (p - 3)x^3 - (3p - 5)x^2 + (2p - 9)x + 6$ , what is the value of  $p$ ?

- (A) 1      (B) 2      (C) 3      (D) 4

**07** If  $2^a + 3^b = 17$  &  $2^{a+1} - 3^{b+1} = -11$  then the values of  $a$  &  $b$  respectively are

- (A) -2 & 3      (B) 2 & -3  
(C) 2 & 3      (D) 3 & 2

**08** 
$$\left( \frac{x^{-1} + y^{-1}}{x^{-1}} \right)^{-1} - \left( \frac{x^{-1} - y^{-1}}{x^{-1}} \right)^{-1} =$$

(A)  $\frac{2y^2}{y^2 - x^2}$       (B)  $\frac{2xy}{x^2 - y^2}$   
(C)  $\frac{2x^2}{x^2 + y^2}$       (D)  $\frac{2y^2}{x + y^2}$

SPACE FOR ROUGH WORK

**[09]** Find the cost of painting the four walls of a room 10 metres long, 5 metres broad and 6 metres high at the cost of ₹ 4 per square metre.

- (A) ₹ 720      (B) ₹ 880  
 (C) ₹ 360      (D) ₹ 1200

**[10]** If  $4(4x)^7 = 4^{6^2}$ , then what is the value of  $x$  ?

- (A) 5      (B) 25      (C) 64      (D) 256

$$\frac{3(4+2m^2-m)-6(3m^2+m+2)}{2(2m-3)+3(m+2)}=?$$

- (A)  $\frac{3(3m+4)}{7}$       (B)  $\frac{3(4m+3)}{7}$   
 (C)  $\frac{3(3m-4)}{7}$       (D)  $\frac{-3(4m+3)}{7}$

SPACE FOR ROUGH WORK

12. ₹ 207 divided among three friends A, B and C in the

ratio  $\frac{1}{6} : \frac{1}{4} : \frac{1}{3}$ . then B's share = \_\_\_\_\_

- (A) ₹ 46      (B) ₹ 92      (C) ₹ 138      (D) ₹ 69

13. Identify the greatest among the options.

- (A)  $(9)^{100}$       (B)  $(81)^{49}$   
(C)  $(27)^{64}$       (D)  $3^{198}$

14.  $\sqrt[3]{x^2(x^4 + 3y^4)} - y^2(3x^4 + y^4) = ?$

- (A)  $(x+y)$       (B)  $(x-y)$   
(C)  $(x^2 - y^2)$       (D)  $(x^3 - y^3)$

SPACE FOR ROUGH WORK

**15.** If  $x = \frac{a-b}{a+b+c+d} = \frac{b-c}{a+b+c+d} = \frac{c-d}{a+b+c+d} = \frac{d-a}{a+b+c+d}$ ,  
then find  $x^3$ ?

- (A) 1      (B) 8      (C) 0      (D) 27

**16.** If  $p = 24$  then  $\sqrt{p(p^2+3p+3)+1} = ?$

(A) 5      (B) 7      (C) 123      (D) 125

**17.** A solution of 150 litres contains 60% of milk and the rest water. How much water must be added to the above solution such that the resulting mixture contains 50% of water (in Litres) ?

- (A) 60      (B) 80      (C) 20      (D) 30

SPACE FOR ROUGH WORK

- 18** If  $\sqrt{3\sqrt{3\sqrt{3\sqrt{3\sqrt{3}}}}} = 3^n$ , find the value of n.
- (A)  $\frac{11}{24}$  (B)  $\frac{15}{16}$  (C)  $\frac{63}{64}$  (D)  $\frac{31}{32}$
- 19** A number consists of two digits. The digit in the ten's place exceeds the digit in the unit's place by 4. The sum of the digits is  $\frac{1}{7}$  of the number. The number is :
- (A) 62 (B) 73 (C) 95 (D) 84
- 20** In a division sum, the divisor is 12 times the quotient and 5 times the remainder. If the remainder is 48, what is the dividend ?
- (A) 240 (B) 576 (C) 4800 (D) 4848

SPACE FOR ROUGH WORK

- 21** The difference between the compound interest and the simple interest on a certain sum of money for 2 years at 11% per annum is ₹ 363. Find the sum.
- (A) ₹ 33,000      (B) ₹ 31,000  
(C) ₹ 30,000      (D) ₹ 32,000
- 22** The speed of a metro train is 54 km/hr excluding stoppage time and including stoppage, the speed is 45 km/hr then for how many minutes does it stop per hour ?
- (A) 9      (B) 10      (C) 20      (D) 11
- 23** The volume of a cubical box is 13.824 cubic metres. Find the length of each side of the box.
- (A) 2.4 m      (B) 2.6 m  
(C) 1.4 m      (D) 1.6 m

**SPACE FOR ROUGH WORK**

**24**

$$\frac{(126)^{\frac{1}{2}} (63)^{\frac{1}{2}} (45)^{\frac{1}{2}}}{(147)^{\frac{1}{2}} (243)^{\frac{1}{2}}} = \underline{\hspace{2cm}}$$

(A)  $2^{\frac{1}{2}}$

(B)  $10^{\frac{1}{2}}$

(C)  $5^{\frac{1}{2}}$

(D)  $7^{\frac{1}{2}}$

**25**

**Square root of sum of cubes of first 10 natural numbers**

is \_\_\_\_\_

(A) 45

(B) 50

(C) 55

(D) 100

**SPACE FOR Rough work**

Q. 5. Edge of the surface piecewise type

which is a part of right prism is \_\_\_\_\_ (A)

an outside excess is \_\_\_\_\_ (B)

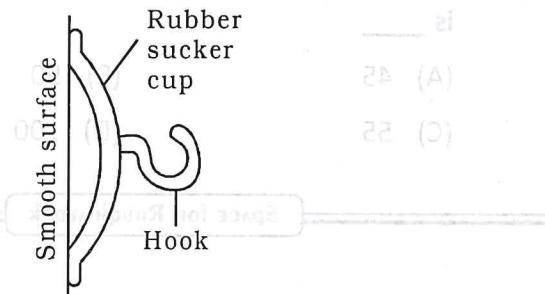
edge is selected by the middle (C)

(D) None (A) (B) (C)

**26** Which of the following does not produce a sound ?

- (A) A bell ringing under water.
- (B) A gun fired in a room with no echoes
- (C) A hammer hitting a block of rubber.
- (D) An explosion in outer space.

**27** A rubber sucker is shown below.



It sticks to the surface because the

- (A) air outside the cup is at higher pressure.
- (B) air outside exerts a force on the cup.
- (C) cup is sucked by the air inside.
- (D) both (A) and (B)

SPACE FOR Rough work

- 28 A wooden block was pushed across different surfaces using the same force. The table below shows the distance moved by the wooden block on each surface. Which surface produced the most frictional force ?

Surfaces	Distance moved by block (cm)
(A) Sand paper	11
(B) Silk	24
(C) Smearred with oil	28
(D) Carpet	19

- 29 Which of the following does not conduct electricity ?
- (A) CuSO<sub>4</sub> Solution (B) Graphite  
(C) Acidified water (D) Solid NaCl
- 30 How many characters or dot patterns are there in a Braille system ?
- (A) 23 (B) 46  
(C) 63 (D) 86
- 31 Identify the similarity and difference between a low-pitch sound and a high-pitch sound produced by the same instrument.

Similarity	Difference
(A) Speed	Frequency
(B) Wavelength	Frequency
(C) Frequency	Wavelength
(D) Frequency	Speed

**32] Which of the following belongs to electro-static force ?**

- (A) Two planets attract one another.
- (B) Two surfaces rub against each other.
- (C) A field pattern is formed when iron fillings are sprinkled around a magnet.
- (D) A plastic ruler attracts tiny pieces of paper after rubbing with a woollen cloth.

**33] Which of the following combinations is possible ?**

	Charge P	Charge Q	Effect
(A)	Positive	Positive	Attraction
(B)	Positive	Negative	Attraction
(C)	Negative	Negative	Attraction
(D)	Negative	Positive	Repulsion

**34] Which electrolyte would you use for electro-plating an iron nail with copper metal ?**

- (A) Copper oxide
- (B) Iron sulphate
- (C) Iron nitrate
- (D) Copper sulphate

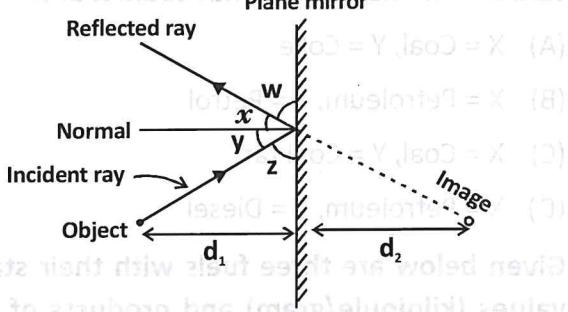
**SPACE FOR ROUGH WORK**

Difference	Similarity
Friction	Speed
Resistance	Wavelength
Wavelength	Frequency
Speed	Friction

- 35 An image of an object is formed in a plane mirror as shown below.

topup\_boroune and a pinky supersetence X and Y are

cliche-dnci wemperale Wrist coung X and Y per 5



Identify the correct option.

	Distance	Angle
(A)	$d_1$ is equal to $d_2$	$x \neq y$
(B)	$d_1$ is greater than $d_2$	$x \neq y$
(C)	$d_1$ is equal to $d_2$	$w = z$
(D)	$d_1$ is lesser than $d_2$	$w = z$

SPACE FOR ROUGH WORK

**36.** When X is heated in the absence of air, Y is formed. Y is tough, porous and a black substance. X and Y are carbon-rich materials. What could X and Y be ?

- (A) X = Coal, Y = Coke
- (B) X = Petroleum, Y = Petrol
- (C) X = Coal, Y = Coal tar
- (D) X = Petroleum, Y = Diesel

**37.** Given below are three fuels with their state, calorific values (kilojoule/gram) and products of combustion respectively.

P : Solid, 33,  $\text{CO}_2$  and forms solid residue.

Q : Liquid, 48,  $\text{CO}_2$  and no residue is formed.

R : Gas, 150, Explodes forming steam and no residue is formed.

Which one of the three fuels is most ideal ?

- (A) Fuel R
- (B) Fuel P
- (C) Fuel Q
- (D) Fuels P and R

SPACE FOR ROUGH WORK

- 38** What is the common product (gas) formed when zinc reacts separately with a dilute acid and a dilute base ?
- (A) Hydrogen (B) Oxygen (C) Carbon dioxide (D) Nitrogen
- 39** A polyester fabric should not be ironed with a hot iron because
- (A) it is a waste of electricity. (B) it will melt.
- (C) it will catch fire. (D) it will lose its colour.
- 40** Wood or coal when burnt in air release X particles into the atmosphere and when inhaled by humans cause a disease Y. What are X and Y ?
- (A) Burnt carbon, respiratory disease. (B) Burnt carbon, nervous disease.
- (C) Unburnt carbon, respiratory disease. (D) Unburnt carbon, nervous disease.

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**SPACE FOR ROUGH WORK**

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**41** In the oil wells, natural gas forms the top most layer, followed by oil and finally water. This is because

- (A) oil and gas are heavier than water. (A)
- (B) gas and oil are lighter than water. (D)
- (C) oil and gas stick to each other. (3)
- (D) none of these. (B)

**42** A student burnt the given fibres one by one with a match stick and observed the following.

- |           |               |              |
|-----------|---------------|--------------|
| I - Nylon | II - Wool     | III - Cotton |
| IV - Silk | V - Polyester |              |

Which statement is true ?

- (A) II and III burn to form a residue. (A)
- (B) I and V melt on burning. (B)
- (C) II and IV burn with smell of burning hair. (8)
- (D) All of the above. (D)

SPACE FOR ROUGH WORK

**43] Which of the given statements is not true ?**

- (A) Among all the naturally occurring elements, around eighty percent are metals. (A)
- (B) Non-metals are more abundant than metals.
- (C) Sodium and potassium are soft like wax. (D)
- (D) Bromine is a reddish brown liquid at room temperature.

**44] A good fuel has ignition temperature and calorific value that are respectively**

- (A) low and high. (B) low and low.
- (C) high and high. (D) high and low.

**45] Which metal does not react with dilute hydrochloric acid to produce hydrogen gas ?**

- (A) Iron (B) Zinc
- (C) Copper (D) Magnesium

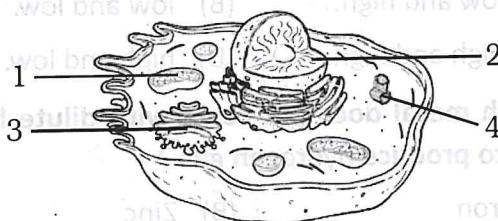
**SPACE FOR ROUGH WORK**

*Show Handwriting*

**46** When can you say an animal is extinct ?

- (A) when it is in its habitat.
- (B) when it is hiding.
- (C) when there are only a few left in the world.
- (D) when it is no longer living.

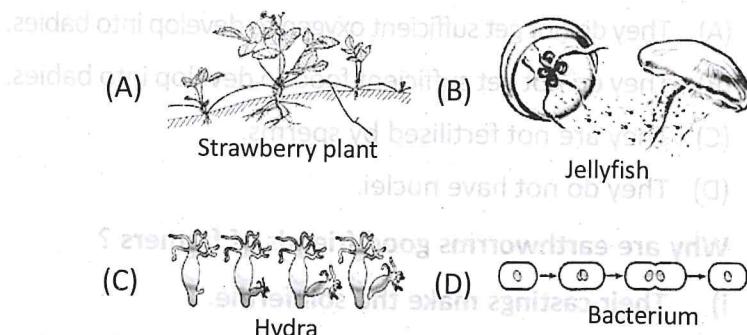
**47** The diagram shows a cell. Which structure should be labelled the nucleus ?



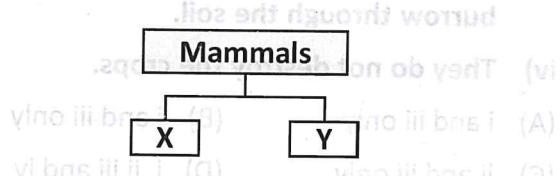
- (A) 1
- (B) 2
- (C) 3
- (D) 4

SPACE FOR Rough work

**48** Which diagram is the best example of an organism undergoing sexual reproduction ?



**49** There are many kinds of mammals. They can be classified in different ways.



Study the chart above. Which of the following can sub-headings X and Y be ?

	X	Y
(A)	External fertilisation	Internal fertilisation
(B)	Reproduce by giving birth to young alive	Reproduce by laying eggs
(C)	One cell	Many cells
(D)	Sexual reproduction	Asexual reproduction

**50** Usually an egg is released from a female reproductive system every month. However, why do most of the eggs not develop into babies ?

- (A) They do not get sufficient oxygen to develop into babies.
- (B) They do not get sufficient food to develop into babies.
- (C) They are not fertilised by sperms.
- (D) They do not have nuclei.

**51** Why are earthworms good friends of farmers ?

- i) Their castings make the soil fertile.
  - ii) They help to drain and aerate the soil when they make tunnels in the soil.
  - iii) They loosen and mix the soil evenly when they burrow through the soil.
  - iv) They do not destroy the crops.
- (A) i and iii only
  - (B) i and iii only
  - (C) ii and iii only
  - (D) i, ii, iii and iv

SPACE for Rough work

Y	X
Unfertilized eggs	Eggs
Reproduction by laying eggs	Reproduction by laying eggs
Offspring of adult size	Offspring of adult size
Muscular cell	Ova cell
Asexual reproduction	Sexual reproduction

52 A bag made of a special material allows oxygen gas but not other gases or air pollutants to pass through it. What can you conclude from the information given ?

- (A) The bag is made from nylon.
- (B) The bag is made from polyester.
- (C) The bag is made partially permeable cell membrane.
- (D) The bag is waterproof.

53 What is the basic unit of life ?

- (A) Tissue
- (B) Cell
- (C) Organ
- (D) System

54 A scientist observes a cell that has cell wall, no nucleus, and no visible organelles. What kind of cell is the scientist observing ?

- (A) Protist
- (B) Gamete
- (C) Plant cell
- (D) Prokaryote

SPACE FOR Rough work

**55** What are some advantages biotechnology has brought to mankind ?



**SPACE FOR Rough work**

- 56** There are 12 points along line AB, excluding A and B.  
How many line segments can be counted altogether ?





- 57** A, B, C, D, E, F and G are sitting in a row facing North.

**F is to the immediate right of E.**

E is 4<sup>th</sup> to the right of G.

**C is the neighbour of B and D.**

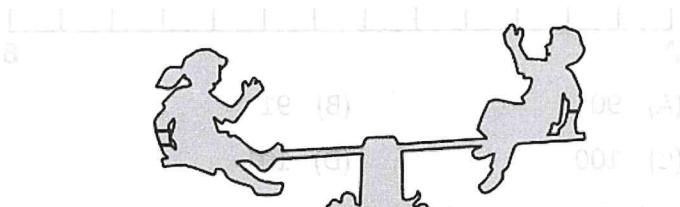
**Person who is third to the left of D is at one of the ends.**

**Which of the following statement is not true ?**

- (A) E is to the immediate left of D
  - (B) A is at one of the ends
  - (C) G is to the immediate left of B
  - (D) F is second to the right of D

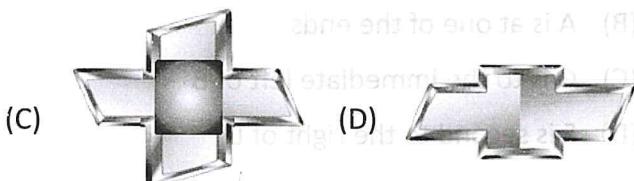
- 58** A cow produces a calf at the beginning of every year. The young cow will become productive and conceive in the fourth year and gives birth to another calf the beginning of every year, starting from the following year. How many cows will there be in the eighth year ?

- 59** The person on the left is lower than the person on the right. What can the person on the right do in order to make the seesaw more level?



- (A) Slide forward
- (B) Sit up straight
- (C) Slide backward
- (D) Lean forward

- 60** Identify the correct logo of Chevrolet company.



**SPACE FOR Rough work**

12 (B)

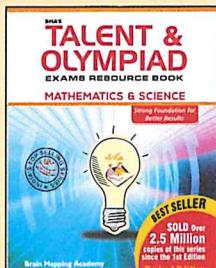
13 (D)

14 (A)

15 (C)

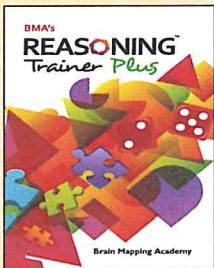
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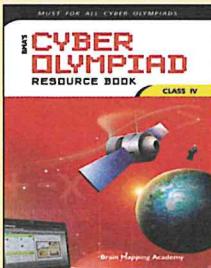
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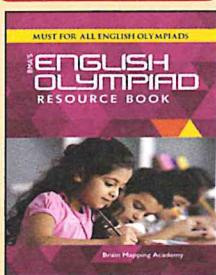
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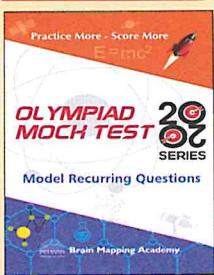
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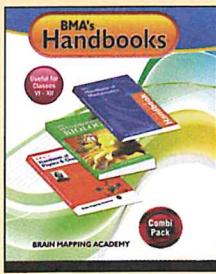
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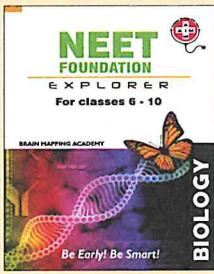
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