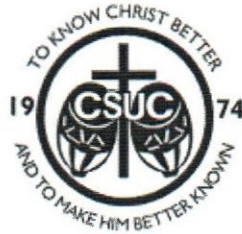


CHRISTIAN SERVICE UNIVERSITY COLLEGE

KUMASI – GHANA



Mature Applicants Entrance Examination, 2019/2020 Academic Year

ACCESS COURSE

QUANTITATIVE TECHNIQUES

June, 2019

Duration: 1 Hour 30 Minutes

SECTION A [40 marks]

INSTRUCTION TO CANDIDATES

- *Answer all questions.*
- *Choose the letter that correspond to the correct answer.*

Index number

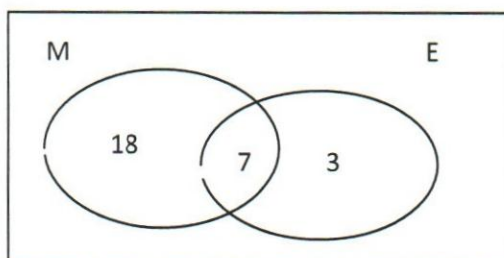
Signature

Date

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.

1. If $P = \{x : x \text{ is an even number greater than two and less than or equal to twelve}\}$, list the members of P .
 A. $\{2, 4, 2, 8, 10, 12\}$
 B. $\{3, 4, 6, 8, 10, 12\}$
 C. $\{2, 4, 6, 8, 10\}$
 D. $\{4, 6, 8, 10, 12\}$
2. Which of the following is an infinite set?
 A. $\{1, 2, \dots, 5, 6, 7\}$
 B. $\{4, 6, 8, 10, 12\}$
 C. $\{2, 3, 5, 7, 11, \dots\}$
 D. $\{3, 6, \dots, 18, 21, \dots, 33, 36\}$
3. If $P = \{\text{factors of } 36\}$ and $Q = \{\text{multiples of } 4 \text{ less than } 40\}$, find the number of subsets in $P \cap Q$.
 A. 10
 B. 8
 C. 6
 D. 4
4. If set N is a subset of set M , then
 A. sets M and N have the same number of elements
 B. some members of set N can be found in set M .
 C. no member of set N is in set M
 D. all members of set N are in set M
5. $M = \{1, 2, 3, 4, 5, \dots, 20\}$, $Q = \{3, 4, 5, 6, 7, 8\}$, and $R = \{2, 3, 5, 7\}$. If Q and R are subsets of M , find $Q \cap R$.
 A. $\{3, 5\}$
 B. $\{5, 7\}$
 C. $\{3, 5, 7\}$
 D. $\{2, 3, 5, 7\}$
6. List the members of the set $\{2 \leq x \leq 5\}$.
 A. $\{2, 5\}$,
 B. $\{2, 3, 4\}$,
 C. $\{2, 3, 5\}$,
 D. $\{2, 3, 4, 5\}$,

The Venn diagram shows the number of pupils who offer Mathematics (M) and/or English (E) in a class.



Use this information to answer Question 7 and 8.

7. How many pupils offer Mathematics?
A. 10
B. 18
C. 25
D. 28
8. How many pupils offer only one subject?
A. 3
B. 7
C. 18
D. 21
9. Solve the inequality: $\frac{1}{2}(3x - 1) + 1 \leq 7 + 2x$
A. $x \geq -14$
B. $x \leq -14$
C. $x \geq -13$
D. $x \leq -13$
10. If $4 - x = 3(4x + 5)$, find the value of x
A. $\frac{11}{13}$
B. $1\frac{6}{13}$
C. $-1\frac{6}{13}$
D. $-\frac{11}{13}$
11. Solve the equation $\frac{2}{3}(x - 3) = \frac{5}{6}(x + 6)$.
A. -42
B. -12
C. 18
D. 42
12. Solve the inequality $2x + 10 \geq \frac{7x}{2} - 5$.
A. $x \leq 10$
B. $x \geq 10$
C. $x \leq 40$
D. $x \geq 40$

The following data show the marks of students in a test. 10, 4, 1, 4, 3, 3, 2, 1, 1, 7, 8
Use the information to answer questions 13 to 16.

13. If the pass mark is 4, find the number of students who scored more than the pass mark.
- A. 1
 - B. 2
 - C. 3
 - D. 4
14. Find the mean mark.
- A. 3
 - B. 4
 - C. 7
 - D. 8
15. Find the median mark
- A. 2
 - B. 3
 - C. 4
 - D. 7
16. Find the modal mark.
- A. 1
 - B. 4
 - C. 7
 - D. 8

The table below shows the average rainfall in a town from March 2003 to August 2003. Use it to answer question 17 and 18.

| Month | March | April | May | June | July | August |
|--------------|-------|-------|-----|------|------|--------|
| Rainfall(mm) | 96 | 147 | 281 | 452 | 265 | 139 |

17. What was the total amount of rainfall in May, June and July?
- A. 696mm
 - B. 930mm
 - C. 998mm
 - D. 1020mm
18. What was the mean rainfall in the town over the six months?
- A. 230mm
 - B. 281mm
 - C. 366mm
 - D. 452

19. Find the solution set of $2x + 1 < 5$ in the domain $\{-1, 0, 1, 2, 3\}$.
- $\{-1, 1, 3\}$
 - $\{-1, 0, 1\}$
 - $\{-1, 1, 2\}$
 - $\{0, 1, 2\}$
20. $P = \{\text{odd numbers between 20 and 30}\}$ and $Q = \{23, 29\}$. Which of the following is true? A.
- $P \subset Q$
 - $Q \subset P$
 - $P = Q$
 - $P \cap Q = \emptyset$
21. The number of girls in a mixed school is 420. If the ratio of boys to girls in the school is 3 : 2, how many students are in the school?
- 1050
 - 1470
 - 1630
 - 1680
22. Eight men can do a piece of work in 12 days. How long will 6 men take to do the same work if they work at the same rate?
- 14 days
 - 16 days
 - 18 days
 - 20 days
23. In a class, there are 12 girls and 48 boys. Find the percentage of boys in the class.
- 20 %
 - 40 %
 - 60 %
 - 80 %
24. A car uses 150 litres of petrol in 45 mins. How many litres of petrol will it use in 1 hour? A. 375 litres
- 230litres
 - 225litres
 - 200litres
25. A boy scores $\frac{17}{25}$ in a French test. Express his score as a percentage.
- 17%
 - 34%
 - 68%
 - 85%
26. Kofi, Kojo and Ama shared GH¢480,000.00 in the ratio 3:5:4. How much did Ama receive?
- GH¢160,000.00

- B. GH¢200,000.00
- C. GH¢218,181.81
- D. GH¢342,859.14

27. A man was 24 years old when his son was born. Now he is three times as old as his son. Find the age of the son.

- A. 6 years
- B. 12 years
- C. 18 years
- D. 36 years

28. Express 6 days is to 3 weeks as a ratio in its simplest form.

- A. 1:2
- B. 2:1
- C. 2:7
- D. 7:2

29. Simplify $5w + 7p^2 - 4w + 3p^2$

- A. $9w + 10p^2$
- B. $w + 10p^2$
- C. $w + 4p^2$
- D. $9w + 4p^2$

30. The ratio 8:12 is equivalent to y:9. What is the value of y?

- A. 4
- B. 5
- C. 6
- D. 7

31. The difference between two numbers is 168. If the smaller number is 113, find the other number.

- A. 223
- B. 271
- C. 281
- D. 291

32. A car uses 150 litres of petrol in 45 mins. How many litres of petrol will it use in 1 hour? A. 375 litres

- B. 230litres
- C. 225litres
- D. 200litres

33. Given that $-1 = 2 - m$, find m

- A. -3
- B. -1
- C. 1

D. 3

34. Make d the subject of the relation $n = 2d + 3$

A. $\frac{3n}{2}$

B. $\frac{n+3}{2}$

C. $\frac{n-3}{2}$

D. $\frac{3-n}{2}$

35. If 15% of the length of a rope is 75 cm, find half of the length of the rope.

A. 500 cm

B. 250 cm

C. 150 cm

D. 100 cm

36. Two sets whose intersection is an empty set are

A. disjoint sets

B. equivalent sets

C. finite sets

D. empty sets

37. If $6n + 4 = 16$, find the value of n .

A. 2

B. 3

C. 5

D. 6

38. Which of the following statements is true?

A. $8 + 4 < 10$

B. $7 + 4 = 10$

C. $6 + 4 < 10$

D. $5 + 4 < 10$

39. If $y = \frac{1}{3}(x - 2)$, express x in terms y .

A. $x = 3y - 2$

B. $x = 3y + 2$

C. $x = \frac{3}{2}y$

D. $x = -\frac{3}{2}y$

40. If 180 oranges were shared among Kwame and Ama in the ratio 7:5 respectively, how many oranges did Ama receive?

A. 45

B. 60

C. 75

D. 90

SECTION B [40 marks]

INSTRUCTION TO CANDIDATES

- Answer only **TWO (2)** questions

1. (a) Solve for x, if $\frac{1}{3}x + 1\frac{2}{3} < -\frac{3}{4}x - \frac{1}{2}$ [6 marks]

(b) 25 students in a class share Twi and French text books. 17 of them had Twi text books and 8 had both Twi and French text books. 3 students did not have any of the text books.

- i) Illustrate the information on a Venn diagram
- ii) How many had French text books [8 marks]

(c) An English textbook cost GH¢25.00. The author of the book agreed to take 20% of the cost of each book sold. If 1,702 copies were sold, calculate the author's share [6 marks]

2. (a) The table shows the distribution of marks of students in a class test.

| | | | | | | |
|-----------|---|---|---|---|---|---|
| Mark | 1 | 2 | 3 | 4 | 5 | 6 |
| Frequency | 5 | 6 | 5 | 3 | 4 | 2 |

- (i) Calculate the mean mark of the distribution correct to the nearest whole number.
- (ii) Find the mode of the distribution
- (iii) Find the median of the distribution [12 marks]

(b) Two apples and a coconut cost GH¢31.00. An apple and two coconuts cost GH¢26.00. What is the cost of two coconuts and three apples? [8 marks]

3. John and Thomas entered into a business with capitals \$12600.00 and \$19200.00 respectively. After four months they were joined by Peter with a capital of \$16200.00. It was agreed that the profits should be shared in proportion to their investment. During the first four months of the year, the business made a profit of 24% of the working capital and during the remaining eight months, the profit was 32% of the working capital.

- (a) Find the amount received by each partner as the share of the profits for the year.
- (b) Express John's share of the profit as a percentage of his investment.