



भारतीय प्रौद्योगिकी संस्थान कानपुर  
Indian Institute of Technology Kanpur  
Office of Outreach Activities

## Sample Question Paper

1. These days Raj \_\_\_\_\_ up at 6:00 am to go jogging.

- (A) wake
- (B) wakes
- (C) woken
- (D) waking

**Answer: (B) wakes**

2. Shabana, along with her brother, \_\_\_\_\_ going to the vegetable market last evening.

- (A) is
- (B) are
- (C) was
- (D) were

**Answer: (C) was**

3. Right now, the children \_\_\_\_ playing in the park.

- (A) will
- (B) have

- (C)are
- (D)were

**Answer: (C) are**

4. Once there was a farmer. \_\_\_\_\_ farmer was very intelligent.

- (A) The
- (B) A
- (C) An
- (D) Those

**Answer: (A) The**

5. The Royal Bengal tiger has been declared as \_\_\_\_\_ national animal of India.

- (A) this
- (B) a
- (C) an
- (D) the

**Answer: (D) the**

6. A bird may be defined as \_\_\_\_\_ warm-blooded egg-laying animal with feathers and claws.

- (A) the

- (B) a
- (C) an
- (D) this

**Answer: (B) a**

7. Susan could not go to the birthday party \_\_\_\_\_ she was not well.

- (A) however
- (B) therefore
- (C) because
- (D) because of

**Answer: (C) because**

8. Jonathan handles accounts \_\_\_\_\_ logistics for his company.

- (A) but
- (B) beside
- (C) besides
- (D) by

**Answer: (C) besides**

9. I answered all the questions in my exam \_\_\_\_\_ the last one as it was too difficult.

- (A) expect
- (B) except

- (C) accept
- (D) excerpt

**Answer: (B) except**

10. Hema produced an \_\_\_\_\_ movie but it eventually flopped.

- (A) interests
- (B) interest
- (C) interesting
- (D) interested

**Answer: (C) interesting**

11. The Nile is arguably the \_\_\_\_\_ river in the world.

- (A) long
- (B) longer
- (C) longing
- (D) longest

**Answer: (D) longest**

12. I have a splitting headache. I need some \_\_\_\_\_ coffee.

- (A) powerful
- (B) vigorous
- (C) strong

(D) sturdy

**Answer: (C) strong**

13. Bal Gangadhar Tilak is a \_\_\_\_\_ figure in the Indian Freedom Movement.

(A) tall

(B) high

(C) long

(D) wide

**Answer: (A) tall**

14. A kilogram of tomatoes cost 50 rupees last year and now it costs 150 rupees.

So, the price has \_\_\_\_\_ increased over a year.

(A) strongly

(B) shabbily

(C) sharply

(D) safely

**Answer: (C) sharply**

15. The greatest scientific discoveries of the past were often built on the small discoveries made by ordinary people closely working with Nature. We need to recognize the contributions of ordinary people in addition to those of the great scientists.

Which of the following can be inferred from this passage?

- (A) We also need to recognize the contributions of the great scientists.
- (B) We only need to recognize the contributions of the great scientists.
- (C) We only need to recognize the contributions of ordinary people.
- (D) We also need to recognize the contributions of ordinary people.

**Answer: (D) We also need to recognize the contributions of ordinary people.**

16. Jeevan occasionally eats sweets after his dinner.

Which of the following can be inferred from this line?

- (A) Jeevan eats sweets after his dinner at all times.
- (B) Jeevan eats sweets after his dinner at no times.
- (C) Jeevan eats sweets after his dinner at times.
- (D) Jeevan eats sweets after his dinner oftentimes.

**Answer: (C) Jeevan eats sweets after his dinner at times.**

17. Consider the following sentences.

- P. She ran back home and went back to the puddle with a glass container.
- Q. Suma, a Class 2 student, was walking back home on a rainy day.
- R. She brought home the container filled up with the puddle water along with several baby fish.
- S. She saw a puddle near her school and it was full of several baby fish.
- T. After a few weeks, to her surprise, her room was full of frogs.

Choose the correct order of sentences.

- (A) QSPRT
- (B) QPSRT

(C)PQRST

(D)PRQST

**Answer: (A) QSPRT**

18. Consider the following sentences.

P. The temple was built by Rashtrakuta King Krishna in the 8<sup>th</sup> century.

Q. It features a main shrine, halls, pillars and elaborate sculptures.

R. The temple is part of the larger Ellora caves complex.

S. The sculptures depict scenes from the epics of Ramayana and Mahabharata.

T. The World's largest single rock-cut structure is the Kailasa Temple located in Ellora.

Choose the correct order of sentences.

(A)QSPRT

(B)TPSQR

(C)TRPQS

(D)QSRPT

**Answer: (C) TRPQS**

19. According to some scientists, the Earth is currently facing the Sixth Mass Extinction. Unlike the five previous mass extinctions, this one is caused by human intervention. The damage inflicted by humans on the Earth is unfathomable. According to an estimate, more than 500 species of land animals are on the brink of extinction.

Which of the following is closest in meaning to the word 'unfathomable' from the passage?

- (A) inaccessible
- (B) incomprehensible
- (C) inadmissible
- (D) inapplicable

**Answer: (B) incomprehensible**

20. In an imaginary language, VITUNA means 'the cat', BITAL means 'the dog', and VITUNA BITAL MESA means 'The cat bit the dog'. In this language how would the sentence 'The dog bit the cat' be written?

- (A) VITUNA BITAL MESA
- (B) VITUNA MESA BITAL
- (C) BITAL VITUNA MESA
- (D) BITAL MESA VITUNA

**Answer: (C) BITAL VITUNA MESA**

21. If HORSE is coded as OVYZL, how would DONKEY be coded as?

- (A) VYZLO
- (B) KVURLF
- (C) WVGDXR
- (D) DONKEY

**Answer: (B) KVURLF**

22. The average weight of the apples in a bag is 32 grams. A new apple is added to the bag, so that the new average weight of the apples is 35 grams. Which of the following is a possible weight (in grams) of the apple added to the bag?

- (A) 29
- (B) 32
- (C) 34
- (D) 44

**Answer: (D) 44**

23. What is the next number in the sequence: 0, 8, 24, 48, 80, ... ?

- (A) 100
- (B) 120
- (C) 113
- (D) 168

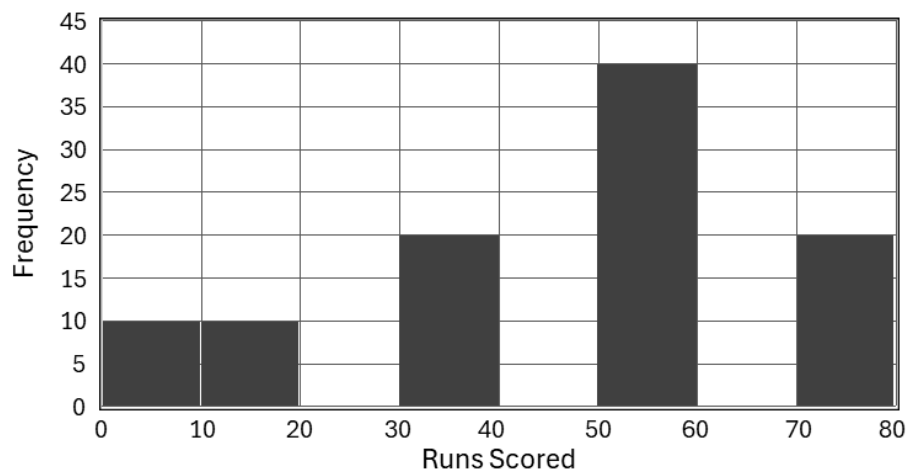
**Answer: (B) 120**

24. When Sushila was 10 years old, her mother was 4 times her age. What would be Sushila's age (in years) when her mother is 48 years old?

- (A) 12
- (B) 28
- (C) 18
- (D) 14

**Answer: (C) 18**

25. Below is a histogram of the runs Smriti scored in her cricketing career. What proportion of times has Smriti scored greater than or equal to 50 runs?



- (A) 0.5
- (B) 0.6
- (C) 0.4
- (D) 0.2

**Answer: (B) 0.6**

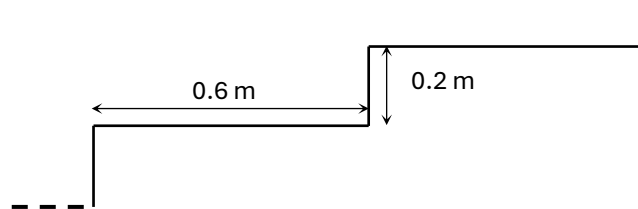
26. A pizza with a radius of 15 cm contains 300 calories. How many calories would a pizza with a radius of 30 cm have, assuming both pizzas are identical in all other aspects?

- (A) 1200

- (B) 1800
- (C) 600
- (D) 800

**Answer: (A) 1200**

27. A staircase is used to connect two storeys of a building. The height (rise) of every step is 0.2 m and the depth (tread) is 0.6 m (see figure below). If the vertical distance between the floors of the two storeys is 4.8 m, how many rises does the staircase have?



- (A) 12
- (B) 24
- (C) 8
- (D) 6

**Answer: (B) 24**

28. Consider a 4-sided fair dice with numbers 1, 2, 3, and 4. In a game, two such dice are rolled and the sum of the numbers that come up is noted. A player must accurately guess this sum to win the game. Which number should the player choose to maximize the probability of winning?

- (A) 4
- (B) 5
- (C) 6
- (D) 7

**Answer: (B) 5**

29. For real numbers  $a$  and  $b$ , which of the following is NOT always true:

(A)  $a^2 + b^2 \geq 2ab$

(B)  $a^2 + b^2 \geq -2ab$

(C)  $\frac{a}{a+b} \leq 1$

(D)  $a^4 \geq 2a^2b^2 - b^4$

**Answer: (C)  $\frac{a}{a+b} \leq 1$**

30. In a “best-of-three” tournament, a maximum of three games are played to determine a winner. However, if a tournament winner is evident at the end of the second game, the third game is not played. Two teams, X and Y, are playing a best-of-three tournament. In any game, both teams have an equal probability of winning the game. Ties are not allowed. Team Y has won the first game of the tournament. What is the probability that Team X wins the tournament?

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

(B)  $\frac{1}{3}$

(C)  $\frac{1}{4}$

(D)  $\frac{1}{5}$

**Answer: (C)  $\frac{1}{4}$**

31. What is the negation of the following sentence: "Every classroom in the school has at least one chair that is broken"?

- (A) All chairs in all classrooms in the school are broken.
- (B) All chairs in all classrooms in the school are not broken.
- (C) Some chairs in some classrooms in the school are not broken.
- (D) At least one classroom in the school has all chairs that are not broken.

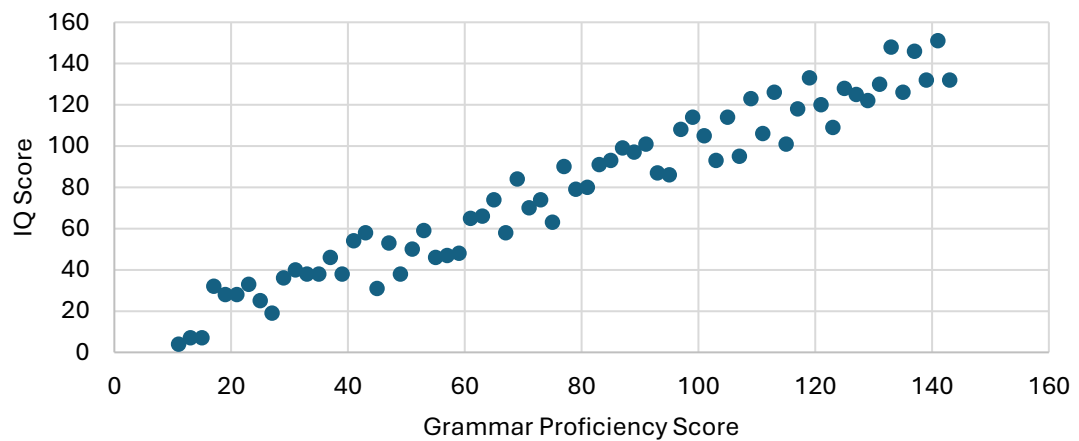
**Answer: (D) At least one classroom in the school has all chairs that are not broken.**

32. Consider a circle of radius 3 cm and a square of side 1 cm. By what factor do we need to reduce the radius of the circle to make the circle perfectly fit inside the square?

- (A) 3
- (B)  $\frac{1}{3}$
- (C) 6
- (D)  $\frac{1}{6}$

**Answer: (C) 6.**

33. The following figure shows a scatterplot of the grammar proficiency scores and the IQ scores of students.



Which of the following is the correct interpretation of the scatterplot?

- (A) Improvement in grammar proficiency causes an improvement in IQ.
- (B) If a student's grammar proficiency is 100, then their IQ must also be 100.
- (C) If a student's grammar proficiency is more than 100, then their IQ must also be more than 100.
- (D) If a student's grammar proficiency is more than 100, then their IQ is expected to be more than 100.

**Answer: (D)** If a student's grammar proficiency is more than 100, then their IQ is expected to be more than 100.

34. Let  $x$  be a real number such that  $x > 1$ . Select the value of  $x$  that satisfies the equation

$$x^2 = \log_3(3^x) + 2 \log_9(3^x)$$

- (A) 2
- (B)  $\sqrt{2}$
- (C)  $\log_3(81)$
- (D)  $\sqrt{\log_3(2)}$

**Answer: (A) 2**

35. Given  $x^2 - y^2 = 31$ , where  $x$  and  $y$  are natural numbers, the value of  $4x + 2y + 6$  is:

- (A) 25
- (B) 50
- (C) 100
- (D) 200

**Answer: (C) 100**

36. A train running at a constant speed crosses a 500 m long bridge and a 2000 m long tunnel in 48 seconds and 168 seconds, respectively. The time (in seconds) it takes to cross a slender signal pole is approximately:

- (A) 2
- (B) 4
- (C) 8
- (D) 16

**Answer: (C) 8**

37. A painter prepares 20 litres of grey colour by mixing white and black liquid colours in the ratio 5:3. However, the colour turns out to be darker than

expected. So, the painter replaces 4 litres of the mix with 4 litres of white colour.  
What is the ratio of the white colour to black colour in the new mix?

- (A) 7:3
- (B) 3:1
- (C) 11:3
- (D) 4:1

**Answer: (A) 7:3**

38. Two sides of a right-angle triangle are  $x$  meters and  $(x + 3)$  meters. If the perimeter of the triangle is  $3(x + 3)$  meters, the area (in square meters) will be:

- (A) 6
- (B) 24
- (C) 54
- (D) 96

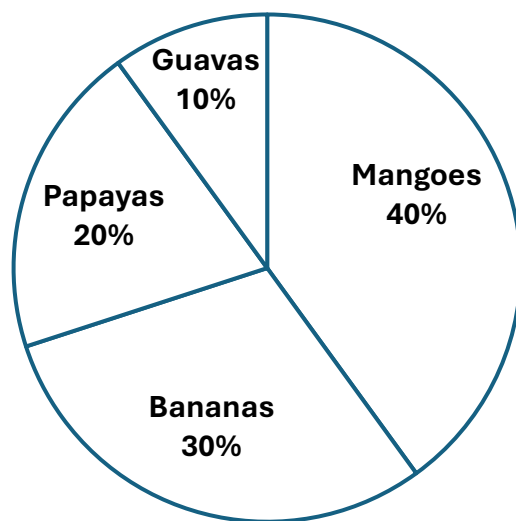
**Answer: (C) 54**

39. The length of a rectangular metal sheet is twice its width and its surface area is  $8\pi^2$ . The sheet is rolled to make a right-circular cylinder. The maximum possible volume enclosed by the cylinder is:

- (A)  $2\pi^2$
- (B)  $4\pi^2$
- (C)  $8\pi^2$
- (D)  $16\pi^2$

**Answer: (C)  $8\pi^2$**

40. The distribution of farmland area to mangoes, bananas, papayas, and guavas is shown in the pie-chart. A new fruit is introduced by diverting equal amount of area from each of the fruit sections. If the area allotted to the new fruit is 10% of the total farm area, what percentage of the guavas' area is allotted to the new fruit?



- (A) 10
- (B) 15
- (C) 20
- (D) 25

**Answer: (D) 25**

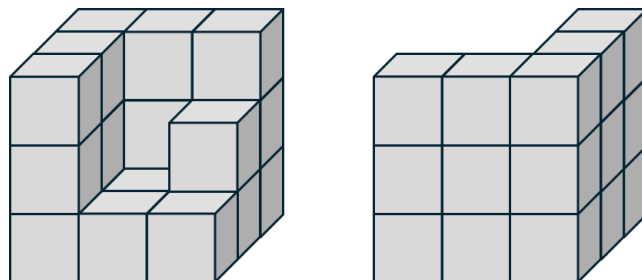
41. The missing number indicated by '?' in the following figure is:

4	81	16
64	?	4
36	4	49

- (A) 25
- (B) 16
- (C) 36
- (D) 9

**Answer: (A) 25**

42. Two views of an object, constructed using cubes weighing 1 gram each, are shown in the following figures.

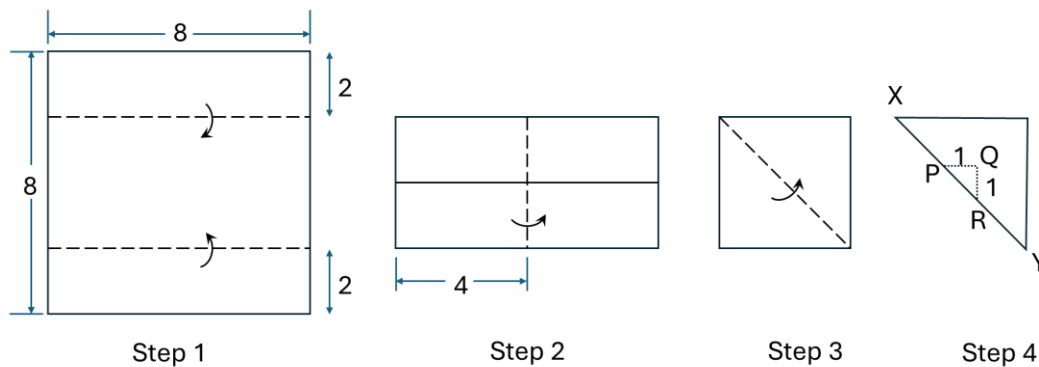


The weight of the object (in grams) is:

- (A) 7
- (B) 20
- (C) 23
- (D) 27

**Answer: (B) 20**

43. A square piece of paper is folded along the dotted lines as shown in the following figures.

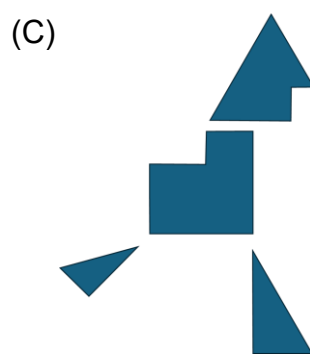
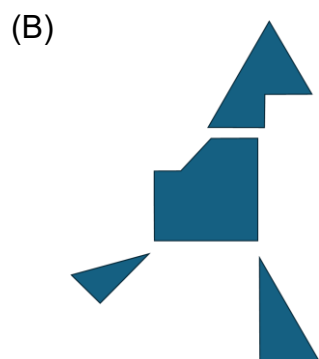
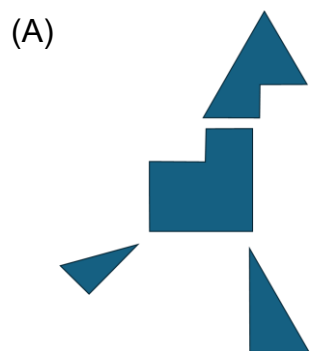


A right-angle triangle PQR, which is symmetrically located on the diagonal XY, i.e.,  $XP=YR$ , is cut out from the folded paper. When the cutout pieces are unfolded, we get \_\_\_\_\_

- (A) 1 triangle, 2 squares, and 3 rectangles.
- (B) 2 rectangles and 4 squares.
- (C) 2 squares and 4 rectangles.
- (D) 2 squares, 2 rectangles, and 2 triangles.

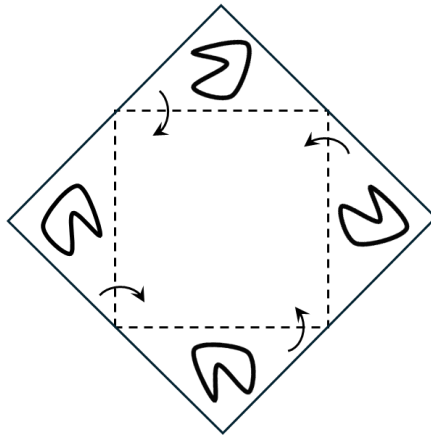
**Answer: (C) 2 squares and 4 rectangles.**

44. The following options show the pieces of a jigsaw puzzle. Which of the following options can be used to construct a filled triangle?

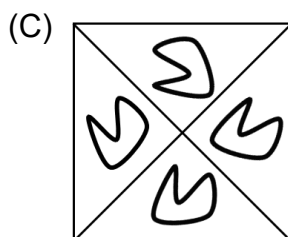
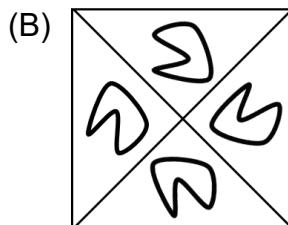
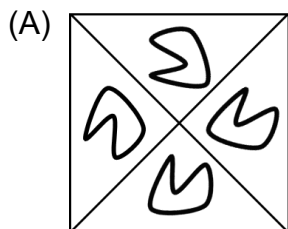


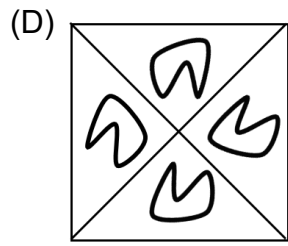
**Answer: (A)**

45. A transparent sheet is shown in the following figure.



If the sheet is folded along the dotted lines as shown by the arrows, the resultant folded sheet appears as:





**Answer: (A)**