

**EXAM SUBJECT BROCHURE**

**ADMISSIONS SESSION - JULY 2023**

**BROCHURE CODE**

**3**

**CAUTION!**

**DO NOT OPEN THE NOTEBOOK UNTIL THE SUPERVISOR GRANTS  
PERMISSION!**

1. All necessary information to correctly answer the exam questions is provided in the text.
2. For each exam question only one answer is correct.
3. For each question, mark the appropriate answer on the answer sheet. Leave unmarked the other answers that you believe to be incorrect.
4. The exam consists of five types of exam questions numbered from 1 to 40. You may solve the items in whichever order you prefer.
5. When marking the correct answer, make sure that the item number on the answer sheet corresponds to the item number from this brochure.

**Good luck!**

I. Below are sequences composed of nine numbers. Your task is to find the rules on which the sequence was built and then, based on the discovered rule, identify the number that could continue the sequence. The rule used in the sequence construction can be simple or complex, combining several simple rules. The list of simple rules includes: 1. Adding or subtracting a constant number less than or equal to ten; 2. Adding or subtracting two previous numbers of the sequence; 3. Adding the digits that make up a number and/or adding and/or subtracting this from a number in the sequence.

1. What is the number that continues the sequence?

24, 27, 30, 33, 36, 39, 42, 45, 48

- A. 49
- B. 51
- C. 68
- D. 67
- E. 56

2. What is the number that continues the sequence?

42, 44, 41, 43, 40, 42, 39, 41, 38

- A. 35
- B. 41
- C. 42
- D. 38
- E. 40

3. What is the number that continues the sequence?

84, 82, 79, 85, 83, 80, 86, 84, 81

- A. 82
- B. 55
- C. 87
- D. 84
- E. 91

4. What is the number that continues the sequence?

21, 26, 31, 36, 41, 46, 51, 56, 61

- A. 69
- B. 66
- C. 67
- D. 64
- E. 59

5. What is the number that continues the sequence?

91, 84, 77, 70, 63, 56, 49, 42, 35

- A. 40
- B. 31
- C. 21
- D. 25
- E. 28

6. What is the number that continues the sequence?

6, 10, 14, 18, 22, 26, 30, 34, 38

- A. 42
- B. 41
- C. 52
- D. 45
- E. 48

7. What is the number that continues the sequence?

35, 32, 29, 26, 23, 20, 17, 14, 11

- A. 6
- B. 14
- C. 11
- D. 10
- E. 8

8. What is the number that continues the sequence?

6, 12, 18, 24, 30, 36, 42, 48, 54

- A. 61
- B. 60
- C. 63
- D. 75
- E. 58

9. What is the number that continues the sequence?

30, 37, 35, 42, 40, 47, 45, 52, 50

- A. 48
- B. 47
- C. 59
- D. 57
- E. 52

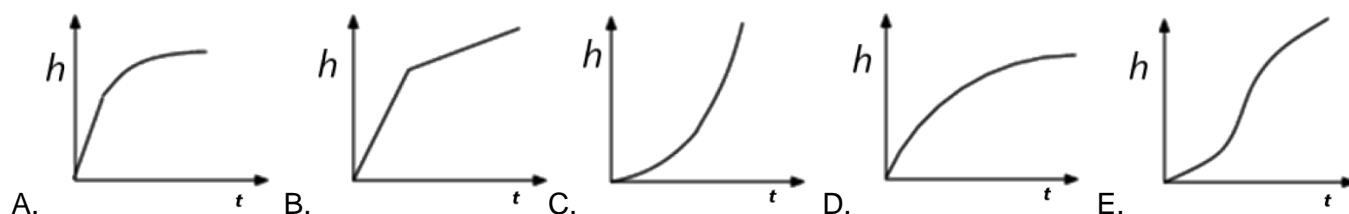
10. What is the number that continues the sequence?

31, 36, 41, 37, 42, 47, 43, 48, 53

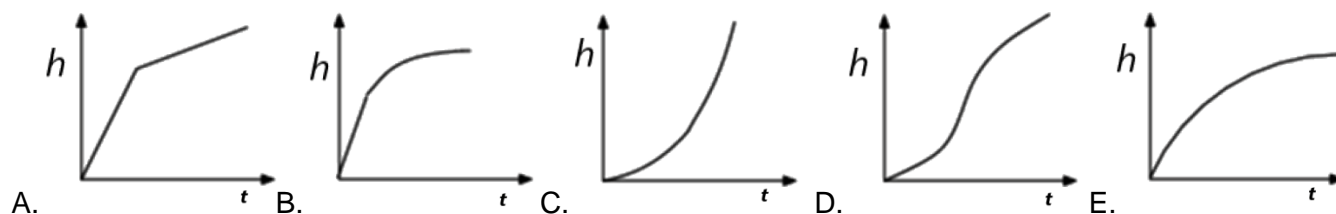
- A. 59
- B. 49
- C. 46
- D. 57
- E. 47

II. The following problems assume the existence of water containers, which are filled with water at a fixed rate of 1 liter per second. Your task is to identify, based on the shape of the container, the graph that best represents the evolution of the water volume in the container over time.

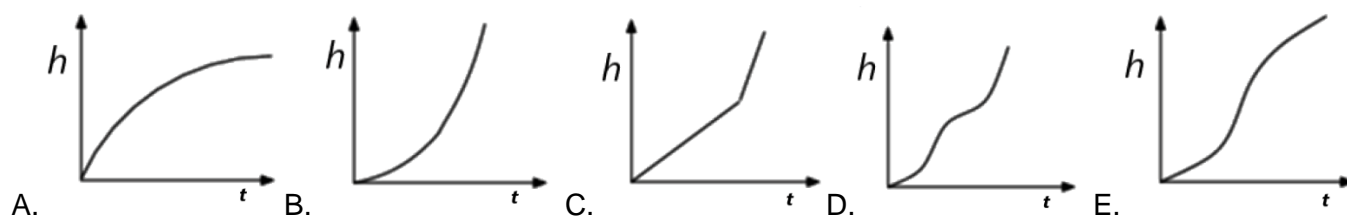
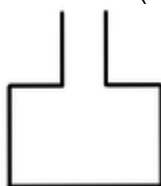
11. The water container below is filled with water at a constant rate of 1 liter per second. Which of the graphs below represents the evolution of the water level ( $h$ ) in the container over time ( $t$ )?



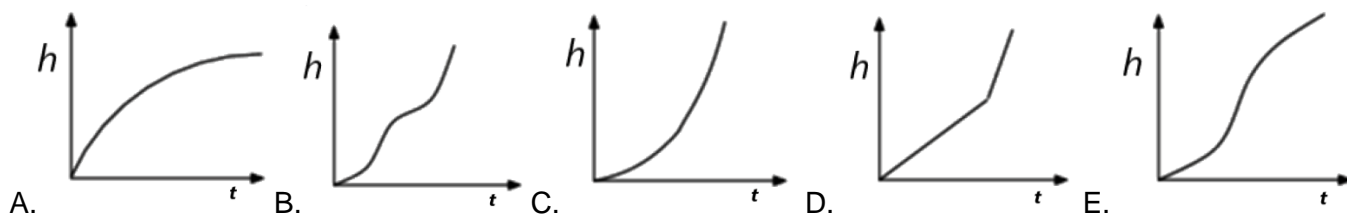
12. The water container below is filled with water at a constant rate of 1 liter per second. Which of the graphs below represents the evolution of the water level ( $h$ ) in the container over time ( $t$ )?



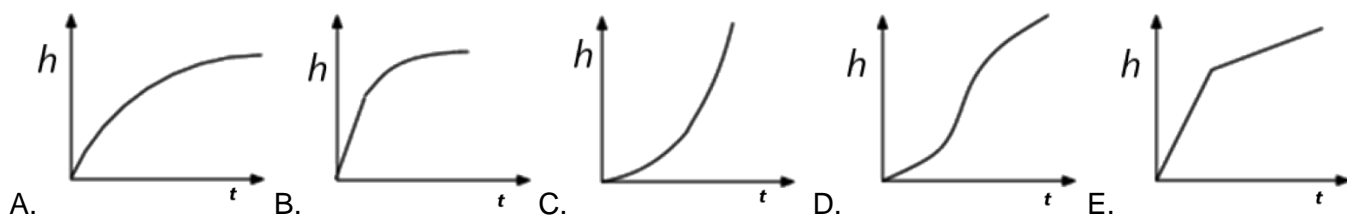
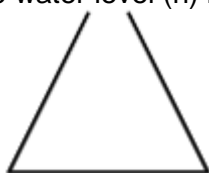
13. The water container below is filled with water at a constant rate of 1 liter per second. Which of the graphs below represents the evolution of the water level ( $h$ ) in the container over time ( $t$ )?



14. The water container below is filled with water at a constant rate of 1 liter per second. Which of the graphs below represents the evolution of the water level ( $h$ ) in the container over time ( $t$ )?



15. The water container below is filled with water at a constant rate of 1 liter per second. Which of the graphs below represents the evolution of the water level ( $h$ ) in the container over time ( $t$ )?



**III. One or more words from an artificial language are given along with their encoded form, which is based on specific rules. Your task is to identify the encoding rule and, using this rule, to encode other words of the artificial language. Mark the option you consider correct on the answer sheet. Pay attention: each problem in this chapter has its own encoding rules!**

16. If the encoding for the word FAMILIE is 1845352, what would be the encoding for the word FEMEIA?

- A. 124258
- B. 152583
- C. 152348
- D. 142458
- E. 124238

17. If the encoding for the word CADUM is CUDAM, what would be the encoding for the word CITAR?

- A. ITARC
- B. CATIR
- C. CIATR
- D. RACIT
- E. CARIT

18. If the encoding for the word VIDRO is DIVRO, what would be the encoding for the word RITOG?

- A. GOTIR
- B. IRTOG
- C. TORIG
- D. OGRIT
- E. TIROG

19. If the encoding for the word PARMA is AMRAP, what would be the encoding for the word CARDI?

- A. IDCAR
- B. CADRI
- C. IDRAC
- D. IDACR
- E. RDICA

20. If the encoding for the word ZATOVEN is ZAVOTEN, what would be the encoding for the word TIDONAX?

- A. TINOXAD
- B. TIONDAX
- C. TOINXAD
- D. TINODAX
- E. TIONXAD

21. If the encoding for the word FILMOGRAFIE is 13542978136, what would be the encoding for the word FAMILIE?

- A. 1843536
- B. 1846565
- C. 1843653
- D. 1875365
- E. 1857376

22. If the encoding for the word VARICE is 134675, and for the word STEAG it is 28539, what would be the encoding for the word VISTERIE?

- A. 16824654
- B. 16285765
- C. 16268745
- D. 16285465
- E. 16287467

23. If the encoding for the word MOLTARIN is TARINLOM, what would be the encoding for the word VITCIRAM?

- A. CIRAMVIT
- B. VITCIMAR
- C. CIRAMTIV
- D. CIRATMIV
- E. VIIRTCAM

24. If the encoding for the word LUNETIDOZ is TIDOZLUNE, what would be the encoding for the word RICOMALFE?

- A. MALFERICO
- B. ALFECOMRI
- C. ALFERICOM
- D. MALFCEORI
- E. MALFECORI

25. If the encoding for the word FEMIDA is DAMIFE, what would be the encoding for the word PIDAKU?

- A. KUPIDA
- B. DAKUPI
- C. DAPIKU
- D. KUDAPI
- E. KUDAIP

**IV. Carefully read the text below. After the text, there are a series of questions. For each question, mark ONE ANSWER that can be logically deduced from the information in the text. The information given is sufficient to identify the correct answer.**

High school Olympians in a tourist resort invented a word game to spend their time more entertainingly. Players have to form words (with meaning or pseudo-words, i.e., strings of nonsense letters) using the following letters: I, M, N, P, O, and R. Words are valid only if they respect the following rules:

- i. Each letter may be used no more than twice in a word;
- ii. if the letter P is used twice, then N will also be used twice;
- iii. if M is used twice, then I and O will also be used twice;
- iv. if no letter occurs twice, then N must be used, in which case the only letter that can occur next to N is R.
- v. if P is not used, then M will not be used either;
- vi. if I is not used, then R must be used;
- vii. the letter M can only sit next to I or N.

26. Which of the following can be a word that satisfies the stated rules?

- A. MNNPO
- B. MMIIIO
- C. IMNP
- D. PPNNMI
- E. ORIMNP

27. Which of the following statements must be true if no letter has been used twice?

- A. the letter R appears twice in the word, but not at the beginning or end
- B. the letters M and P do not appear in the word
- C. the letters N and R are part of the word
- D. the letters I and R are part of the generated word
- E. the letter M must be the first or last letter of the word

28. How many letters will the shortest word that can be generated in the game include?

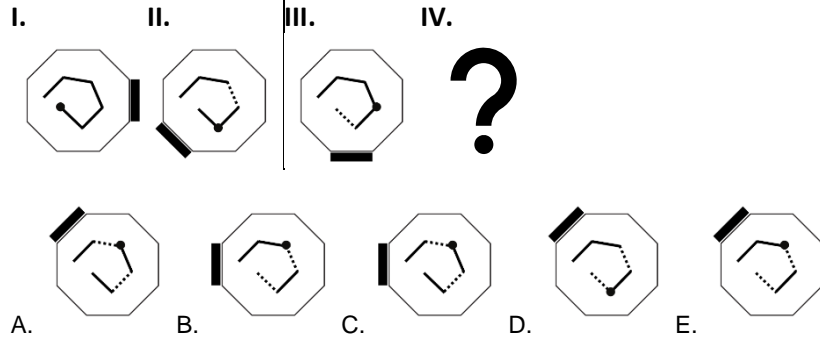
- A. 5
- B. 2
- C. 3
- D. 4
- E. 1

29. What is the number of letters in the longest word that can be created following the rules?

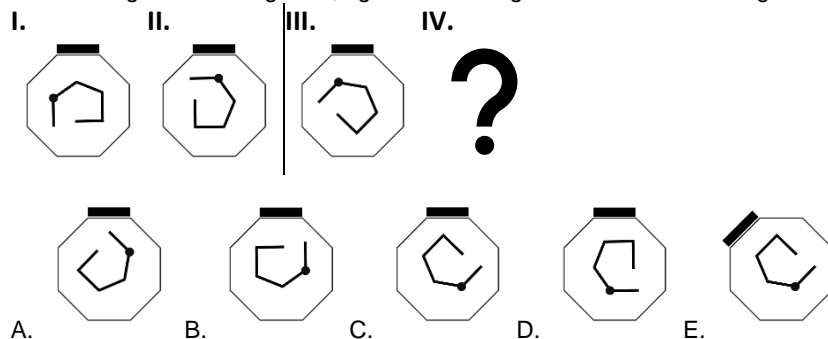
- A. 14
- B. 12
- C. 11
- D. 10
- E. 13

V. Consider a set of figures marked with Roman numerals (I, II, III and IV), arranged in two pairs (I, II and III, IV) on one side and the other of the "I" sign. Between the figures of each pair there is a certain relationship defined by modifying some features (e.g. the position of the central object, the position of the black dot, the line type of the central object or the position of the black rectangle). One of the four figures is missing. The task is to identify the relationship between the figures of the complete pair and, based on this, to identify the missing figure of the other pair.

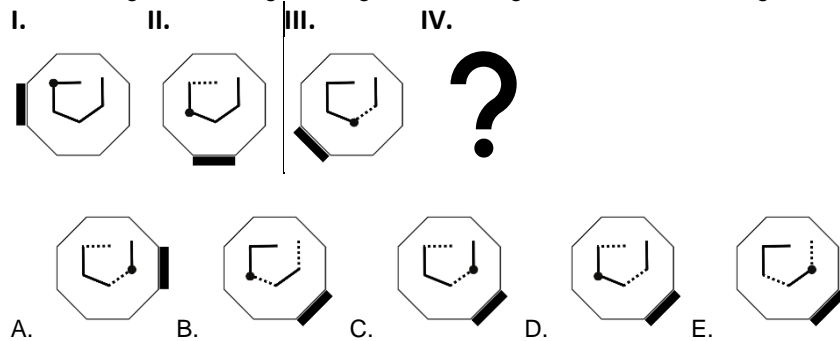
30. What figure I is for figure II, figure III is for figure IV. Which one is figure IV?



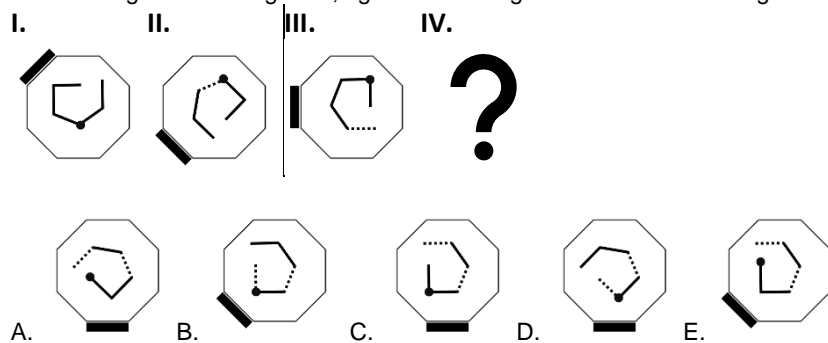
31. What figure I is for figure II, figure III is for figure IV. Which one is figure IV?



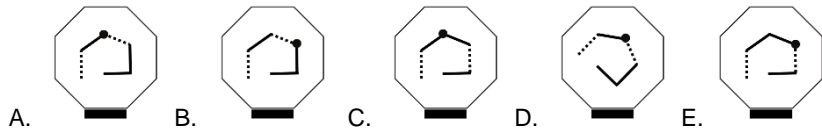
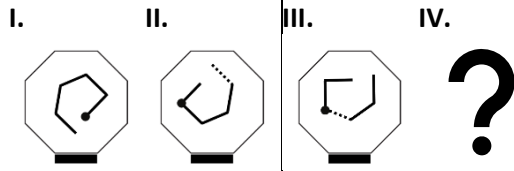
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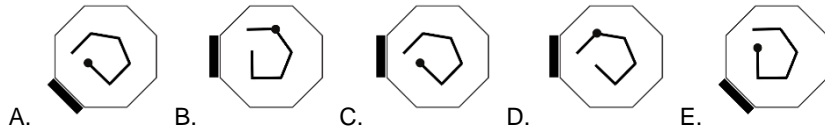
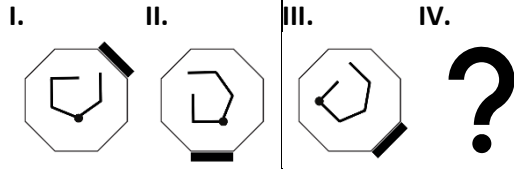
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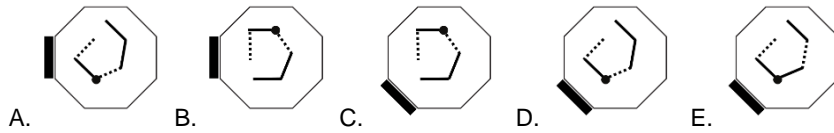
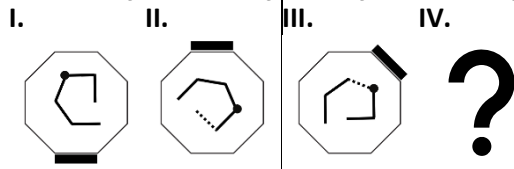
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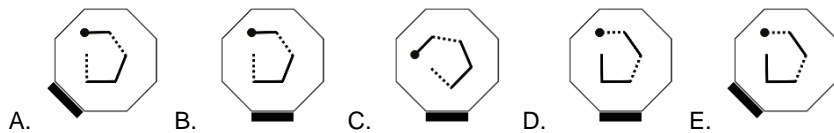
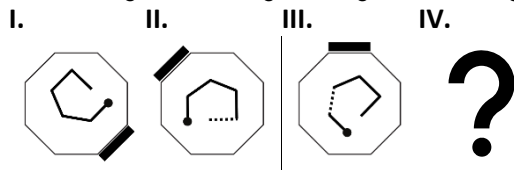
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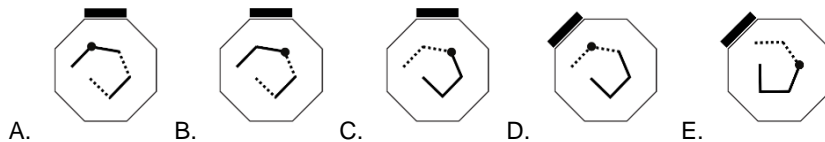
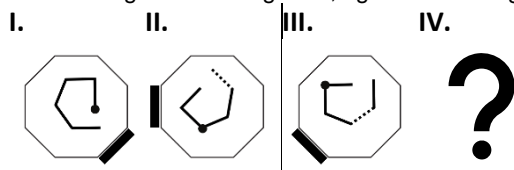
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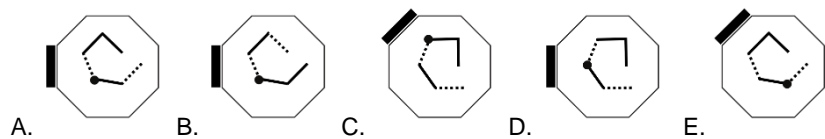
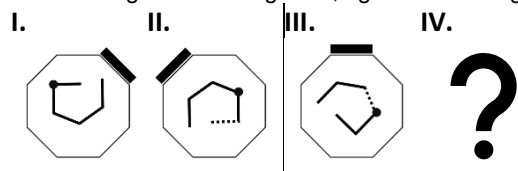
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38. What figure I is for figure II, figure III is for figure IV. Which one is figure IV?



39. What figure I is for figure II, figure III is for figure IV. Which one is figure IV?



40. What figure I is for figure II, figure III is for figure IV. Which one is figure IV?

