



**Pre-  
Foundation  
Zest / Zenith  
Course**

**SAMPLE PAPER**

**SET**

**(Spectrum Entrance Test)**

**JEE-Advanced (IIT) | JEE-Main | NEET-UG | MHT-CET | Olympiad | Pre-Foundation**

**SPECTRUM ENTRANCE TEST**

TEST BOOKLET CODE : A

TEST CODE : 6598

Class : IX

Date :

Time : 90 Min.

Max. Marks : 180

**INSTRUCTIONS**

- 1) This question paper consists of 60 questions divided into three parts:
  - **Part A: Mathematics** – 25 questions
  - **Part B: Mental Ability** – 25 questions
  - **Part C: Science** – 10 questions
- 2) Each question has four options (**A, B, C, and D**), with only one correct answer.
- 3) Marking Scheme:
  - **Correct Answer:** +3 marks
  - **Wrong Answer:** -1 mark
- 4) Before starting, ensure that your question paper contains **all questions and pages**. If you find any missing questions or pages, inform the **invigilator immediately**.
- 5) Mark your answers by **darkening the appropriate bubble** on the OMR sheet.
- 6) Use **only a black or blue ballpoint pen** to fill the bubbles.
- 7) The use of **calculators, log tables, slide rules, and mobile phones** is strictly **prohibited**.
- 8) Example: If only option '**B**' is correct, the correct method for filling the bubble is as follows:



A	B	C	D
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Any other method (such as putting ⊙, ⊗ partial shading ● etc.) will be considered incorrect.

Name : ..... Reg. No. : .....

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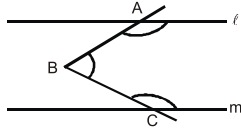
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**PART A: MATHEMATICS**

**Q.1 to Q.25** has four choices (A), (B), (C), (D) out of which only **ONE** is correct.

1. If the area of a circle is 100 times the area of another circle, then the ratio of circumferences of circles is  
 (A) 10 : 1                      (B) 1 : 10                      (C) 5 : 1                      (D) 1 : 5

2. In the diagram,  $\ell$  and  $m$  are parallel line. The sum of the angles A, B and C marked in the diagram is :



- (A)  $180^\circ$                       (B)  $270^\circ$                       (C)  $360^\circ$                       (D)  $300^\circ$

3. If the supplement of an angle is three times its complement, then angle is :

- (A)  $40^\circ$                       (B)  $35^\circ$                       (C)  $50^\circ$                       (D)  $45^\circ$

4.  $\frac{-3}{7} \times \frac{-2}{3} \div \frac{16}{-21}$  is :

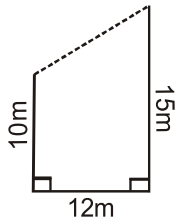
- (A)  $-\frac{3}{8}$                       (B)  $-\frac{32}{147}$                       (C)  $-\frac{8}{49}$                       (D)  $-\frac{27}{32}$

5. Rahim is 15 years older than Vimal. Ten years ago Vimal was half the age of Rahim. Rahim's present age is :

- (A) 25 years                      (B) 30 years                      (C) 15 years                      (D) 40 years

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6. A car goes 90 km in 5 litres of petrol. For covering a distance of 135 km, the petrol required will be:  
 (A)  $7\frac{1}{5}$  litres      (B)  $3\frac{1}{3}$  litres      (C)  $7\frac{1}{2}$  litres      (D)  $33\frac{1}{3}$  litres
7. A square pyramid has  
 (A) 4 vertices 4 faces      (B) 5 vertices 4 faces      (C) 5 vertices 5 faces      (D) 8 vertices 6 faces
8. The value of  $\frac{3^{(12+n)} \times 9^{(2n-7)}}{3^{5n}}$  is :  
 (A)  $\frac{1}{3}$       (B)  $\frac{9}{13}$       (C)  $\frac{1}{9}$       (D)  $\frac{2}{3}$
9. A's salary is 50% more than B's. How much percent is B's salary less than A's ?  
 (A) 33%      (B)  $33\frac{1}{4}$       (C)  $33\frac{1}{3}\%$       (D)  $33\frac{1}{2}$
10. Two poles of heights 10 m and 15 m stand upright on the ground. The feet of the poles are 12 m apart.



How far apart are their tops ?

- (A) 13 m      (B) 14m      (C) 15 m      (D) 16 m

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11. If  $2 + \frac{2x-3}{2x+3} = \frac{3x+4}{x+2}$  then the value of x is :  
 (A) - 3                      (B) - 2                      (C) 3                      (D) - 4
12. A wire of 396 m length is in the form of a square. It is cut and bent to form a circle. Find the ratio of the area of the square to that of circle.  
 (A) 11 : 14                      (B) 14 : 11                      (C) 10 : 14                      (D) 1 : 11
13. A sum of Rs.7000 is divisible among A, B, C in such a way that shares of A and B are in the ratio 2 : 3 and those of B and C are in the ratio 4 : 5. The amount received by C is :  
 (A) Rs. 2600                      (B) Rs. 2800                      (C) Rs. 3000                      (D) Rs. 3900
14. Ekta drives a car with a speed of 48 km./hr. and covers a fixed distance in 10 hrs., if the same distance is to be covered in 8 hrs., How much speed should Ekta increase.  
 (A) 60 km/ hr.                      (B) 36 km/ hr.                      (C) 24 km/ hr.                      (D) 12 km/ hr.
15. Nitin started a business with Rs. 10,000 and after 4 months Shailesh joins the business by investing Rs. 12,000. If the total profit is Rs. 10,800 then profit share of Shailesh is :  
 (A) Rs. 4800                      (B) Rs. 6000                      (C) Rs. 5000                      (D) Rs. 5800
16. The sum of seven consecutive natural numbers is 1617. How many of these numbers are not prime :  
 (A) 4                      (B) 2                      (C) 5                      (D) 7
17. If the average of 11, 12, 13, 14 and x is 13, then the value of x will be :  
 (A) 17                      (B) 21                      (C) 15                      (D) 34

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18. The measure of each interior angles of a regular polygon is  $135^\circ$  degree, the number of its sides is :  
 (A) 8 Nos                      (B) 6 Nos                      (C) 10 Nos                      (D) 7 Nos
19. The base of a parallelogram is thrice its height. If the area is  $867\text{cm}^2$ , find the height of the parallelogram.  
 (A) 17 cm                      (B) 51 cm                      (C) 34 cm                      (D) 15 cm
20. A square ABCD is inscribed in a circle and  $AB = 4$  cm, then radius of the circle is :  
 (A) 2 cm                      (B)  $2\sqrt{2}$  cm                      (C) 4 cm                      (D)  $4\sqrt{2}$  cm
21. If  $\frac{p}{q} = \left(\frac{2}{3}\right)^2 \div \left(\frac{6}{7}\right)^0$ . Find the value of  $\left(\frac{q}{p}\right)^2$   
 (A)  $\frac{4}{9}$                       (B)  $\frac{16}{81}$                       (C)  $\frac{9}{16}$                       (D)  $\frac{81}{16}$
22. Choose the rational number which does not lie between rational numbers  $\frac{3}{5}$  and  $\frac{2}{3}$  :  
 (A)  $\frac{46}{75}$                       (B)  $\frac{47}{75}$                       (C)  $\frac{49}{75}$                       (D)  $\frac{50}{75}$
23. In a two-digit number, the sum of digit is 15. If 9 is added to the number, the digits are reversed. The number is :  
 (A) 87                      (B) 78                      (C) 69                      (D) 96

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24. In a school  $\frac{2}{7}$  of the students are boys. If there are 305 girls, find the number of boys in the school ?  
(A) 112                      (B) 122                      (C) 132                      (D) 127
25. Factorize :  $9x^2y - 24xy + 16y$   
(A)  $(3x-4)^2$                       (B)  $(3x+4)^2$                       (C)  $(3x-4)^2y^2$                       (D)  $(3x-4)^2y$

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*SPACE FOR ROUGH WORK*

## PART B: MENTAL ABILITY

**Q.26 to Q.55** has four choices (A), (B), (C), (D) out of which only **ONE** is correct.

**Directions : (Q.26 to Q.28)** In the following questions, questions are formed by putting any three signs  $\times$ ,  $=$ ,  $+$ ,  $-$  in an appropriate order in place of \* four options are given for the answer of these signs. Find out the correct answer and show it on your answer sheet.

26.  $12 * 5 * 48 * 12$   
 (A)  $= + \times$                       (B)  $\times = +$                       (C)  $= \times -$                       (D)  $+ \times =$
27.  $95 * 5 * 18 * 5$   
 (A)  $= - +$                       (B)  $+ \times =$                       (C)  $= + \times$                       (D)  $\times = +$
28.  $10 * 10 * 10 * 10$   
 (A)  $+ - =$                       (B)  $\times =$                       (C)  $+ = \times$                       (D)  $- \times =$
29. Bhavan's Ranks 27<sup>th</sup> in the class. Preksha is 7 ranks ahead of Bhavan in the class. Preksha's rank from the last is 36<sup>th</sup>. How many students are there in the class ?  
 (A) 55                      (B) 63                      (C) 43                      (D) 56

**Directions : (Q.30)** : In the question below, there are four words. These words are to be arranged in alphabetical order (as they are placed in the dictionary). Find out the word that comes last in the dictionary.

30. (A) Slave                      (B) Slope                      (C) Slab                      (D) Shine

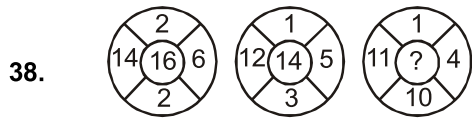
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**Directions :** ( Q.31 ) In the series given below, one term is missing. Series is followed by four alternatives (A), (B), (C) & (D). One among them is the right answer. Identify the right answer and indicate it as per the "Instructions".

31. 2, 5, 10, 17, ?  
 (A) 19 (B) 26 (C) 28 (D) 30
32. Select the word which not formed by the given letters –  
 IMPROVEMENT  
 (A) INPROVE (B) EVENT (C) MENTAIN (D) PREVENT
33. How many 'b' are there which have 'a' as prefix and 'c' as suffix in the given series –  
 aabbcabbaabccabccabbccacabccbaabcc  
 (A) 1 (B) 2 (C) 3 (D) 4
34. In a queue Suresh is seventh from his right and 29th from the left, the number of the students in the queue will be-  
 (A) 28 (B) 27 (C) 14 (D) 35
35. Ram is to the South-East of Mukesh, Shyam is to the East of Mukesh and North-East of Ram. If Suresh is to the North of Ram and North-West of Shyam, in which direction of Mukesh is Suresh located ?  
 (A) North-West (B) South-West (C) North-East (D) South-East
36. If **Eye** is called **Hand**, **Hand** is called **Mouth**, **Mouth** is called **Ear**, **Ear** is called **Nose** and **Nose** is called **Tongue**, with which of the following would a person **hear** ?  
 (A) Eye (B) Mouth (C) Nose (D) Ear
37. How many even numbers are there in the following sequence which are immediately preceded by an odd number and immediately followed by an even number ?  
**5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 4 9 6**  
 (A) 1 (B) 2 (C) 3 (D) 4

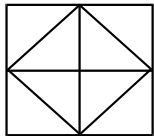
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Directions (Q.38) : Find the missing term :



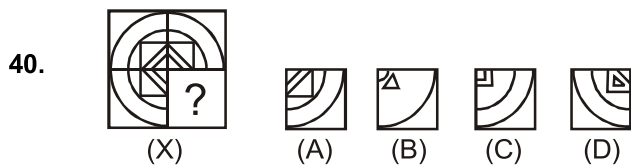
- (A) 0                      (B) 10                      (C) 15    (D) 5

39. Count the number of triangles in the following figure.



- (A) 8                      (B) 10                      (C) 12                      (D) None of these

Directions : (Q.40) Select a figure from the alternatives which when placed in the blank space of (X) would complete the pattern ?




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SPACE FOR ROUGH WORK

41. In a certain code, 23 is coded as OX, 529 as FOR, and 0229 as DOOR, how is 235290 coded ?  
 (A) DOXFOR (B) FORDOX (C) OXFORD (D) FOXORD
42. 'A' travelled Westwards 5 km, turned left and travelled 3 km, turned right and travelled 9 km. He then travelled North 3 km. How far was 'A' from the starting point now ?  
 (A) 3 kms (B) 5 kms (C) 10 kms (D) 14 kms
43. Ankur is taller than Anil, but not taller than Ashish. Ashish is smaller than Manish who is not taller than Nishant. Who in this group is tallest ?  
 (A) Ashish (B) Manish (C) Nishant (D) Ankur

Answer the given questions (Q.44 to Q.46) based on the following English alphabet:

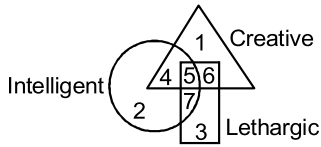
**A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

44. Which letter is fifth to the right of the eighteenth letter from your right?  
 (A) C (B) D (C) E (D) N
45. If all the vowels are removed from the alphabet, which letter will be the seventh to the right of the fifth letter from the left?  
 (A) L (B) M (C) N (D) P
46. If every alternate letter, starting with A, is removed from the alphabet, which letter among the remaining letters would be the third to the right of the fifth letter from the right?
- 
- (A) X (B) V (C) L (D) J

*SPACE FOR ROUGH WORK*

47. Rohit says, "If Jai gives me Rs.40, he will have half as much as Atul, but if Atul gives me Rs. 40, then the three of us will all have the same amount." What is the total amount of money that Rohit, Jai and Atul have between them ?  
 (A) Rs. 240                      (B) Rs. 320                      (C) Rs. 360                      (D) Rs. 420

48. Refer to the given diagram and answer the following question :



Who are intelligent as well as lethargic but not creative persons ?

- (A) 4                      (B) 5                      (C) 7                      (D) 12

**Direction (Q.49) : Find out the Mirror Image of following.**

49. AN5 4 WMG3  
 (A) AN54WMG3 (B) 3GMW42NA (C) 3GMW42NA (D) 3GMW42NA
50. How many such pairs of digits are there in the number 531268947 each of which has as many digits between them in the number as when they are arranged in descending order?  
 (A) None                      (B) One                      (C) Two                      (D) More than three

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*SPACE FOR ROUGH WORK*

**PART C : SCIENCE**

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**Q.56 to Q.75** has four choices (A), (B), (C), (D) out of which only **ONE** is correct.

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- 51.** An image formed by a plane mirror is :  
(A) upside down. (B) equidistant from mirror as the object.  
(C) smaller than the object (D) not laterally inverted
- 52.** Electric bell  
(A) has filament (B) has an electromagnet  
(C) works on heating effect of current (D) can be used as a switch
- 53.** The energy of wind is-  
(A) Kinetic energy (B) Potential energy  
(C) Mechanical energy (D) Thermal energy
- 54.** Change of seasons on the earth takes place due to the reason that  
(A) the axis of rotation of the earth is tilted to the orbital plane.  
(B) the axis of rotation of the earth is perpendicular to the plane of its orbit.  
(C) the temperature of the earth keeps on changing.  
(D) the sun sends unequal amount of light on the earth.
- 55.** An example of a base which is without a metal atom, is -  
(A) sodium hydroxide (B) magnesium hydroxide  
(C) ammonium hydroxide. (D) potassium hydroxide
- 

*SPACE FOR ROUGH WORK*

56. Convection in air means  
(A) movement of air from hotter place to colder place.  
(B) transfer of heat from hotter place to colder place through air.  
(C) movement of air from the place of higher air pressure to the lower one.  
(D) movement of air from the place of lower air pressure to the higher one.
57. Which of the following statements are true regarding a mixture?  
(A) Mixtures are always homogeneous.  
(B) In a mixture constituents substances are mixed chemically.  
(C) The constituents in a mixture retain their individual properties.  
(D) Mixtures have fixed melting points or boiling points
58. Arteries and veins are joined by a network of -  
(A) valves.                      (B) muscles.                      (C) capillaries.                      (D) platelets.
59. Plants prevent :  
(A) soil erosion by wind or water  
(B) the loosening of soil and they bind the soil with the help of their roots  
(C) soil erosion due to afforestation  
(D) all of these
60. Carrier of malaria-causing protozoan is :  
(A) Female Anopheles mosquito                      (B) Cockroach  
(C) Housefly                      (D) Butterfly

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1	2	3	4	5	6	7	8	9	10
A	C	D	A	D	C	C	C	C	A
11	12	13	14	15	16	17	18	19	20
A	A	C	D	A	C	C	A	A	B
21	22	23	24	25	26	27	28	29	30
D	D	B	B	D	B	C	A	A	B
31	32	33	34	35	36	37	38	39	40
B	C	D	D	C	C	C	D	C	A
41	42	43	44	45	46	47	48	49	50
C	D	C	D	D	A	C	C	B	D
51	52	53	54	55	56	57	58	59	60
B	B	A	A	C	A	C	C	D	A

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