NGSF

NGSE

| CLASS **7** | Time : 90 Minutes | **National Genius Search Examination® : 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.**
2. 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.
3. Do not seek clarification on any item in the test booklet from anyone including the test invigilator or the centre supervisor. Use your best judgment.
4. This booklet consists of three sections, as given below :
   a. Mathematics – 20 Questions
   b. Science – 20 Questions
   c. General Knowledge – 5 Questions
   In case of any problem with your test booklet, inform the invigilator immediately. You will be provided with a replacement.
5. 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.**
6. 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.
7. Use the margin in the test booklet for rough work. NO other piece of paper is permitted to be used for rough work.
8. **NEGATIVE MARKS** are not allotted to any question.
9. Failure to follow instructions and examination norms will lead to disqualification.
10. 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: 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. What is the smallest number of the small squares that have to be shaded in order to get at least one axis of symmetry of the figure below?
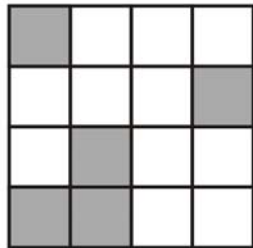
    (a) 5   (b) 4   (c) 3   (d) 2

02. One corner of a cube was cut off. Which of the figure below represents the pattern of the cube after unfolding it?

    (a)   (b)   (c)   (d)
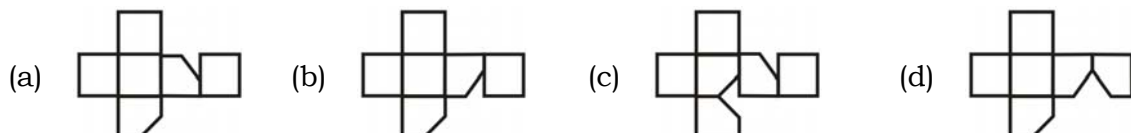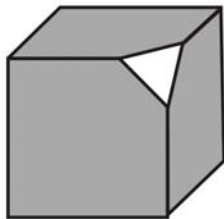
03. Quana called Vidya and said she and Richa were planning to visit Vidya. Vidya's mother was preparing a recipe that has 1/2 cup sugar, 1/2 cup brown sugar, 1/4 cup flour, and 1 egg as ingratiates. Since Quana and Richa were going to her, Vidya told her mother to double the recipe. How much of each ingredient she would need now?
    (a) A: 1 cup sugar, 1 cup brown sugar, 1/2 cup flour, 2 eggs
    (b) B: 2 cup sugar, 2 cup brown sugar, 1 cup flour, 3 eggs
    (c) C: 1 cup sugar, 1 cup brown sugar, 3/4 cup flour, 2 eggs
    (d) D: 2 cup sugar, 2 cup brown sugar, 1/2 cup flour, 2 eggs

04. Wisden deposits Rs. 1900 in his mother's bank account on Monday. He withdraws Rs. 650 on Wednesday and Rs. 1530 on Friday. If his mother's account had Rs. 18222 before the deposit of Rs. 1900 on Monday, what is the current balance in her account?
   (a) Rs. 20122   (b) Rs. 20402   (c) Rs. 17412   (d) Rs. 17942

05. In the NGSE last year (+4) marks were given for every correct answer and (−2) marks were given for every incorrect answer. Vidya answered all the questions and scored good marks though some of her answers were wrong. One of Vidya's

classmate has also answered all the questions and scored (-18) marks and got 12 answers correct. How many incorrect answers were attempted by Vidya's classmate?

(a) 21   (b) 28   (c) 33   (d) 13

06. Division by 10, 100 and 1000 are explained on page No. 52 of Richa's textbook using 31.5 as the example. Richa would like to know what answer she will get if she divides 31.5 by zero. Choose your option.

(a) 31.5   (b) Infinity

(c) Undefined   (d) None of the other options are correct

07. Santa Clause visits Wisden's home to greet them Christmas. He gave a chocolate to Wisden. Thereafter he gave one chocolate to everyone present at his home. Which of the following you should know to calculate the probability of Wisden getting a 'Cadbury Dairy Milk Silk'?

(a) Whether Santa Claus had 'Cadbury Diary Milk Silk' with him

(b) Number of different varieties of chocolates Santa Clause had

(c) Number of persons present at home

(d) Number of Chocolates Santa Clause had

08. Choose the pair/s having unlike terms

(a) $7x, 12y$ (b) $3xy, 3x$ (c) $6xy^2, 9x^2y$ (d) $pq^2, -4pq^2$

09. In the inter school cricket match, Wisden scored the highest number of runs and his partner Tony, the lowest. Wisden's score was 79. If Wisden's score was seven added to twice the lowest runs scored, what was Tony's score?

(a)36   (b) 72   (c) 63   (d) 39

10. The figures (a – f) given below were drawn by students of Vidya's class on the board when their teacher asked them to do so.

Choose the figure / s that is / are wrong.
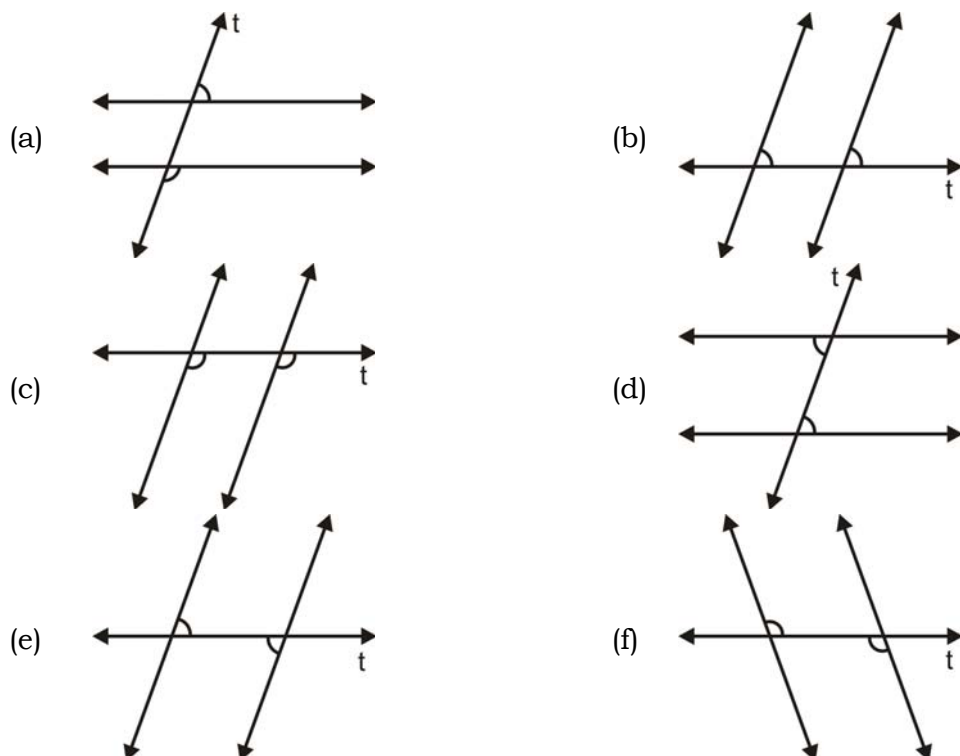
11. Which of the following is the right figure to explain Pythagoras theorem?

(a)

(b)

(c)

(d)
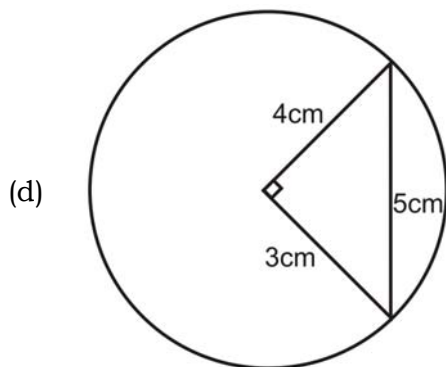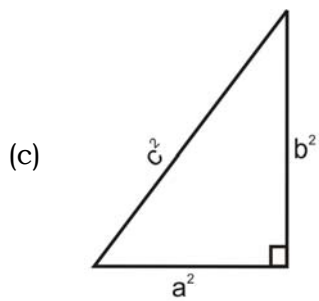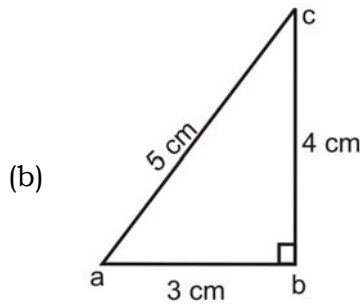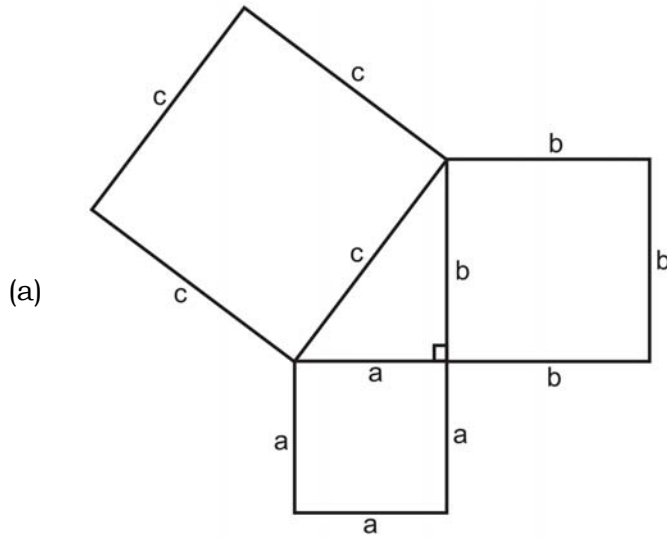
12. Vidya's Garden has a pond in the shape of a parallelogram which has equal sides. If BE is 4 meters and AE is 3 meters as given in the figure, what is the area of the surface of water in the pond?
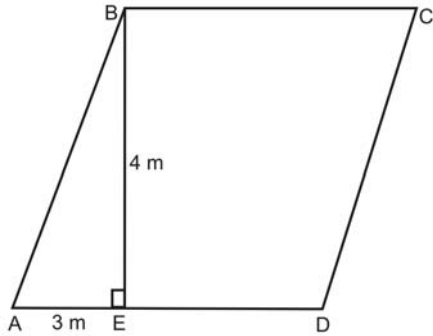
(a) 15 m²   (b) 20 m²   (c) 35 m²   (d) 12 m²

13. As the part of Formative Assessment, Vidya's Teacher asked her students to frame questions that check the clarity of concepts they have learnt. It was Vidya's turn to write such a question on the board. We reproduce her question here:
    Which of the following is an incorrect statement?
    (a) If under a given correspondence, the three sides of one triangle are equal to the three corresponding sides of another triangle, then the triangles are congruent.
    (b) If under a correspondence, two sides and the angle included between them of a triangle are equal to two corresponding sides and the angle included between them of another triangle, then the triangles are congruent.
    (c) If under a correspondence, two angles and the included side of a triangle are equal to two corresponding angles and the included side of another triangle, then the triangles are congruent.
    (d) If under a correspondence, the hypotenuse and one side of a triangle are respectively equal to the hypotenuse and one side of another triangle, then the triangles are congruent.
    Choose the option/s that is/are wrong. Shade 'e' if no statement is wrong. Shade 'f' if all the statements are wrong

14. Choose parallel lines from the figure given below.
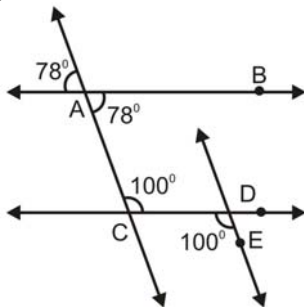
    (a) AC   (b) CD   (c) AB   (d) DE

15. Given figure shows the area of Quana's courtyard which is in the shape of a square with ' O ' as its center. The shaded area is the landscaped meadow. What percent of the courtyard is the meadow?
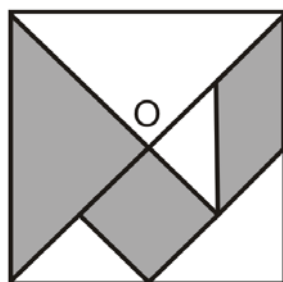
    (a) 75%   (b) 62.5%   (c) 50%   (d) 25%

16. Wisden's farmhouse is 225 m long and 175 m wide. It has two roads in its centre. Both roads are of uniform width of 5 m, one parallel to its length and the other parallel to its breadth. Find the cost of leveling the roads at Rs.25 per square meter.
(a) Rs. 49375   (b) Rs. 1125   (c) Rs. 28125   (d) Rs. 1975

17. The bigger circle you see in the figure is the fenced area inside Wisden's farm house. Out of the two shaded circles, the smaller one is an uncovered bore well. The other shaded circle inside the bigger circle is the pit created by Indian Army to rescue Rohit, a 2 year old boy who has accidently fallen into the bore well. The pit and the bore well has diameters $\frac{3^{th}}{4}$ and $\frac{1^{th}}{4}$ of the diameter of the big circle. Find the area of the shaded portion, if the length of the diameter of the fenced area is 16 cm. (Measurements are scale down to centimeters)
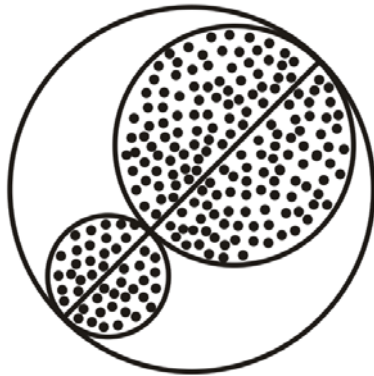
(a) 125 cm²   (b) 163 cm²   (c) 464 cm²   (d) 525 cm²

18. After the class on exponents and powers, Vidya came home thinking what should be 0^0 (zero raised to the power of zero). She called Wisden and asked him what the answer is. What would be the right answer to her question?
(a) Infinity   (b) Undefined   (c) 1   (d) 0

19. The following is the sales data for the year 2006 and 2011 of a FMCG Company owned by Richa's dad. Richa would like to know; in percentage terms, which product mentioned in the chart shows maximum increase in sales from 2006 to 2011?
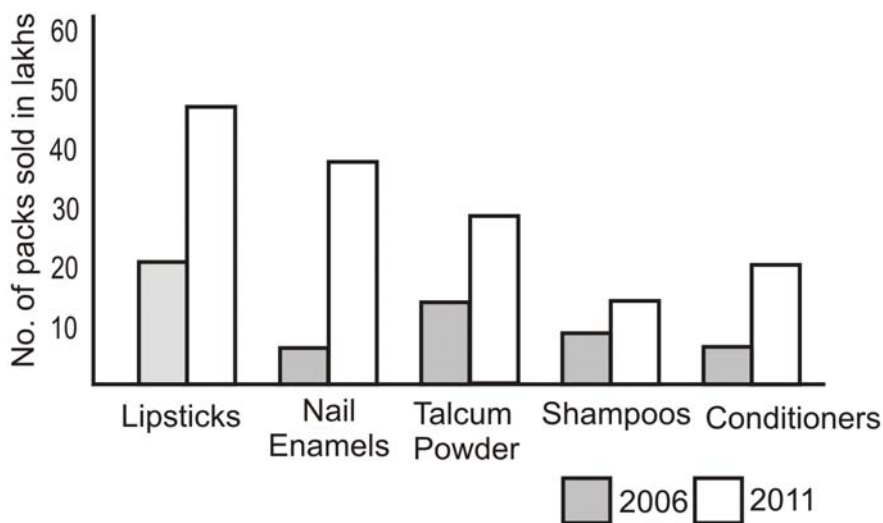
(a) Lipsticks   (b) Nail Enamels   (c) Talcum Powder   (d) Shampoos (e) Conditioners

20. Tony used to buy fruits from his friend's shop. When he went to buy fruits this morning, only 6 varieties of fruits were available at the shop. The quantity available was 32, 41, 28, 54, 35 and 26. What is the mean number of fruits available in the shop?

   (a) 28　　　　　(b) 26　　　　　(c) 32　　　　　(d) 36

SECTION 2: SCIENCE

21. An extract of Vidya's textbook reads as follows:
   'During the process oxygen is released. The carbohydrates ultimately get converted into starch. The presence of starch in leaves indicates the occurrence of photosynthesis.'
   What is starch?

   (a) Protein　　　(b) Carbohydrate　　(c) Chlorophyll　　(d) Pigment

22. Quana saw an animal during her picnic last week. It has the following characteristics:
   (i) It feeds on animals covered by hard shells
   (ii) It pops out its stomach through its mouth to eat animals
   (iii) After taking food, it takes the stomach back to its body
   (iv) It doesn't have blood
   Choose the name of the animal from the options given.

   (a) Octopus　　　(b) Puffer fish　　(c) Turtle　　　(d) Starfish

23. List the following digestive process in proper order of the digestive process.
   (a) Assimilation
   (b) Ingestion
   (c) Gall bladder
   (d) Bile juice
   (e) Egestion
   (f) Starch into sugar

24. It was Sunday morning and Vidya's dad was shaving his beard. She was watching him closely and the movement of the blade. She asked him why shaving is not hurting him. What should be his answer to Vidya? Choose your option/s

   (a) The texture of facial skin is smooth　　(b) Shaving is like shearing
   (c) The uppermost layer of skin is dead　　(d) Skin is adapted to a regular process

25. Quana's teacher asked her class to read certain part of the textbook with full concentration. Then the teacher asked Quana to frame a question on the topic. Here is the question Quana's had framed:
   Which of the following is a protein?
   Choose your answer.

   (a) Sodium chloride　　　　　　(b) Silk Fiber
   (c) Chlorophyll　　　　　　　　(d) Food Vacuole

26. Wisden's mother was down with high fever. She asked him to a buy thermometer that does not use mercury. Which thermometer he should buy from the following?

   (a) Digital thermometer　　　　(b) Clinical thermometer
   (c) Laboratory thermometer　　　(d) Electric thermometer

27. Woolen cloths keep us warm in winter as it is a poor conductor of heat. It has air trapped between the wool fibers which prevent air flow from the body to cold surroundings. So we feel warm.
Vidya feels cold despite wearing a woolen jacket. Choose the best option that can keep her warmer?
(a) ignite campfire
(b) use a blanket over the woolen jacket
(c) use a cap that covers her ears
(d) cover her nose which is sensitive

28. Richa kept a glass of chilled water on her table top. After some time she saw some droplets of water on the outer side of the glass. Why this happens?
(a) Water oozes out like in a clay pot   (b) Moisture in air condenses
(c) Dew drops are formed   (d) Due to evaporation of water

29. Wisden was invited for tea at Vidya's home. He said he prefers boiling tea to hot tea. Vidya's mother said if she pours boiling tea in his glass, the glass will break. Wisden argues a lot. He said 'No'. But, he took a stainless steel spoon from the dining table and put it in his glass. She served the tea and the glass didn't break. Vidya recollected that her glass broke when she poured boiling tea in her glass a few days ago. Vidya asked her mother why the glass didn't break this time.
What is your answer? Choose the right options.
(a) Due to stirring of tea with the spoon
(b) He was sitting below a fan
(c) The water stopped boiling
(d) Spoon absorbed some heat

30. Quana read the topic on 'Acids, Bases and Salts' of her science text book. It says: 'Excessive use of chemical fertilizers makes the soil acidic. Plants do not grow well when the soil is either too acidic or too basic. When the soil is too acidic, it is treated with bases like quick lime (calcium oxide) or slaked lime (calcium hydroxide).'

She got the soil of her garden tested as plants were not showing proper growth. The test result said the soil is basic.
What do you suggest her?
(a) Add dilute acid to the soil   (b) Add cow dung to soil
(c) Add prescribed pesticides to soil   (d) Add small amount of urea to soil

31. Vidya was asked by her teacher to choose the wrong statements from the following statement/s given.
(a) Nitric acid turns red litmus blue
(b) Sodium hydroxide turns blue litmus red
(c) Indicator is a substance which shows different colours in acidic and basic solutions
(d) Tooth decay is caused by the presence of a base

32. Each cell in our body contains an acid, the deoxyribonucleic acid or DNA. It controls every feature of the body such as our looks, colour of our eyes, our height etc. proteins that build part of our cells are also made of amino acids. The fats in our body contain fatty acids.
What does the DNA contain?
(a) Genetic code   (b) Cell organelles   (c) Protoplasm   (d) Indicators

33. Which of the following is / are chemical changes ?
    (a) Photosynthesis
    (b) Dissolving sugar in water
    (c) Burning of coal
    (d) Melting of wax
    (e) Beating aluminum to make aluminum foil
    (f) Digestion of food
    Choose the right option /s

34. Hydrogen burns. Oxygen supports burning. When they combine, water is formed which extinguishes fire. A piece of iron rusts. But when you mix it with soft elements like chromium, nickel and manganese, its physical properties are changed. Which of the following is obtained when you mix iron with chromium, nickel and manganese?
    (a) Magnalium   (b) Rose metal   (c) Stainless steel   (d) Cast iron

35. Choose the place which has hot and dry climate for most part of the year.
    (a) Srinagar   (b) Kochi   (c) Jaipur   (d) Guwahati

36. Law of conservation of energy says that energy cannot be destroyed or created. But the functioning of an ordinary electric bulb and tube light puzzles Tony a lot. Both ordinary electric bulb and the tube light consume 40 watts of electric energy. But tube light gives more light than the electric bulb. Why is it so? Can you answer Tony? Choose the best option.
    (a) The bulb and tube light are different
    (b) The surface area of the tube light is more
    (c) Ordinary bulb is hot as it releases heat
    (d) Tube light is cooler as it does not release heat

37. Some migratory birds travel as much as 15000 km to escape the extreme climatic conditions at home. Generally they fly high where the wind flow is helpful and the cold conditions allow them to disperse the heat generated by their flight muscles. But how these birds travel to the same place year after year is still a mystery. It seems that these birds have a built-in sense of direction and know in which direction to travel. Some birds probably use landmarks to guide them. Many birds may be guided by the sun during the day and stars at night. There is some evidence that birds may use the magnetic field of the earth to find direction.
    It was noticed that just before the tsunami, many animals including birds and dogs moved to the higher ground (hills) to escape. What might have signaled them to move to the higher ground?
    (a) Infrasonic sound pulses created by earthquake
    (b) The disturbance in the magnetic field of the earth
    (c) Unusual change in the direction of the wind
    (d) The rise of water level in the sea due to strong waves

38. A mass of 1 kilogram weighs 1 kilogram weight on earth. It weighs less than 1 kilogram on moon but the mass remains the same. Which of the following you choose to explain this?
    (a) The question is not correct
    (b) Mass of the amount of matter contained in a body
    (c) Weight is the force of gravity acting on the body
    (d) Moon has less force of gravity than earth

39. Vidya, Richa, Quana and Wisden were sitting in a small and closed air conditioned room for more than 10 hours to prepare a science project. Quana wondered that even after sitting in a small room for more than 10 hours how they get enough oxygen to breath. She learnt in her science class that we inhale oxygen and exhale carbon dioxide. What is the best reason you give to clear her doubt? Choose the right option.
    (a) Inhaled air has 21% oxygen
    (b) Exhaled air has more carbon dioxide than oxygen
    (c) Exhaled air has more oxygen than carbon dioxide
    (d) People adapted to air-conditioned environment can manage longer time without oxygen

40. Which of the following is /are associated with blood?
    (a) WBC   (b) RBC   (c) DNA   (d) IVF

SECTION 3 : GENEWRAL KNOWLEDGE

41. What is the most common form of energy on earth?
    (a) Water   (b) Light   (c) Heat   (d) Air

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 Sirotta, 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

END OF QUESTIONS