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## National Level Science Talent Search Examination

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### CLASS VII

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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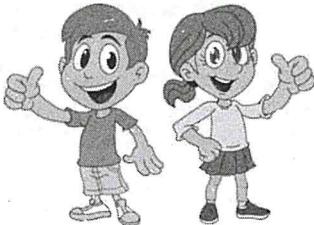
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**PAPER CODE** UN446



UCN/QP-VII/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!*

(Space for Rough Work)

**01** If  $x^{\left(\frac{-p}{q}\right)^{-1}} = \left(\frac{1}{x}\right)^k$  then  $k =$

- (A)  $\frac{p}{q}$       (B)  $-\frac{p}{q}$       (C)  $-\frac{q}{p}$       (D)  $\frac{q}{p}$

**02**  $(-12) \times 6 - (-12) \times 4 \div (-2 \times -12) = ?$

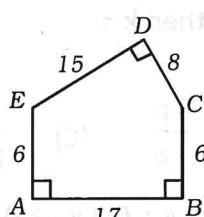
- (A) 1      (B) -70      (C) 120      (D) -120

**03** A piece of string is 40 centimeters long. It is cut into three pieces. The longest piece is 5 cm more than twice as long as the middle-sized and the shortest piece is half of the middle piece. Find the length of the longest piece (in cm)

- (A) 27      (B) 25      (C) 4      (D) 9

SPACE FOR Rough work

**04** Find the area of the following figure.



- (A) 140 units<sup>2</sup>      (B) 162 units<sup>2</sup>  
 (C) 172 units<sup>2</sup>      (D) 200 units<sup>2</sup>

**05** Of the 120 people in the room,  $\frac{3}{5}$ th are women. If  $\frac{2}{3}$ rd of the people are married, what is the maximum number of women in the room who could be unmarried?

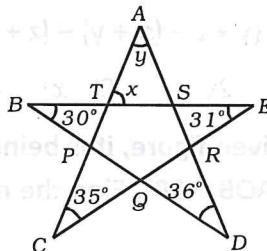
- (A) 40      (B) 20  
 (C) 30      (D) 60

**SPACE FOR Rough work**

**06** A jar contains black and white marbles. If there are ten marbles in the jar, which of the following could not be the ratio of black to white marbles?

- (A) 9:1      (B) 7:3      (C) 1:10      (D) 1:4

**07** Find the angles  $x$  and  $y$  in the following figure.



- (A)  $x = 71^\circ$  and  $y = 61^\circ$   
 (B)  $x = 61^\circ$  and  $y = 71^\circ$   
 (C)  $x = 66^\circ$  and  $y = 48^\circ$   
 (D)  $x = 48^\circ$  and  $y = 66^\circ$

SPACE FOR ROUGH WORK

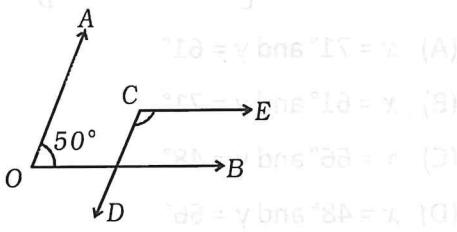
**08** The sum of three expressions is  $x^2 + y^2 + z^2$ . If two of them are  $4x^2 - 5y^2 + z^2$  and  $-3x^2 + 4y^2 + 2z^2$ , find the third expression.

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

**09** Which of the following is equal to  $x + y - [z - x - \{y + z - (x + y) - (z + x - \overline{y + z + x})\}]$

- (A)  $3x$       (B)  $2y$       (C)  $x$       (D)  $0$

**10** In the below given figure, it is being given that  $AO \parallel CD$ ,  $OB \parallel CE$  and  $\angle AOB = 50^\circ$ . Find the measure of  $\angle ECD$ .



- (A)  $50^\circ$       (B)  $90^\circ$   
 (C)  $110^\circ$       (D)  $130^\circ$

SPACE FOR ROUGH WORK

**11** Angles ratio of quadrilateral is 1:2:3:4. What is the size of the greatest angle ?

- (A)  $144^\circ$       (B)  $180^\circ$   
(C)  $160^\circ$       (D)  $170^\circ$

**12**  $(-8) \div 0 = ?$

- (A) -8      (B) 0  
(C) not defined      (D) Any real number

**13** If a piece of cloth  $2\frac{1}{2}$  m long costs ₹ $128\frac{1}{3}$ , then the cost of 1 m cloth is

- (A) ₹ 110      (B) ₹  $\frac{110}{3}$   
(C) ₹  $\frac{140}{3}$       (D) ₹  $\frac{55}{3}$

SPACE FOR ROUGH WORK

- 14**  $7^{20} \times 49^5 \times 343^{-10} =$
- (A)  $7^2$       (B) 7      (C) 1      (D)  $49^2$
- 15** Find the value of  $9^{4.5} : 3^7$ .
- (A) 9 : 1      (B) 3 : 1      (C) 9 : 2      (D) 3 : 2
- 16** If  $P = 3x - 4y - 8z$ ,  $Q = -10y + 7x + 11z$  and  $R = 19z - 6y + 4x$ , find  $P - Q + R$ .
- (A)  $13x - 20y + 16z$       (B) 0  
 (C)  $x + y + z$       (D)  $2x - 4y + 3z$
- 17** Sum of two natural numbers is 30. If one number is one-fifth of other the product of those numbers is
- (A) 200      (B) 216  
 (C) 125      (D) 225

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 SPACE FOR Rough work
 

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- 18** If  $\left(4^{\frac{1}{3}}\right)^{2x+\frac{1}{2}} = \frac{1}{32}$ , find  $x$ .
- (A) -2      (B) 4      (C) -6      (D) -4
- 19**  $(a - 1)(a + 1)(a^2 + 1)(a^4 + 1)(a^8 + 1) = ?$
- (A)  $a^4 - 4$       (B)  $a^8 - 16$   
 (C)  $a^{16} - 1$       (D)  $a^{16} - 16$
- 20** The price of a house increases by 25% after 10 years, reduces by 25% during the subsequent 10 years. If the present cost is ₹ 10 lakh, what will be its cost after 20 years?

- (A) ₹ 937500      (B) ₹ 900000  
 (C) ₹ 850000      (D) ₹ 725000

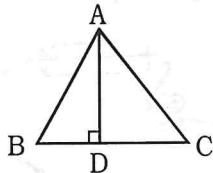
SPACE FOR ROUGH WORK



- 21** A small bottle holds 0.845 kg of sauce. How much sauce will be there in 72 such bottles?
- (A) 60.84 kg      (B) 22.815 kg  
(C) 34.92 kg      (D) 13.095 kg
- 22** Identify the point that always lie in the interior of a triangle.
- (A) Orthocentre and incentre  
(B) Incentre and circumcentre  
(C) Centroid and Orthocentre  
(D) Centroid and Incentre
- 23** Naresh sold two books for ₹ 600 each there by gaining 20% on one book and losing 20% on the other book. Find his overall loss or gain percent.
- (A) 5% loss      (B) 5% gain  
(C) 4% loss      (D) 4% profit

SPACE FOR ROUGH WORK

- [24]** In the adjoining figure find the measure of  $\angle BAC$  if  $\angle ABD = \angle CAD$  and  $\angle BAD = \angle ACD$ .



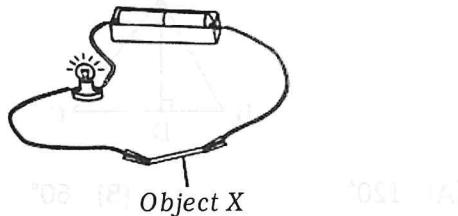
- (A)  $120^\circ$       (B)  $60^\circ$   
(C)  $75^\circ$       (D)  $90^\circ$

- [25]** The fifth part of a number when increased by 5 equals its fourth part decreased by 5. Find the number.

- (A) 80      (B) 100  
(C) 160      (D) 200

**SPACE FOR ROUGH WORK**

- 26** When an object X is connected in the circuit shown below, the bulb lights up.



What can you conclude from this observation ?

- (A) Object X is an electrical insulator.
- (B) Object X is an electrical conductor.
- (C) Electric current does not flow through an open circuit.
- (D) Both (A) and (B)

- 27** Which of the following properties remains constant when a metal rod is heated ?

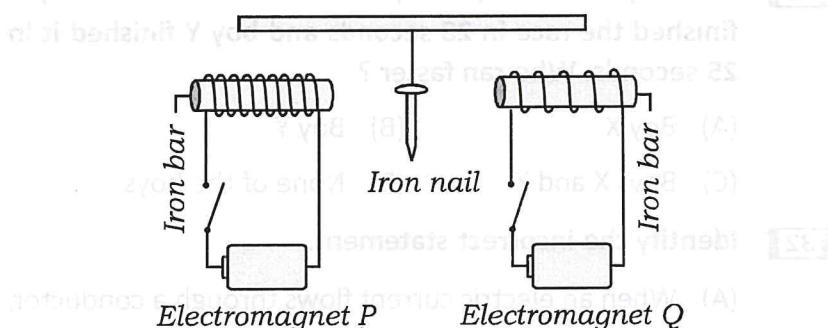
- (A) Length
- (B) Density
- (C) Volume
- (D) Mass

**SPACE FOR ROUGH WORK**

**28** A school bus takes 45 minutes to cover a distance of 18 km. Calculate its speed in km/h.

- (A) 11 km/h      (B) 15 km/h  
(C) 18 km/h      (D) 24 km/h

**29** An iron nail is suspended freely midway between electromagnet P and electromagnet Q as shown.



If both the circuits are closed, what will happen to the iron nail?

- (A) There is no change in the position of iron nail.  
(B) Iron nail moves towards electromagnet Q.  
(C) Iron nail moves towards electromagnet P.  
(D) Both (A) and (B).

SPACE FOR ROUGH WORK

**30** Which of these is an example of contraction ?

- (A) Riveting steel plates together
- (B) Skating on ice
- (C) Sagging of telephone wires
- (D) Drinking through a straw

**31** Two boys X and Y participated in a 200 m race. Boy X finished the race in 20 seconds and boy Y finished it in 25 seconds. Who ran faster ?

- (A) Boy X
- (B) Boy Y
- (C) Boys X and Y
- (D) None of the boys

**32** Identify the incorrect statement.

- (A) When an electric current flows through a conductor, heat is produced.
- (B) Room heater, electric bulb etc, utilize the heating effect of current.
- (C) Electromagnets are used in electric bells and buzzers.
- (D) An electric circuit is a continuous, non-conducting path for flow of electric current.

**SPACE FOR ROUGH WORK**

**33** A metal ball heated to a temperature of  $150^{\circ}\text{ C}$  is placed at a room temperature of  $25^{\circ}\text{ C}$ . At what temperature will it stop radiating heat ?



**34** Which of the following will increase the period of a pendulum?

- (A) Use a heavier pendulum bob.
  - (B) Shorten the length of the pendulum.
  - (C) Swing with a larger angle of oscillation.
  - (D) Use a longer pendulum.

**35** Which one becomes a strongest electro-magnet with the given turns of wire on a coil and flow of current through it?

	<b>Number of turns of wire</b>	<b>Current in wire</b>
(A)	10	0.1 A
(B)	20	0.1 A
(C)	20	0.5 A
(D)	10	0.5 A

#### **SPACE FOR Rough work**

**36** A mixture of five parts of iron filings and three parts of sulphur are strongly heated. Which of the following does not take place ?

- (A) Heat is given off.
- (B) Light is given off.
- (C) A chemical change took place.
- (D) The black residue is attracted to a magnet.

**37** Which substance is used to reduce the acidity in soil ?

- (A) Ammonium sulfate
- (B) Calcium hydroxide
- (C) Sodium chloride
- (D) Calcium nitrate

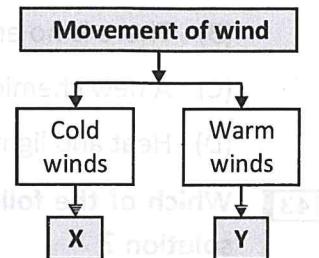
**38** Which of the following is mostly affected by a strong typhoon ?

- (A) Areas along the shores
- (B) Fertile valley
- (C) High mountains
- (D) Wide plateaus

SPACE FOR Rough work

- 39** Identify an exothermic process.
- Melting of ice
  - Evaporation of ethanol
  - Formation of iodine vapour from iodine crystals
  - Condensation of water vapour to form liquid droplets.
- 40** Study the flow chart given below and identify 'X' and 'Y'.

	X	Y
(A)	Lateral	Vertical
(B)	Vertical	Lateral
(C)	Lateral	Lateral
(D)	Vertical	Vertical



**SPACE FOR Rough work**



**41** Which of the following elements burn in oxygen to form an oxide, which when mixed with water, gives an acidic solution with a pH less than 7 ?

- (A) Calcium
- (B) Copper
- (C) Magnesium
- (D) Sulfur

**42** Which of these changes indicate a chemical change ?

- (A) The reaction is reversible.
- (B) There is no energy change.
- (C) A new chemical substance is formed.
- (D) Heat and light are not given off.

**43** Which of the following is true of all acids in aqueous solution ?

- (A) They conduct electricity.
- (B) They turn universal indicator red.
- (C) They react with all metals to give hydrogen gas.
- (D) They react with ammonium salts to give ammonia gas.

SPACE FOR ROUGH WORK

**44** Match the entries in Column-I with those in Column-II.

	Column I		Column II
a	Burning of wood	1	Physical change
b	Formation of days and nights	2	Slow change
c	Curdling of milk	3	Periodic change
d	Melting of ice	4	Chemical change

(A) a-2, b-3, c-4, d-1      (B) a-4, b-3, c-2, d-1

(C) a-4, b-3, c-1, d-2      (D) a-3, b-4, c-2, d-1

**45** Which of the following word equations represents neutralisation ?

(A) Sodium hydroxide + hydrochloric acid → sodium chloride + water

(B) Calcium carbonate → calcium oxide + carbon dioxide

(C) Hydrogen + oxygen → water

(D) Methane + oxygen → carbon dioxide + water

SPACE FOR ROUGH WORK

**46** A rain forest is a very wet place. What helps plants survive there ?

(A) Thick stems that store water

(B) Roots that grow close to the ground

(C) Stems that move around

(D) Large, pointed leaves

**47** Which organism(s) is/are both a predator and a prey in the given food chain ?

Banana → Fruit fly → Frog → Snake → Eagle.

(1) Fruit fly

(2) Frog

(3) Snake

(4) Eagle

(A) 2 only

(B) 2 and 3 only

(C) 1, 2 and 3 only

(D) 1, 2, 3 and 4

**48** Which organisms are most important for adding nutrients to the soil ?

(A) Consumers

(B) Scavengers

(C) Producers

(D) Decomposers

SPACE FOR ROUGH WORK

**49** Study the chart.

It shows that P develops into Q after P undergoes processes S and T. What can P, Q, S and T be ?

	P	Q	S	T
(A)	Flower	Fruit	Fertilisation	Pollination
(B)	Flower	Pollination	Fertilisation	Fruit
(C)	Flower	Fruit	Pollination	Fertilisation
(D)	Seed	Seedling	Fertilisation	Pollination

**50** How will an oxygen molecular travel after it enters the body from the atmosphere ?

- (A) Trachea → bronchus → bronchiole → alveoli
- (B) Bronchus → bronchiole → trachea → alveoli
- (C) Bronchus → trachea → bronchiole → alveoli
- (D) Trachea → bronchus → alveoli → bronchiole

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**SPACE FOR ROUGH WORK**

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**51** What are the products of aerobic and anaerobic respiration in humans ?

	Aerobic respiration			Anaerobic respiration		
	Carbon dioxide	Lactic acid	Water	Carbon dioxide	Lactic acid	Water
(A)	✓	✓	✗	✓	✓	✓
(B)	✓	✗	✓	✓	✓	✓
(C)	✓	✗	✓	✗	✓	✓
(D)	✗	✓	✗	✓	✗	✗

Key: ✓ = is a product

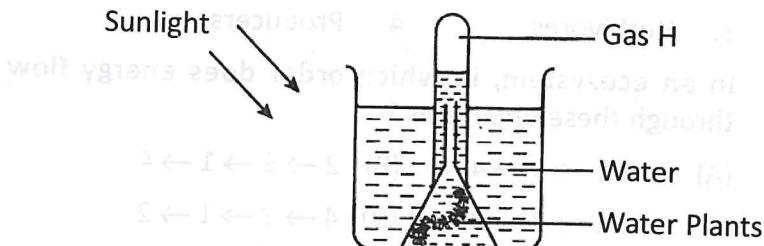
Key: ✓ = is not product

**52** What can we do to prevent landslides on a slope?

- i) Grow more trees on the slope.
  - ii) Grow grass on the slope.
  - iii) Have more cattle grazing on the slope.
  - iv) Stop cutting down trees that have grown healthily on the slope.
- (A) i and ii only      (B) i, ii and iv only  
 (C) iii and iv only      (D) i, iii and iv only

SPACE FOR ROUGH WORK

- 53** Gas H is collected when the set-up below is left for four hours under the sun.



Which of the following statements about Gas H are true ?

- i) It is produced when water plants make food.
  - ii) It can be used to light up a glowing splinter.
  - iii) It turns limewater chalky.
- (A) i and ii only      (B) i and iii only      (C) ii and iii only      (D) i, ii and iii

**SPACE FOR ROUGH WORK**

**54** Four types of organisms are listed.

1. Carnivores
2. Decomposers
3. Herbivores
4. Producers

In an ecosystem, in which order does energy flow through these organisms ?

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

**55** How do penguins keep themselves warm ?

- i) They have a layer of fat or blubber beneath their skin.
  - ii) They have a webbed feet.
  - iii) They huddle together.
  - iv) They have feathers.
- (A) i and iii only      (B) i and iv only  
(C) i, iii and iv only      (D) i, ii, iii and iv

SPACE FOR ROUGH WORK

Class : 7

## **Critical Thinking**

**56** The nine keys to nine padlocks have all been mixed up.

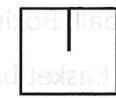
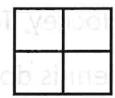
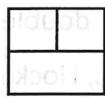
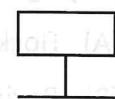
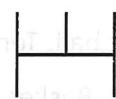
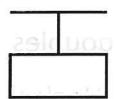
**How many times must you try at the most to match each key to its correct padlock ?**

- (A) 28      (B) 32  
 (C) 36      (D) 38

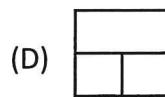
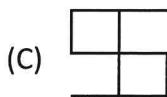
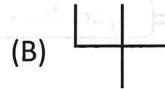
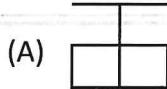
**57** How many times does the digit '5' appear in a book that has 255 pages ?

- (A) 182      (B) 48  
 (C) 66      (D) 52

**58** Identify the last diagram to continue with the logical pattern.

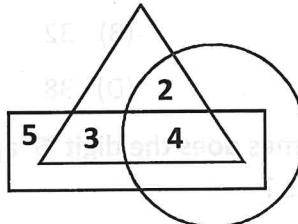


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SPACE FOR Rough work

- 59** In the given figure if triangle represents healthy people, rectangle represents old persons and circle represents men. Then how many men are healthy but not old ?



- (A) 3      (B) 4      (C) 6      (D) 2

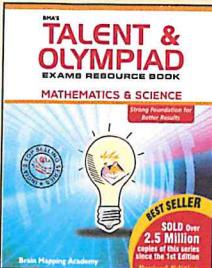
- 60** Starting from the least, arrange these sporting events in increasing order of the number of players in the playing area during a game.

- (A) Hockey, Boxing, Basket ball, Tennis doubles  
 (B) Boxing, Tennis doubles, Basket ball, Hockey  
 (C) Basket ball, Boxing, Hockey, Tennis doubles  
 (D) Boxing, Basket ball, Tennis doubles, Hockey

SPACE FOR ROUGH WORK

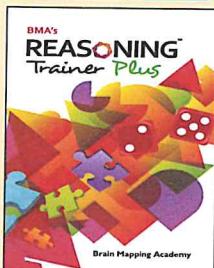
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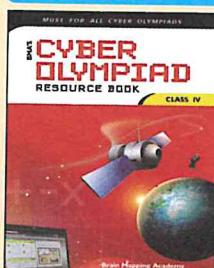
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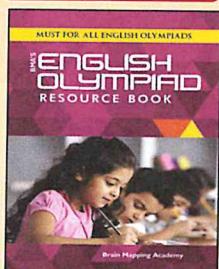
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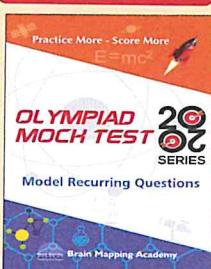
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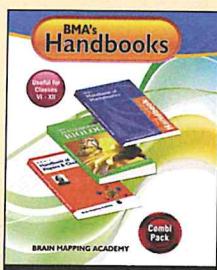
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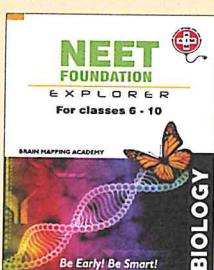
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