

Student's Signature \_\_\_\_\_



# NGSE

**CLASS 8**

Time :  
90 Minutes

**National Genius Search  
Examination<sup>®</sup> : Mains**

Student Name

NGSE Roll No

Test Booklet Code:

### INSTRUCTIONS TO THE CANDIDATE

- 1. DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO.**
- Fill the information required in the answer sheet. Your test may not be evaluated if the required details are not entered on the answer sheet.
- Do not seek clarification on any item in the test booklet from anyone including the test invigilator or the centre supervisor. Use your best judgement.
- This booklet consists of three sections, as given below :
  - Mathematics – 20 Questions
  - Science – 20 Questions
  - General Knowledge – 5 QuestionsIn case of any problem with your test booklet, inform the invigilator immediately. You will be provided with a replacement.
- Each question carries 2 marks.

Questions from 1 to 45 have one or more options right. **To score full marks for each question, bubbles for ALL THE RIGHT ANSWER options should be shaded. Shading one or more WRONG bubble/s make the answer wrong. No marks are given for partial answers.**
- Only **BLACK/BLUE BALL POINT PEN** is to be used for marking answers on OMR sheet. Do not use fountain pens/gel based pens or pencils. Remember that you cannot erase and re-shade the bubbles.
- Use the margin in the test booklet for rough work. No other piece of paper is permitted to be used for rough work.
- NEGATIVE MARKS** are not allotted to any question.
- Failure to follow instructions and examination norms will lead to disqualification.
- Complete the feedback form before you leave the examination hall.

**PLEASE WAIT FOR THE SIGNAL TO OPEN THE TEST BOOKLET**

Open from this side →



## SECTION 1 - MATHEMATICS

**Important Note:** Read the questions carefully and comprehend them correctly before you answer. Questions from 1 to 45 have one or more options right. To score full marks for each question, bubbles for all the right answer options should be shaded. Shading one or more wrong bubble/s make the answer wrong. No marks are given for partial answers.

01. Tony approached Wisden with the homework given by his teacher. It reads as follows

Choose the right statements from the options given:

- (a) Every natural number is a whole number  
 (b) Every whole number is a natural number  
 (c) Every integer is a rational number  
 (d) Every fraction is a rational number

What right answer options would Wisden suggest? Shade the right option

02. Which of the following is not a property of rational numbers?  
 (a) Closure property of addition (b) Commutative property of subtraction  
 (c) Associative property of addition (d) Property of additive inverse

03. One of the student in Vidya's class could not solve the following as she went wrong at one of the steps:

$$\begin{array}{r}
 \hline
 63.037 \\
 \hline
 6 \quad \overline{36} \overline{36} \overline{09} \\
 - 36 \quad \leftarrow \text{(a)} \\
 \hline
 12 \quad 036 \\
 - 36 \quad \leftarrow \text{(b)} \\
 \hline
 24 \quad 000900 \leftarrow \text{(c)} \\
 \quad \quad 888 \\
 \hline
 \quad \quad \quad 12 \leftarrow \text{(d)} \\
 \hline
 \end{array}$$

There are steps marked (a), (b), (c) and (d). Exactly at which step she went wrong?

04. Quana doubled a number and added the same number to the result. Then she has subtracted 15 from it. The result was 33. Choose the correct algebraic representation to help her.

- (a)  $3x - 15 = 33$  (b)  $(2x + x) - 15 = 33$   
 (c)  $(x + x) + x - 15 = 33$  (d)  $3x = (33 - 15)$

05. Wisden gave 4 values 12.5%, 25%, 50% and 100% to Richa and asked her to find the equivalents from the following set of answers. Shade the option/s which are correct.

- (a) 1 : 8, 1 : 4, 1 : 2, 100 : 100 (b) 0.125, 0.25, 0.50, 0.1  
 (c) 1 : 8, 1 : 4, 1 : 2, 1 : 1 (d) 0.125, 0.25, 0.50, 1.00

06. Quana asked Vidya: "In order to find the cube root of a perfect cube by factors, can we follow the following procedure?"

- (a) Obtain the given number  
 (b) Resolve it into prime factors.  
 (c) Group the factors in triples such that all the three factors in each triple are equal

- (d) Find the product of factors obtained in step
- (e) This product is the required cube root.

Vidya said that one of the above steps is wrong. Which step is wrong?

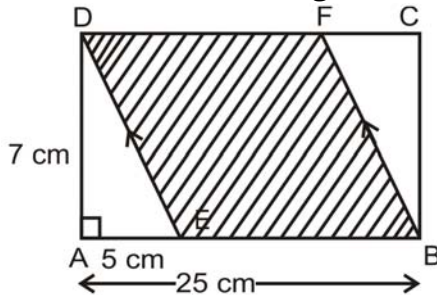
07. Richa was asked by her teacher to check the following solution.

$$\begin{aligned}
 x^3 - 3x^2 + 3x + 7 &= (x^3 - 3x^2 + 3x - 1) + 8 \\
 &= (x - 1)^3 + 2^3 \\
 &= (x - 1) + 2 \{ (x - 1)^2 - (x - 1) \times 2 + 2^2 \} \dots\dots\dots (a) \\
 &= (x - 1 + 2) \{ (x - 1)^2 - 2(x - 1) + 4 \} \dots\dots\dots (b) \\
 &= (x + 1)(x^2 - 2x + 1 - 2x + 2 + 4) \dots\dots\dots (c) \\
 &= (x + 1)(x^2 - 4x + 7) \dots\dots\dots (d)
 \end{aligned}$$

She found a mistake in the solution. Where is the mistake? Choose the option given against the wrong step.

- 08. Wisden bought a toy car where shopkeeper made a profit of 12%. Had it been sold to Wisden for Rs 33 more, the gain would have been 14%. What is the cost price of the toy car?  
 (a) Rs. 1450                      (b) Rs. 1650                      (c) Rs. 1760                      (d) Rs. 2070
- 09. The population of Wisden’s ancestral town was 160000 three years ago. It had increased by 3%, 2.5% and 5% in the last three years. Can you tell us what is the present population of that town?  
 (a) 177366                      (b) 199388                      (c) 222378                      (d) 331254
- 10. A train travelling at 45 kmph crosses a signal post in 22 seconds. It passes the platform in 42 seconds. What is the length of the platform?  
 (a) 525 m                      (b) 250 m                      (c) 275 m                      (d) 145 m

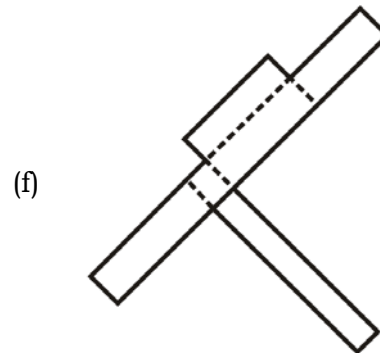
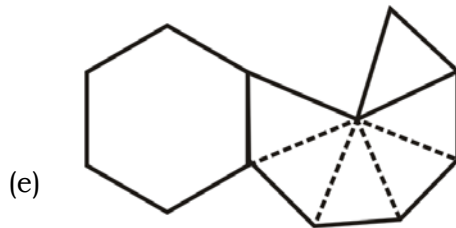
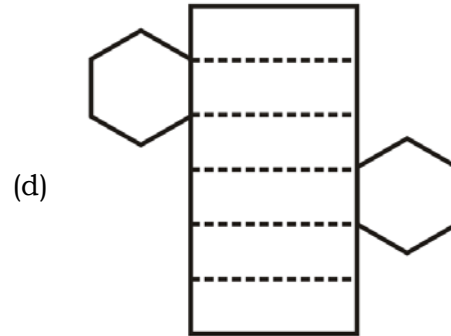
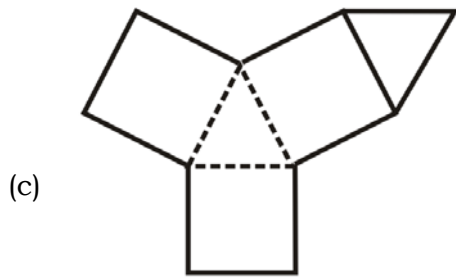
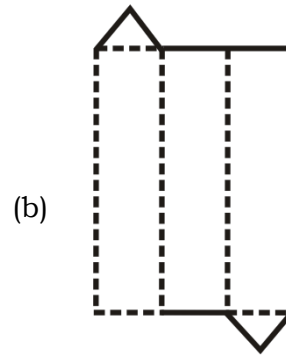
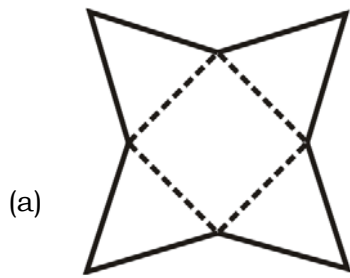
11. Find the area of the shaded regions.



- (a) 120 cm<sup>2</sup>                      (b) 140 cm<sup>2</sup>                      (c) 49 cm<sup>2</sup>                      (d) 280 cm<sup>2</sup>

- 12. The flute gifted by Vidya’s teacher on her birthday is one meter long. It has an outer radius of 11 cm and thickness 1 cm. If the density of flute is 0.025 gram per cubic centimeter, what is the mass of the flute?  
 (a) 125 gram                      (b) 165 gram                      (c) 225 gram                      (d) 330 gram
- 13. Quana and her family went for a picnic. Her dad drove the car at a speed of 30 kmph for the first 30 km. He drove the car with a different speed for the next 90 km. If the average speed of the entire journey is 60 kmph, what is the time taken to complete the journey and the speed for the last 90 km?  
 (a) 2 hours, 85 kmph                      (b) 1 hour, 135 kmph  
 (c) 1 hour, 45 kmph                      (d) 2 hours, 90 kmph

14. Vidya's Mathematics teacher asked her and 5 of her friends to make paper folding nets for various shapes. The paper folding nets they have created is given below.



Name the folding nets as follows.

Shade 'P' for Pyramid with hexagonal base,

'Q' for Cube with square base,

'R' for Prism with rectangular base,

'S' for Pyramid with square base,

'T' for Prism with rectangular base,

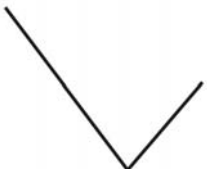
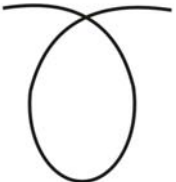
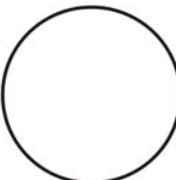
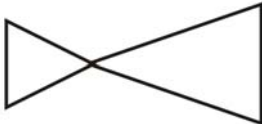

'U' for Prism with square base and

'V' if the name of solid it is not given.

15. Quana's Grandpa has a farm house (scaled down to centimeters) in the shape of a trapezium. The ratio of the length of the parallel sides of the land is 3 : 2. The shortest distance (scaled down to centimeters) between them is 15 cm. If the area of the trapezium is 450 cm<sup>2</sup>. Find the length of the parallel sides.

- (a) 22 cm, 18 cm    (b) 24 cm, 36 cm    (c) 28 cm, 22 cm    (d) 31 cm, 27 cm

16. Match figures with their types. Shade ' U ' if the Figure is not matching with any of the types given.

	Figure		Type
(a)		(P)	Simple closed curve
(b)		(Q)	A closed curve that is not simple
(c)		(R)	Simple curve that is not closed
(d)		(S)	Not a simple curve
(e)		(T)	Line

17. Assume that the telecom companies in Quana's uncle's village are shown in the pie chart with each of their subscription percentage. All the villagers above the age of 18 years has got a cell phone connection. Uninor has 40 subscribers in that village. Choose the right options against each question.



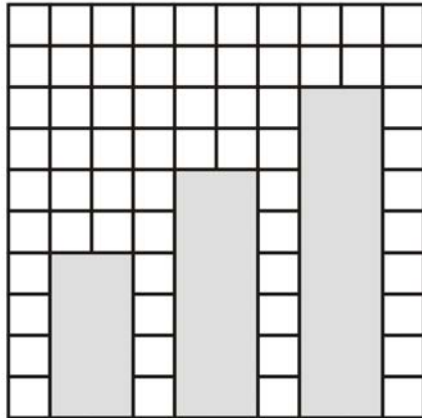
- (a) How many subscribers of age below 21 years are using idea?
- (b) What is the total number of subscribers using Tata Docomo and Vodafone?
- (c) If 10% of idea subscribers port to Uninor what will be the percentage increase in Uninor's subscribers?
- (d) After Uninor gets more subscribers as given in (c), its 20 subscribers have ported to Tata Docomo. What percentage of the cell phone uses are Uninor's subscribers now?

(P) 40                      (Q) 11                      (R) 200                      (S) 9                      (T) Can't say

18. Richa threw a ball up in air ten times. The ball attained different heights and had reached a maximum height of 20 meters, twice. It has reached 12 meters thrice and 18 meters five times.

Which of the following terms can be easily explained using the given data

- (a) Raw data (b) Frequency  
 (c) Histogram (d) Random experiment  
 (e) Probability (f) Event  
 (g) Pie chart
19. The shaded area is what part of the given square?



- (a)  $\frac{12}{25}$  (b)  $\frac{8}{25}$  (c)  $\frac{9}{25}$  (d)  $\frac{16}{25}$
20. Choose the correct statement/s
- (a) A numbering in the form 'abc' is divisible by 9 if  $a + b + c$  is divisible by 9  
 (b) A number is divisible by 3 when the sum of digits is divisible by 3  
 (c)  $10a + b$  is divisible by 3 if  $(a + b)$  is divisible by 3 and  $100a + 10b + c$  is divisible by 3 if  $(a + b + c)$  is divisible by 3  
 (d)  $10a + b$  is divisible by 9 if  $(a + b)$  is divisible by 9 and  $100a + 10b + c$  is divisible by 9 if  $(a + b + c)$  is divisible by 9

### SECTION 2: SCIENCE

21. Wisden accompanied his neighbour to the hospital. The doctor said his neighbour has vitamin D deficiency and suggested him to have cod-liver oil. But the neighbour doesn't like cod-liver oil due to its taste. He replied the doctor that he can have the source that gives cod-liver oil. What among the items listed below is/are the source of cod-liver oil?
- (a) Red meat (b) Mustard (c) Fish (d) Soybean
22. Arrange the following terms in the proper order of their use during crop production.
- (a) Weedicides  
 (b) Seed drill  
 (c) Threshing  
 (d) Tilling  
 (e) Sprinkler system  
 (f) Cattle dung

- (g) Granary
23. During a discussion, Wisden's father said the type of plastic used for making electric switches are not used for making toys. Which of the following thermo plastics is/are used for making toys?  
(a) PVC (b) Polythene (c) Bakelite (d) Melamine
24. Richa could not choose the microbe that reproduce only in the host organism. Help her to choose the right answer from the following list.  
(a) Rhizobium (b) Yeast (c) Virus (d) Protozoan
25. The cut of subsidy given for household LPG cylinders is a matter of discussion among women across the country. They discuss about the practical difficulty and the economics of shifting to alternate fuel. Why CNG and LPG are encouraged to use as fuel though its subsidy is partially removed?  
(a) LPG and CNG has virtually no ash particles left after burning  
(b) CNG is used for power generation and is a cleaner fuel  
(c) They are not fossil derived fuels and are cheap  
(d) LPG can be used directly for burning in homes and factories  
(e) They are used as non-polluting fuels to transport vehicles
26. The website <http://edugreen.teri.res.in> talks about the time taken by various materials to degenerate. Which from the following list degenerate the fastest?  
(a) Plastic Bags (b) Wood articles (c) Metal cans (d) Woolen cloths
27. While delivering speech on Independence Day, Vidya said, as responsible citizens of India, we should be aware of our fundamental duties and fundamental rights. All responsible citizens including children should be aware of the 4 R principle related to environment which we often remember to forget. What is 4 R principle?  
(a) Right to Reduce, Reuse, Recycle and Recover  
(b) Remember to Reuse, Recycle and Recover  
(c) Reserve, Reduce, Recycle and Recover  
(d) Reduce, Reuse, Recycle and Recover
28. Which of the following is malleable?  
(a) Zinc (b) Phosphorus (c) Sulphur (d) Oxygen
29. While Wisden having dinner at Vidya's home, light (electricity) went off. Her mother lighted a candle using match stick. Seeing this, as usual, Wisden has started a lecture on the scientific background of the match stick. Can you tell us what are the chemicals glued to the tip of a modern day match stick? Choose the right option/s.  
(a) Potassium chlorate (b) White Phosphorus  
(c) Potassium chloride (d) Antimony trisulphide
30. Quana's aunt had a test-tube baby as she had problems with her oviducts. Which of the following is/are not correct about test-tube babies?  
(a) During fertilization, the nuclei of the sperm and egg fuse to form zygote  
(b) Fertilization takes place inside the female body  
(c) In vitro fertilization takes place outside the female body  
(d) The zygote groves in to embryo in a test tube



31. What are the terms associated with females?  
 (a) Menarche (b) Menopause (c) Chromosomes (d) Testosterone
32. Wisden and Tony were travelling in a car when they had the first drizzle (light rain) of the monsoon. Immediately after that, on their way, they saw some of the vehicles are skidded out of the road. Wisden's dad, who was driving the car said- 'It is common during the first rain of every monsoon. Thereafter, even if it downpours this won't usually happen.' Can you tell us why this happens during the first rain of the season?  
 (a) Due to sliding friction (b) Due to fluid friction  
 (c) Due to static friction (d) Due to rolling friction

33. Match the following

Column I		Column II	
a	Pole Star	P	Planet
b	Mercury	Q	Solar System
c	Uranus	R	Constellation
d	INSAT	S	Satellite
e	Orion	T	Dwarf Planet
f	Moon	U	Star
g	Sun	V	Asteroid

34. Richa used to wonder why wooden or concrete blocks are laid below the railway tracks perpendicular to the rails. On her way to her village by train she asked her dad about this. What should be his answer?  
 (a) It reduces pressure on the tracks  
 (b) It increases the area of contact with ground  
 (c) It reduces friction on the tracks  
 (d) It helps to hold the wheels of train on tracks.
35. The news paper headline says Municipal authorities are planning to use interlocking tiles on the road where potholes are seen during monsoon. Vidya turned back and asked Wisden that why they should do this. He said interlocking tiles won't get loosened and come out easily. Hence it is used to prevent potholes. Tell us why interlocking tiles won't come out easily.  
 (a) The grip of interlocking tiles is stronger  
 (b) Interlocking tiles requires extra force to remove them  
 (c) Interlocking tiles will have stronger static friction  
 (d) Interlocking tiles have more surface area
36. Vidya learned from her Physics class that human beings cannot hear sounds of frequencies above 20,000Hz. She also learnt from her teacher that dogs can hear sounds as high as 48,000Hz. She tried to develop a whistle that produces more than 25,000Hz to train her dog Sumo not to bark. While doing this, Wisden told her that even human beings below the age of 25 can hear slightly higher frequencies than that is usually audible to people in the middle age and above. Vidya immediately struck with another idea of developing a ring tone of little higher frequency for her phone. Why should she do this? Choose all logically relevant options.

- (a) Sumo can bring her phone every time it rings  
(b) She can present it to her mother on her birthday  
(c) She can carry it to her classroom and the teacher won't hear when it rings  
(d) She can exhibit it in the forthcoming School science exhibition
37. Which of the following is/are associated with earthquakes?  
(a) Seismograph (b) Tsunami (c) Richter Scale (d) Epic center
38. Lateral inversion is associated with  
(a) Regular reflection (b) Reflection of reflected ray  
(c) Incident ray (d) Defused reflection
39. What prevents the mass use of Light Emitting Diodes?  
(a) Inadequate awareness (b) They contain mercury  
(c) High cost (d) They emit less light
40. The loudness of a sound is related to  
(a) The amplitude of sound vibration  
(b) The distance between the successive vibrations in air  
(c) The complexity of the sound waves  
(d) The frequency of vibration

### SECTION 3: GENERAL KNOWLEDGE

41. Prof. Brahma Chellaney, professor of strategic studies at the Center for Policy Research in New Delhi says that the battle of tomorrow between countries will be fought over water.  
What would have prompted him to comment like this?  
(a) Poor water management by various countries  
(b) Scarcity of potable water across the world  
(c) Careless use and wastage of drinking water  
(d) Reduction in the quantity of rainwater year after year
42. A googol is a large number  $10^{100}$ ; that is, the digit 1 followed by 100 zeroes: The term was coined in 1938 by 9-year-old Milton Sirota, nephew of American mathematician Edward Kasner. Kasner popularized the concept in his 1940 book *Mathematics and the Imagination*. A famous internet company has derived its name from the word googol. Which of the following website belongs to the company?  
(a) www.googol.com  
(b) www.facebook.com  
(c) www.microsoft.com  
(d) www.google.com
43. Indian scientist Satyendra Nath Bose (worked with Albert Einstein in the 1920s) made discoveries that led to a kind of particle being named for him.  
It was Peter Higgs, a British physicist, who in the 1960s made advances in the field, resulting the naming of Higgs Boson.  
Do you know what is it popularly called?  
(a) Higgs particle

- (b) God particle
  - (c) Bose particle
  - (d) Good particle
44. Why Koodankulam is in the news for quite long?
- (a) Generation of electricity
  - (b) Extraction of nuclear fuels
  - (c) Anti nuclear protest
  - (d) Nuclear energy conservation
45. Which of the following Mr. Sam Pitroda is/was associated with
- (a) Telecom Revolution
  - (b) National Knowledge Commission
  - (c) National Innovation Council
  - (d) Center for Mathematical Biology

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