

ADDIS ABABA UNIVERSITY
INSTITUTE OF EDUCATIONAL RESEARCH, TESTING CENTER

GRADUATE ADMISSION TEST (GAT)

Tikemt 7, 2013/October 17, 2020

BOOKLET CODE: 01

TIME ALLOWED: 3 HOURS

GENERAL DIRECTIONS

THIS BOOKLET CONTAINS **GENERAL APTITUDE TEST**. THE CODE FOR THIS PARTICULAR BOOKLET IS **01**.

THE TEST HAS **THREE MAIN SECTIONS** WITH A TOTAL OF **125 ITEMS**. SECTION ONE CONTAINS **VERBAL REASONING (1-60)** AND SECTION TWO CONTAINS **QUANTITATIVE REASONING (61-100)** AND SECTION THREE **ANALYTICAL REASONING (101-125)**. VISUALLY IMPAIRED CANDIDATES ARE REQUIRED TO ATTEMPT THE **VERBAL REASONING SECTION ONLY**. ALL OTHER CANDIDATES ARE REQUIRED TO ATTEMPT **ALL THE THREE SECTIONS**.

EACH SECTION CONTAINS **MULTIPLE CHOICE ITEMS** CONSISTING OF FOUR POSSIBLE ANSWERS. IN EACH CASE, SELECT THE BEST ANSWER AND **BLACKEN** THE LETTER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET PROVIDED. FOLLOW THE INSTRUCTIONS ON THE ANSWER SHEET AND THE EXAMINATION PAPER CAREFULLY. USE ONLY **PENCIL** TO MARK YOUR ANSWERS. YOUR ANSWER MARK SHOULD BE **HEAVY AND DARK**, COVERING THE ANSWER SPACE COMPLETELY. PLEASE ERASE ALL UNNECESSARY MARKS COMPLETELY FROM YOUR ANSWER SHEET.

VISUALLY IMPAIRED CANDIDATES ARE ALLOWED TO WORK FOR **ONE HOUR ONLY**. THE OTHER CANDIDATES ARE ALLOWED TO WORK FOR **THREE HOURS** ON THE TEST. WHEN TIME IS CALLED, YOU MUST IMMEDIATELY STOP WORKING, PUT YOUR PENCIL DOWN AND WAIT FOR FURTHER INSTRUCTIONS.

ANY FORM OF CHEATING OR AN ATTEMPT TO CHEAT IN THE EXAMINATION WILL RESULT IN AN AUTOMATIC DISMISSAL FROM THE EXAMINATION HALL AND CANCELLATION OF YOUR SCORE (S).

PLEASE MAKE SURE THAT YOU HAVE WRITTEN ALL THE REQUIRED INFORMATION ON THE ANSWER SHEET BEFORE YOU START TO WORK ON THE EXAMINATION.

DO NOT TURN THIS PAGE OVER UNTIL YOU ARE TOLD TO DO SO.

Institute of Educational Research
Addis Ababa University
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Section I: Verbal Reasoning

Analogy

Directions: Items 1 to 14 deal with verbal analogy questions. A related pair of words written in CAPITAL letters is followed by four pairs of words or phrases. Select the letter with a pair that has the same relationship as the original **CAPITALIZED** pair and **blacken** the letter of your choice on the separate answer sheet provided.

1. LIQUID : LITER

(A) Mercury: Thermometer

(B) Height: Yard

☒ (C) Distance: Kilometer

(D) Water: Glass

2. ANESTHESIA: ANESTHETIST

(A) Patient : Doctor

☒ (B) Physics: Physicist

(C) Biology: Life

(D) University: Academics

☒ 3. POND : OCEAN

(A) River: Rapids

(B) Land : Train

(C) Aquarium : Fish

☒ (D) Pebble : Boulder

4. DUBIOUS: INCONTROVERTIBLE

(A) Defamation: Disparagement

(B) Painful: Tantalizing

(C) Rapacious: Generous

(D) Perspicacious: Tenacity

5. LIBRARY: CATALOGUE

(A) Telephone: Directory

☒ (B) Restaurant: Menu

(C) Office: Calendar

(D) Tourist: Map

6. DEFORESTATION: DROUGHT

☒ (A) Fasting: Starvation

(B) Summer: Warm

(C) Rehabilitation: Restoration

(D) Investigation: Crime

7. BAKERY: DOUGH

(A) Business: Fortune

☒ (B) Garage: Grease

(C) Egg: Yolk

(D) Milk: Cream

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8. POET: POETRY
(A) Carpentry: Carpet x
(B) Pottery: Pot
(C) Driver: Drive
(D) Artist: Art
9. ZINC: METAL
(A) Engine: Car
(B) Clove: Spice
(C) Furniture: Wood
(D) Computer: Mouse
10. ARCHIVE: DOCUMENTS
(A) Barrel: Beer
x(B) Gallery: Pictures
(C) Barn: Corn
(D) Winery: Wine
11. COVID-19: MASK
x(A) AIDS: Condom
(B) Head: Helmet
(C) Ebola: Hood
(D) Hand: Glove
12. CANNULA: VEIN
(A) Syringe: Artery
(B) Ventilator: Lung
(C) Stethoscope: Heart
(D) Catheter: Bladder
13. Cheetah: Cub
(A) Grasshopper: nymph
(B) Deer: Buck
(C) Hen: Chechen
(D) Ass: Jenny
14. WRENCH: NUTS
(A) Jack: Tyre
(B) Chisel: Door
(C) Tong: Metals
(D) Hammer: Nails

Directions: For questions 15 and 16 there is a certain relationship between the two given words on one side of :: and one word is given on the other side of :: from the given alternatives, choose one word that has the same relationship with this word as the words given in the pair and **blacken** the letter of your choice on the separate answer sheet provided.

15. Persons : Massacre :: Buildings : ? _____
(A) Demolish
(B) Damage
(C) Ruin
x(D) Collapse

16. Paw : Cat :: Sole : ? _____
- | | |
|----------|-----------|
| (A) Lion | (C) Horse |
| (B) Dog | (D) Bird |

Reading Comprehension

Directions: For items 17 – 28, there are texts (sentences, paragraphs or short passages). Each text is followed by questions based on its content. Read them carefully and answer all questions on the basis of what is stated or implied in the text and **blacken** the letter of your choice on the separate answer sheet provided.

17. Sam shivered as he passed from the bright sunlight into the gloom of the alley on that brilliant January day. As he pulled his jacket collar closer to his neck, feeling miserable about his mission, the eternally childish shouts from the end of the alley echoed familiarly. He could make out his parents' silhouettes, posed like old-fashioned boxers, ahead of him in the gloom, and wondered anew at how they could always make him feel like he was the forever big brother, the forever responsible party. The paragraph could be entitled:
- | | |
|------------------------|---|
| (A) A Cold January Day | ☒ (C) The Child as Parent |
| (B) The Battered Wife | (D) Alleys |
18. The skies were gray so long that one doubted the stars were still there. Day after day, the steady rains beat down. Factories fell silent, bread lines lengthened, and deaths rose. All smiles seemed forced. The tone of the passage is :
- ☒ (A) somber over events. ✓
- (B) happy that natural and man-made events are similar.
- (C) puzzled.
- (D) wonderment at nature.
19. The United States has given the free world the concept of "the American Dream," and thousands from all over the earth immigrate to America to pursue it. If one works hard, educates oneself and one's children, obeys the laws, and executes the responsibilities of a citizen, one can expect prosperity. One's children can only do better.
- The main idea of this passage is that:
- ☒ (A) hard work reaps rewards all over the earth.
- (B) only the children profit from their parents' efforts.
- (C) "the American Dream" is only a dream.
- ☒ (D) "the American Dream" promises earthly rewards for productive behaviors.

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20. A set of footprints was visible, leading from the porch to the driveway. Another set, as fresh, marked the ground from the front door to the driveway. A third set, smaller but similarly puddle with the ongoing rain, marked the earth between the sandbox and the driveway. It seemed the family had recently converged and driven, or been driven away.

What technique of idea development is used in the paragraph?

- ☒ (A) Induction (C) Contrast
(B) Analogies (D) Deduction

21. "If you give a man a fish, you feed him today. If you teach him how to fish, you feed him forever." This sentence is the same as:

- (A) Give a man a fish to feed him.
(B) Give a man a fish to feed him forever.
☒ (C) Teach a man how to fish to feed him forever.
(D) Teach a man how to eat fish to feed him.

22. "As I left the peaceful sleeping village, the mist over the marshes was rising, to show me the great unknown world I was entering...." What does the writer want to say?

- (A) The village was sleepy.
(B) The village was unknown.
(C) I was new for the village.
☒ (D) I was amazed by the mist.

23. "The politicians like to throw mud at each other." This sentence means:

- (A) Politicians like throwing mud.
(B) Politicians like speaking ill of someone.
☒ (C) Politicians hate each other.
(D) Politicians like each other.

24. "Though I understand all mysteries and all knowledge, and though I have all faith, so that I could remove mountains, but have not love, I am nothing; it profits me nothing." This is to mean:

- (A) Love profits nothing.
☒ (B) Everything is nothing without love.
(C) Knowledge is nothing.
(D) Everything is nothing without knowledge.

25. 'Chris' a white man called his name from a hut at the gates.
 'Coming!' Chris shouted. He laughed and slapped Johannes on the shoulder - then he saw Xuma.
 'Who is this?!'
 'He's called Xuma,' Johannes said.
 Chris smiled at Xuma and Xuma smiled back. Suddenly, the white man called Chris slapped Xuma hard in the chest. Xuma raised his fists and stepped forward...

What can be most likely said from the above text?

- (A) Xuma was welcomed.
 (B) Xuma was slapped.
 (C) Johannes introduced Xuma to the white men.
 (D) The white men smiled at Xuma.
26. "Children tend to accept everything they see as real". This sentence means:
 (A) Everything is real for children.
 (B) Everything they see is real for children.
 (C) Everything they see seems real to children.
 (D) Everything is real in the eyes of children.
27. "People used to think the earth was a kind of flat cake, with the sea all around it; but we know that it's really like a ball-not quite round, but a little flattened, like an orange". This means that :
 (A) People thought that the earth was quite round.
 (B) People think that the earth is quite round.
 (C) People thought that the earth was a little flattened.
 (D) People think that the earth is a kind of flat cake.
28. The hashtag symbol, or #, has recently been named the UK's children's word of the year. Children's dictionary writers at Oxford University Press analysed 120,421 entries to BBC Radio 2's annual short story competition. They found that under thirteens were using the hashtag symbol in a new way: to add emphasis, or to signal a comment, in their story writing. According to Vineeta Gupta, head of children's dictionaries at Oxford, examples of this phenomenon might include: 'This is a wonderful day, #sunny,' or: 'I have the best family, # fantastic family.'
- From the preceding text, we can deduce that:
- (A) The hashtag symbol is more widely used nowadays than ever before.
 (B) The hashtag symbol can be included in a dictionary because of its widespread use.
 (C) The hashtag symbol is widely used by today's children.
 (D) The symbol # is named the hashtag symbol since it is used to add emphasis.

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Directions: Read the passage below very carefully and answer questions 29 - 32 based on the information in the passage. You are to choose the one best answer, (A), (B), (C) or (D) to each question and **blacken** the letter of your choice on the separate answer sheet provided.

Parenting in the 21st Century

I decided to write this book for several reasons. I was dissatisfied with parenting-advice literature, finding it to be riddled with oversimplified messages, and often unrelated to or at odds with current scientific knowledge. I also felt certain after years as a professor, researcher, and author of textbooks on child development that contemporary theory and research contain many vital, practical messages... ones crucial for parents to understand if they are to effectively help their children develop. Furthermore, I've been approached on countless occasions by uneasy parents, frustrated by a wide array of child-rearing issues. I became convinced, therefore, that parents needed a consistent way of thinking about their role to guide them in making effective decisions.

It's little wonder that parents are perplexed about what approach to take to child-rearing. Today's world is one which makes parenting exceedingly difficult. In many industrialized countries, the majority of mothers of preschool children are in the workforce, though not always through choice. This group in particular tends to lament the lack of practical advice for parents in their child-rearing roles. Many parents simultaneously complain that they're busier than ever and that due to the growing demands of their jobs, they have little time for their children. Nations of pressured, preoccupied parents have emerged in an era of grave public concern for the well-being of youth.

It would seem from looking at current media that the younger generation are achieving less well than they should and that they often display a worrying lack of direction, manifested at its worst in a variety of social problems. These problems seem to have infiltrated even the most economically privileged sectors of the population, affecting young people who, on the face of things, have been granted the best of life's chances. Accounts of children being deprived of their childhood and growing up too fast, or the dangers of promoting materialism to young people abound in the media.

In many countries there is a growing sense of 'youth alienation' and parents rightly fear for their own children's futures. But agreement on what parents can and should do to shield children from underachievement and demoralization eludes those who seek it on the shelves of libraries or bookstores. Parenting advice has always been in a state of flux, at no time more so than the present. While the fundamental goal of parenting – to instill character and moral development –

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has stood firm amid the various passing fashions in child care over the years, the approach to accomplishing this has varied considerably.

Some authors, convinced that parents are in control of what their children become, advise a 'get tough' approach. The educational parallel to this 'parent-power' stance is to train and instruct as early as possible, and this has been justified by claims of maximizing brain growth or securing high achievement by starting sooner. Other authors, however, attribute many of today's social problems to the excessive pressure put on children by parents. According to these 'child-power' advocates, children have their own built-in timetables for maturing and learning. Waiting for cues that children are ready, these experts say, will relieve the stress that fuels youth discontent and rebellion. The reality, however, is that there are no hard-and-fast rules.

Current thinking on child-rearing advice mirrors historical shifts in theories of development and education. The most disturbing trend in the literature has been a move to deny that parents make any notable contribution to their children's development. Indeed, according to one highly publicised book, children's genes, and secondarily their peer groups, not parents, dictate how children turn out. This public declaration of parental weakness comes at a time when many busy parents are poised to retreat from family obligations, and, indeed, it grants them license to do so.

29. The author says that one reason for writing the book was the fact that
- (A) research suggests the quality of parenting skills has deteriorated.
 - (B) today's scientific views of parenting seem to be flawed.
 - (C) there is a lack of parenting literature written in a straightforward way.
 - (D) the available advisory material does not reflect current academic thinking.
30. What view of young people is promoted in the media?
- (A) They want to live an adult life before they are mentally ready.
 - (B) They are unaware of the opportunities provided for them.
 - (C) They are unable to appreciate the value of money.
 - (D) They fail to demonstrate a sense of purpose.
31. Which of the following is what the author says in the fourth paragraph about parenting advice?
- (A) Its core objective has remained constant.
 - (B) Its ideology stems from contemporary social issues.
 - (C) It traditionally placed a strong emphasis on the protection of the child.
 - (D) It currently benefits from techniques tried and tested by previous generations.

32. What criticism of contemporary thinking on child-rearing does the author make?

- (A) It repeats theories which have no solid foundation.
- (B) It places too much importance on formal education.
- (C) It encourages parents to neglect their responsibilities.
- (D) It undermines the role of friends in children's development.

Sentence completion

Directions: Four alternatives (A), (B), (C) and (D) are given for each (Items 33-47). Select the alternative that fills best in the blank/blanks in the sentence and **blacken** the letter of your choice on the separate answer sheet provided.

? 33. The weather was awful since it rained all weekend. We were _____ wet and I began to wish that I had stayed at home.

- ☒ (A) foggily
- (B) soaking
- (C) streaming
- (D) absolutely ☒

34. Are there any passengers today with _____ needs?

- ☒ (A) special
- (B) private
- (C) extraordinary
- (D) specialist

35. Flies, priests and lights can _____ any house.

- (A) pass
- ☒ (B) enter
- (C) see
- (D) build

36. The _____ of aid corresponds to need.

- (A) contribution
- (B) distribution
- (C) consumption
- ☒ (D) donation

? 37. After sitting in the sink for several days, the dirty, food-encrusted dishes became _____.

- (A) emphatic
- ☒ (B) perforated
- (C) prevalent
- (D) malodorous

38. The _____ of a mental disorder can be brought about by some form of chemical imbalance or a traumatic event such as war or the death of a partner.

- (A) conclusion
- (B) onset
- (C) set up
- ☒ (D) symptom

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39. It was _____ to think that it could possibly snow in the middle of the desert.
(A) advantageous (C) preventative
(B) philosophical ☒ (D) preposterous
40. She wrote in her _____ that her mom used to buy her cream at a local _____.
(A) dairy/diary (C) dairy/ dairy *dairy*
☒ (B) diary/ dairy (D) diary/ diary *diary* ☒
41. Important discoveries in chemistry _____ that scientists could produce synthetic medicines in laboratories.
(A) which meant (C) means
(B) mean ☒ (D) meant
42. Mary became _____ at typing because she practiced every day for six months.
(A) proficient ☒ (C) effective
(B) reflective (D) redundant
- ☒ 43. Roman's glance was a _____ invitation to speak later in private about events of the meeting.
(A) treacherous ☒ (C) tactful
(B) scintillating (D) taboo
- ☒ 44. She hadn't eaten all day, and by the time she got home she was _____.
(A) blighted ☒ (C) ravenous
(B) confutative (D) ostentatious
- ☒ 45. It is difficult to believe that charging 20% on an outstanding credit card balance isn't _____.
☒ (A) bankruptcy (C) novice
(B) usury (D) flagrancy
46. The high-profile company CEO was given an _____ for speaking at the monthly meeting of the area business leaders' society.
(A) expiation (C) interpretation
☒ (B) honorarium (D) inquisition
47. Must we be subjected to your _____ complaints all day long?
☒ (A) tiresome (C) awesome
(B) fearsome (D) wholesome

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Antonyms

Directions: Items 48 – 58 consist of words printed in capital letters, followed by four words/phrases. Choose the word or phrase that is most nearly **opposite** to the word in each question and **blacken** the letter of your choice on the separate answer sheet provided.

48. ROOSTER

- (A) Chicken
- (B) Check

- (C) Hen
- (D) Cockrell

49. NAIVE

- (A) Ignorant
- X (B) Wise

- (C) Immature
- (D) Unaffected

50. CONCLUSION

- (A) Commencement
- (B) Denouement

- (C) Precipitation
- (D) Culmination

51. EXILE

- (A) Expulsion
- (B) Inclusion

- (C) Displacement
- (D) Exclusion

52. FRAUDULENT

- (A) Candid
- (B) Forthright

- (C) Direct
- X (D) Genuine

53. SURRENDER

- (A) Hand over
- X (B) Conquer

- (C) Consign
- (D) Roll over

54. CROOKED

- (A) Lopsided
- (B) Curled

- (C) Untwisted
- (D) Hooked

55. BOAR

- (A) Bear
- (B) Sow

- (C) Cub
- (D) Fawn

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56. COMMAND

- (A) Bab
- (B) Adjuration

- (C) Serve
- (D) Edict

57. BUSY

- ☒ (A) Idle
- (B) Hustling

- (C) Industrious
- (D) Unavailable

58. OBSCURE

- (A) Implicit
- (B) Explicit

- (C) Obnoxious
- (D) Pedantic

Directions: Each sentence below (**Items 59- 60**) consists of a word or a phrase in **bold** followed by four words or phrases. Select the word or phrase which is closest to the **OPPOSITE** meaning of the word or phrase in bold and **blacken** the letter of your choice on the separate answer sheet provided.

59. Anything that might be used as a weapon will be **confiscated** by the security guards.

- (A) attached
- (B) expropriated

- (C) sequestered
- (D) delivered

60. The members thought that the task was **feasible**.

- (A) impossible
- (B) ill - planned

- ☒ (C) difficult
- (D) impractical

Section II: Quantitative Reasoning

Instructions

Numbers: All numbers used are real numbers.

Figures: Position of points, angles, regions, etc. can be assumed to be in the order shown; and angle measures can be assumed to be positive.

Lines shown as straight can be assumed to be straight.

Figures can be assumed to lie in a plane unless otherwise indicated.

Figures that accompany questions are intended to provide information useful in answering the questions. However, unless a note states that a figure is drawn to scale, you should solve these problems NOT by estimating sizes by sight or by measurement, but by using your knowledge of mathematics.

Quantitative comparison

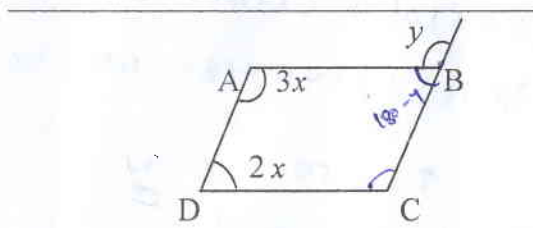
Directions: Each of the questions 61-74 consists of two quantities, one in column A and one in column B. You are to compare the two quantities and choose:

- 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.

Information: In a question, information concerning one or both of the quantities to be compared is centered above the two columns. A symbol that appears in both columns represents the same thing in column A as it does in column B.

	<u>Column A</u>	<u>Column B</u>
61.	$\frac{1}{2} + \frac{3}{4}$	$\frac{4}{6}$

$$\frac{5}{4} > \frac{2}{3}$$



ABCD is a Parallelogram.

B 62. x

70

Refer to the diagram in Question 62.

A 63. y

108

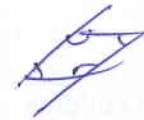
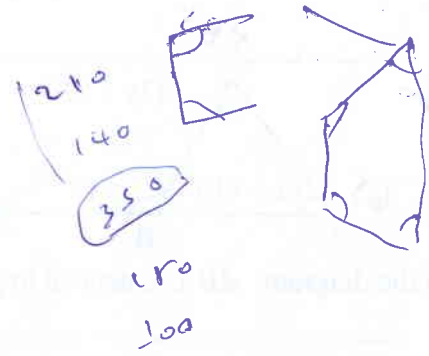
D 64. a $a + b = 0$ b

C 65. ad $a : b = c : d$ bc

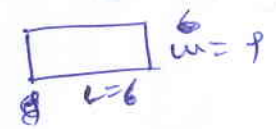
The perimeter of a rectangle with area 54cm^2 and length 6cm is x .

A 66. x

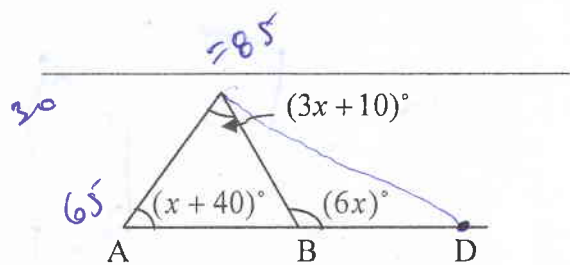
15



$180 - 108$



$12 + 18$



In the diagram, AB is extended to point D .

$$(3x + 10) + (x + 40) + (180 - 6x) = 180$$

$$3x + 10 + x + 40 + 180 - 6x = 180$$

$$2x = 50, \quad x = 25$$



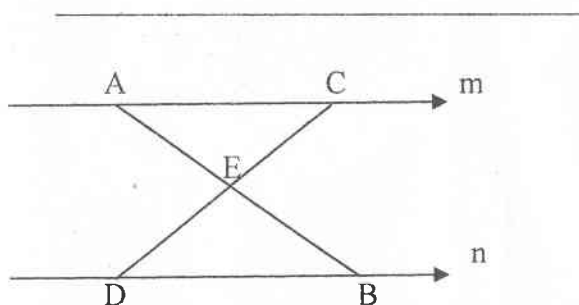
x - no. fam. having 2
 y - no. fam. having 3

67. x 65

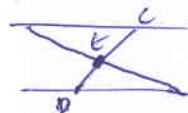
No. of children	0	1	2	3	5
No. of Family	2	4	3	5	1

In drawing a pie-chart for the above table, let x and y be degree measures of the sectors representing the number of families having 2 and 3 children respectively.

68. $x + y$ 180°



m is parallel to n and E is the mid point of AB .



69. DE EC

The three sides of a triangle are 5, 1.5 and x .

70. x 3.5

$$(10, -6)$$

$$(a, b)$$

$$(k, y)$$

$$a = \frac{k+10}{2}$$

$$b = \frac{10}{2}$$

$$a = 18 - 10 = 8$$

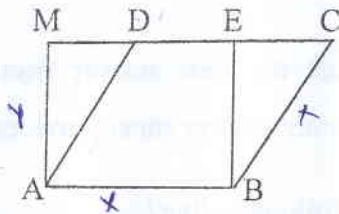
$$16 = k + 10$$

$$\frac{b+6}{a-10} = \frac{10}{k-10}$$

$$10(a-10) = k-10(b+6)$$

$$10a - 100 = bk + 6k - 10b - 60$$

$$10a = bk + 6k - 10b + 40$$

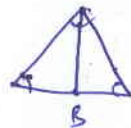
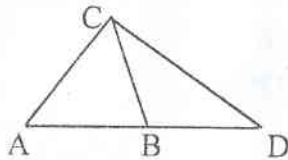


$A = xy$, $P = 2x + 2y$
 $A = xy$

Parallelogram ABCD and rectangle ABEM are of equal area.

71. Perimeter of ABCD Perimeter of ABEM

72. $249^2 - 248^2$ 1



$\triangle ABC$ is an equilateral triangle, B is midpoint of $\overline{AD}$.

73. $m(\angle ACD)$ 100°

$x < 0$ and x is less than its square by 30.

Column A

Column B

74. x -6

Discrete Quantitative

Directions: For each of the questions from 75-88, select the best answer from the four alternatives and **blacken** the letter of your choice on the separate answer sheet provided.

75. A point of the form $(a, -a)$ always lies on which of the following line?
 (A) $x = a$ (C) $y - x = 0$
 (B) $y = -a$ ~~(D) $x + y = 0$~~
76. A school is planning to increase the number of students from 40 to 50 per class. How much is the percentage increase?
 (A) 40% (C) 20%
~~(B) 25%~~ (D) 10%
77. The angles of a triangle are in the ratio 8:3:4. What is the measure of the smallest angle?
 (A) 12° ~~(C) 36°~~
 (B) 24° (D) 72°
78. A father wants to divide birr 390 to his two children A and B in the ratio 5:8. How much money child A and child B get, respectively?
~~(A) 150 & 240~~ (C) 130 & 260
 (B) 120 & 270 (D) 100 & 290
79. A retail store buys a shoe for 80 birr and sells at 75% profit. What is the selling price of the shoe?
 (A) 100 birr (C) 130 birr
 (B) 120 birr ~~(D) 140 birr~~
80. A bus is carrying 28 passengers, of which 18 are male. What is the ratio of female to male passengers?
 (A) $\frac{5}{14}$ ~~(C) $\frac{5}{9}$~~
 (B) $\frac{9}{14}$ ~~(D) $\frac{9}{5}$~~

28, 18 = 10

$$\frac{5}{13} = \frac{x}{29}, \frac{8}{13} = \frac{x}{39}$$

150 240

$$\frac{8}{15}, \frac{3}{15}, \frac{4}{15}$$

$$\frac{18}{10}$$

$$\sqrt{49x^2} - \sqrt{2x^2}$$

$$= 7\sqrt{2} - \sqrt{2}$$

$$= 6\sqrt{2}$$

$$\frac{k+10}{2} = a$$

$$\frac{4-b}{2} = b$$

$$k+10 = 40$$

$$k = 30$$

$$\frac{k+10}{2} = 2a$$

$$\frac{4-b}{2} = b$$

$$b = 1$$

$$\frac{8}{15} = \frac{x}{180}$$

$$\frac{3}{15} = \frac{x}{180}$$

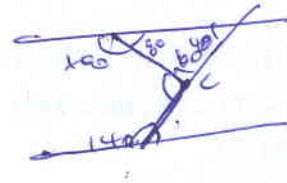
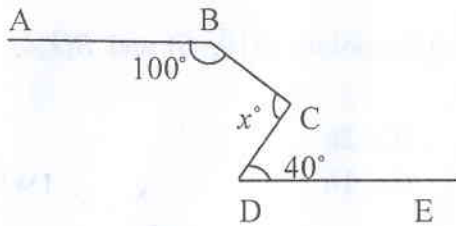
$$a - 2b = 18$$

$$a = 20$$

$$= 36$$

$$96$$

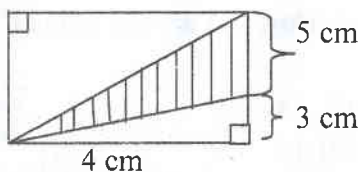
$$48$$



81. In the figure above, if $AB \parallel DE$, then $x =$ _____.
- (A) 100 (C) 140
(B) 120 (D) 160

82. The daily sales of a shop is birr 2400. If the shop owner pays 4.5% sales tax, how much does he pay from his daily sales?
- (A) 234 (C) 108
(B) 180 (D) 216

0.045
2400
0.045



$A = \frac{1}{2} \times 4 \times 3 = 6$
 $A = \frac{1}{2} \times 4 \times 5 = 10$

83. In the figure above, what is the area of the shaded region?
- (A) 16 sq. cm (C) 10 sq. cm
(B) 6 sq. cm (D) 4 sq. cm

$x = 42$
 $y = 500$

84. A shop keeper bought 5 dozen pens at 85 cents per pen and planned to sell each for 1 Birr. However, 10% of the pens were damaged and thrown away. How much did he profit?
- (A) 15 Birr (C) 5 Birr
(B) 9 Birr (D) 3 Birr

$20 = 100$
 $500 = 85$
 $500 = 200$

85. What is the point of intersection of the line $2x + 3y = 6$ and the x -axis?
- (A) (0,2) (C) (3,0)
(B) (2,0) (D) (0,3)

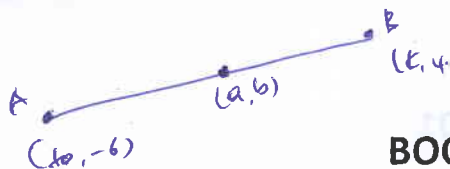
9
45 5

86. Corresponding sides of two similar triangles are in the ratio 2:3. If the area of the smaller triangle is 16 sq. cm, what is the area of the larger triangle?
- (A) 24 sq. cm (C) 48 sq. cm
(B) 36 sq. cm (D) 64 sq. cm

$\frac{2}{3}$

1 dose = 10 pen
50 pen = 85 = 4250
 $7x = 6$
 $x = 2$

$\frac{2 \times 3}{5 \times 10} \times 16 = 48$
 $x = 24$
 $x = 6$



$$\frac{14}{k-10}$$

$$y = mx$$

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87. If (a, b) is the midpoint of the line segment joining the points $A(10, -6)$ and $B(k, 4)$ and $a - 2b = 18$, then what is the value of k ?

(A) 22 (C) 26
(B) 32 (D) 16

88. When $\sqrt{98} - \sqrt{50}$ is simplified it is equal to _____.

(A) $4\sqrt{3}$ (C) $4\sqrt{2}$
(B) $2\sqrt{2}$ (D) $2\sqrt{3}$

$$\begin{aligned} \frac{x}{4} &= 14.5 \\ x &= 58 \\ 58 + 2x &= 14 \\ \frac{58 + 2x}{6} &= 14 \\ 2x &= 26 \\ x &= 13 \end{aligned}$$

Data Interpretation

Directions: Each of Questions 89 – 100 has four choices. For each of these questions, select the best of the answer choices given and **blacken** the letter of your choice on the separate answer sheet provided.

89. The average age of 6 friends that include 2 twins is 14. How old are the twins if the average age of the remaining 4 is 14.5 years?

(A) 12 (C) 14
(B) 13 (D) 15

(1/4) HH
(1/4) HT
(1/4) TH
(1/4) TT

90. If two coins are tossed, what is the probability that at least one head turns up?

(A) $\frac{1}{4}$ (C) $\frac{3}{4}$
(B) $\frac{1}{2}$ (D) $\frac{2}{3}$

HT
TH
TT
HT

$$\frac{4}{11}$$

91. If a letter is selected from the word "Probability", what is the probability that the selected letter is a vowel?

(A) $\frac{1}{11}$ (C) $\frac{3}{10}$
(B) $\frac{3}{10}$ (D) $\frac{4}{11}$

92. A class representative is to be selected from a classroom. 12 of the students in the classroom are boys. If 48% of the students in the classroom are boys, what is the probability that the class representative that will be selected is a girl?

(A) $\frac{13}{25}$ (C) $\frac{1}{25}$
(B) $\frac{12}{25}$ (D) $\frac{7}{25}$

$$\begin{aligned} B &= 12 \\ G &= 13 \\ 48\% \times 25 &= 12 \\ 13C_1 &= \frac{13}{25} \end{aligned}$$

$$y = mx + b$$

$$m = \frac{4-10}{k-10}$$

$$\frac{4-b}{k-a} = \frac{10}{k-10}$$

$$y = \frac{10}{k-10}x + b$$

$$10k - 10a = (4-b)(k-10) = 4k - 40 - bk + 10b$$

$$6k - bk = 10a + 10b - 40$$

$$5C_5 =$$

$$a \ b \ c \ d \ e$$

$$5 \times 4$$

BOOKLET CODE: 01

93. If a fair coin is tossed five times, how many possible different sequences of heads and tails are there?

(A) 10

(C) 32

(B) 64

(D) 16

$$\frac{2 \times 6 \times 5 \times 4 \times 3}{2 \times 2!}$$

94. Suppose that the Ethiopian premier league has 5 teams entered in the computation. In how many different orders can the teams finish?

(A) 120

(C) 720

(B) 840

(D) 125

$$\frac{7!}{2!2!3!}$$

95. How many different 7-digit numbers can be made using the digits 1,1,5,5,8,8 and 8?

(A) 120

(C) 210

(B) 140

(D) 240

96. A committee of 3 people is to be chosen from among 8 members of a club. How many such committees are there?

(A) 6

(C) 56

(B) 12

(D) 42

97. The percent increase in the price of a car was 4%. The new price is birr 15,600. What was the price before the increase?

(A) 15,000 birr

(C) 14,976 birr

(B) 14,600 birr

(D) 14,000 birr

$$8C_3 = \frac{8 \times 7 \times 6}{3 \times 2 \times 1}$$

Directions: For Questions 98-100 refer to the following data:

1, 2, 3, 5, 2, 2, 6, 3

98. What is the mean of the data?

(A) 1

(C) 3

(B) 2

(D) 1.5

$$\begin{aligned} x + 0.04x &= 15600 \\ x(1.04) &= 15000 \end{aligned}$$

99. What is the median of the data?

(A) 3.5

(C) 3

(B) 2

(D) 2.5

$$\begin{aligned} (1-3)^2 &+ (2-3)^2 + (5-3)^2 + (6-3)^2 \\ &+ 3(1)^2 + 4(4)^2 + 9 \\ &= 4 + 1 + 4 + 9 + 3 + 16 + 9 \\ &= 42 \end{aligned}$$

100. What is the standard deviation of the data?

(A) $\sqrt{2.5}$

(C) $\sqrt{1.5}$

(B) $\sqrt{2}$

(D) $4\sqrt{3}$

$$\begin{aligned} &1, 2, 2, 2, 3, 5, 6 \\ &1-3 \quad (3-3) \\ &(2-3) \quad (6-3) \\ &(3-3) \\ &\sqrt{4+1+1+1+4+9} \\ &30+80+12 = 122 \\ &\sqrt{\frac{122}{8}} \end{aligned}$$

Section III: Analytical Reasoning

General Directions: The Analytical Reasoning (AR) part is composed of items that measure your ability to make inferences and draw conclusions based on information provided. In this section, you are expected to identify discrepancies, assumptions, choose a statement that weaken/strengthen an argument, evaluate an argument and reason out how the argument is made.

Directions: Each of the following questions has four alternative choices. Read the questions carefully and choose the BEST ANSWER from the given alternatives and **blacken** the letter of your choice on the separate answer sheet provided.

101. A group consists of seven post-graduate students: Tadesse, Challa, Meseret, Roman, Kassa, Asteway, and Amsale. From them, four will be selected to give a presentation to the class based on the following criteria:

1. Either Tadesse or Challa must be selected, but Tadesse and Challa cannot both be selected
2. Either Kassa or Asteway must be selected, but Kassa and Asteway cannot both be selected
3. Kassa cannot be selected unless Meseret is selected.
4. Amsale cannot be selected unless Challa is selected.

A or B
E or F
E = i + c
G = i + B

1, E C A
2, E C B G

If we know that Asteway is not selected to present, how many different groups of four can be made, as per the criteria?

- (A) One (C) Three
(B) Two (D) Four

102. There are seven piano students, namely Kelemua, Rahel, Aschenaki, Goitom, Naol, Lemlem, and Taye who are supposed to give a recital. Their instructor decides the order in which each student will play exactly one piece, a piano solo. In deciding the order of performance, the instructor placed the following restrictions:

1. Naol cannot play first or second $E \neq 1, 2$
2. Goitom cannot play until Naol has played $D \neq 1, 2, E$
3. Neither Kelemua nor Lemlem can play seventh $A \neq F \neq \text{Last}$
4. Either Lemlem or Taye must play immediately after Goitom plays $\text{For } G = \text{next } D$
5. Aschenaki must play either immediately after or immediately before Rahel plays $C = B$

If Aschenaki plays first, which one of the following must be true?

- (A) Kelemua plays sixth
(B) Kelemua plays immediately after Lemlem
(C) Naol plays third
(D) Taye plays seventh

C B

C B E D F/G A G
C B E D F A G
X = = =
A + F

103. A charitable foundation awards grants in exactly four areas: medical services, theater arts, wildlife preservation, and youth services. One or more grants are awarded in each of the four quarters of a calendar year based on the following criteria:

1. Grants are awarded in all four areas. ✓
2. No more than six grants are awarded.
3. No grants in the same area are awarded in the same quarter or in consecutive quarters.
4. Exactly two medical services grants are awarded.
5. A wildlife preservation grant is awarded in the second quarter.

If a wildlife preservation grant and a youth services grant are awarded in the same quarter of a particular calendar year, then any of the following could be true that year EXCEPT:

- (A) Medical services grant is awarded in the second quarter
 (B) Theater arts grant is awarded in the first quarter
 (C) Wildlife preservation grant is awarded in the fourth quarter X
 (D) Youth services grant is awarded in the third quarter X

$$\begin{aligned} A \rightarrow B & \quad x - 420 \\ 0.4x & = 420 \\ \underline{1050} \end{aligned}$$

104. Ethiopian Airways is selling tickets from Addis Ababa to Beijing. It has sold 40% of the available tickets and still has 420 tickets available to sell. How many tickets were originally available on this flight?

- (A) 535
 (B) 650
 (C) 700
 (D) 850

$$420 = x(1 - 0.4)$$

105. Geremew states: When I went fishing the other day, every fish that I caught was a tuna, and every tuna I saw I caught. Of the following statements listed below, which one can be concluded from the observations of Geremew?

- (A) All of the fish that Geremew saw he caught
 (B) Geremew caught no fish other than tuna while he was fishing. ✓
 (C) In the area that Geremew fished, there were no other fish
 (D) Tuna was the only fish that Geremew saw while he was fishing

700

106. Gelata is a rich businessman who runs a prosperous company. He is disappointed in his two children, Robera and Toltu, because he believes that neither of them presents the potential of having the ability to take control of his company. He thinks that both of his children lack common sense. This belief formulates from the opinion that:

- (A) Even a person who is not brilliant can control a company if she or he has been able to obtain an MBA
 (B) If Toltu showed any sign of common sense, she would have the ability to aid Robera in controlling the company
 (C) In order to run a company, a person needs common sense
 (D) Robera and Toltu are ignorant to the experience of controlling the company

A 8, 9, 6, ~~7~~ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

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107. There are nine individuals, namely Woinshet, Sindu, Kebede, Abraham, Abdella, Sibamo, Tigist, Almaz and Nesru who are the only candidates to serve on three committees (A, B and C) based on the following criteria:
1. Each candidate should serve on exactly one of the Committees
 2. Committee A should consist of exactly one member more than Committee B
 3. It is possible that there are no members of Committee C
 4. Among Woinshet, Sindu and Kebede none can serve on Committee A
 5. Among Abraham, Abdella and Sibamo none can serve on Committee B
 6. Among Tigist, Almaz and Nesru none can serve on Committee C

In case Tigist and Woinshet are the individuals serving on committee B, how many of the nine individuals should serve on committee C?

- (A) 3 (C) 5
(B) 4 (D) 6

108. Below are given arguments of two persons. Examine the arguments and choose the one correct answer.

Molla: Financially the private university is ruined. In case it raises its tuition fees, the number of paying students will come down and if they refrain from raising the fees the university will go bankrupt.

Workinesh: The pay of the teachers and professors could be cut.

Workinesh responds to Molla's argument by:

- (A) Attacking his method of reasoning
(B) Attacking Molla on a personal level
(C) Drawing attention to a previously overlooked alternative
(D) Resigning herself to the demise of the private university

109. Many people prefer to retain their own individuality and identity, where this leads to a decline in the rate of marriage. Which of the following assumptions are used in the above premises?

1. A married person loses his or her own identity and is no longer accountable to himself or herself
 2. Married persons do not find contentment as opposed to unmarried people
 3. There has been a steady increase in the divorce rate
- (A) I only (C) I and II only
(B) II only (D) III only

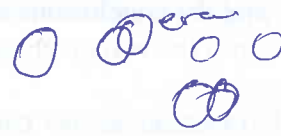
110. Below are given two statements and two conclusions. Read both the statements and conclusions and choose the conclusion that follows from the statements.

Statements:

1. No pencil is paper
2. Some papers are not eraser

Conclusions:

- I. No eraser is pencil
 - II. Some papers may be eraser
- (A) Either I or II follows
 (B) Neither I nor II follows
 (C) Only conclusion I follows
 (D) Only conclusion II follows

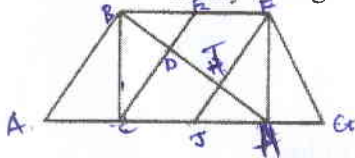


- A
B
C
D
E

111. In a row of five persons facing north, Tadele is to the right of Bekele who is second to the left of Muzein. Mamo, who is second to the right of Leta, is an immediate neighbor of Bekele and Muzein. Who is standing in the middle of the row?

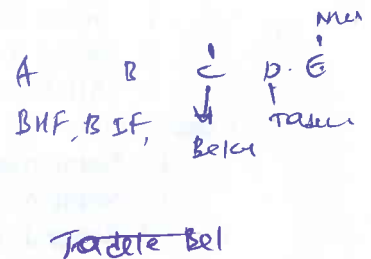
- (A) Bekele (C) Mamo
 (B) Leta (D) Tadele

112. How many triangles are there in the figure given below?

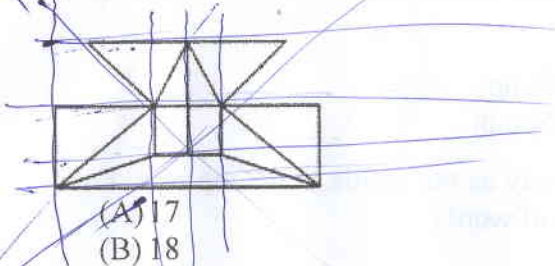


- (A) 8 (C) 12
 (B) 10 (D) 14

ABC, ABD, BDC, BEC, BED, BHC, BHF, BIF, CHD, JHE, FGH, FIH, FJH, FGO



113. What is the minimum number of straight lines required to make the figure given below?



- (A) 17 (C) 19
 (B) 18 (D) 20

Tadele, Leta, Bekele, Mamo, Muzein

BOOKLET CODE: 01

114. Below are given two statements followed by two conclusions. Read both the statements and the conclusions and decide which of the given conclusions logically follows from the two given statements.

Statements:

1. No woman teacher can play.
2. Some women teachers are athletes.

Conclusions:

- I. Male athletes can play
 - II. Some athletes can play
- (A) Only conclusion I follows (C) Either I or II follows
(B) Only conclusion II follows ~~(D) Neither I nor II follows~~

115. In the following question, three statements are given followed by three conclusions. Read both the statements and the conclusions and decide which of the given conclusions logically follows from the three statements.

Statements:

1. Some hills are rivers
2. Some rivers are deserts
3. All deserts are roads

Conclusions:

- I. Some roads are rivers
 - II. Some roads are hills ✓
 - III. Some deserts are hills ✓
- (A) Only II follows (C) Only I and II follow
~~(B) Only I follows~~ (D) Only II and III follow

116. In the following analogy question, a given sentence describes the relationship between the first two words. Use the same pattern of relationship and choose the word that has the same relationship with the third word.

Cup is to *coffee* as *bowl* is to:

- (A) Dish ~~(C) Soup~~
(B) Food (D) Spoon

117. The words in the bottom row are related in the same way as the words in the top row. For each item, find the word that completes the bottom row of words.

Apples Fruit Supermarket

Novel Book ?

- ~~(A) Bookstore~~ (C) Shopping
(B) Magazine (D) Vegetable

118. Choose the pair that best represents a similar relationship to the one expressed in the original pair of words: *BINDING : BOOK*

- (A) Criminal : Gang ~~(C) Frame : Picture~~
(B) Display : Museum (D) Nail : hammer

- X 119. In the next passage, the information that may support certain statements is given. Then, choose the statement that is best supported by the information given in the paragraph.

Human technology developed from the first stone tools about two and a half million years ago. At the beginning, the rate of development was slow. Hundreds of thousands of years passed without much change. Today, new technologies are reported daily on television and in newspapers.

- (A) Stone tools were not really technology
- (B) Stone tools were in use for two and a half million years
- (C) There is no way to know when stone tools first came into use
- (D) These days, new technologies are constantly being developed

120. Below are given two statements. The statements may have cause and effect relationship; can be the effects of the same or independent causes; or may be the independent causes without having any relationship. Then, read both the statements and choose the right answer.

Statements:

- I. All the schools in the area had to be kept closed for most part of the week
- II. Many parents have withdrawn their children from the local schools
- (A) Both the statements I and II are independent causes
- (B) Both the statements I and II are effects of independent causes
- (C) Statement I is the cause and statement II is its effect
- (D) Statement II is the cause and statement I is its effect

121. In the following passage, the information that may support certain statements is given. So, choose the statement that is best supported by the information given in the passage

Mathematics allows us to expand our consciousness. Mathematics tells us about economic trends, patterns of disease, and the growth of populations. Math is good at exposing the truth, but it can also perpetuate misunderstandings and untruths. Figures have the power to mislead people.

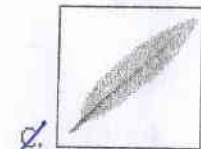
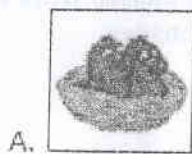
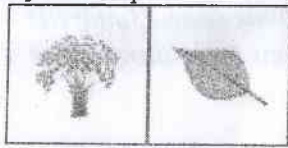
- (A) Figures are sometimes used to deceive people
- (B) The study of mathematics is dangerous
- (C) The study of mathematics is more important than other disciplines
- (D) The power of numbers is that they cannot lie

- X 122. In the passage given below, an argument is made by the speaker. So, choose the statement, if true, would strengthen the speaker's argument.

Giving children computers in grade school is a waste of money and teachers' time. These children are too young to learn how to use computers effectively and need to spend time on learning the basics, like arithmetic and reading. After all, a baby has to crawl before she can walk.

- (A) Evidence that using computers makes learning to read difficult
- (B) Proof that the cost of computers is coming down
- (C) Research on the effect of computer games on children
- (D) Studies showing computers are expensive

123. In the following question two pairs of pictures are given. The first pair is complete, and the second pair is incomplete. Out of the four pictures given below select a picture that will complete the second pair so that pictures in the second pair are related to each other in the same way as the pictures in the first pair are related to each other.



124. Pointing to an old woman, Araya said "her son is my son's uncle." How is Araya related to the old woman?
 (A) Father
 (B) Nephew
 (C) Uncle
☒ (D) Son

125. Below are given two statements. Analyze the data of both the statements and choose the correct answer that contains information needed to decide Mulat's rank in the class.

I. There are 30 students in the class

II. There are 10 students who scored less than Mulat

- ☒ (A) Both statements are needed to decide Mulat's rank
 (B) Data in both the statements together are not sufficient
 (C) Statement I alone is sufficient, but statement II alone is not sufficient
 (D) Statement II alone is sufficient, but statement I alone is not sufficient