

**DOST-SEI S&T  
UNDERGRADUATE  
SCHOLARSHIP  
EXAMINATION REVIEWER**

## **ABOUT THIS MATERIAL**

This review material has two (2) parts: 1) Logical Reasoning; and 2) Power Test. Logical reasoning consists of two (2) sub-tests, as follows: 1) Verbal Reasoning; and 2) Non-Verbal Reasoning. Power Test, on the other hand, have four (4) sub-tests, namely: 1) English; 2) Science; 3) Mathematics; and 4) Mechanical Technical.

Verbal Reasoning tests your ability to understand, analyze and interpret information. It also measures your ability to extract meaning from complex information and to think logically and analytically. Non-Verbal Reasoning measures your abilities to: visualize and transform images in your mind; recreate visual experiences and reasoning about shape, measurement, depiction and navigation; and mentally rotate and manipulate two and three-dimensional spaces. The English sub-test measures your ability to apply the rules of the English language, specifically on grammar and syntax, vocabulary and reading comprehension. Science sub-tests will test your ability to accomplish various important scientific tasks. Mathematics sub-test will measure your ability to comprehend qualitative relationships and their representations. Mechanical-Technical will measure your ability to acquire information about everyday physics and to comprehend mechanical relationships. It consists of mechanical and electrical problems, as well as items that deal with physical forces.

The answer key is given at the end for your reference.

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## **I. LOGICAL REASONING**

### **VERBAL REASONING**

Verbal Reasoning tests your ability to understand, analyze and interpret information. It also measures your ability to extract meaning from complex information and to think logically and analytically.

1. SARAH:TBSBT::PALMA:
  - A. NBQJBO
  - B. RIFJMBO
  - C. QBMNB
  - D. SBSSZ
  
2. BIG:ENORMOUS::SMALL:
  - A. MINISCULE
  - B. VOLUMINOUS
  - C. MACROSCOPIC
  - D. PARASITIC
  
3. GALILEO GALILEI:TELESCOPE::BENJAMIN FRANKLIN:
  - A. ELECTRICITY
  - B. STEAM ENGINE
  - C. TELEGRAPH WIRE
  - D. MOTION PICTURE CAMERA
  
4. ALBERT EINSTEIN:LAW OF GRAVITY:: ALEXANDER FLEMING:
  - A. PENICILLIN
  - B. MONOGRAPH
  - C. TELEPHONE
  - D. SONOGRAM
  
5. BAT:BALL::BOW:\_\_\_\_\_
  - A. ARROW
  - B. TIE
  - C. STRING
  - D. BONE
  
6. HIDE:CONCEAL::STOP:\_\_\_\_\_
  - A. PAUSE
  - B. REFLECT
  - C. HALT
  - D. PONDER

7. BOWED STRINGS:VIOLIN::WOODWIND:\_\_\_\_\_  
A. GUITAR  
B. FLUTE  
C. PIANO  
D. HORN
8. WHALE:POD::KITTEN:\_\_\_\_\_  
A. PACK  
B. HERD  
C. LITTER  
D. PRIDE
9. SPONGE:POROUS::SKUNK:\_\_\_\_\_  
A. SHINY  
B. CARNIVOROUS  
C. NOCTURNAL  
D. SMELLY
10. DO:DID::COST:\_\_\_\_\_  
A. COSTED  
B. COAST  
C. COASTED  
D. COST
11. LIFE BELT : SEA :: AIR : \_\_\_\_\_  
A. PILOT  
B. STRAP  
C. BALOON  
D. PATA CHUTE
12. ANTERIOR : POSTERIOR :: FRONT : \_\_\_\_\_  
A. SIDE  
B. HIND  
C. HEAD  
D. MIDSECTION
13. GEO : EARTH :: FERRO : \_\_\_\_\_  
A. AIR  
B. FIRE  
C. IRON  
D. SAND
14. NEWTON : CALCULUS :: COPERNICUS : \_\_\_\_\_  
A. ASTROLOGY  
B. METEOROLOGY  
C. ARCHAEOLOGY  
D. ASTRONOMY

15. HAMMER : CARPENTER :: \_\_\_\_\_  
A. ANCHOR : SAILOR  
B. BRUSH : PAINTER  
C. BLUEPRINT : ARCHITECT  
D. SHAVES : BARBER
16. AFFECTION : INFATUATION :: \_\_\_\_\_  
A. LENIENT : FORGIVE  
B. LARGE : GIGANTIC  
C. TIMIDITY : COWARDICE  
D. FRANKNESS : CANDOR
17. Arrange the following words in a meaningful order.  
1. Death 2. Marriage 3. Education 4. Birth 5. Funeral  
A. 5, 1, 2, 3, 4  
B. 4, 2, 3, 1, 5  
C. 4, 3, 2, 5, 1  
D. 4, 3, 2, 1, 5
18. Arrange the following words in a meaningful order.  
1. Word 2. Paragraph 3. Sentence 4. Letters 5. Phrase  
A. 4, 1, 5, 3, 2  
B. 4, 1, 3, 5, 2  
C. 4, 2, 5, 1, 3  
D. 4, 5, 1, 3, 2
19. Statements: Some actors are singers. All the singers are dancers.  
Conclusions:  
(1) Some actors are dancers.  
(2) No singer is actor.  
A. Only (1) conclusion follows  
B. Only (2) conclusion follows  
C. Either (1) or (2)  
D. Neither (1) or (2)
20. Statements: All the harmoniums are flutes.  
Conclusions:  
(1) All the flutes are instruments.  
(2) All the harmoniums are flutes.  
A. Only (1) conclusion follows  
B. Only (2) conclusion follows  
C. Either (1) or (2)  
D. Neither (1) or (2)

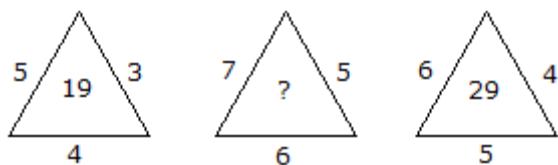
21. Statements: No door is dog. All the dogs are cats.  
Conclusions:  
No door is cat.  
No cat is door.  
Some cats are dogs.  
All the cats are dogs.  
A. Only (1) and (4)  
B. Only (1) and (3)  
C. Only (3) and (4)  
D. Only (3)
22. Statements:  
Importance of Yoga and exercise is being realized by all sections of the society.  
There is an increasing awareness about health in the society particularly among middle ages group of people.  
A. Statement I is the cause and statement II is its effect.  
B. Statement II is the cause and statement I is its effect.  
C. Both the statements I and II are independent causes.  
D. Both the statements I and II are effects of independent causes.  
E. Both the statements I and II are effects of some common cause.
23. Statements:  
Many people in the area are reported to be suffering from Malaria.  
Private Medical Practitioners in the area have decided to close their clinics for few days.  
A. Statement I is the cause and statement II is its effect.  
B. Statement II is the cause and statement I is its effect.  
C. Both the statements I and II are independent causes.  
D. Both the statements I and II are effects of independent causes.  
E. Both the statements I and II are effects of some common cause.
24. MALARIA : MOSQUITO :: ? : ?  
A. POISON : DEATH  
B. CHOLERA : WATER  
C. RAT : PLAGUE  
D. MEDICINE : DISEASE
25. ABC : ZYX :: CBA : ?  
A. XYZ  
B. BCA  
C. YZX  
D. ZXY
26. AB4 : 18 :: 6 : ?  
A. 32  
B. 38  
C. 11  
D. 37

27. Which one will replace the question mark ?

A <sub>2</sub>	C <sub>4</sub>	E <sub>6</sub>
G <sub>3</sub>	I <sub>5</sub>	?
M <sub>5</sub>	O <sub>9</sub>	Q <sub>14</sub>

- A. L10
- B. K15
- C. I15
- D. K8

28. Which one will replace the question mark ?



- A. 25
- B. 37
- C. 41
- D. 47

29. Which one will replace the question mark?

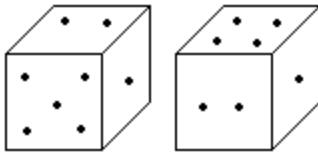
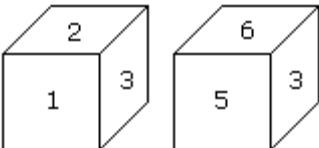
3	?	5
5	4	7
4	4	4
60	96	140

- A. 4
- B. 6
- C. 9
- D. 8

30. Choose the word which is different from the rest.

- A. Chicken
- B. Swan
- C. Eagle
- D. Crocodile

31. Choose the word which is different from the rest.
- A. Dagger
  - B. Knife
  - C. Hammer
  - D. Sword
32. Choose the word which is different from the rest.
- A. Cherry
  - B. Strawberry
  - C. Apple
  - D. Orange
33. The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages three years ago ?
- A. 71 years
  - B. 72 years
  - C. 73 years
  - D. 74 years
34. A father is now three times as old as his son. Five years back, he was four times as old as his son. The age of the son (in years) is
- A. 12
  - B. 15
  - C. 18
  - D. 20
35. Pointing to a photograph of a boy, Ben said, "He is the son of the only son of my mother." How is Ben related to that boy?
- A. Brother
  - B. Uncle
  - C. Cousin
  - D. Father
36. Introducing a woman, Gwen said, "She is the mother of the only daughter of my son." How is that woman related to Gwen?
- A. Daughter
  - B. Sister-in-Law
  - C. Wife
  - D. Daughter-in-Law
37. 120, 99, 80, 63, 48, ?
- A. 35
  - B. 38
  - C. 39
  - D. 40

38. 2, 3, 5, 7, 11, ?, 17  
A. 12  
B. 13  
C. 14  
D. 15
39. Two positions of dice are shown below. How many points will appear on the opposite to the face containing 5 points?
- 
- A. 3  
B. 1  
C. 2  
D. 4
40. Which digit will appear on the face opposite to the face with number 4?
- 
- A. 3  
B. 5  
C. 6  
D. 2/3
41. A, P, R, X, S and Z are sitting in a row. S and Z are in the centre. A and P are at the ends. R is sitting to the left of A. Who is to the right of P?  
A. A  
B. X  
C. S  
D. Z
42. Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Ben. Mary is to the right of Rani. Reeta is between Rani and Mary. Who is sitting to the right of Reeta?  
A. Ben  
B. Rani  
C. Mary  
D. Seema

43. One morning Ren and Josh were talking to each other face to face at a crossing. If Josh's shadow was exactly to the left of Ren, which direction was Ren facing?
- A. East
  - B. West
  - C. North
  - D. South
44. A man walks 5 km toward south and then turns to the right. After walking 3 km he turns to the left and walks 5 km. Now in which direction is he from the starting place?
- A. East
  - B. West
  - C. North-East
  - D. South-West
45. Sham walks 5 km towards East and then turns left and walks 6 km. Again he turns right and walks 9 km. Finally he turns to his right and walks 6 km. How far is he from the starting point?
- A. 26 km
  - B. 21 km
  - C. 14 km
  - D. 19 km
46. A train always has?
- A. Rails
  - B. Driver
  - C. Guard
  - D. Engine
47. A lightbulb always has?
- A. Glass
  - B. Filament
  - C. Current
  - D. Light
48. If PALE is coded as 2134, EARTH is coded as 41590, how can is PEARL be coded in that language?
- A. 25413
  - B. 24153
  - C. 25430
  - D. 29530
49. Select the word that has a similar meaning to outgoing:
- A. Extroverted
  - B. Outside
  - C. Exit
  - D. Contained

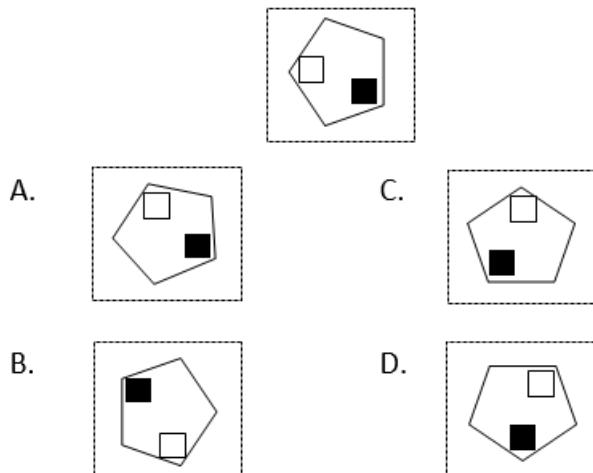
50. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it?

- A. His father's
- B. His son's
- C. His own
- D. His nephew's

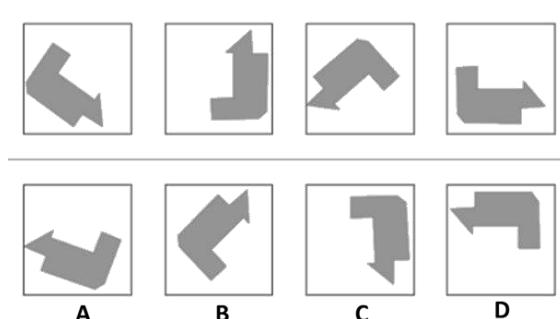
## NON-VERBAL REASONING

In this test you will be performing tasks that will measure your abilities to: visualize and transform images in your mind; recreate visual experiences and reasoning about shape, measurement, depiction and navigation; and mentally rotate and manipulate two and three-dimensional spaces.

1. Which one is identical to this figure?



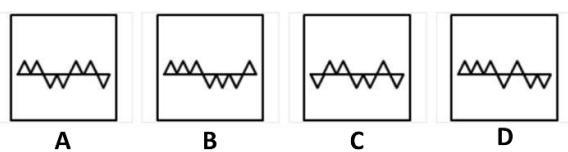
2. Which box contains the same shape as the top series?



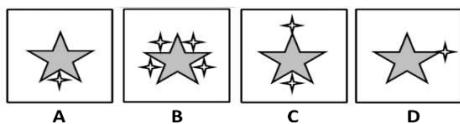
3. Which of the following frames completes the pattern?



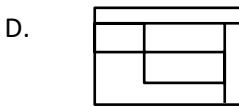
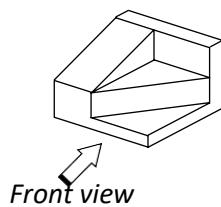
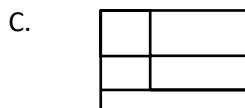
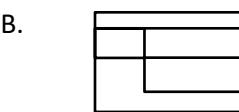
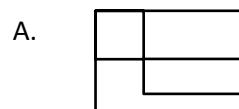
Options:



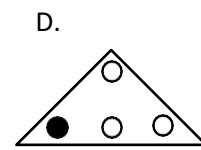
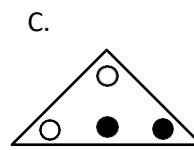
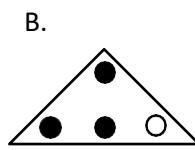
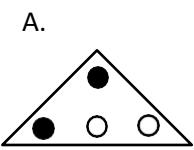
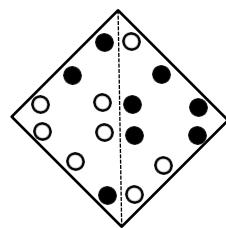
4. Which of the following frames does not belong to the group?



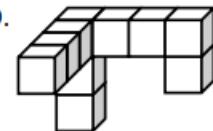
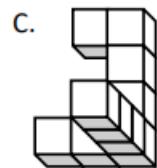
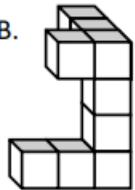
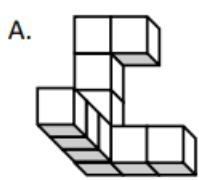
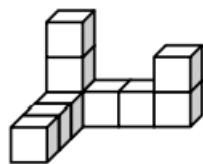
5. A three-dimensional object is shown. Which front side view is correct?



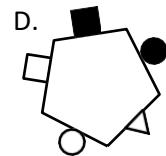
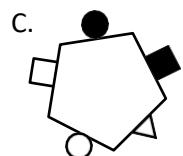
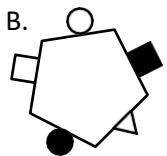
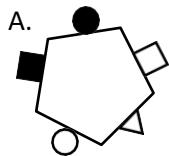
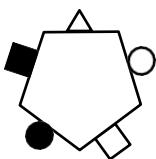
6. Which of the four figures below is the result when the figure is folded along the dotted lines?



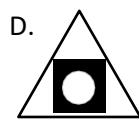
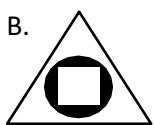
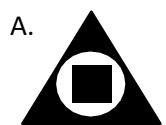
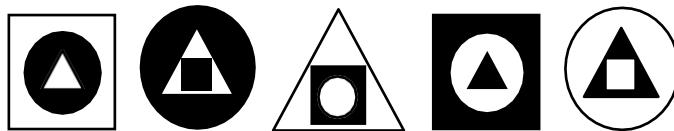
7. Which of the four choices below is the rotated version of the given figure?



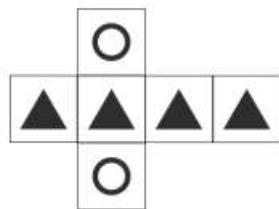
8. If you rotate the given figure, which of the following will be the result?



9. Which is the next figure in the series?



10. Which cube cannot be made based on the unfolded cube?



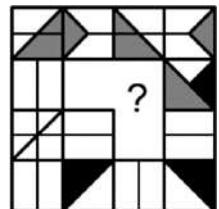
- A. A cube with a triangle on the top face, a circle on the front face, and a circle on the right face.  
B. A cube with a triangle on the top face, a circle on the front face, and a circle on the right face.  
C. A cube with a triangle on the top face, a circle on the front face, and a circle on the right face.  
D. A cube with a triangle on the top face, a circle on the front face, and a circle on the right face.

11. Which of the answer cubes is the original cube rotated in any direction?



- A. A cube with a circle on the top face, a circle on the front face, and a circle on the right face.  
B. A cube with a circle on the top face, a circle on the front face, and a circle on the right face.  
C. A cube with a circle on the top face, a circle on the front face, and a circle on the right face.  
D. A cube with a circle on the top face, a circle on the front face, and a circle on the right face.

12. Which of the following frames completes the pattern?



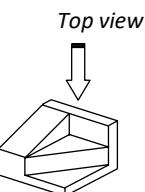
- A. A 4x4 grid with a black triangle in the center cell, and other cells containing white, black, or grey shapes.  
B. A 4x4 grid with a black triangle in the center cell, and other cells containing white, black, or grey shapes.  
C. A 4x4 grid with a black triangle in the center cell, and other cells containing white, black, or grey shapes.  
D. A 4x4 grid with a black triangle in the center cell, and other cells containing white, black, or grey shapes.

13. Two pieces of the cube puzzle with three adjacent faces in each piece are shown and to be used to form a cube. Each face is drawn with figure different to other sides. Which view fits to the arrangement of the symbol when the cube is assembled?



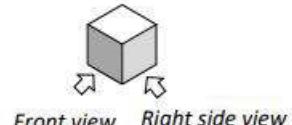
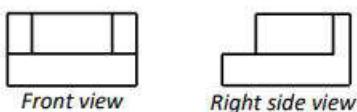
- A. 
- B. 
- C. 
- D. 

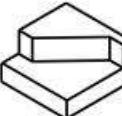
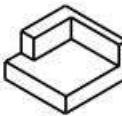
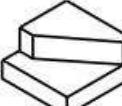
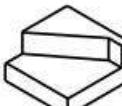
14. A three-dimensional object is shown. Which top side view is correct?



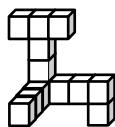
- A. 
- B. 
- C. 
- D. 

15. Create a three-dimensional object out of the two given views below.

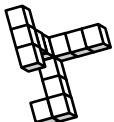


- A. 
- B. 
- C. 
- D. 

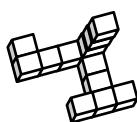
16. Which of the four choices below is the rotated version of the given figure?



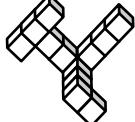
A.



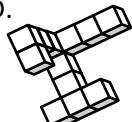
B.



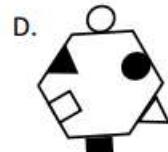
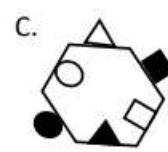
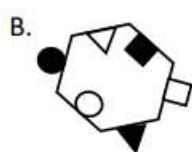
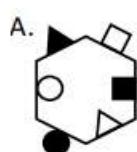
C.



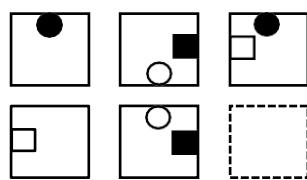
D.



17. If you rotate the given figure, which of the following will be the result?



18. Which is the next figure in the series?



A.



B.



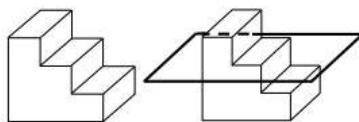
C.

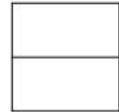


D.

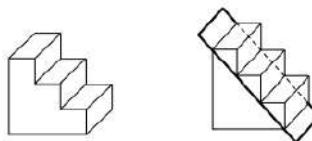


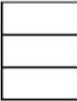
19. Which of the four choices is the result when the figure is cut by a plane as shown below?



- A.  B.  C.  D. 

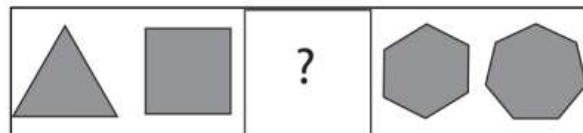
20. Which of the four choices is the result when the figure is cut by a plane as shown below?



- A.  B.  C.  D. 

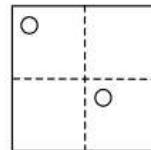
21.

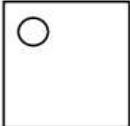
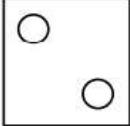
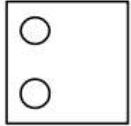
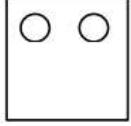
What shape is needed to complete the series below?



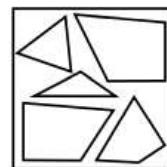
- A.  C.   
B.  D. 

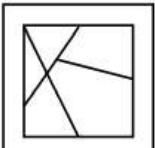
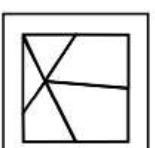
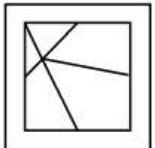
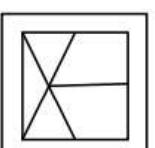
22. If a piece of paper containing two circular holes as shown is folded along the dashed lines, which of the following is the resulting figure?



- A. 
- B. 
- C. 
- D. 

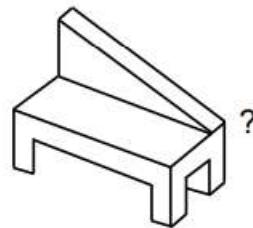
23. Which of the four figures below will show when all the given parts are fitted together?



- A. 
- B. 
- C. 
- D. 

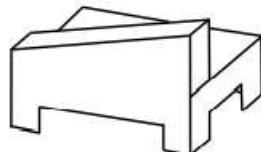
24.

Which of the following is a rotation of the solid

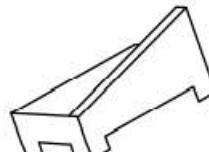


?

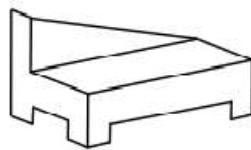
A.



C.



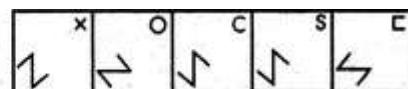
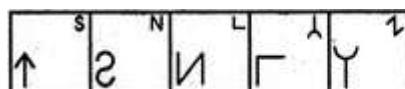
B.



D.

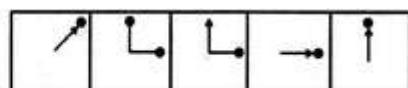
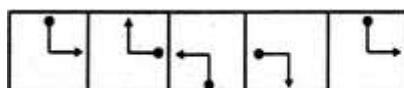


25. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures.



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

26. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures.



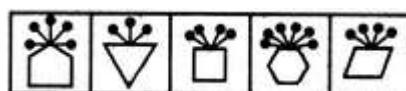
- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

27. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures.



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

28. Choose the figure which is different from the rest.



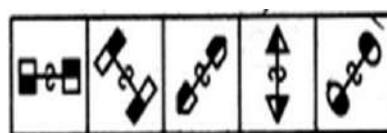
- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

29. Choose the figure which is different from the rest.



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

30. Choose the figure which is different from the rest.



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

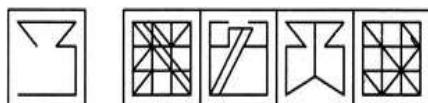
31. Choose the alternative which is closely resembles the mirror image of the given combination.

**EFFECTIVE**  
**(1) EFFECECTIVE**  
**(3) EVITCEFFE**

**(2) EVITCEFFE**  
**(4) EFFECECTIVE**

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

32. Find out the alternative figure which contains figure (X) as its part.



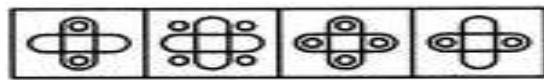
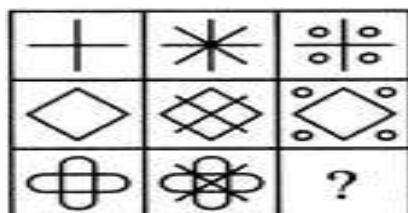
- A. 1  
B. 2  
C. 3  
D. 4

33. Find out the alternative figure which contains figure (X) as its part.



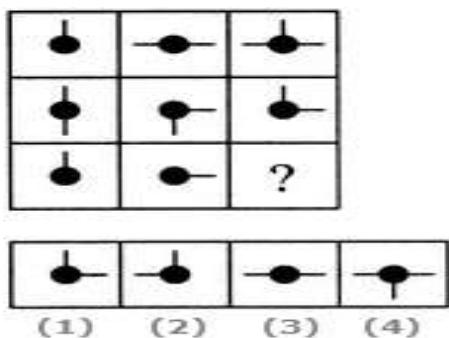
- A. 1  
B. 2  
C. 3  
D. 4

34. Select a suitable figure from the four alternatives that would complete the figure matrix.



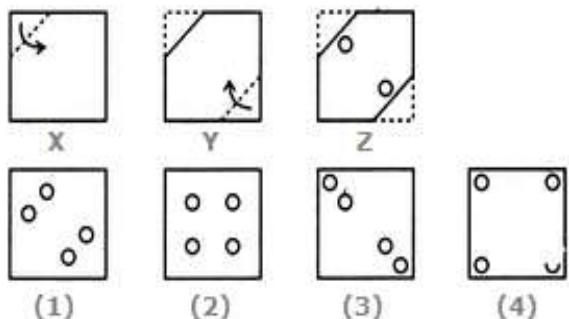
- A. 1  
B. 2  
C. 3  
D. 4

35. Select a suitable figure from the four alternatives that would complete the figure matrix.



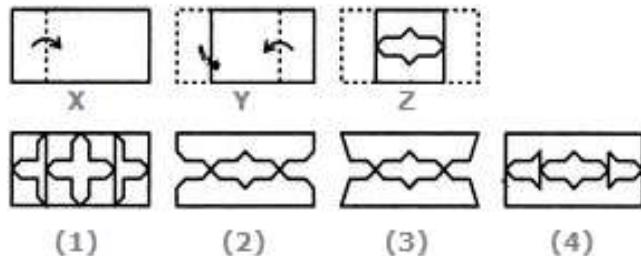
- A. 1
- B. 2
- C. 3
- D. 4

36. Choose a figure which would most closely resemble the unfolded form of Figure (Z).



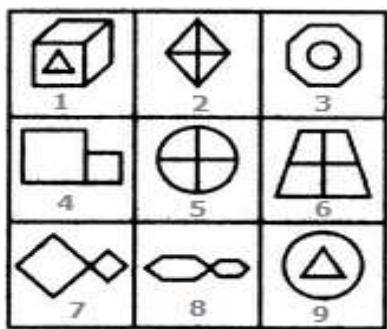
- A. 1
- B. 2
- C. 3
- D. 4

37. Choose a figure which would most closely resemble the unfolded form of Figure (Z).



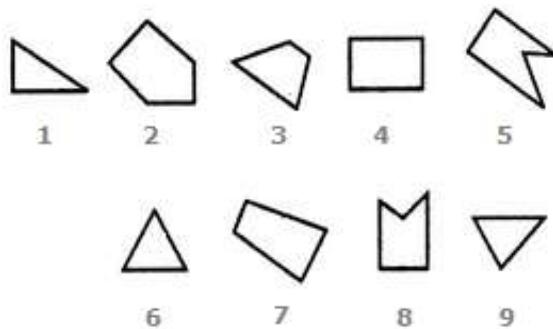
- A. 1
- B. 2
- C. 3
- D. 4

38. Group the given figures into three classes using each figure only once.



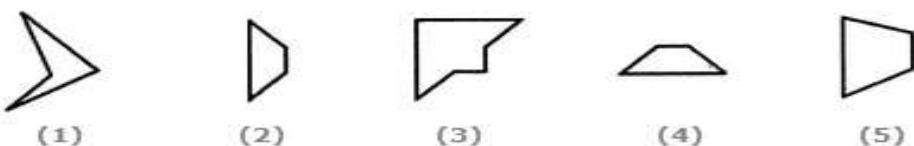
- A. 1,3,9 ; 2,5,6 ; 4,7,8
- B. 1,3,9 ; 2,7,8 ; 4,5,6
- C. 1,2,4 ; 3,5,7 ; 6,8,9
- D. 1,3,6 ; 2,4,8 ; 5,7,9

39. Group the given figures into three classes using each figure only once.



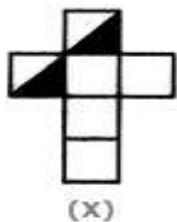
- A. 7,8,9 ; 2,4,3 ; 1,5,6
- B. 1,3,2 ; 4,5,7 ; 6,8,9
- C. 1,6,8 ; 3,4,7 ; 2,5,9
- D. 1,6,9 ; 3,4,7 ; 2,5,8

40. Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



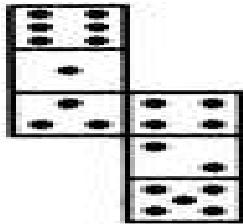
- A. 145
- B. 245
- C. 123
- D. 234

41. Choose the box that is similar to the box formed from the given sheet of paper (X).

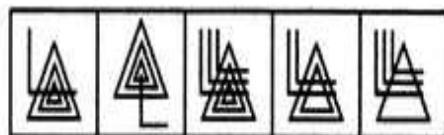
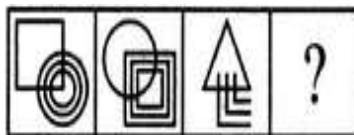


- A. 1 and 4
  - B. 2 and 4
  - C. 1 and 2
  - D. 2 and 3
42. How many dots lie opposite to the face having three dots, when the given figure is folded to form a cube?

- A. 1
- B. 2
- C. 5
- D. 6



43. Select a suitable figure from the Answer Figures that would replace the question mark (?).  
Problem Figures: Answer Figures



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

44. Select a suitable figure from the Answer Figures that would replace the question mark (?). Problem Figures: Answer Figures

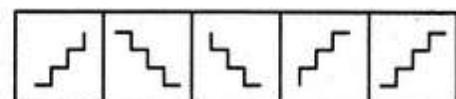
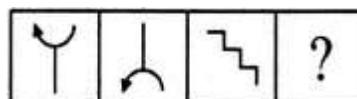
A. 1

B. 2

C. 3

D. 4

E. 5



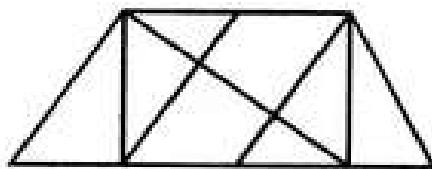
45. Find the number of triangles in the given figure.

A. 8

B. 13

C. 14

D. 15



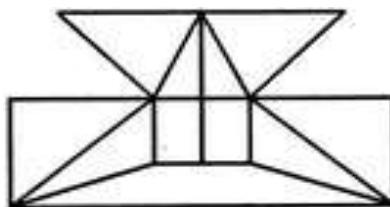
46. Find the number of straight lines to make the given figure.

A. 16

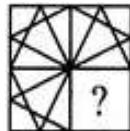
B. 17

C. 14

D. 13



47. Identify the figure that completes the pattern.



A. 1

B. 2

C. 4

D. 3

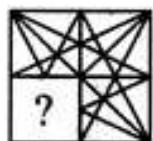
48. Identify the figure that completes the pattern.

A. 1

B. 2

C. 3

D. 4



49. Identify the figure that completes the pattern.

A. 1

B. 2

C. 3

D. 4



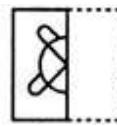
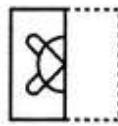
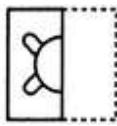
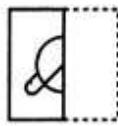
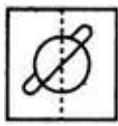
50. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.

A. 1

B. 2

C. 3

D. 4



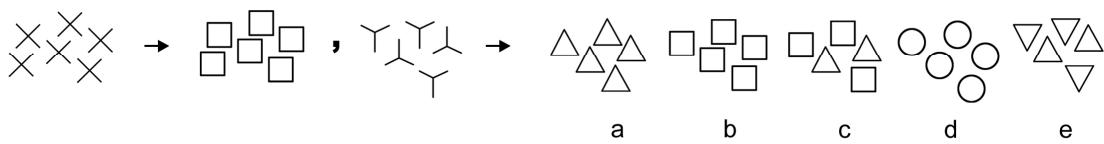
## Section 1 – ANALOGY

Which shape or figure on the right completes the second pair in a similar way as in the first pair.

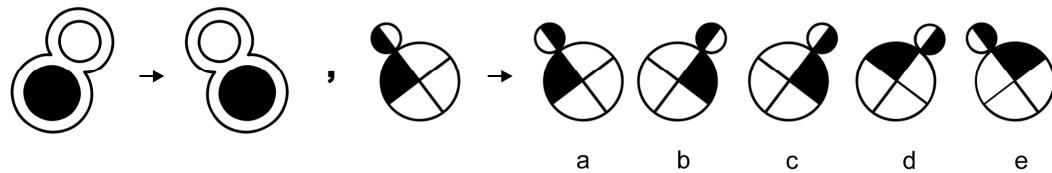
01	
02	
03	
04	
05	

## Section 1 - ANALOGY

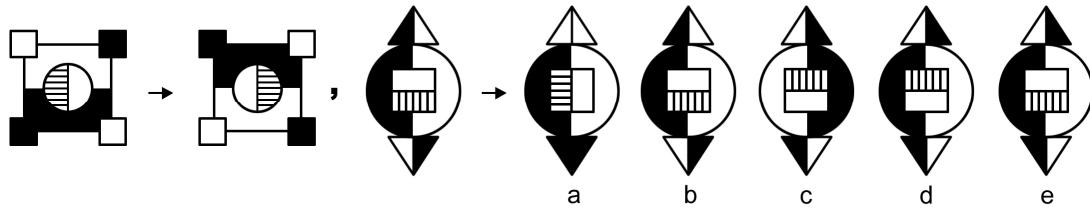
06



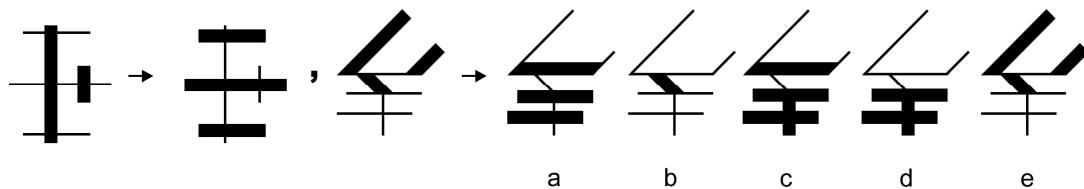
07



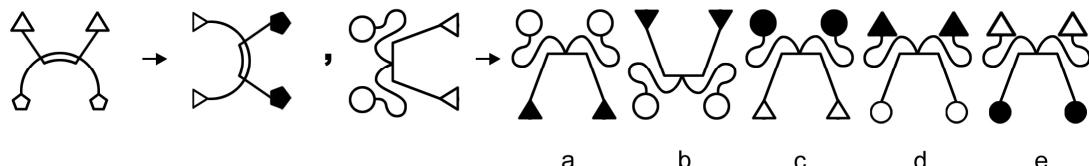
08



09



10

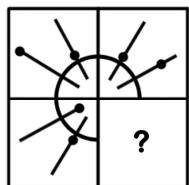


**END OF SECTION 1- DO NOT TURN**

## Section 2 – MATRICES

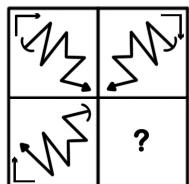
Find which shape should fill the empty square.

01



- a
- b
- c
- d
- e

02



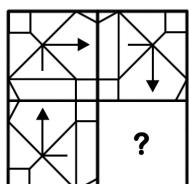
- a
- b
- c
- d
- e

03



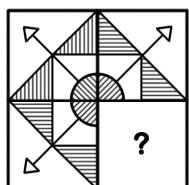
- a
- b
- c
- d
- e

04



- a
- b
- c
- d
- e

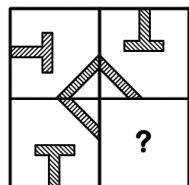
05



- a
- b
- c
- d
- e

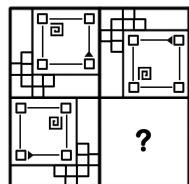
## Section 2 – MATRICES

06



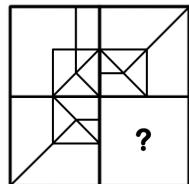
- a
- b
- c
- d
- e

07



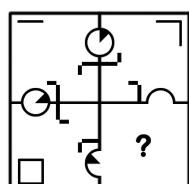
- a
- b
- c
- d
- e

08



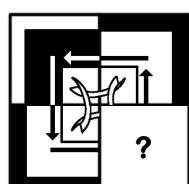
- a
- b
- c
- d
- e

09



- a
- b
- c
- d
- e

10



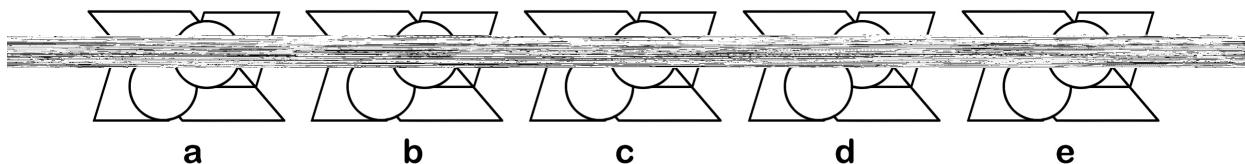
- a
- b
- c
- d
- e

**END OF SECTION 2 - DO NOT TURN**

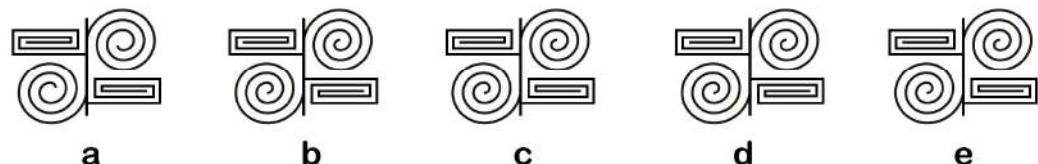
### Section 3 – ODD ONE OUT

Which figure is the odd one out in the group.

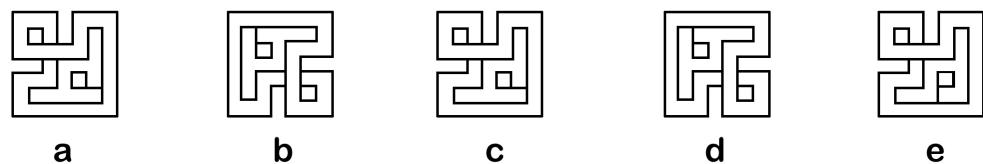
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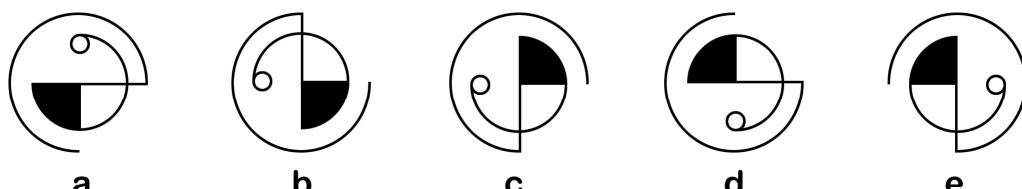
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03



04



05



### Section 3 – ODD ONE OUT

06



a



b



c



d



e

07



a



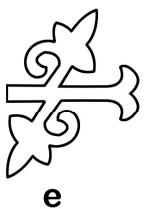
b



c



d



e

08



a



b



c

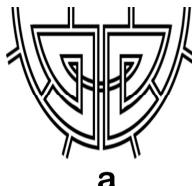


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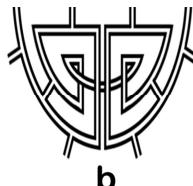


e

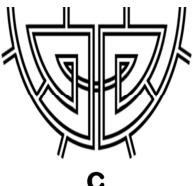
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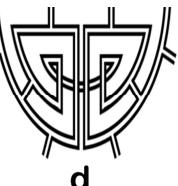
a



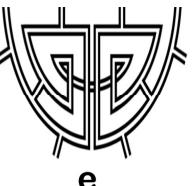
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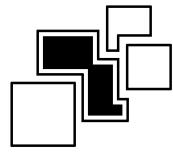


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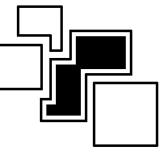


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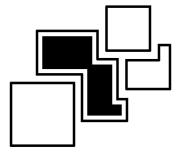
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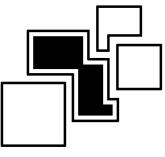
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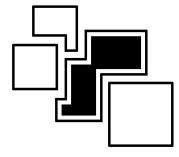
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c



d



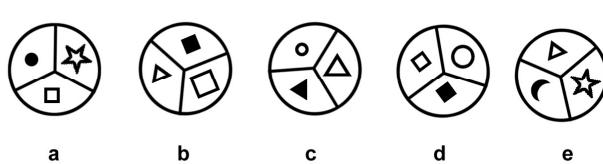
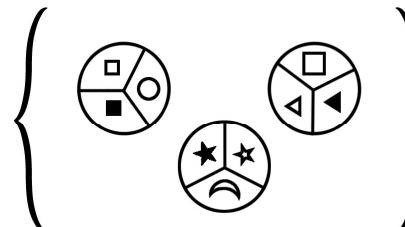
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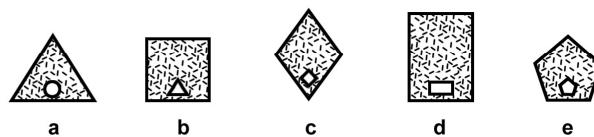
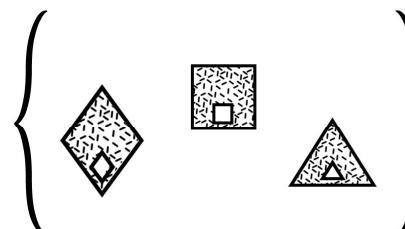
## Section 4 – SIMILARITY

Which figure on the right is similar to the figures on the left.

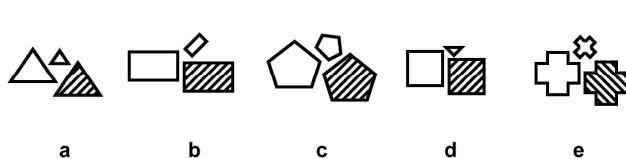
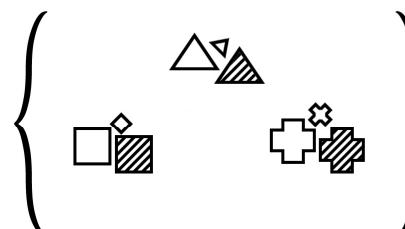
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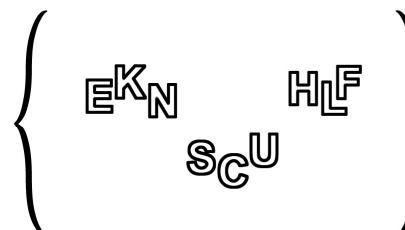
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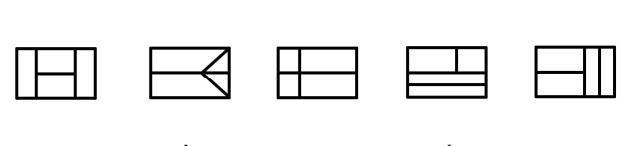
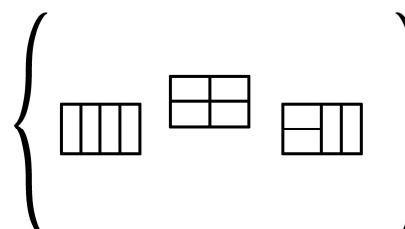
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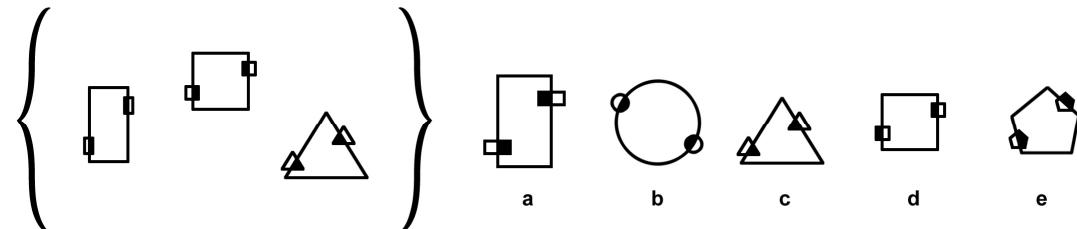
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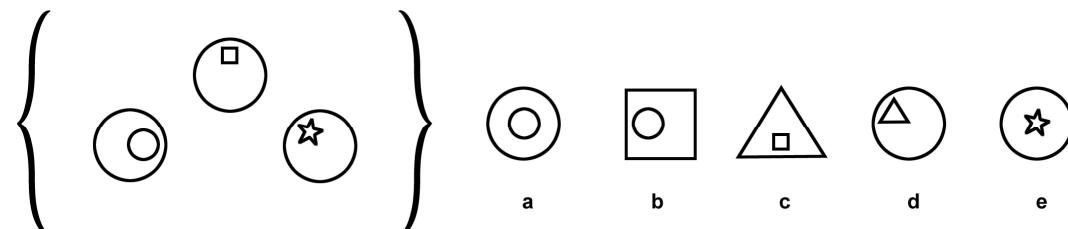


## Section 4 – SIMILARITY

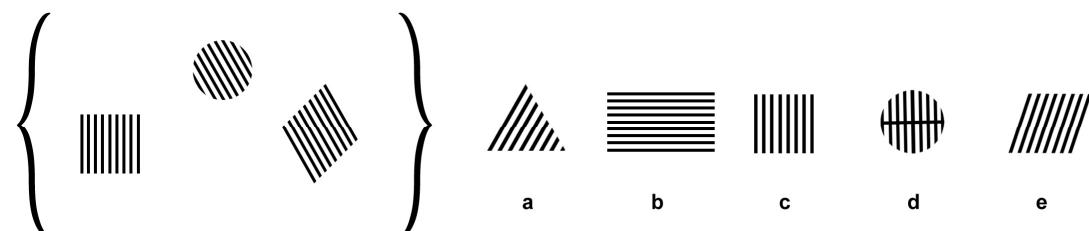
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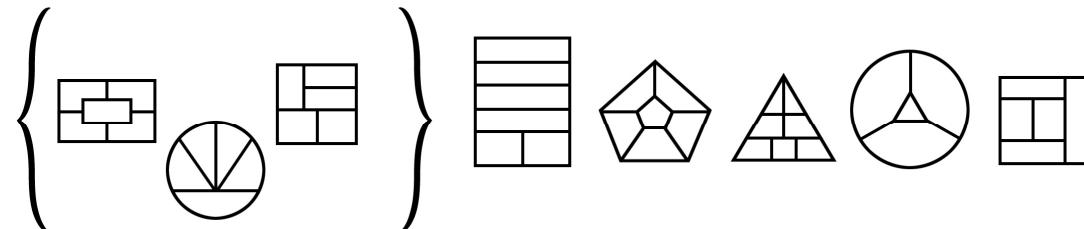
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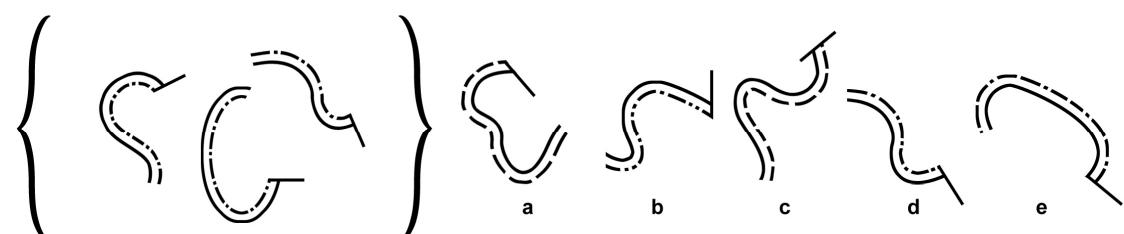
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**END OF SECTION 4 - DO NOT TURN**

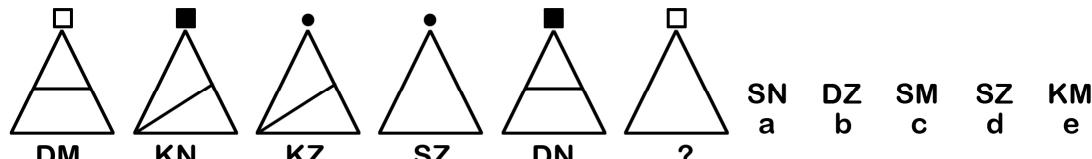
## Section 5 – CODES

Find which code matches the shape or pattern given at the end of each question.

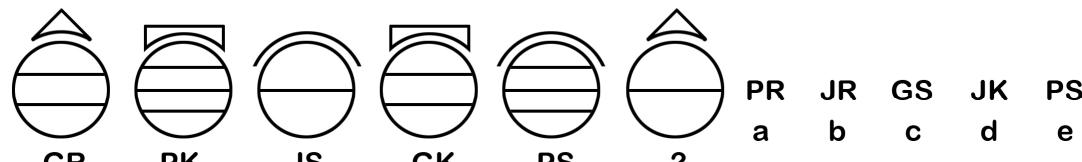
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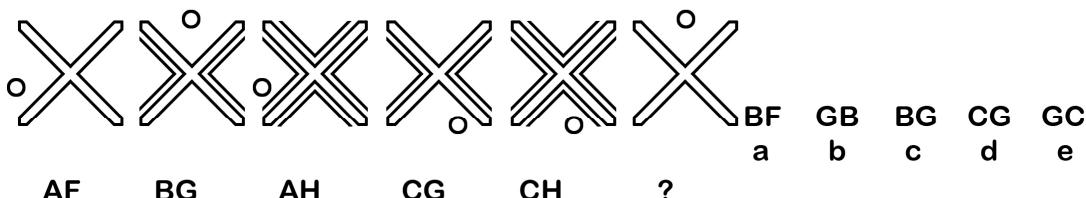
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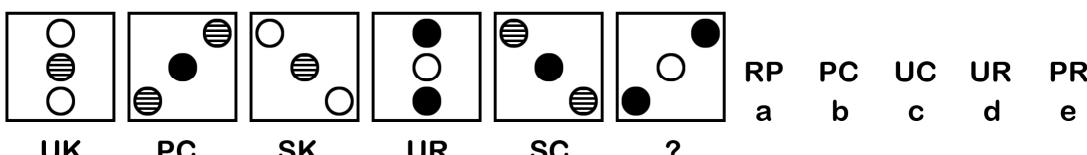
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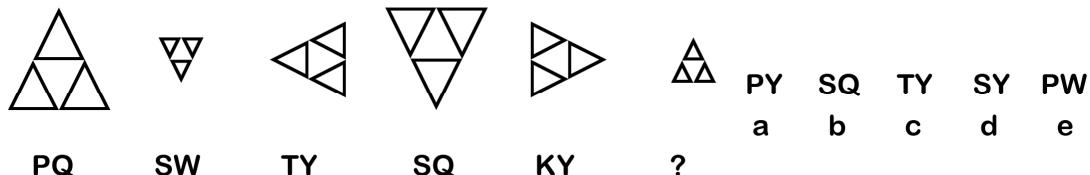


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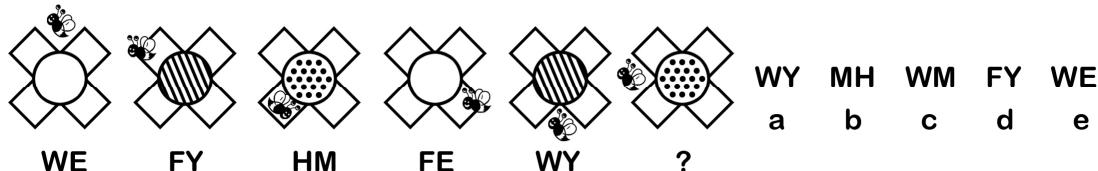


## Section 5 – CODES

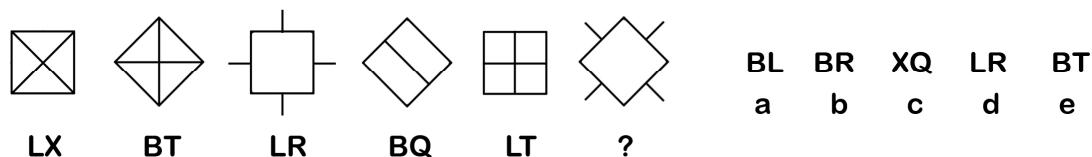
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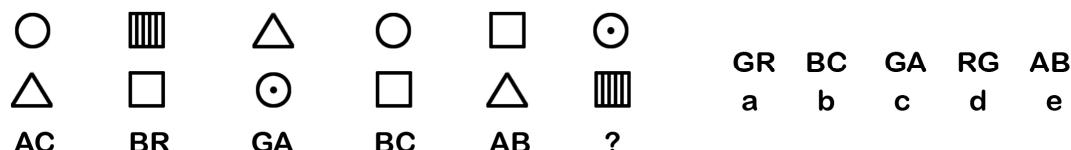
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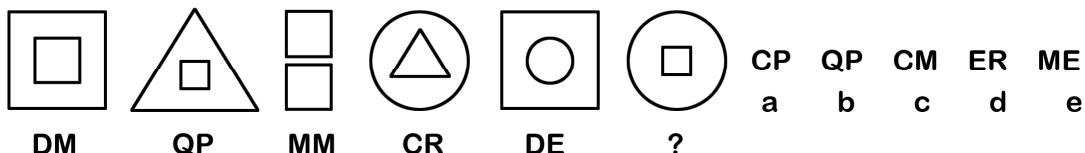
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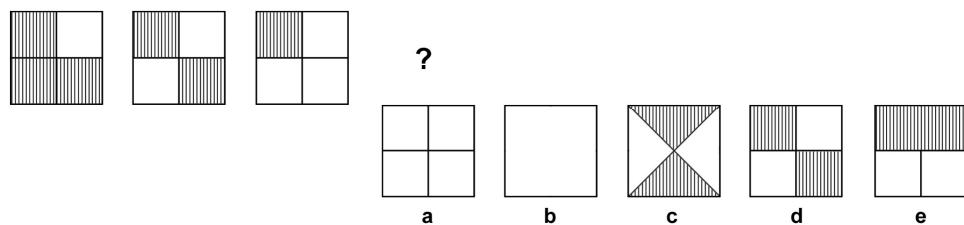


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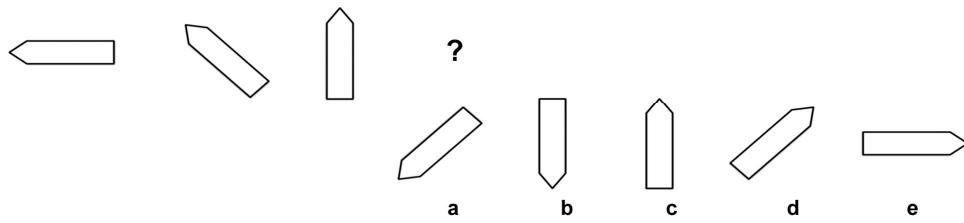
## Section 6 – SERIES

Find which one of the five figures on the right should come next.

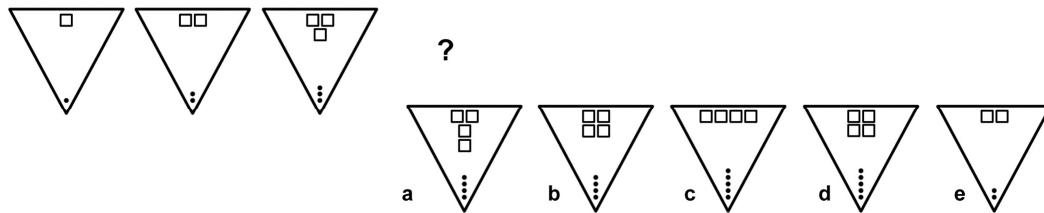
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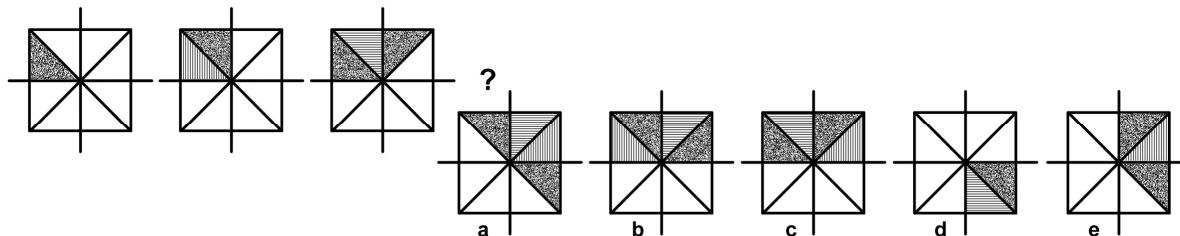
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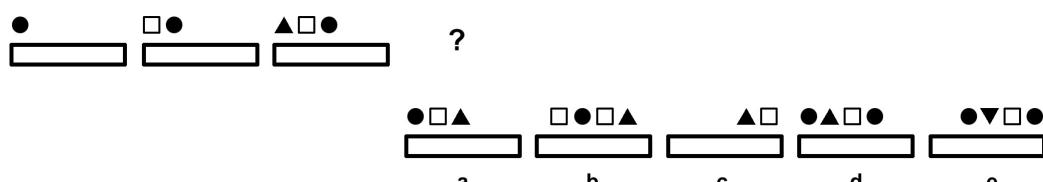
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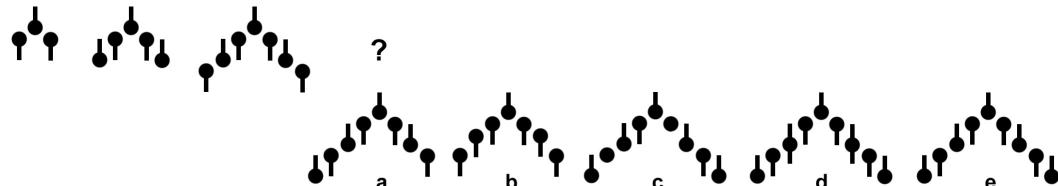


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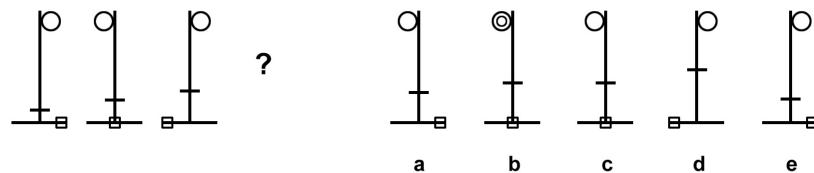


## Section 6 – SERIES

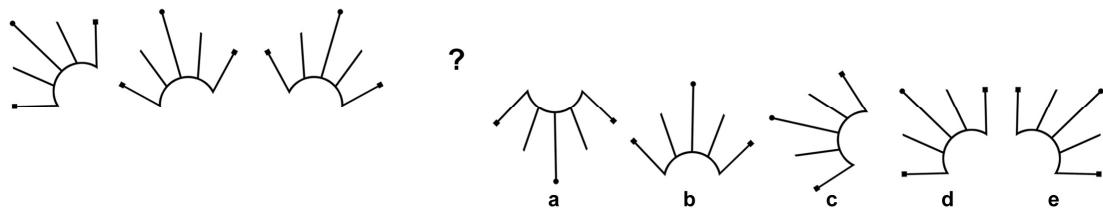
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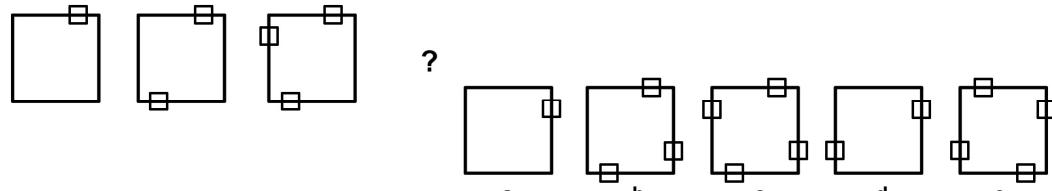
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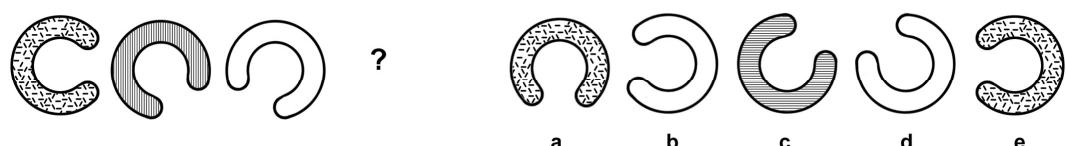
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**END OF SECTION 6 - DO NOT TURN**

## **II. POWER TEST**

### **ENGLISH**

This sub-test measures your ability to apply the rules of the English language, specifically on grammar and syntax, vocabulary and reading comprehension.

1. Which sentence clearly and states the idea and has no structural errors?
  - A. The interest if a loan company is higher than a bank effectively
  - B. The interest at a loan company is higher than a bank
  - C. The interest at a loan company is higher than at a bank
  - D. The interest of a loan company is higher than in a bank.
  
2. A. Following his defeat, he abdicated with the apparent intention of going into exile in America.  
B. At Rochefort, however he found the harbor blockaded and he decided to surrender himself to Royal Navy.  
C. He was escorted aboard HMS Bellerophon. It was a new experience for him to see the inside of a ship of the Royal Navy, the instrument of France's defeat at Trafalgar a few years earlier.  
D. If you or I had been in Napoleon's shoes after his shattering defeat at Waterloo, we might well have lapsed into a state of inward-looking depression if not despair. Not so Napoleon.  
A. ABCD  
B. DABC  
C. DBCA  
D. ACBD
  
3. The measure of choosing well is whether or not man likes what he \_\_\_\_\_.  
A. is choosing  
B. choose  
C. chosen  
D. chose
  
4. A dance instructor is holding an aerobics class every morning in front of the town market where there is a big open space. There are many participants and he charges them 10 pesos per session. In contrast, a Zumba class in the nearby dance studio has only 10 participants because the enrollment fee is expensive. Only the rich can afford to enroll in the Zumba class. What can we deduce from the situation?  
A. The aerobics class is more enjoyable than the Zumba class.  
B. The aerobics class is more popular than the Zumba class.  
C. The participants of the aerobics class are all poor.  
D. More people enroll in the aerobics class because the enrollment fee is affordable.
  
5. TAILOR is related to NEEDLE as MECHANIC is related to \_\_\_\_\_.  
A. brush  
B. tool chest  
C. engineer  
D. screwdriver

6. The traffic flow at the corner was jammed. Manny feared getting late so he \_\_\_\_\_ with a bus and leaped at the door.
- A. has caught
  - B. was catching
  - C. catch up
  - D. caught up
7. A. Now we shall do everything we can to enforce this law.  
B. In the struggle against crime, government and people should join hands.  
C. Republic Act 7659, the death penalty law is government's response in law against cruelty and heartlessness.  
D. The law's main objective is not retribution but reform and rehabilitation of offenders and would-be offenders.  
E. All countries in the world are presently sieged by violent crime.
- A. EBCDA
  - B. CBEDA
  - C. ACEBD
  - D. CEBAD
8. "I die just when the dawn breaks to herald the day." This is a famous quote from \_\_\_\_\_.  
A. Benigno S. Aquino  
B. Manuel L. Quezon  
C. Jose P. Rizal  
D. Jose Aquino
9. What word is not properly spelled and used in these sentences?  
A. There were confusions on admission.  
B. There were commissions on the fare.  
C. There was confusion in the plane.  
D. There was confusion on directions.
10. The games we used to play when we were young have been sidelined by modern gadgets.  
Nowadays, we no longer see children and teens playing piko, tumbang preso, luksong baka, patintero and other enjoyable games our parents used to play. The young generation of today is so hooked on gadgets that they even have no time to talk to each other during their free time. This is very unhealthy according to some social scientists. From the passage, we can conclude that:  
A. Children and teens will not enjoy playing piko, patintero, luksong baka and tumbang preso.  
B. The young generation of today prefers modern gadgets over piko, patintero and the likes.  
C. Children and teens who use modern gadgets are sickly.  
D. Modern gadgets should be totally banned to protect our children.
11. The Greek dramatist authored "Alcestis" and "Andromache."  
A. Virgil  
B. Homer  
C. Sophocles  
D. Euripides

12. "Of man's first disobedience and the fruit/of that forbidden tree" is the opening to:
- A. The Pilgrim's Progress by John Bunyan
  - B. The Fairie Quenne by Edmund Spenser
  - C. The Vision of Delight by ben Johnson
  - D. Paradise Lost by John Milton
13. Before the sleeping time, children are discouraged to watch \_\_\_\_ shows that cause nightmares.
- A. Special
  - B. Spectacular
  - C. Spectral
  - D. Spiteful
14. In the past, consumers would rarely walk into an ice cream store and order low-fat ice cream. But that isn't the case today. An increasing health consciousness combined with a much bigger selection of tasty low-fat foods in all categories has made low-fat ice cream a very profitable item for ice cream store owners. This paragraph best supports the statement that
- A. Low-fat ice cream is more popular than other kinds of ice cream.
  - B. Ice cream store owners would be better off carrying only low-fat ice cream.
  - C. Low-fat ice cream produces more revenue than other low-fat foods.
  - D. Ice cream store owners no longer think that low-fat ice cream is an unpopular item.
15. I was speaking to Raquel on the phone when suddenly we were \_\_\_\_\_.  
A. Disconnected  
B. Broken down  
C. Hung up  
D. Cut off
16. PORCINE is related to PIG as BOVINE is related to \_\_\_\_\_.  
A. Boy  
B. Sheep  
C. Iodine  
D. Cow
17. Rousseau advised, "Have a good bank account, a good cook and a good digestion." What is being referred to?  
A. Investment  
B. Family  
C. Duty  
D. Security

18. What figure of speech is employed when the author states, " O souls and spirits of the martyred brave. Arise?"

**Excerpt from Like the Molave**

**Not you alone, Rizal. O souls  
And spirits of the martyred brave, arise!  
Arise and scour the land! Shed once again  
Your willing blood! Infuse the vibrant red  
Into our thin anemic veins; until  
We pick up your Promethean tools and, strong,  
Out of the depthless matrix of your faith  
In us, and on the silent cliffs of freedom,  
We carve for all time your marmoreal dream!  
Until our people, seeing, are become  
like the Molave, firm, resilient, staunch,  
Rising on the hillside, unafeard,  
Strong in its own fiber, yes, like the Molave!**

- Rafael Zulueta Da Acosta

- A. Apostrophe
  - B. Metonymy
  - C. Onomatopoeia
  - D. Metaphor
19. We buy only cherry plums since we like \_\_\_\_\_ best.
- A. That kinds
  - B. That
  - C. These kind
  - D. Those kind
20. Being the scion of a wealthy patriarch, the family enjoys a good life.
- A. Relative
  - B. Paintings
  - C. Family
  - D. Descendant
21. Which of the following works by DANIEL DEFOE features a castaway who spends 28 years on a remote tropical island near Venezuela, encountering Native Americans, captives, and mutineers before being rescued?
- A. Moll Flanders
  - B. Memoirs of a Cavalier
  - C. Robinson Crusoe
  - D. Captain Singleton

22. The main protagonist acted out the part with great elan.
- A. Great pride
  - B. Supervised movements
  - C. Memorized dialogue
  - D. Enthusiasm and style
23. One New York publisher has estimated that 50,000 to 60,000 people in the United States want an anthology that includes the complete works of William Shakespeare. And what accounts for this renewed interest in Shakespeare? As scholars point out, his psychological insights into both male and female characters are amazing even today. This paragraph best supports the statement that
- A. Shakespeare's characters are more interesting than fictional characters today.
  - B. Academic scholars are putting together an anthology of Shakespeare's work.
  - C. People even today are interested in Shakespeare's work because of the characters.
  - D. New Yorkers have a renewed interest in the work of Shakespeare.
24. Which of the following is a work of SAMUEL LANGHORNE CLEMENS?
- A. The Scarlet Letter
  - B. Animal Farm
  - C. Adventures of Huckleberry Finn
  - D. Uncle Tom's Cabin
25. Which is NOT synonym for 'gathering'?
- A. Colligation
  - B. Contesseration
  - C. Collocation
  - D. Conjuration
26. \_\_\_\_\_ wiring is the cause of the sudden blackout.
- A. Lose
  - B. Losing
  - C. Lost
  - D. Loose
27. We should work for a total ban \_\_\_\_\_ of pesticides that are harmful to man.
- A. By the use
  - B. With the use
  - C. On the use
  - D. On using
28. Please read the chapter \_\_\_\_\_.
- A. "Filing Your Income Tax Returns"
  - B. Filling your Income Tax Returns
  - C. Filing Your Income Tax Returns
  - D. "Filing your Income Tax Returns"

29. There was HIATUS of two years before I went back to college. HIATUS means \_\_\_\_\_.

- A. Uninterruption
- B. Length
- C. Continuation
- D. Lapse

30. BREAD is related to BUTTER as POTATOES is related to \_\_\_\_\_.

- A. Gravy
- B. Margarine
- C. Lamb
- D. Steak

31. The ancient people made a \_\_\_\_\_ that the end of the world is near.

- A. Prophetic
- B. Prophesy
- C. Prophecy
- D. Prophet

32. "We moved into the house last week, but I'm afraid everything, is still at sixes and sevens."

- A. The things have not been shipped.
- B. In a state of confusion.
- C. In an orderly manner.
- D. The boxes are still intact

33. Both Nenita and \_\_\_\_\_ plan to go.

- A. I
- B. Myself
- C. Me myself
- D. Me

34. The nearest post office is on \_\_\_\_\_.

- A. Twenty-Second Street
- B. Twenty second street
- C. Twenty Second Street
- D. Twenty-second street

35. Which of the following sentences is punctuated correctly?

- A. He worked all night, therefore, he was able to finish the report in time.
- B. He worked all night; therefore, he was able to finish the report in time.
- C. He worked all night, therefore he was able to finish the report in time.
- D. He worked all night therefore he was able to finish the report in time.

36. Select the sentence with the most appropriate order of adverbs and adverbial phrases.

- A. Ramonita prays fervently for her grandmother's recovery at St. Matthew's Church.
- B. Ramonita prays fervently at St. Matthew's Church for her grandmother's recovery.
- C. Ramonita prays at St. Matthew's Church fervently for her grandmother's recovery.
- D. Any one of the choices is fine.

37. A Chinese proverb says, "the virtue with the shortest memory is gratitude." This tells of persons who are:
- A. Grateful
  - B. Greetful
  - C. Hospitable
  - D. Careful
38. Choose the sentence that expresses the thought clearly and that has no error in structure/spelling.
- A. The farmer has plowed, planted and harvested his corn in record time.
  - B. The farmer plowed, planted and harvested his corn in record time .
  - C. The farmer did plow, plant, harvest his corn in record time.
  - D. The farmer plowed, has planted and has harvested his corn in record time.
39. The wounded soldiers were visited by the President who honored them with \_\_\_\_\_ for their \_\_\_\_\_.
- A. Appointments – consistency
  - B. Medals – valor
  - C. Appearance – bravery
  - D. Money – sacrifice
40. GNASH is related to TEETH as LISTEN is related to \_\_\_\_\_.
- A. Dissuade
  - B. Resolve
  - C. Ears
  - D. Hear
41. Joeyy \_\_\_\_\_ in bed too long and missed her classes.
- A. Lay
  - B. Lied
  - C. Lays
  - D. Laid
42. In Feng Shui, clutter is a big no-no. Clutter is consists of old toys, clothes, old magazines and everything old which are no longer used. It hinders the free circulation of the fresh energy inside the house, preventing it to enter every room. It makes the energy inside the house stale and inactive, making the residents of the house sickly and less aggressive. To avoid more unlucky situations in the homes, clutter should be cleared once it starts to pile up. This is good Feng Shui. What conclusion can we make?
- A. Old toys should be recycled.
  - B. Old books and old magazines should be arranged in one place.
  - C. Clutter should be stored in one room of the house for good Feng Shui.
  - D. Clutter is inauspicious in the homes.
43. All of the following correctly describes the BALLAD, except
- A. A ballad often uses learned language
  - B. A ballad often rhymes
  - C. A ballad use dialogue
  - D. A ballad is a narrative poem

44. He's a good doctor but instead of working in a big hospital, he opts to practice his profession in remote areas.
- A. Tries
  - B. Decides
  - C. Chooses
  - D. Starts
45. The line from the Koran, "Woe to every backbiter," talks of \_\_\_\_\_.
- A. Anguish for those who defend unrighteousness
  - B. Sorrow for those who oppose other's opinion
  - C. Misery for those who talk ill of others
  - D. Punishment for those who say good things
46. Which of the following job has the stress on the first syllable?
- A. Psychiatrist
  - B. Secretary
  - C. Biologist
  - D. Photographer
47. It is hard to earn a dollar these days.
- A. Metonymy
  - B. Synechdoche
  - C. Personification
  - D. Oxymoron
48. I should have returned this book last Tuesday, it is now five days \_\_\_\_.
- A. Delayed
  - B. Overdue
  - C. Postponed
  - D. Beyond
49. The beautiful façade of the building elicited admiration from the guests.
- A. Front
  - B. Paintings
  - C. Decoration
  - D. Lobby
50. Which among the following is the correct sequence of the sentences below?
1. The image of a good teacher is one who is constantly reflecting about how best to help different types of learners how to learn.
  2. The National Competency-Based Teacher Standards (NCBTS) define a new paradigm of teaching where the teacher is viewed as a knowledge professional who is responsible for facilitating learning.
  3. Good teaching is defined in terms of those practices that help students learn better.
  4. Competency-based means that the standards or criteria for characterizing good.

5. The NCBTS can be used as a self assessment tool for professional development.

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

## SCIENCE

This section consists of test items in Biology, Chemistry, Physics, and Earth Science that will test your ability to accomplish various important scientific tasks.

1. What type of soil is most suitable for plant growth?  
a. loam                          b. sand                          c. silt                          d. clay
  
2. What instrument measures earthquakes?  
a. seismograph                  b. barograph                  c. thermograph                  d. polygraph
  
3. What is believed to be the composition of the earth's core?  
a. heavy liquid                  b. heavy solid                  c. soft liquid                          d. soft gases
  
4. Where are nutrients mostly absorbed?  
a. small intestine                  b. large intestine                  c. stomach                          d. esophagus
  
5. Why are whales considered mammals?  
a. They nourish their young with milk.  
b. They give birth to live youngs and not hatched from eggs.  
c. They use lungs to breathe.  
d. All of the these
  
6. Why are most fungi parasitic?  
a. They can kill their host.  
b. They take nutrients from their host.  
c. They can cause diseases or infections.  
d. They stick to the other organisms.
  
7. Convert 104°F to Celsius.  
a. 27°C                          b. 30°C                          c. 40°C                          d. 100°C
  
8. If your mass on Earth is 54 kg, what is your weight on the moon?  
a. 90 kg                          b. 54 kg                          c. 88 N                          d. 540 N
  
9. Which of the following is true about acids?  
a. It tastes bitter.  
b. It feels slippery.  
c. Its pH is more than 7.  
d. It turns blue litmus paper into red.
  
10. Which of the following produces the greatest acceleration?  
a.  $F = 16 \text{ N}$ ,  $m = 4 \text{ kg}$   
b.  $F = 10 \text{ N}$ ,  $m = 5 \text{ kg}$   
c.  $F = 5 \text{ N}$ ,  $m = 1 \text{ kg}$   
d.  $F = 2 \text{ N}$ ,  $m = 15 \text{ kg}$

11. Which of the following is the function of the liver?
- It filters waste materials from the blood.
  - It manufactures bile to aid fat digestion and remove toxins from the blood.**
  - It supplies most enzymes for digestion.
  - It destroys old red blood cells, produces lymphocytes, which is a type of white blood cells, and stores blood.
12. Which of the following chemical equations shows a composition reaction?
- |   |  |
|---|--|
| a. $\text{Cl}_2 + \text{NaBr} \rightarrow \text{NaCl} + \text{Br}_2$                      | c. $\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$                |
| b. $\text{C}_{20}\text{H}_{42} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ | d. $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ |
13. Why is it warmer in the regions near the equator than those near the poles?
- Regions near the equator receive vertical rays of the sun.**
  - The air above the equator is thicker.
  - Regions near the equator have longer days than night.
  - Sunlight is converted into heat faster near the equator.
14. The atomic mass of iron is 56 and its atomic number is 26. How many neutrons does an atom of iron have?
- a. 26    b. 28    c. **30**    d. 32
15. What is the most abundant gas in the Earth's atmosphere?
- |                    |                   |
|--------------------|-------------------|
| a. oxygen          | c. carbon dioxide |
| b. <b>nitrogen</b> | d. hydrogen       |
16. The principal quantum number of an atom is 5, what can you conclude?
- |                                  |   |
|----------------------------------|---|
| a. There are 10 orbitals.        | c. The electron has very low energy.      |
| b. <b>There are 5 subshells.</b> | d. The maximum number of electrons is 25. |
17. What is the longest fault?
- |                             |                    |
|-----------------------------|--------------------|
| a. <b>San Andreas Fault</b> | c. Chaman Fault    |
| b. Marikina Fault           | d. Calaveras Fault |
18. The half-life of radon is four days. If at start, you have 32 grams, how many grams will be left after 20 days?
- a. 4    b. 2    c. **1**    d. 0.5
19. How many 1.5-volt dry cells can you put in a circuit that has a 12-volt lamp to give maximum light without breaking the lamp?
- a. 6    b. **8**    c. 9    d. 12

20. What do you call a hail rain?
- a. precipitation      b. mixture      c. solution      d. condensation
21. A plant's leaves have parallel veins and each of its flower has 6 petals; to which group does it belong?
- a. monocot      c. cannot be determined  
b. dicot      d. neither monocot nor dicot
22. What is the largest classification of animals?
- a. Kingdom      b. Phylum      c. Class      d. Species
23. If the resistance of the circuit is decreased, what happens to the current?
- a. Decreases      c. Stays the same  
b. Increases      d. None of these
24. If the distance between two objects is doubled, what happens to the force of attraction between them?
- a. Decreases      c. Stays the same  
b. Increases      d. None of these
25. If you would travel from Earth to Mars, your
- a. mass would stay same but your weight would be different.  
b. mass and weight would both stay the same.  
c. mass would be different but your weight would stay the same.  
d. mass and weight would both change.
26. Barnacles adhering to the skin of a whale is an example of
- a. mutualism.      c. parasitism.  
b. commensalism.      d. predation.
27. Which of the following is true?
- a. pH of less than 7 is basic.      c. Acids are bitter.  
b. pH of more than 7 is acidic.      d. None of the above.
28. When blood passes through the lungs, what do the lungs do on the blood?
- a. Supply oxygen to the blood      c. Supplies carbon dioxide to the blood  
b. Filters waste from the blood      d. Takes away oxygen from the blood
29. What is the part of the earth in which living organisms exist?
- a. lithosphere      b. hydrosphere      c. biosphere      d. atmosphere
30. How many alleles can be formed in a person with AaBb genotype?
- a. 1      b. 2      c. 3      d. 4

31. Temperatures have risen during the last 30 years. As the Earth warms up, seawater level rises. Why is there an expected increase in seawater level when the temperature increases?

- a. The oceans spread or expand.
- b. The mountain glaciers melt.
- c. The ice in the north and south poles melt.
- d. All of these

32. Where are chromosomes located?

- a. nucleolus
- b. nucleus
- c. plasma membrane
- d. cytoplasm

33. Lightning can be defined as

- a. collision of cold air and hot air.
- b. the expansion of rapidly heated air.
- c. violent disturbance of the atmosphere with strong winds and usually rain.
- d. massive electrostatic discharge between electrically charged regions within clouds.

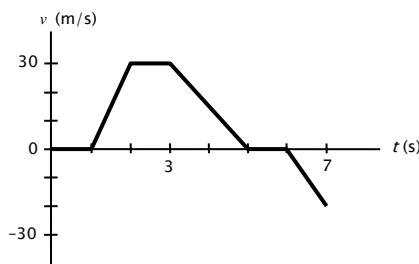
34. What is the moho?

- a. inner core
- b. outer core
- c. boundary between the outer and inner core
- d. boundary between the crust and the mantle

35. Where is chlorophyll found?

- a. stomata
- b. chloroplasts
- c. chromoplasts
- d. leucoplasts

For numbers 36 and 37, refer to the v-t graph below.



36. What is the slope of the line segment from 3 s to 5 s?

- a. -15
- b. 15
- c. -30
- d. 30

37. To what does the slope of the graph refer?

- a. distance
- b. displacement
- c. velocity
- d. acceleration

38. What does the stomach produce other than hydrochloric acid?

- a. pepsin
- b. lipase
- c. citric acid
- d. lactic acid

39. A projectile is launched at an angle from the ground. What becomes zero as the projectile approaches the ground?

- a. vertical displacement
- b. speed
- c. acceleration
- d. velocity

40. Why can you smell perfume in an open bottle?

- (1) Molecules are moving.
- (2) Molecules attract one another.
- (3) Molecules of air have large spaces between them.
- (4) Air has no definite volume.

41. The movement of food through the intestines is known as:

- A. Peristalsis
- B. Ileum translation
- C. Microvilli propulsion
- D. Flexure propulsion

42. The enzyme maltase does the following:

- A. Breaks down lactose to glucose
- B. Turns glucose into maltose
- C. Breaks down maltose to glucose
- D. Turns glucose into lactose

43. High levels of bilirubin in the blood stream can result in:

- A. Uric acid overexposure
- B. Jaundice
- C. Bile salt production
- D. Hepatic mutation

44. The symbol B on the periodic table stands for:

- A. Beryllium
- B. Boron
- C. Barium
- D. Berkelium

45. The symbol Mn on the periodic table stands for:

- A. Magnesium
- B. Molybdenum
- C. Manganese
- D. Margon

46. The symbol Ca on the periodic table stands for:

- A. Calcium
- B. Carbon
- C. Cobalt
- D. Chlorine

47. The symbol Br on the periodic table stands for:

- A. Beryllium
- B. Boron
- C. Barium
- D. **Bromine**

48. Vinegar is also known as:

- A. **Acetic acid**
- B. Acetone acid
- C. Sulfuric acid
- D. Ascorbic acid

49. A Lewis acid is a/an \_\_\_\_ pair acceptor.

- A. Neutron
- B. Proton
- C. **Electron**
- D. Ion

50. \_\_\_\_ reactions produce heat.

- A. Endothermic
- B. **Exothermic**
- C. Hydrogen
- D. Buffered

51. Which of the following match the definition: The pressure (P) is inversely proportional to the volume (V) of a gas.

- A. Archimedes' principle
- B. Charles' law
- C. **Boyle's law**
- D. Anderson's principle

52. The combination of sodium and chlorine to form NaCL is considered a/an \_\_\_\_ bond.

- A. **Ionic**
- B. Covalent
- C. Hydrogen
- D. Metallic

53. Outer shell electrons are known as \_\_\_\_\_ electrons.

- A. Hybrid
- B. **Valence**
- C. Vector
- D. Transitional

54. Forces can be indicated on graph paper by the use of \_\_\_\_\_.

- A. Empirical rules
- B. Interaction coefficients
- C. Variables
- D. **Vectors**

55.  $P_1V_1 = P_2V_2$  represents:

- A. Archimedes' principle
- B. Charles' law
- C. Boyle's law
- D. Anderson's principle

56. Which of the following is not considered a primary color of light?

- A. Green
- B. Blue
- C. Red
- D. Yellow

57. The unit of charge is called the \_\_\_\_\_.

- A. Newton
- B. Coulomb
- C. Joule
- D. Watt

58. A/An \_\_\_\_\_ is a device specifically designed to measure current.

- A. Ammeter
- B. Cyclotron
- C. Resistor
- D. Capacitor

59. The two bones found in the area between the knee and ankle in humans are known as:

- A. Femur and Tibia
- B. Fibula and Tibia
- C. Ulna and Tibia
- D. Radius and Tibia

60. \_\_\_\_\_ is the current flow of one coulomb per second.

- A. Ampere
- B. Joule
- C. Watt
- D. Kilowatt

## MATHEMATICS

1. What does D represent in Roman numeral system?

- a. 500
- b. 50
- c. 100
- d. 1000

2. What is 70.3 divided by 10?

- a. 7.03
- b. 27.03
- c. 17.03
- d. 703

3. How many irrational numbers are there between 1 and 6 ?

- a. Infinitely many
- b. 3
- c. 10
- d. 4

4. Which of the following has the smallest value?

- a. 0.01
- b. 0.0001
- c. 0.1
- d. 0.00001
- e. 0.001

5. A herd of cows gives 4 liters of milk each day. But each cow gives one-third of total milk each day. They give 24 liters milk in six days. How many cows are there in the herd?

- a. 2
- b. 3
- c. 5
- d. 4

6. What is the square root of 144?

- a. 67
- b. 12
- c. 34
- d. 24

7. Which fraction is equal to 0.20%?

- a. 1/500

- b.  $\frac{1}{20}$
- c.  $\frac{1}{400}$
- d.  $\frac{1}{50}$

8. Sarah is twice as old as her youngest brother. If the difference between their ages is 15 years. How old is her youngest brother?

- a. 15
- b. 10
- c. 20
- d. 25

9. Simplify:  $\sqrt{48}$

- a.  $6\sqrt{3}$
- b.  $4\sqrt{2}$
- c.  $4\sqrt{3}$
- d.  $4\sqrt{2}$

10. A typical high school student consumes 67.5 pounds of sugar per year. As part of a new nutrition plan, each member of a track team plans to lower the sugar he or she consumes by at least 20% for the coming year. Assuming each track member had consumed sugar at the level of a typical high school student and will adhere to this plan for the coming year, what is the maximum number of pounds of sugar to be consumed by each track team member in the coming year?

- a. 66
- b. 54
- c. 48
- d. 44

11. If you purchase two stamps costing 60 centavos each and you give the cashier ₱2.00, how much change should you receive?

- a. 60 cents
- b. 40 cents
- c. 70 cents
- d. 80 cents

12. In a writing competition, the first place winner receives  $\frac{1}{2}$  of the prize money. The second runner up receives  $\frac{1}{4}$  of what the winner won. What was the total amount of prize money distributed if the winner receives ₱6,000?

- a. ₱12,000
- b. ₱6,000
- c. ₱8,500
- d. ₱15,000

13. You decide to dye your hair various colors for Halloween. If you dye  $\frac{1}{3}$  of it blue,  $\frac{1}{4}$  pink, and  $\frac{1}{4}$  black, how much of your original hair color is left?

- a. 4/5
- b. 5/6
- c. 3/4
- d. 4/6

14. A DVD player with a list price of ₦100 is marked down 30%. If John gets an employee discount of 20% off the sale price, how much does John pay for the DVD player ?

- a. ₦86.00
- b. ₦56.00
- c. ₦44.00
- d. ₦77.60

15. What will it cost to tile a kitchen floor that is 12 feet wide by 20 feet long if the tile cost ₦8.91 per square yard?

- a. ₦271.38
- b. ₦237.60
- c. ₦246.55
- d. ₦224.51

16. An instrument store gives a 10% discount to all students off the original cost of an instrument. During a back to school sale an additional 15% is taken off the discounted price. Julie, a student at the local high school, purchases a flute for ₦306. How much did it originally cost?

- a. ₦450
- b. ₦325
- c. ₦400
- d. ₦350

17. If 5 ounces is equal to 140 grams, then 2 pounds of ground meat is equal to how many grams?

- a. 896
- b. 915
- c. 863
- d. 878

18. One half of the students in a school are girls,  $\frac{3}{5}$  of these girls are studying in lower classes. What fraction of girls are studying in lower classes?

- a. 2/4
- b. 3/10
- c. 2/10
- d. 3/4

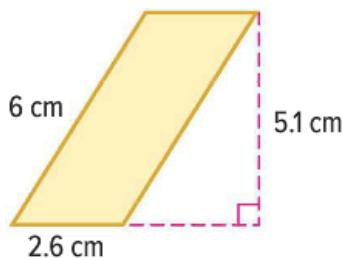
19. If  $3x=6x-15$  then  $x + 8 =$

- a. 5
- b. 10
- c. 13

d. 11

20. Find the area of the parallelogram.

- a.  $30.6 \text{ m}^2$
- b.  $13 - 50 \dots \text{thats } 47$
- c.  $\dots 5.6 \text{ m}^2$
- d.  $\dots 13.26 \text{ m}^2$



21. Find the missing term in the following sequence: 4, 9, 19, \_\_, 79

- a. 36
- b. 37
- c. 38
- d. 39

22. What is three fifths of 50?

- a. Thirty-five (35)
- b. Forty (40)
- c. Forty-five (45)
- d. Thirty (30)

23. You are lying 120 ft away from a tree that is 50 feet tall. You look up at the top of the tree.

Approximately how far is your hear from the top of the tree in a straight line?

- a. 75 feet
- b. 130 feet
- c. 120 feet
- d. 50 feet

24. Which of the following fractions is equal to  $5/6$ ?

- a.  $20/30$
- b.  $15/24$
- c.  $25/30$
- d.  $40/54$

25. In his pocket, a boy has 3 red marbles, 4 blue marbles, and 4 green marbles. How many will he have to take out of his pocket to ensure that he has taken out at least one of each color?

- a. 7
- b. 8
- c. 3
- d. 9

26. What is the cube root of 216?

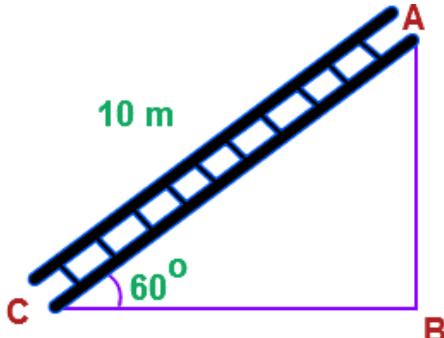
- a. ₦12,000
- b. ₦6,000
- c. ₦8,500

d. ₩15,000

27. A car averages 27 miles per gallon. If gas costs \$4.04 per gallon, which of the following is closest to how much the gas would cost for this car to travel 2,727 typical miles?

- a. \$44.44
- b. \$109.08
- c. \$408.4
- d. \$444.40

28. Find side AB?



- a. 11.54 m
- b. 8.66 m
- c. 20 m
- d. 5 m

29. The number of milliliters in 1 liter is:

- a. 0.1
- b. 10,000
- c. 1,000
- d. 0.01

30.  $\frac{4}{7}$  of a number is 84. Find the number.

- a. 140
- b. 100
- c. 120
- d. 147

31.  $0.2 + 0.02 + 0.002 = ?$

- a. 0.22
- b. 22
- c. 2
- d. 0.222
- e. 0.2

32. 20 % of 2 is equal to:

- a. 0.4
- b. 4
- c. 0.04
- d. 20

33.  $2345 \times 0.00001 = ?$

- a. 0.2345

- b. 2.345
- c. 23.45
- d. 0.02345
- e. 234.5

34. What is the greatest common factor of 42, 126, and 210 ?

- a. 14
- b. 21
- c. 42
- d. 2

35. Students mailed invitations to a play to 414 parents. Each student mailed 18 invitations. If  $s$  equals the number of students who mailed invitations, which equation best shows the number of invitations that were mailed?

- a.  $18s = 414$
- b.  $s \div 18 = 414$
- c.  $18 \div s = 414$
- d.  $s + 18 = 414$

36. How many degrees are there in a right angle?

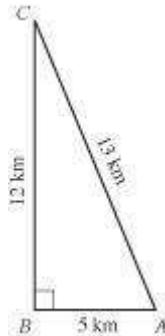
- a. 90
- b. 360
- c. 180
- d. 45

37.  $0.00072 \times 10000 = ?$

- a. 0.0072
- b. 7.2
- c. 0.72
- d. 72,000
- e. 720,000

38. Which of the following is the sine of angle A in the right triangle below?

- a.  $12/5$
- b.  $12/13$
- c.  $5/13$
- d.  $5/12$



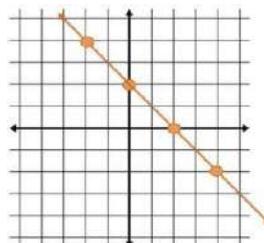
39. Sharon weeded  $\frac{5}{6}$  of her yard in the morning and  $\frac{1}{6}$  of the yard in the afternoon. What part of the yard did she weed altogether?

- a.  $3/6$
- b.  $2/6$

- c.  $4/6$
- d. 1

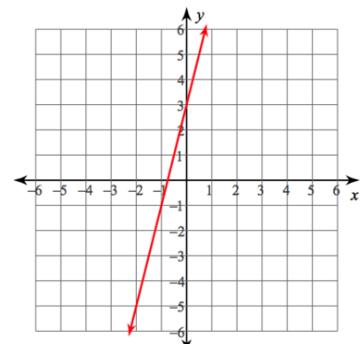
40. What is the equation of this line?

- a. Cannot be Determined
- b.  $y = 2x - 2$
- c.  $y = 2x + 2$
- d.  $y = -x + 2$



41. Write the equation for the line in slope-intercept form.

- a.  $y=1/4x+3$
- b.  $y=-4x+3$
- c.  $y=4x+3$
- d.  $y=-1x+3$



42. In a small company average salary of three employees is ₦1000 per week. If one employee earns ₦1100 and other earns ₦500, how much will the third employee earn?

- a. 1400
- b. 2000
- c. 1000
- d. 1200

43.  $2/5 + 3/8 = ?$

- a.  $34/40$
- b.  $5/13$
- c.  $6/13$
- d.  $31/40$

44. What is 4995 divided by 15?

- a. 350
- b. 333
- c. 320
- d. 325

45. What is the square root of 81?

- a. 7
- b. 8
- c. 9
- d. 6

46. What is the value of x when  $2x + 3 = 3x - 4$  ?

- a. -7
- b. 1
- c.  $-1/5$

d. 7

47. If  $y(x-1)=z$  then  $x=$

- a.  $z(y-1)$
- b.  $y-z$
- c.  $z/y + 1$
- d.  $y(z-1)$

48. There is a box of pebbles where  $1/4$  are blue,  $2/4$  are yellow, and  $1/4$  are black. What fraction of the box has yellow and black pebbles?

- a.  $2/4$
- b.  $1/2$
- c.  $3/4$
- d.  $1/4$

49. What is the meaning of Pi in Math?

- a. It's the ratio of a circle's circumference to its radius.
- b. It's the ratio of a circle's secant to its diameter.
- c. It's the ratio of a circle's chord to its diameter.
- d. It's the ratio of a circle's circumference to its diameter.

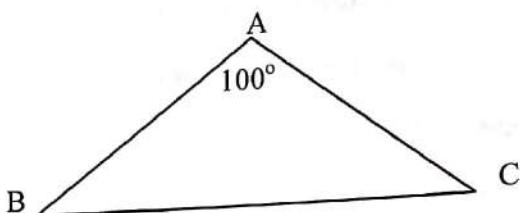
50. The ratio in a right triangle of adjacent to hypotenuse is \_\_\_\_\_

- a. cosine
- b. inverse cosine
- c. tangent
- d. sine

**MATHEMATICS TEST**  
60 minutes; 50 questions

1. On five successive days, a delivery boy from a water company listed the distances he traveled to different provinces. These are: 50 km, 90 km, 100 km, 50 km and 60 km. If his delivery van averages 10 km for each 1 liter of gas used, how many liters of gas did he use during these five days?
- 30 liters
  - 35 liters
  - 40 liters
  - 45 liters
2. A signpost in the parking lot of a mall reads 60 minutes for 15 pesos. Maximum deposit of 60 pesos. What is the maximum time allowed for a driver to be legally parked in this mall?
- 2 hours
  - 3 hours
  - 4 hours
  - 5 hours

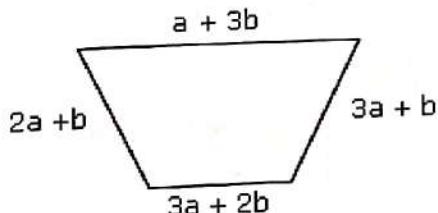
**For No. 3**



3. Base sa pigura na nasa itaas, kung  $AB = AC$  at  $\angle A = 100^\circ$ , ano ang sukat ng  $\angle B$ ?
- $40^\circ$
  - $45^\circ$
  - $50^\circ$
  - $60^\circ$
4. Shoemart had a special sale on shirts. Bench sold at 115 pesos per shirt and Company B sold at 125 per shirt. If 432 shirts were sold at 115 pesos each and 368 shirts were sold at 125 pesos each, the amount of money taken in at the shirt sale may be represented as:
- $800(115 + 125)$
  - $115(368) + 125(432)$
  - $240(432 + 368)$
  - $115(432) + 125(368)$
5. Ang isang koponan sa basketbol ay nanalo sa X na laro, natalo sa Y na laro at tumabla sa Z na laro. Anong parte ng pangkalahatang laro ang naipanalo ng koponan?
- $X$
  - $X$
  - $X$
  - $X$
- $\frac{X+Y+Z}{XYZ}$
- $X$
  - $X$
  - $X$
  - $X$
- $\frac{XY}{X+Y}$
6. One half the students at the University of the Philippines ride jeepneys in going to school. One fourth of the remainder goes to school by car. What part of the school population travel by some other means?
- $1/8$
  - $3/8$
  - $3/4$
  - $1/4$
7. For which value of  $x$  is the inequality  $2x > 9$  true?
- 2
  - 3
  - 4
  - 5
8. Ang layo sa pagitan ng Lungsod ng Quezon at Lungsod ng Kalookan ay sinasabing humigit kumulang sa 3800
- metro
  - kilometro
  - kilogram
  - sentimetro

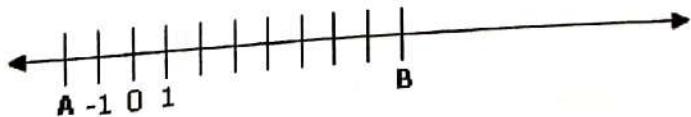
9. A flagpole casts a shadow of 16 feet. At the same time, a pole 9 feet high casts a shadow of 6 feet. What is the height of the flagpole, in feet?
- 18 feet
  - 19 feet
  - 20 feet
  - 24 feet
10. Si Mylene ay mayroong tela na may sukat na 9 natalampakan at 8 pulgada. Gusto n'ya itong hatiin sa 4 na magkakasukat na bahagi. Gaano kalayo mula sa pinakadulo ng tela dapat magputol si Mylene upang makuha n'ya ang unang bahagi?
- 2.5 talampakan
  - 2 talampakan at 5 pulgada
  - 2.9 talampakan
  - 29 talampakan
11. A purse contains 6 1 peso coins, 5 25 centavo coins and 8 5 peso coins. If one coin is drawn at random from the purse, what is the probability that the coin drawn is a 25-centavo coin?
- $\frac{5}{19}$
  - $\frac{5}{14}$
  - $\frac{5}{8}$
  - $\frac{5}{6}$
12. The top five board passers had the following scores taken at random? 91, 95, 90, 88, 94. What is the median of these scores?
- 90
  - 91
  - 94
  - 95
13. Ang halaga ng isang dosenang panda bolpen at 8 mongol na lapis ay 64 piso. Kung ang presyo ng bolpen ay 12 piso kada 3 piraso, magkano ang bawat isang lapis?
- 1 peso
  - 1.5 pesos
  - 2 pesos
  - 3 pesos
14. The scale on a map is 1 inch = 1.5 km. Manila and Batangas are  $3\frac{1}{2}$  inches apart on this map. What is the distance between the two cities?
- 1.4 km
  - 2.5 km
  - 5.00 km
  - 5.25 km

**For No. 15**



15. What is the perimeter of the figure above?
- $8a + 5b$
  - $9a + 7b$
  - $7a + 5b$
  - $6a + 6b$
16. What is the value of  $3ab - x^2y$  if  $a = 4$ ,  $b = 5$ ,  $y = x^3$  and  $x = 2$ ?
- 18
  - 24
  - 28
  - 54

**For No. 17**



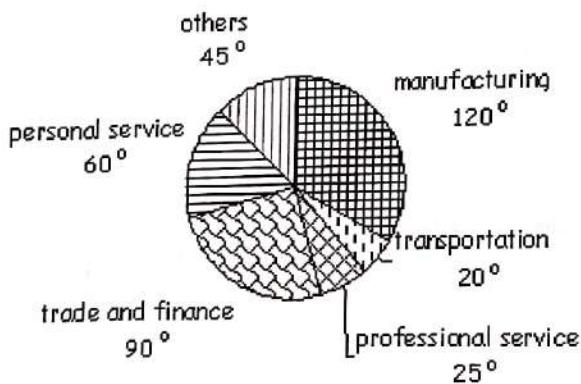
17. On the number line above, what is the coordinate of the midpoint AB?
- 3
  - 0
  - 6
  - 8

GO ON TO THE NEXT PAGE

18. The surplus shop advertised a summer sale. Dan was especially interested in the following sale items:
- 3 ties for 200 pesos, or 67 pesos each
  - 3 shirts for 350, or 117 pesos each
  - slacks for 175 pesos each pair
  - jackets for 425 pesos each
- Dan bought 6 ties, 3 shirts, 2 pairs of slacks and one jacket. What was his bill?
- a. 1500 pesos
  - b. 1525 pesos
  - c. 1600 pesos
  - d. 1625 pesos
19. Bumili si Ginoong Domingo ng telebisyon na nagkakahalaga ng 14,785 peso. Kung kailangan n'ya pang magbayad ng sales tax na 5% para sa TV, magkano lahat ang kanyang dapat bayaran?
- a. 14,880.50 pesos
  - b. 14,888.50 pesos
  - c. 15,619.275 pesos
  - d. 15,524.25
20. Ang layo sa pagitan ng dalawang kometa sa kalawakan ay 85,000,000,000 milya. Ang numerong ito kapag sinulat sa scientific notation ay katumbas ng
- a.  $8.5 \times 10^{-10}$
  - b.  $8.5 \times 10^{10}$
  - c.  $85 \times 10^9$
  - d.  $.85 \times 10^{-9}$
21. If an airplane completes its flight of 67,947 km in 5 hours and 30 minutes, what is its average speed in km/hr?
- a. 12,354 km/hr
  - b. 12,345 km/hr
  - c. 12,534 km/hr
  - d. 12,355 km/hr

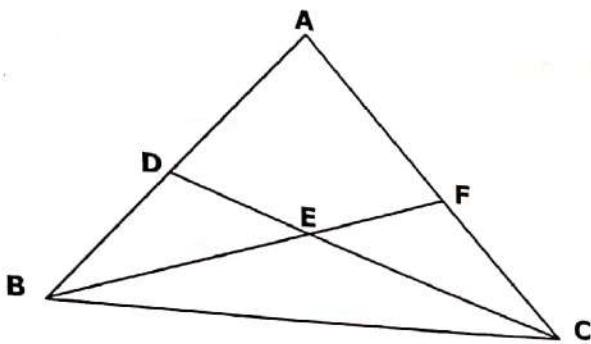
**Use the graph to answer # 22-23**

This graph shows how 18,000 wage earners in a certain city earned their living during a given period. (The numbers indicate the angles formed by the part of each category in a whole).



22. The number of persons engaged in transportation in the city during this period was
- a. 1,000
  - b. 9,000
  - c. 3,600
  - d. 18,000
23. If the number of persons in Trade and Finance is represented by M, then the number in manufacturing is represented as
- a.  $\frac{M}{3}$
  - b.  $M + 3$
  - c.  $30M$
  - d.  $\frac{4M}{3}$

GO ON TO THE NEXT PAGE



24. If  $BF$  bisects  $\angle ABC$ ,  $CD$  bisects  $\angle ACB$ ,  $\angle ABC = 68^\circ$ , and  $\angle ACB = 72^\circ$ , then  $\angle BEC =$
- $90^\circ$
  - $98^\circ$
  - $100^\circ$
  - $110^\circ$
25. Jose has 5 pesos more than Carl, and Carl has 3 pesos less than Alex. If Alex has 30 pesos, how much does Jose have?
- 30 pesos
  - 27 pesos
  - 32 pesos
  - 36 pesos
26. John Davis weighed 192 pounds. His doctor put him on a diet, which enabled him to lose at least 4 pounds per month. What was John's weight after 6 months on the diet?
- 160 pounds
  - 165 pounds
  - 167 pounds
  - 168 pounds
27. An aquarium is in the form of a rectangular solid. The aquarium is 3 feet long, 1 foot 10 inches wide, and 1 foot 2 inches high. If 1 gallon of water is contained in 231 cubic inches, how many gallons of water are needed to fill the aquarium?
- 48 gallons
  - 40 gallons
  - 36 gallons
  - 24 gallons
28. The ratio of men to women at a professional meeting was 9:2. If there were 12 women at the meeting, how many men were at the meeting?
- 33
  - 44
  - 54
  - 66
29. In a basketball game, Bill scored 3 times as many points as Jim. The sum of the scores of Bill and Jim was 56 points. How many points did Bill score?
- 14
  - 28
  - 42
  - 48
30. The enrollment of a college is distributed as follows:
- |                |
|----------------|
| 360 freshmen   |
| 300 sophomores |
| 280 juniors    |
| 260 seniors    |
- The total freshman class makes up what percent of the total enrollment?
- 18%
  - 20%
  - 25%
  - 30%

Questions 31-50 Each consist of two quantities, one in column A and one in column B. Compare the two quantities and on the answer sheet blacken oval

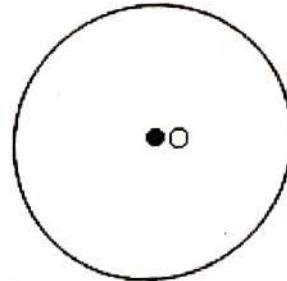
- A if the quantity in Column A is greater;
- B if the quantity in Column B is greater;
- C if the two quantities are equal;
- D if the relationship cannot be determined from the information given.

All letters such as  $x$ ,  $y$ , and  $n$  represent real numbers. A symbol, appearing in both columns, represents the same quantity in Column A as it does in Column B. In some questions, information concerning one or both of the quantities to be compared is centered above the two columns.

GO ON TO THE NEXT PAGE

**Column A**

31. 30% of 40



32. radius of circle O

**Column B**

40% of 30

chord of circle O

**For number 33: g and h are positive numbers**

$$\frac{gh - 3}{gh}$$

$$\frac{g - 3/h}{g}$$

34. The sale price of an 80\$ radio after a 30% discount

The sale price of an 80\$ radio after successive discounts of 20% and 10%

**For number 35: x, y and z are negative integers**

$$35. x^2 - y^2 + z^2$$

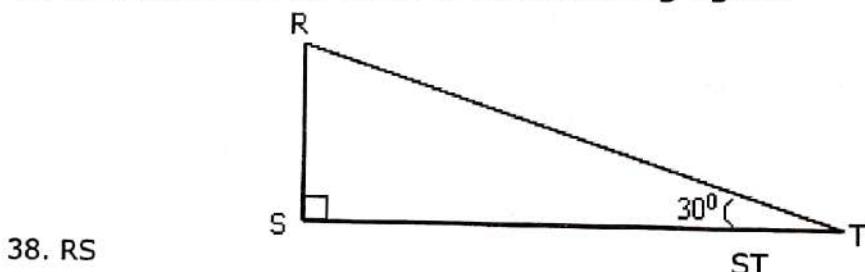
$$x^2 + y^2 - z^2$$

36. The number of prime factors of 330

The number of prime factors of 210

$$37. y^2$$

$$y(y + 2)$$

**For number 38 to 40: Refer to the following figure.**

$$39. RS$$

$$\frac{1}{2} RT$$

$$40. ST$$

$$\frac{3}{4} RT$$

**For number 41:  $2 < p < 7$  and  $7 < q < 10$** 

$$41. p$$

$$q$$

**For number 42: r, s and t are positive integers;  $r > 1$** 

$$42. r(s + t)$$

$$rs + t$$

$$43. \frac{1}{3} \times \frac{1}{4}$$

$$\frac{1}{3} \div \frac{1}{4}$$

**For number 44:  $r = 2s$** 

$$44. 6s + 3$$

$$2r + 3$$

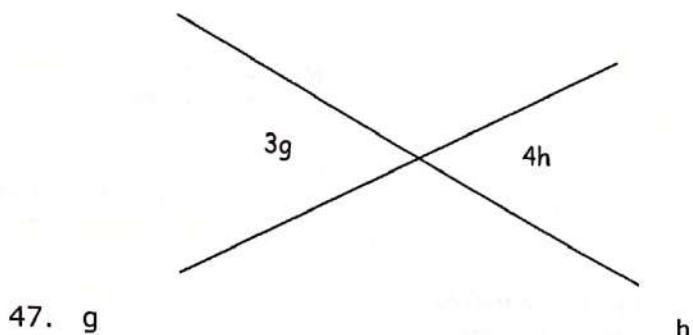
$$45. 11 \times 180 \times 7$$

$$9 \times 180 \times 12$$

46. Area of circle with diameter  $d$

Area of square with side  $\frac{3}{4}d$

**For No. 47**



47.  $g$

$h$

**For Nos. 48-49**

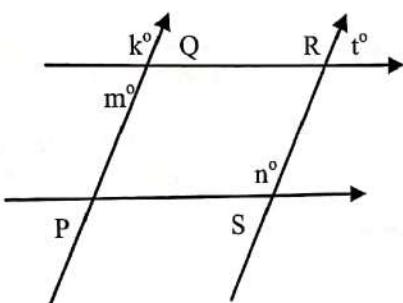


Figure is not drawn to scale. PQRS is a parallelogram.

48.  $k$

$n$

49.  $m + k$

$n + t$

**For No. 50**

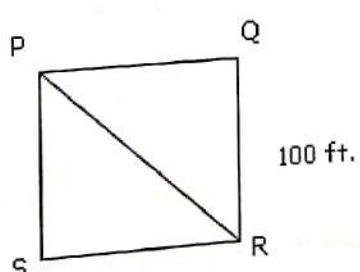


Figure not drawn to scale. PQRS is a square.

The number of seconds it takes a man to walk from  $P$  to  $R$  directly at 5 feet per second

The number of seconds it takes a man to run from  $P$  to  $Q$  and  $Q$  to  $R$  at 8 feet per second

STOP. DO NOT TURN TO THE NEXT PAGE BUT  
YOU MAY GO BACK TO THE PREVIOUS PAGES.

**DIAGNOSTIC TEST****79 PRACTICE QUESTIONS****Shop Arithmetic**

1. A length of rope 3 feet 4 inches long was divided in 5 equal parts. How long was each part?
  - a. 1 foot 2 inches
  - b. 10 inches
  - c. 8 inches
  - d. 6 inches
  
2. Plattville is 80 miles west and 60 miles north of Quincy. How long is a direct route from Plattville to Quincy?
  - a. 100 miles
  - b. 120 miles
  - c. 140 miles
  - d. 160 miles
  
3. A builder has 27 cubic feet of concrete to pave a sidewalk whose length is 6 times its width. The concrete must be poured 6 inches deep. How long is the sidewalk?
  - a. 9 feet
  - b. 12 feet
  - c. 15 feet
  - d. 18 feet
  
4. A floor plan is drawn to scale so that  $\frac{1}{4}$  inch represents 2 feet. If a hall on the plan is 4 inches long, how long will the actual hall be when it is built?
  - a. 2 feet
  - b. 8 feet
  - c. 16 feet
  - d. 32 feet

5. All of the rooms in a building are rectangular, with 8-foot ceilings. One room is 9 feet wide by 11 feet long. What is the combined area of the four walls, including doors and windows?
  - a. 99 square feet
  - b. 160 square feet
  - c. 320 square feet
  - d. 72 square feet

**Tool Knowledge**

Put the correct letter next to the description of the tools.

(A)



(B)



(C)



(D)



(E)



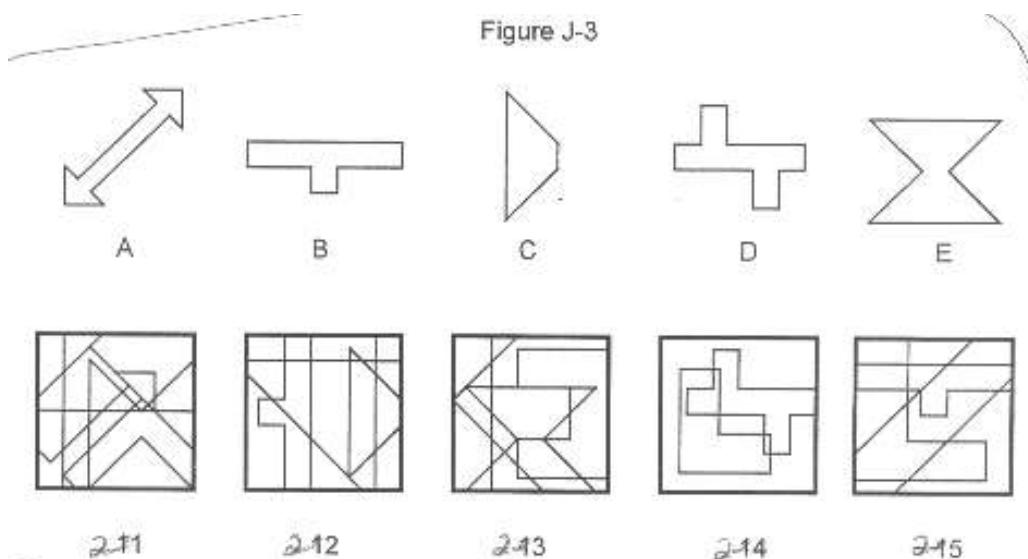
6. used with hammer to notch or chip away stone \_\_\_\_\_
  
7. used to crimp wire ends to fit into screw terminals \_\_\_\_\_
  
8. used with glue stick to apply adhesive \_\_\_\_\_
  
9. used to remove nails or open crates \_\_\_\_\_
  
10. used with sockets to loosen or tighten nuts and/or bolts \_\_\_\_\_

**Mechanical Knowledge**

- 11.** Which of the following automotive systems uses lubrication fluid?
  - a. the transmission system
  - b. the exhaust system
  - c. the suspension system
  - d. the electrical system
  
- 12.** Which automotive system uses fuses and an alternator?
  - a. the steering system
  - b. the cooling system
  - c. the electrical system
  - d. the engine
  
- 13.** What is the function of the spark plugs in the internal combustion engine in a car?
  - a. to transfer electricity to the alternator
  - b. to increase the cylinder size
  - c. to cool the engine
  - d. to ignite the fuel
  
- 14.** Which fluid is contained in a car radiator?
  - a. transmission fluid
  - b. cooling fluid
  - c. brake fluid
  - d. steering fluid
  
- 15.** What is the primary function of the water pump in a car?
  - a. to circulate coolant
  - b. to evacuate waste water
  - c. to remove exhaust
  - d. to filter water

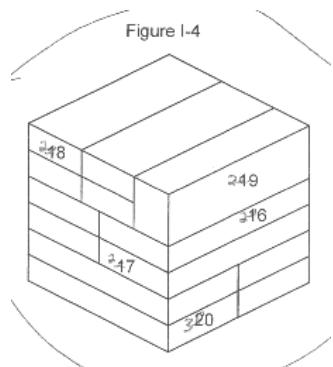
**Mechanical Insight**

- 16.** What is the most accurate statement regarding the relationship between weight and density?
  - a. Weight equals density divided by volume.
  - b. A bathroom scale cannot measure density.
  - c. Density can be measured in pounds.
  - d. All of the above.
  
- 17.** Expansion is to contraction as
  - a. pressure is to density.
  - b. acceleration is to deceleration.
  - c. weight is to center of gravity.
  - d. direction is to velocity.
  
- 18.** The center of gravity of a baseball bat would be best described as
  - a. near the grip.
  - b. near the fat end.
  - c. near the skinny end.
  - d. at the top.
  
- 19.** Which is heavier, five pounds of feathers or five pounds of lead?
  - a. The feathers are heavier.
  - b. The lead is heavier.
  - c. They weigh the same.
  - d. It is not possible to compare the two.
  
- 20.** Which material is best suited for use as a boat anchor?
  - a. metal
  - b. foam
  - c. wood
  - d. glass

**Hidden Figures**

Use Figure J-3 for questions 21–25:

- 21.** The hidden figure in block 21 is \_\_\_\_.
- A
  - B
  - C
  - D
  - E
- 22.** The hidden figure in block 22 is \_\_\_\_.
- A
  - B
  - C
  - D
  - E
- 23.** The hidden figure in block 23 is \_\_\_\_.
- A
  - B
  - C
  - D
  - E
- 24.** The hidden figure in block 24 is \_\_\_\_.
- A
  - B
  - C
  - D
  - E
- 25.** The hidden figure in block 25 is \_\_\_\_.
- A
  - B
  - C
  - D
  - E

**Block Counting**

For questions 26–30, refer to Figure I-4

- 26.** Block 26 is touched by \_\_\_\_ other blocks.

- a. 2
- b. 3
- c. 4
- d. 5
- e. 6

- 27.** Block 27 is touched by \_\_\_\_ other blocks.

- a. 2
- b. 3
- c. 4
- d. 5
- e. 6

- 28.** Block 28 is touched by \_\_\_\_ other blocks.

- a. 2
- b. 3
- c. 4
- d. 5
- e. 6

- 29.** Block 29 is touched by \_\_\_\_ other blocks.

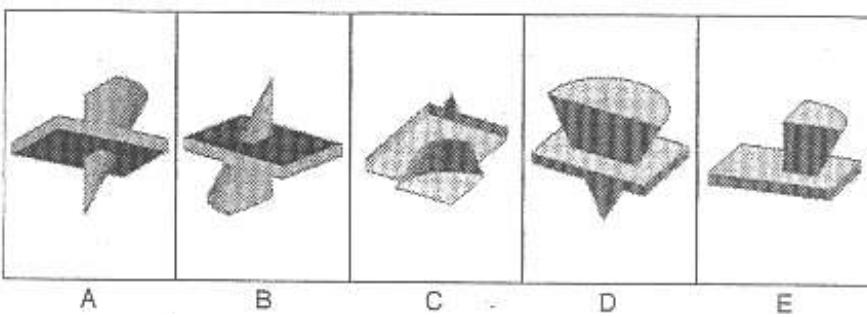
- a. 2
- b. 3
- c. 4
- d. 5
- e. 6

- 30.** Block 30 is touched by \_\_\_\_ other blocks.

- a. 2
- b. 3
- c. 4
- d. 5
- e. 6

**Rotated Blocks**

- 31.**

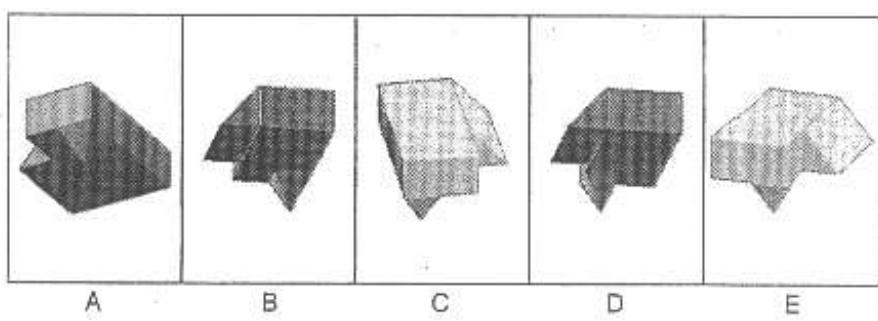


**DIAGNOSTIC TEST**

32.



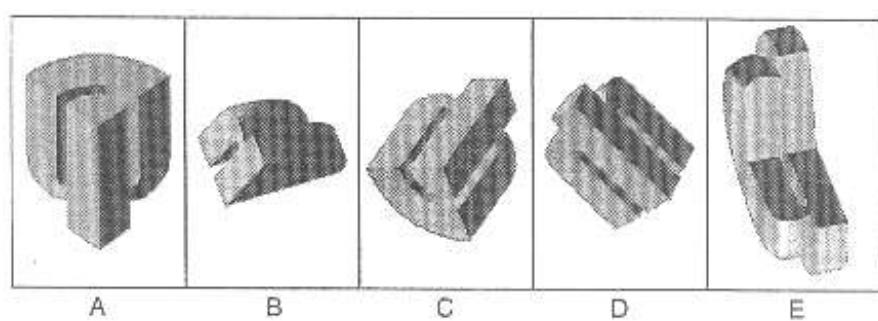
12



33.



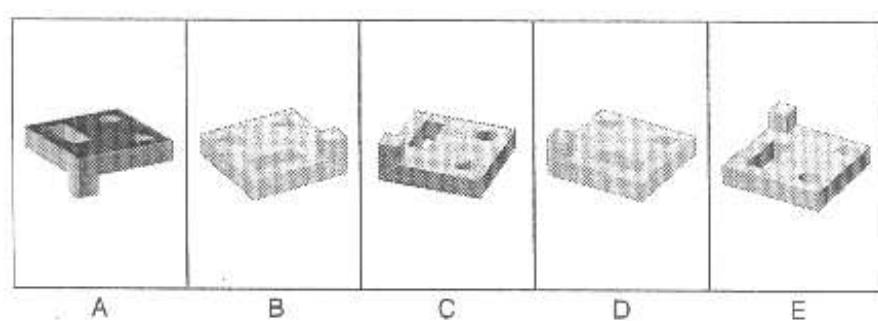
13



34.



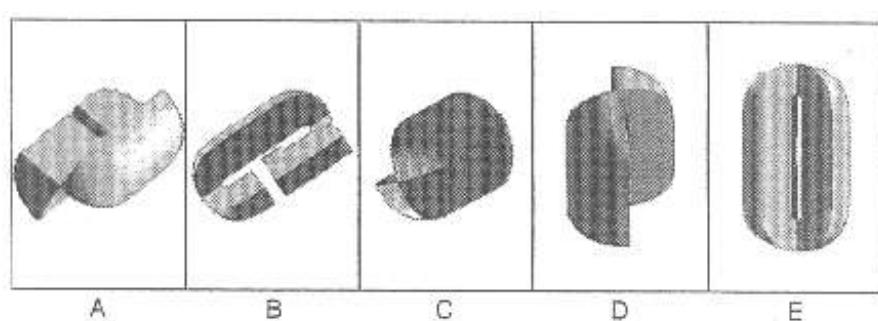
14



35.



15



**Matching Pieces and Parts**

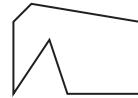
In questions 36–37 below, select the single answer choice that represents the two parts that join together to make the given whole. Pieces may be reflected and/or rotated.

36.



- a)
- b)
- c)
- d)

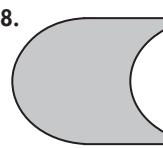
37.



- a)
- b)
- c)
- d)

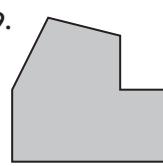
In questions 38–39 below, pick the two answer choices that will come together to make the figure shown. Pieces may be reflected and/or rotated.

38.



- a)
- b)
- c)
- d)
- e)

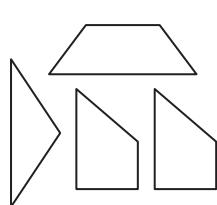
39.



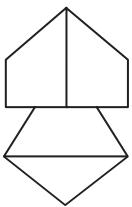
- a)
- b)
- c)
- d)
- e)

In question 40 below, four pieces are given. Choose the answer choice that represents a figure comprised of all four pieces. Pieces may be rotated and/or reflected.

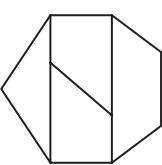
40.



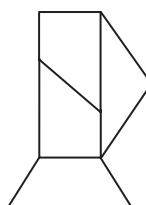
a)



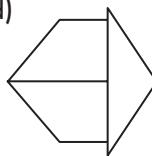
b)



c)

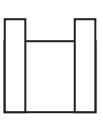
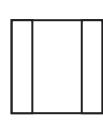
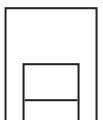
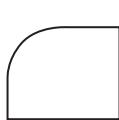
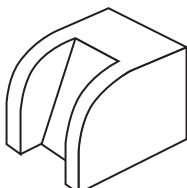


d)



### Spatial Analysis

41.



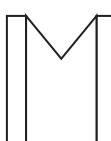
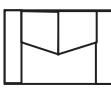
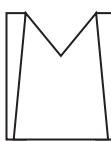
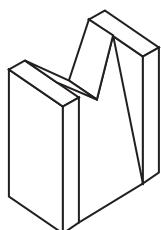
a.

b.

c.

d.

42.



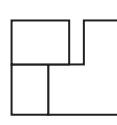
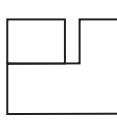
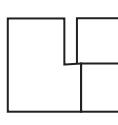
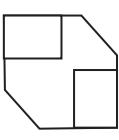
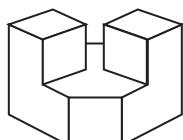
a.

b.

c.

d.

43.



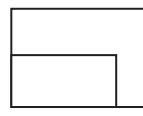
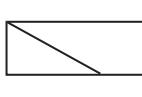
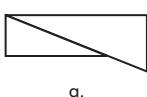
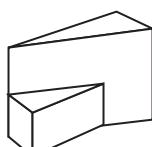
a.

b.

c.

d.

44.



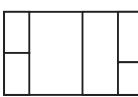
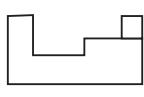
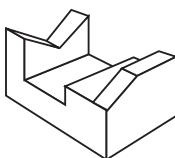
a.

b.

c.

d.

45.



a.

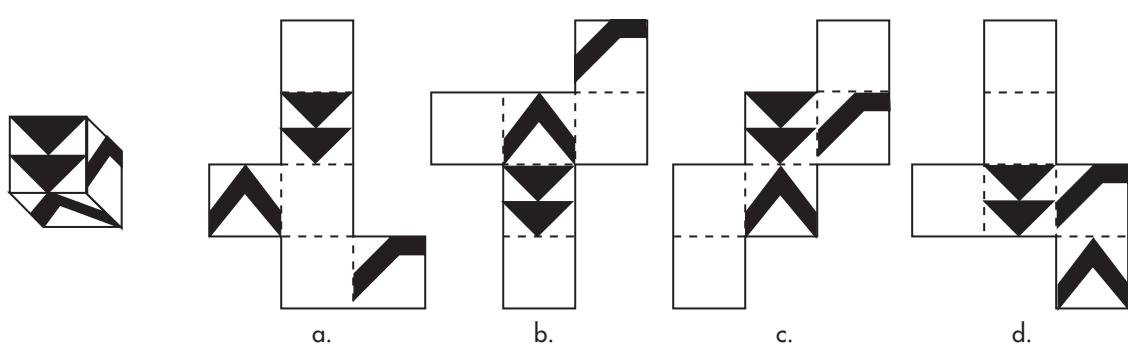
b.

c.

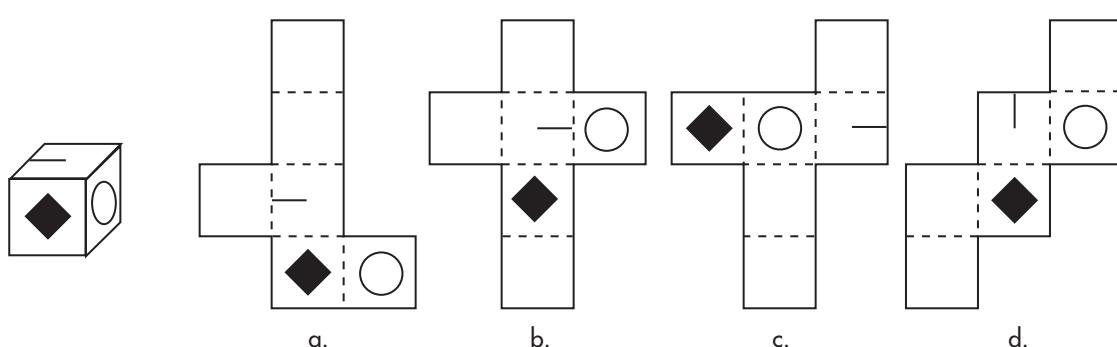
d.

**Understanding Patterns**

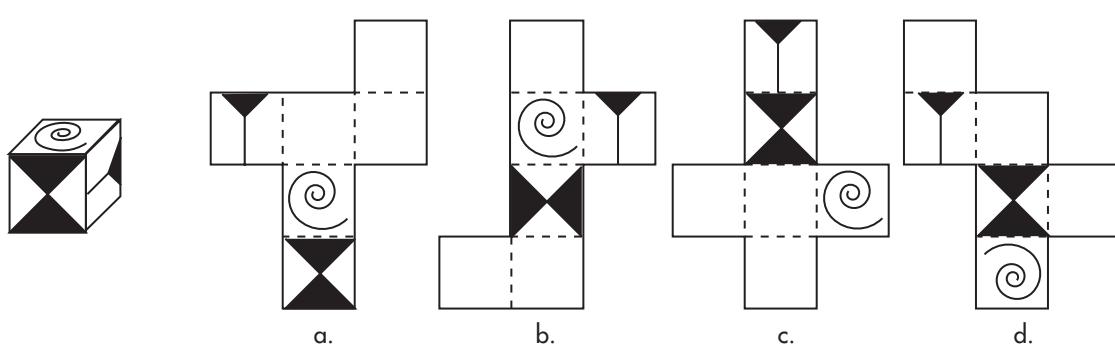
46.



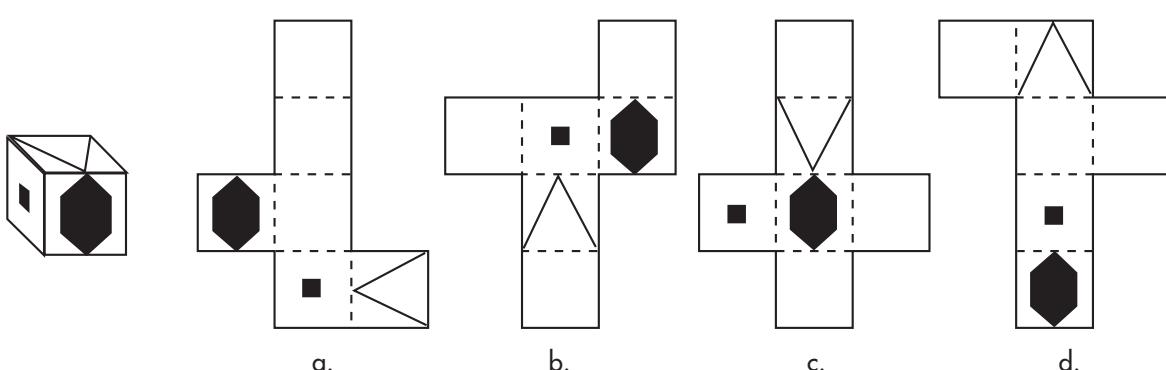
47.



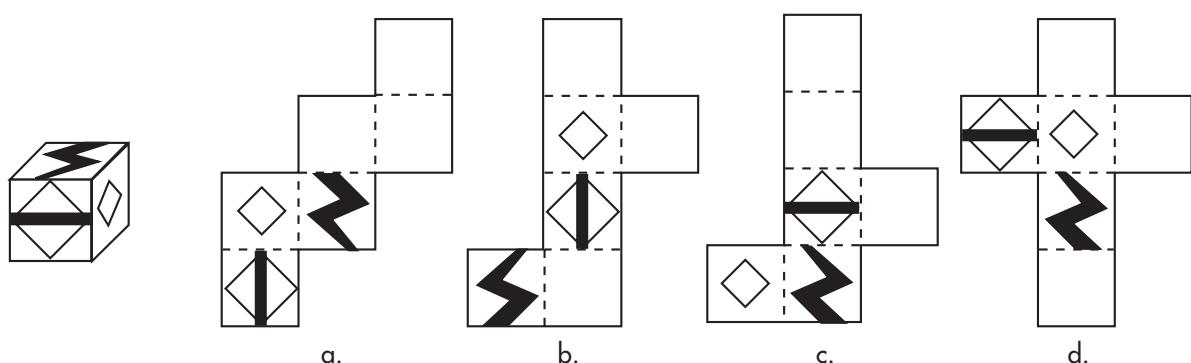
48.



49.



50.

**Eye-Hand Coordination**

4 LETTER-SYMBOL QUESTIONS

Reference Code

Letter	A	B	C	D	E	F	G	H	I	J
Code	•○	○○	▽▽	▽▽	●○	○○	○○	●○	○○	△△
Letter	K	L	M	N	O	P	Q	R	S	T
Code	○○	○○	△△	●○	○○	☆○	○○	○○	▽○	○○

Questions

Question	Answer
1. ○○	
2. ○○	
3. ○○	
4. ○○	

**DIAGNOSTIC TEST**

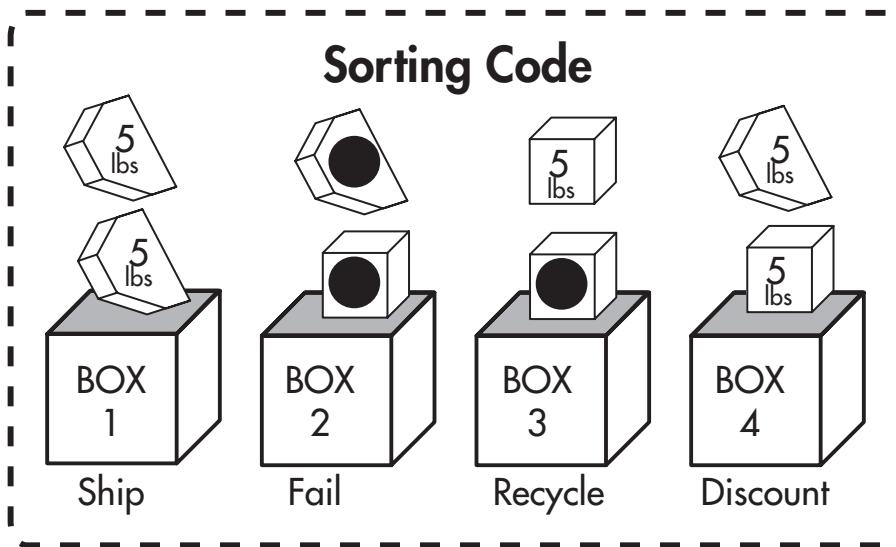
Answers

Question	Answer
1.	O
2.	T
3.	L
4.	Q

Letter	A	B	C	D	E	F	G	H	I	J
Code										
Letter	K	L	M	N	O	P	Q	R	S	T
Code										

3      1      4      2

3 EXAMINING OBJECTS QUESTIONS



The Sorting Code above is a graphical summary for the following Sorting Code. Read the code carefully.

Sorting Code for Boxes 1 through 4:

**Box 1: Ship**

All packages placed in this box must satisfy each of the following requirements

- The two pieces are the same weight.
- The two pieces are the same shape.
- The two pieces are free from defects.

**Box 2: Fail**

All packages placed in this box contain two defective pieces. Regardless of weight or shape, if both pieces inside a package are defective, put them in Box 2.

Note: A “defect” is displayed as a black circle on the piece. See the graphic code above.

**Box 3: Recycle**

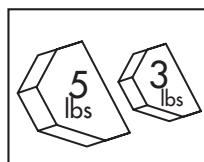
All packages placed in this box contain one defective piece. Regardless of shape or weight, if one piece of the pair is defective, put the package in Box 3.

**Box 4: Discount**

All packages placed in this box contain non-defective pieces that do not match in weight or shape.

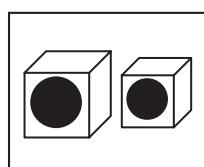
In the questions below, you are presented with a package containing two pieces. Use the above sorting code to determine which box each package needs to be placed in.

**51.**



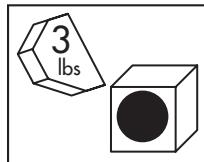
- a. Box 1
- b. Box 2
- c. Box 3
- d. Box 4

**52.**



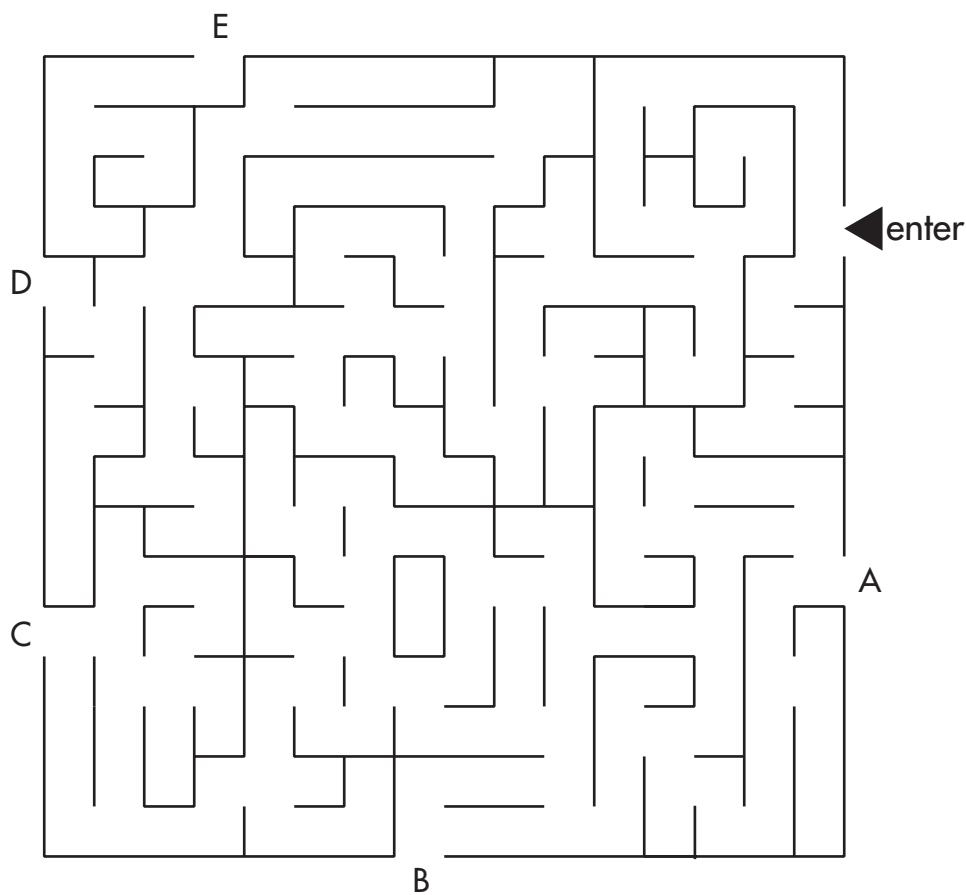
- a. Box 1
- b. Box 2
- c. Box 3
- d. Box 4

**53.**



- a. Box 1
- b. Box 2
- c. Box 3
- d. Box 4

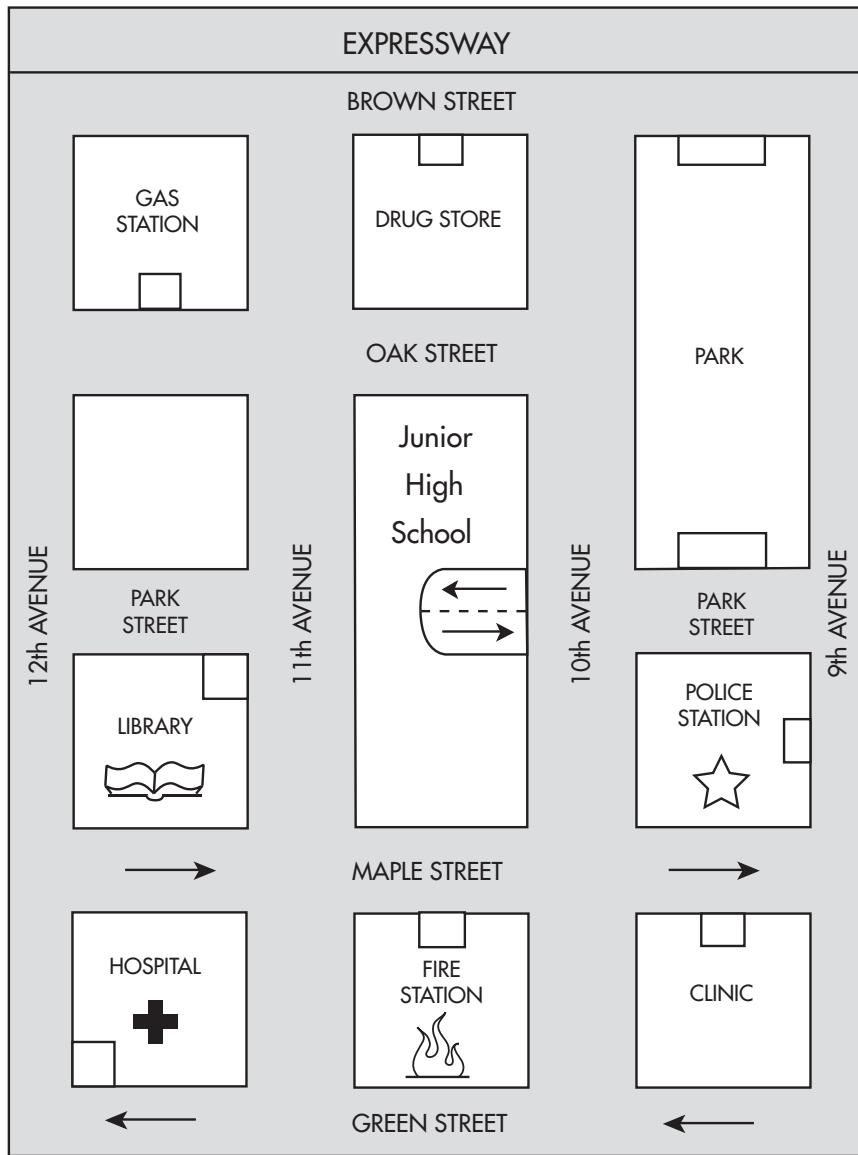
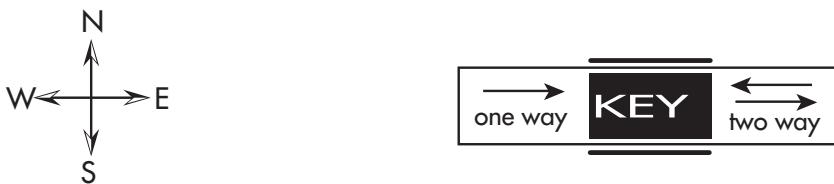
MAZES



54. Follow the maze above and mark the letter that correctly represents the way out of the maze. \_\_\_\_

**Reading Maps**

Answer questions 55–59 based on the map and the information below.



This is a map of a section of the city where some public buildings are located. Each of the squares represent one city block. Street names are as shown. If there is an arrow next to the street name, it means the street is one way only, in the direction of the arrow. If there is no arrow next to the street name, two-way traffic is allowed.

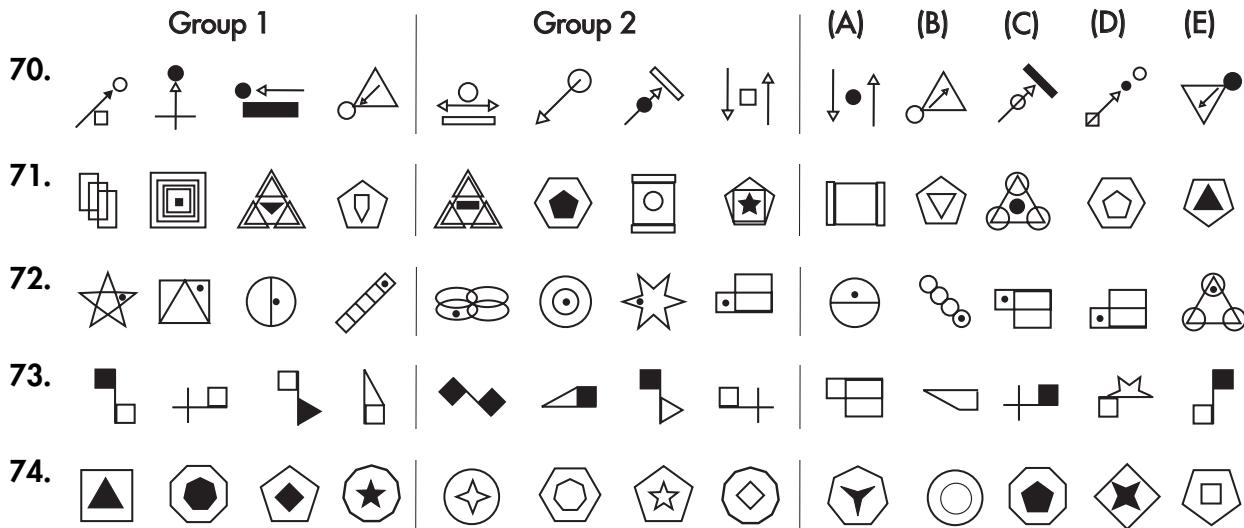
- 55.** There has been a vehicular accident at the corner of Brown Street and 9th Avenue and gasoline is leaking from one of the cars. What is the most direct legal way for a fire engine to travel to the scene of the accident?
- east on Maple Street and north on 9th Avenue to the accident
  - west on Maple Street, north on 12th Avenue, and east on Brown Street to the accident
  - east on Maple Street and north on 11th Avenue to the accident
  - west on Maple Street, north on 11th Avenue, and east on Brown Street to the accident
- 56.** What streets run north and south of the park?
- Brown Street and Oak Street
  - Maple Street and Park Street
  - Brown Street and Park Street
  - Green Street and Oak Street
- 57.** If you were giving directions to the drug store from the hospital, what would be the most direct, legal route?
- east on Maple Street, north on 9th Avenue, and west on Brown Street to the store entrance
  - west on Maple Street, north on 10th Avenue, and west on Brown Street to the store entrance
  - west on Green Street, north on 12th Avenue, and east on Brown Street to the store entrance
  - east on Oak Street, north on 11th Avenue, and east on Brown Street to the store entrance
- 58.** Someone at the junior high school has been injured and needs to go to the hospital. What directions would you give to the ambulance driver?
- north on 10th Avenue, west on Brown Street, and south on 12th Avenue to the hospital entrance
  - south on 10th Avenue and west on Green Street to the hospital entrance
  - north on 10th Avenue and south on Brown Street to the hospital entrance
  - south on 10th Avenue, west on Maple Street, and west on Green Street to the hospital entrance
- 59.** You are leaving work at the police station and need to fill your gas tank before you go home. What is the quickest legal route to the gas station?
- south on 9th Avenue, west on Maple Street, north on 11th Avenue, and west on Oak Street to the entrance
  - east on Maple Street, north on 10th Avenue, and west on Oak Street to the entrance
  - north on 9th Avenue and west on Brown Street to the entrance
  - north on 9th Avenue, west on Park Street, north on 10th Avenue, and west on Oak Street to the entrance

**Symbol Series**

60. (A) (B) (C) (D) (E) (F)
61. (A) (B) (C) (D) (E)
62. (A) (B) (C) (D) (E)
63. (A) (B) (C) (D) (E)
64. (A) (B) (C) (D) (E)

**Symbol Analogies**

65. (A) (B) (C) (D) (E)
66. (A) (B) (C) (D) (E)
67. (A) (B) (C) (D) (E)
68. (A) (B) (C) (D) (E)
69. (A) (B) (C) (D)

**Sorting and Classifying Figures****Series Reasoning**

- 75.** Look at this series: U32, V29, W26, X23, ... What number should come next?
- Y20
  - Y17
  - Z20
  - Z26
- 76.** Look at this series: 664, 332, 340, 170, 178, ... What number should come next?
- 89
  - 94
  - 109
  - 184
- 77.** Look at this series: 2, IV, 8, XVI, ... What number/Roman numeral should come next?
- XXXII
  - XIX
  - 16
  - 32
- 78.** Look at this series: 17, \_\_\_, 28, 28, 39, 39, ... What number should fill the blank?
- 6
  - 17
  - 28
  - 50
- 79.** Look at this series: 75, 65, 85, 55, \_\_\_, 85, 35, 25, ... What number should fill the blank?
- 25
  - 45
  - 65
  - 85

## **Answer Key**

### **Part I**

#### **VERBAL REASONING**

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

## **NON-VERBAL REASONING**

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

## **NVR Sample1**

## **Answers**

Analogy		Matrices		Odd One Out		Similarity		Codes		Series	
1	D	1	C	1	D	1	D	1	D	1	A
2	C	2	D	2	A	2	E	2	C	2	D
3	B	3	B	3	E	3	C	3	B	3	B
4	B	4	A	4	B	4	B	4	A	4	B
5	D	5	E	5	C	5	A	5	E	5	D
6	E	6	C	6	D	6	C	6	E	6	E
7	C	7	B	7	A	7	D	7	C	7	C
8	C	8	A	8	D	8	B	8	B	8	E
9	C	9	B	9	B	9	E	9	D	9	C
10	D	10	D	10	C	10	D	10	A	10	E

**PART II**

**ENGLISH**

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

## **MATHEMATICS**

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

**Answer Key to MATHEMATICS TEST**

126

- |       |   |       |   |
|-------|---|-------|---|
| 1. b  | $5 + 9 + 10 + 5 + 6 = 35$   | 17. a | $(8 + -2)/2 = 6/2 = 3$  |
| 2. c  | $60/15 = 4 \text{ hrs}$   | 18. b | $(400) + 350 + 2(175) + 425 = 400 + 350 + 350 + 425 = 1,100 + 425 = 1,525$  |
| 3. a  | $(180 - 100)/2 = 40$  | 19. d | $14,785 + 0.05 (14,785) = 15,524.25$  |
| 4. d  |   | 20. b | $85000000000 = 8.5 \times 10^{10}$  |
| 5. a  | $x / (x + y + z)$   | 21. a | $5 \text{ hr } 30 \text{ min} = 5.5 \text{ h}$<br>$67,947/5.5 = 12,354 \text{ km/hr}$<br>$= 12,354 \text{ km/hr}$   |
| 6. b  | $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8} \text{ car}$<br>$+ \frac{1}{2} \text{ jeep}$<br>$\text{total: } \frac{5}{8} \text{ (car + jeep)}$<br>$\text{other means: } \frac{8}{8} - \frac{5}{8} = \frac{3}{8}$ | 22. a | $20^\circ/360^\circ = 1/18 \rightarrow 1/18(18000) = 1000$  |
| 7. d  | $x = 5$   | 23. d | $M = 90 \text{ Trade and Finance}$<br>$M + 30 = 120 \text{ Manufacturing}$<br>$M + M/3 = 4M/3$  |
| 8. a  |   | 24. d | BF bisects ABC<br>$ABC = 68^\circ$ $EBC = 68/2 = 34^\circ$<br>CD bisects ACB<br>$ACB = 72^\circ$ $ECB = 72/2 = 36^\circ$<br>$BEC = 180^\circ - (34^\circ + 36^\circ)$<br>$= 180^\circ - (34^\circ + 36^\circ)$<br>$= 180^\circ - 70^\circ = 110^\circ$                |
| 9. d  | $x/16 = 9/6$<br>$2x = 3(16)$<br>$x = 24$  | 25. c | Represent: Jose: $x - 3 + 5 \Rightarrow x + 2$<br>Carl: $x - 3$<br>Alex: $x$<br>If $x = 30$ , Jose has $x + 2 = 30 + 2 = 32$  |
| 10. b | $9\text{ft} + 8\text{in} = 12 \frac{\text{in}}{\text{ft}} (9\text{ft}) + 8 \text{ in} = 116 \text{ in}$<br>$116 \text{ in}/4 = 29 \text{ in} = 2 \text{ ft} + 5\text{in}$   | 26. d | $192 - 4(6) = 192 - 24 = 168$   |
| 11. a | $5/(6+5+8) = 5/19$  | 27. a | length = $3 \times 12 = 36 \text{ in}$<br>width = $12 + 10 = 22 \text{ in}$<br>height = $12 + 2 = 14 \text{ in}$<br>volume of aquarium = $36 \times 22 \times 14$<br>gallons water contained:<br>$11,088 \text{ cu. in} = 48 \text{ gals}$<br>$231 \text{ cu.in/gal}$ |
| 12. b | 88 90 <u>91</u> 94 95   | 28. c | $9/2 = x/12$ $2x = 108 \rightarrow x = 54 \text{ men}$  |
| 13. c | $12B + 8P = 64$<br>$B = 12/3 = 4 \text{ each}$<br>$12(4) + 8P = 64$<br>$8P = 64 - 48$<br>$= 16$<br>$P = 2$  |       |   |
| 14. d | $3.5 \times 1.5 = 5.25$   |       |   |
| 15. b | $a + 3b$<br>$3a + b$<br>$2a + b$<br>$3a + 2b$<br>$9a + 7b$  |       |   |
| 16. c | $3ab - x^2y$<br>$= 3(4)(5) - (2)^2(x^3)$<br>$= 60 - 4(2^3)$<br>$= 60 - 4(8) = 60 - 32 = 28$   |       |   |

- 29.c Rep: Jim's score =  $x$   
Bill's score =  $3x$   
Eqn:  $x + 3x = 56$   
 $4x = 56$   
 $x = 56/4 = 14$  Jim  
 $42 = 3(14)$  Bill
- 30.d Total =  $360 + 300 + 280 + 260 = 1,200$   
% freshmen =  $360/1200 \times 100 = 30\%$
- 31.c  $40(0.3) = 120$     $30(0.4) = 120$
- 32.d can be  $<$ ,  $=$  or  $>$
- 33.c  $\frac{gh - 3}{gh} = \frac{gh}{gh} - \frac{3}{gh} = 1 - \frac{3}{gh}$   
 $\frac{g - 3/h}{g} = \frac{g}{g} - \frac{3/h}{g} = 1 - \frac{3}{gh}$
- 34.b  $80 - 0.3(80) = 56$   
 $80 - 0.2(80) = 80 - 16 = 64$   
 $64 - 0.1(64) = 64 - 6.4 = 57.6$
- 35.d let  $x = -1$ ,  $y = -2$ ,  $z = -3$   
 $x^2 - y^2 + z^2 = 1 - 4 + 9 = 6$   
 $x^2 + y^2 - z^2 = 1 + 4 - 9 = -4$
- let  $x = -3$ ,  $y = -2$ ,  $z = -1$   
 $9 - 4 + 1 = 6$   
 $9 + 4 - 1 = 12$
- 36.b 
$$\begin{array}{rcl} 330 & & 210 \\ \backslash & & \backslash \\ 10 & 33 & 7 & 30 \\ / & / & & \backslash \\ 2 & 5 & 11 & 3 & 5 & 6 \\ & & & & & / \\ & & & & & 2 & 3 \end{array}$$
  
**3, 2, 5, 11      2, 3, 5, 7**
- 37.d if  $y = 1$     $y^2 = 1$     $y(y+2) = 1(1+2) = 3$   
if  $y = 0$     $y^2 = 0$     $y(y+2) = 0$
- 38.b RT is the hypotenuse (longest)
- 39.c  $\angle SRT = 30^\circ$  so  $RS = \frac{1}{2}RT$
- 40.a  $RS = \frac{1}{2}RT$   
 $RS^2 + ST^2 = RT^2$
- 41.b  $q > p$
- 42.a  $r(s+t) = rs+rt$
- 43.b  $\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$   
 $(1/3)/1/4 = 1/3 \times 4/1 = 4/3$
- 44.a  $r = 2s$   
 $6s + 3 > 2(2s + 3)$
- 45.b  $11 \times 7 < 9 \times 12$
- 46.a  $A_{\text{circle}} = \pi(d/2)^2 = \pi/4 d^2$   
 $A_{\text{square}} = (3/4d)(3/4d) = 9/16 d^2$   
 $\pi/4 = 0.78$     $9/16 = 0.56$
- 47.a  $3g = 4h$  (vertical angles)  
 $g > h$  since  $3 < 4$
- 48.c  $k = q$  vertical angles  
 $q = n$  opposite angles in a parallelogram  
 $k = n$
- 
- 49.c  $m + k = 180$   
 $R + t = 180$   
 $n = R \rightarrow n + t = 180$
- 50.a 
$$\begin{aligned} PR^2 &= 100^2 + 100^2 \\ PR^2 &= 10,000 + 10,000 \\ PR &= \sqrt{20000} = \sqrt{10000 \times 2} \\ PR &= 100\sqrt{2} \end{aligned}$$
  
 $PR = rt$     $t = PR/r$
- $t_1 = (100 \times \sqrt{2})/5 = 20\sqrt{2} \approx 28 \text{ sec}$     $t_2 = 200/8 = 25 \text{ sec}$

## DIAGNOSTIC TEST ANSWER EXPLANATIONS

### Shop Arithmetic

1. c. Three feet 4 inches equals 40 inches; 40 divided by 5 is 8.
2. a. The distance between Plattville and Quincy is the hypotenuse of a right triangle with sides of length 80 and 60. The length of the hypotenuse equals the square root of  $(80^2 + 60^2)$ , which equals the square root of  $(6,400 + 3,600)$ , which equals the square root of 10,000, which equals 100 miles.
3. d. The volume of concrete is 27 cubic feet. Volume is length times width times depth, or  $(L)(W)(D)$ , so  $(L)(W)(D) = 27$ . We're told that the length L is 6 times the width W, so L equals  $6W$ . We're also told that the depth is 6 inches, or 0.5 feet. Substituting what we know about the length and depth into the original equation and solving for W, we get  $(L)(W)(D) = (6W)(W)(0.5) = 27$ .  $3W^2 = 27$ .  $W^2 = 9$ , so  $W = 3$ . To get the length, we remember that L equals  $6W$ , so L equals  $(6)(3)$ , or 18 feet.
4. d. Four inches is equal to 16 quarter inches. Each quarter inch is 2 feet, so 16 quarter inches is 32 feet.
5. c. Each 9-foot wall has an area of  $9(8)$  or 72 square feet. There are two such walls, so those two walls combined have an area of 144 square feet. Each 11-foot wall has an area of  $11(8)$  or 88 square feet, and again there are two such walls:  $88(2) = 176$ . Finally, add 144 and 176 to get 320 square feet.

### Tool Knowledge

6. d. Choice d is a stone chisel used with a hammer to notch or chip stone.
7. b. A pair of needle nose pliers is shown in choice b. These pliers have a multitude of uses including handling electrical wiring.
8. e. A common glue gun is represented in choice e. By melting a stick of glue, the glue gun is used to apply a hot adhesive.
9. c. Choice c is a pry bar which has many uses from removing nails to separating wood planks.
10. a. The tool represented in choice a is a socket wrench. This tool can be used to tighten and loosen any size nut or bolt easily by changing the size of the socket.

### Mechanical Knowledge

11. a. The transmission has many moving parts (gears and shafts), which must be lubricated by transmission fluid in order to prevent excessive wear and allow the parts to move smoothly.
12. c. The fuses are used as links in the electrical system to prevent damage to other key components. The alternator is used to recharge the battery when the car is running.
13. d. The spark plug sends a spark into the cylinder, igniting the fuel.
14. b. The radiator is part of the cooling system. The cooling fluid is stored in the radiator and is then pumped through the cooling system by the water pump. As air passes over the radiator, the fluid is cooled, which prevents engine overheating.
15. a. The water pump pumps the engine coolant (a combination of water and

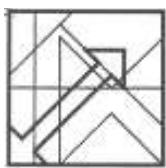
antifreeze) out of the radiator and around the engine block in order to cool the engine.

### Mechanical Insight

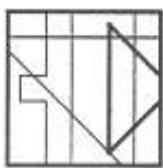
- 16.** b. Choice a is not correct, as weight is equal to density multiplied by volume. Choice c is not correct, as density is measured in weight (pounds) per unit volume.
- 17.** b. Expansion and contraction are opposites, as are acceleration and deceleration. The other choices are not opposites.

- 18.** b. The center of gravity is the place on an object where there is equal weight on either side.
- 19.** c. Weight is measured in pounds, and the question states that both the feathers and the lead weigh five pounds.
- 20.** a. Foam and wood float and would therefore make poor boat anchors. Glass is not strong enough to be used as a boat anchor.

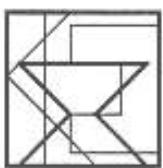
### Hidden Figures



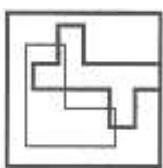
11 A



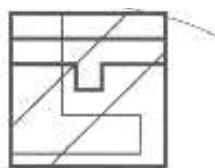
12 C



13 E



14 D



15 B

### Block Counting

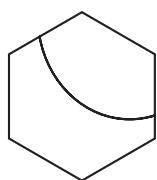
- 26.** c. Block 26 touches two blocks above, one block to the left, and one block below.
- 27.** c. Block 27 touches one block above, one block to the left, and two blocks below.
- 28.** a. Block 28 touches one block to the right and one block below.
- 29.** b. Block 29 touches two blocks to the left and one block below.
- 30.** a. Block 30 touches one block above and one block to the right.

### Rotated Blocks

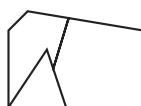
- 31.** b  
**32.** a  
**33.** b  
**34.** a  
**35.** c

**Matching Pieces and Parts**

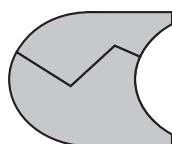
36. c.



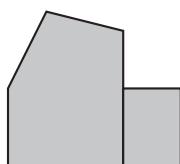
37. b.



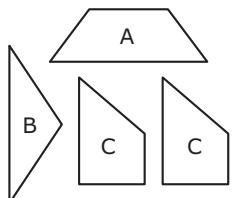
38. a + e.



39. b + d.

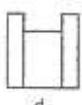
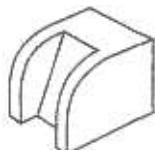


40. b.



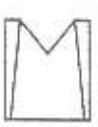
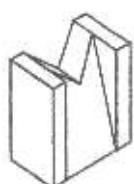
**Spatial Analysis**

41.



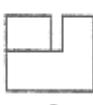
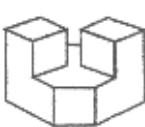
d.

42.



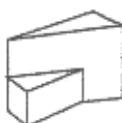
a.

43.



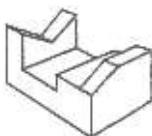
c.

44.



c.

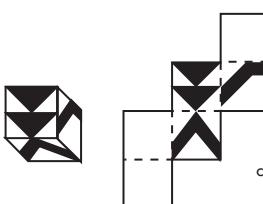
45.



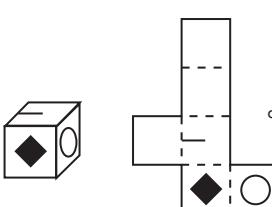
b.

**Understanding Patterns**

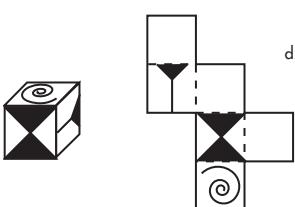
46.



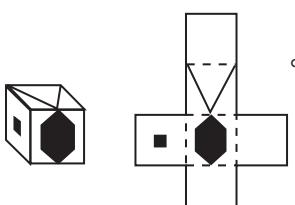
47.



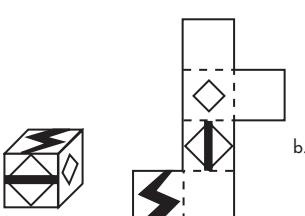
48.



49.

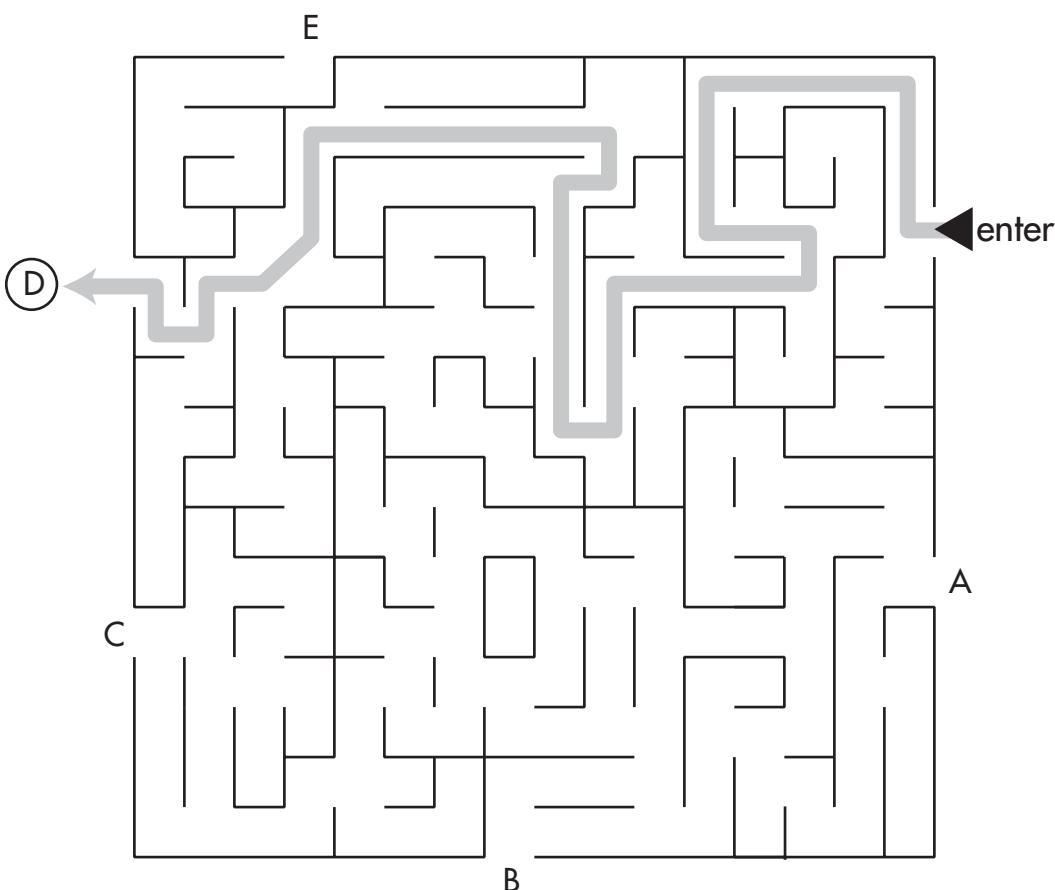


50.



**Eye-Hand Coordination**

- 51.** d. This package should go into Box 4 (Discount) because the two pieces are non-defective and do not have the same weight. The Sorting Code states: *All packages placed in this box contain non-defective pieces that do not match in weight or shape.*

**54.****Reading Maps**

- 55.** a. The other routes are impossible or illegal.  
**56.** c. Brown Street and Park Street are the two streets that run north and south of the park.  
**57.** a. The other routes are impossible or illegal.

- 52.** b. Because both pieces are damaged, this package should be placed into Box 2 (Fail).  
**53.** c. This package should be placed into Box 3 (Recycle) because it contains one damaged piece. The Sorting Code states: *All packages placed in this box contain one defective piece. Regardless of shape or weight, if one piece of the pair is defective, put the package in Box 3.*

- 58.** b. The other routes are impossible (choices c and d) or circuitous (choice a).  
**59.** d. Choice a takes you the wrong way on Maple Street. Choice b starts from the fire house, not the police station. Choice c will not get you to the entrance of the gas station.

**Symbol Series**

- 60.** d. Each symbol is a star. As the series matures the symbols follow a shading pattern (white, gray, black) and also add a point to the star in each step. Since the fifth symbol is gray and has seven points, the answer must be black and have eight points, which is choice d.
- 61.** c. The pattern in this series consists of a seven-sided shape for the first symbol, a similar shape but with a dotted line for the second symbol, and six-sided figure for the third with a dotted line version for the fourth. The fifth symbol has five sides implying that the next figure will be the same but with dotted lines instead.  
Answer c.
- 62.** b. In this series, the symbols are five pointed stars each with a shaded region. In symbol two, the shaded region begins a counter-clockwise pattern continued throughout the rest of the series. Answer b best fits the pattern.
- 63.** d. Each symbol consists of a circle divided into thirds. As the series matures each symbol is rotated 45 degrees counter-clockwise. The answer must be a 45-degree counter-clockwise rotation of symbol five, which is best shown in choice d.
- 64.** a. Each symbol consists of the same figure simply rotated 45 degrees clockwise. The answer is a 45-degree clockwise rotation of symbol five, which is best represented as choice a.

**Symbol Analogies**

- 65.** d. In each of the symbols of Group 1, an elliptical shape has been cut from each figure and follows a pattern of circle, square, and triangle. In Group 2, each of the symbols shows a triangular shape has been cut out, but follows the same pattern of shapes, which makes choice d the answer.
- 66.** c. In Group 1, each symbol consists of two shapes that connect at corners to make up each figure. In Group 2, the symbols consist of shapes connected at round ends of each shapes. This would leave c as the best answer.
- 67.** b. In Group 1, each figure consists of a big shape and a small shape with each symbol having the small shape circled. In Group 2, the symbols follow a similar pattern but each of the bigger shapes are marked with an "X" making choice b the answer.
- 68.** c. In Group 1, the first symbol is made up of three lines; the second symbol is made up of three circles; and the third three stars. In Group 2, each symbol is made up of five similar shapes, making choice c the only answer that fits.
- 69.** d. The first figure in Group 1 is made up of three quadrilaterals, the second is made up of two, and the third is made up of one shaded quadrilateral. In Group 2, the symbols are made up of triangles that follow the same pattern. This would leave choice d as the only logical response.

**Sorting and Classifying Figures**

- 70.** d. Each symbol in Group 1 has an arrow pointed at a circle. The only choice with this trait is choice **d**.
- 71.** a. Each individual symbol in Group 1 consists of only its kind. Figure 1 has only quadrilaterals; figure 3 has only triangles, etc. Choice **a** is the answer.
- 72.** b. Each symbol in Group 1 has a black dot in the right most section of the shape which is only reflected in choice **b**.
- 73.** d. Each symbol in Group 1 consists mainly of a blank square with a line along its left side rotated about with added embellishments. Choice **d** has these same components.
- 74.** a. Each figure in Group 1 has a blank shape, and a shaded shape inside with one less side than its surrounding shape. This is reflected through choice **a**.

**Series Reasoning**

- 75.** a. In this series, the letters progress by one; the numbers increase by three.
- 76.** a. This is an alternating multiplication and addition series: First, divide by two, and then add eight.
- 77.** d. This is an alternating multiplication series. Each number is two times more than the previous number. Roman numerals alternate with Arabic numbers.
- 78.** b. In this simple addition with repetition series, each number in the series repeats itself, and then increases by 11 to arrive at the next number.
- 79.** b. This is a simple subtraction series in which a random number, 85, is interpolated as every third number. In the subtraction series, ten is subtracted from each number to arrive at the next.

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