Aga Khan University

Resource: Math Reasoning Practice Questions

MBBS Programme

Note:

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**Questions 1 – 6 ask you to compare two quantities.**

The questions are independent but the answer for each question can be either of the four choices given below:

Answer choices:
- **A.** **Quantity A is greater than Quantity B.**
- **B.** **Quantity B is greater than Quantity A.**
- **C.** **Quantities A and B are equal.**
- **D.** **The relationship cannot be determined from the information given.**

Answer questions 1 – 6 using the option A, B, C, D (above) as possible answers for each of the questions.

1. **The distribution of Irfan's family monthly budget is Rs. 4,500/-**

Insurance · Othe¨ · Food · Savings · Rent and · Entertainment

Not to Scale
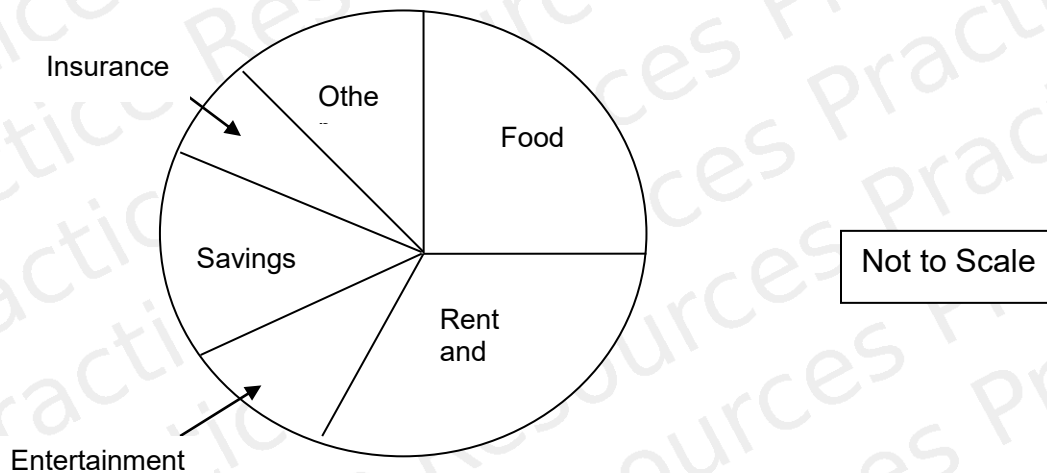
Quantity A: the monthly budget for food

Quantity B: Rs. 1,000/-

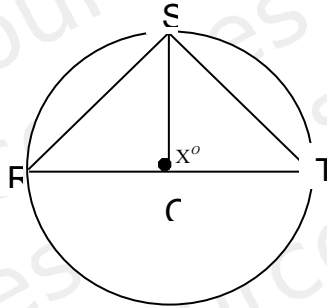2. $X < O; X^2 > 9$

Quantity A: X

Quantity B: -3

3. **Two music stores between them have 930 different titles on offer. Jamshed stocks 710 titles while Altaf stocks 520.**

Quantity A: Titles stocked by both Jamshed and Altaf

Quantity B: Titles stocked by Jamshed alone

4. **RT is the diameter of the circle with centre O.**

Not to Scale

Quantity A: The perimeter of triangle *RSO*

Quantity B: The perimeter of triangle *OST*

5. **A real estate agent has the following houses**.

House Price in Rs.'000	Number of Houses
100-133	12
134-166	25
167-199	8

The most expensive house is on offer at Rs. 1,90,000/-

Quantity A: The range of prices of the 45 houses

Quantity B: Rs. 56,000/-

6. **Selected Environment Statistics for Seven Provinces (Year 2007)**

Province	Area (in square kilometers)	Population	Number of Endangered Species	Solid Waste (in tons)	Number of Hazardous Waste Sites	Percent of Budget Allocated to Environmental Protection
1	1,700,580	570,000	6	800,000	6	4.0
2	424,111	30,380,000	110	45,732,000	95	2.5
3	28,321	1,135,000	126	1,321,000	2	0.8
4	216,512	1,039,000	10	1,004,000	9	4.2
5	22,596	7,760,000	110	7,215,000	108	3.6
6	116,135	10,939,000	15	15,955,000	33	0.7
7	253,415	460,000	15	325,000	3	7.7

The number of endangered species in an 8th province is X

Quantity A: The median number of endangered species in the eight provinces

Quantity B: 15

7. **The children in a large school consist of boys and girls from 5 to 18 years old. They can be thought of as members or non-members of the following sets:**

   I. boys younger than 8 years old
   II. boys younger than 14 years old
   III. boys older than 14 years old
   IV. girls older than 8 years old
   V. girls older than 14 years old
   VI. children older than 8 years old
   VII. children between 8 and 14 years old

   Which of the following statements is true?

   A. (i) is a subset of (ii) is a subset of (iii)

   B. (iv) is a subset of (v) is a subset of (vi)

   C. (ii) is a subset of (vi) is a subset of (vii)

   D. (v) is a subset of (iv) is a subset of (vi)

8. **Rearrange the individual digits (numbers 0 to 9) in the equations so the equations are true. Arithmetical signs remain where they are.**

   When $(5 \times 3) + 1 = 21$ is rearranged the answer is

   A. 11
   B. 12
   C. 13
   D. 23

9. **Mushtaq has three grandparents with brown eyes and one with blue eyes.**
   Raisa has two grand parents with brown eyes and two with blue eyes.
   Mushtaq and Raisa marry and have two children, both with brown eyes.
   What is the best estimate of the probability that their next child will have blue eyes?

   A. $\frac{1}{8}$

   B. $\frac{1}{4}$

   C. $\frac{3}{8}$

   D. $\frac{1}{2}$

10. **Mushtaq can run at 16km for an hour but then he must rest for an hour. Arif runs   more slowly, 10km an hour, but can keep up that pace for three hours. They need   to get drugs from the pharmacy which is 12 kms away. There is no transport available.**

   What is the shortest time it will take to get the drugs back to their starting point?

   A.   68 mins approx

   B.   108 mins approx

   C.   111 mins approx

   D.   144 mins approx.

Questions 11 and 12 refer to the following information.

A farmer sold apples, pears, and tomatoes by the kilogram for a total receipt of Rs. 480.00. How many kilograms of apples did the farmer sell?

Which two of the following statements together provide sufficient additional information to answer the question?

i.   Apples and pears were each sold at Rs.0.50 per kilogram
ii.   A total of 780 kilograms of pears, and tomatoes was sold.
iii.   The total receipt for apples was equal to the combined receipt for pears and tomatoes.
iv.   The total receipt for apples was 4 times the total receipt for pears.
v.   The total receipt for tomatoes was 3 times the total receipt for pears.

11.   **The first required additional statement is**

   A.   i and iii
   B.   ii and iv
   C.   iii and v
   D.   i and iv

12.   **Which of these percentages equals 1.25?**

   A.   0.125%
   B.   12.5%
   C.   125%
   D.   1250%

Question 13 refers to the following information:

In a class of girls and boys, the average (arithmetic mean) height of the girls is 44.3 inches. What is the average height of all of the students in the class?
Which two of the following statements together provide sufficient additional information to answer the question?

- (i)   The number of girls in the class is 18.
- (ii)   The sum of the heights of all of the students in the class is 1,379.4 inches.
- (iii)   The average height of the boys in the class is 48.5 inches.
- (iv)   The ratio of the number of girls to the number of boys in the class is 3 to 2.
- (v)   The difference between the number of girls and the number of boys in the class is 6.

13.   The required additional statements are

- A.   (i) and (ii)
- B.   (ii) and (iii)
- C.   (iii) and (iv)
- D.   (iv) and (v)

14.   **What is the cost of a banana?**

Which <u>two</u> of the following statements <u>together</u> provide sufficient information to answer the question?

- i.   7 mangoes and 9 bananas cost Rs. 14.80
- ii.   4 mangoes and 8 bananas cost Rs. 11.60
- iii.   3 mangoes and 7 oranges cost Rs. 9.15
- iv.   5 bananas, 2 mangoes and 3 oranges cost Rs. 12.65

- A.   i and ii
- B.   i and iv
- C.   ii and iv
- D.   iii and iv

15.   **Two sacks of rice are for sale at the same price:**
    Which is the best bargain?

    Sack (i) contains 54 lbs. plus one third of its own weight
    Sack (ii) contains 60 lbs. plus one quarter of its own weight

- A.   Sack (i) has more rice than Sack (ii)
- B.   Sack (ii) has more rice than Sack (i)
- C.   both contain the same amount of rice
- D.   the best buy cannot be determined from the information give

16. Mr. Ali gave a quiz. The results for two of his classes are shown on the box and whisker plots below.
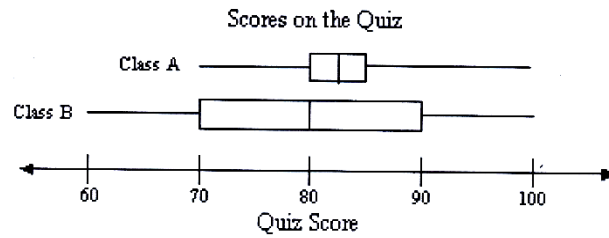
Scores on the Quiz

Which statement best describe the quiz results?

A. Class A performed better than Class B.

B. The lower extreme of Class B is greater than the lower extreme of Class A.

C. Class B has a smaller range of scores in the upper quartile than Class A.

D. The medians for the two classes are the same.

17. The value of 7! Divided by 3! Is:

A. 2.33

B. 840

C. 210

D. 1320

18. A nurse has to record her temperature in Celsius but her thermometer reads Fahrenheit. A patient's temperature is 100.7°F. What is the temperature in °C?

(C x 9/5) +32= F

A. 32 °C

B. 36.5°C

C. 38.2 °C

D. 213.3°C

19. In the graph below, no axes or origin is shown. If point B's coordinates are (10, 3), which of the following coordinates would most likely be A's?
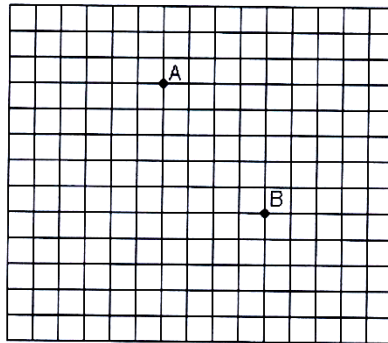
A. (17, -2)

B. (10, 6)

C. (6, 8)

D. (-10, 3)

20. Which of the following has the least value?

A. 1/4

B. 3/8

C. 2/11

D. 11%

21. Parveen flips a coin and then spins the arrow on the spinner.

What is the total number of outcomes for this event?

A. 7

B. 10

C. 15

D. 25
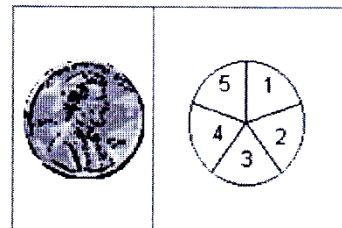
22. **A shop keeper offers a discount of 20% on a jacket and sales tax levied on the jacket is 15%.**

   Quantity X: if a person first paid the tax then took the discount.
   Quantity Y: if a person first took the discount then paid the tax.

   A.   Quantity X is greater than Quantity Y.

   B.   Quantity Y is greater than Quantity X.

   C.   Quantity X and Quantity Y are equal.

   D.   The relationship cannot be determined.

23. **The dimensions of an examination room are 32 feet by 27 feet. If distance between chairs should be 4 feet in all directions and the size of each chair is 2 X 2 square feet, then the maximum number of chairs placed in the room is**

   (Note: The distance from each wall is not necessarily 4 feet)

   A.   24

   B.   26

   C.   30

   D.   34

24. **What is the length of a rope required to cover the boundaries of a square with area 64 squares metres?**

   A.   32m

   B. $32m^2$

   C.   64m

   D. $64m^2$

25. **If 30% of 30 is 9 and 40% of 40 is 16, then 110% of 110 is**

   A.   64

   B.   81

   C.   121

   D.   144

26. A circular cycling track has a circumference of 1km. If two cyclists starting simultaneously have constant speeds of 15km/hr and 20km/hr, how long will it take them to meet at the starting point again?

    A. 6 minutes
    B. 9 minutes
    C. 12 minutes
    D. 15 minutes

27. If a > b >1, then $\frac{1}{b} - \frac{1}{a} - \frac{1}{ab}$

    A. Is greater than 1.
    B. Is greater than a.
    C. Is greater than b.
    D. Cannot be determined from the information given.

28. If 2a = 7b and 14b = c, then a is equal to

    A. 4c
    B. 2c
    C. c
    D. $\frac{c}{4}$

29. A bowl contains 40 coloured balls. If 40% of the balls are green, then the number of balls which are not green will be
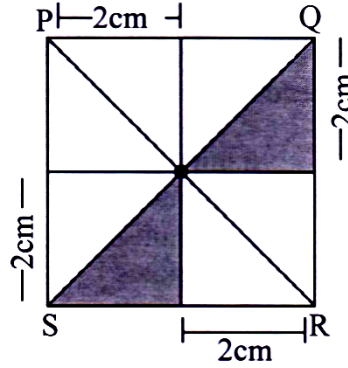
    A. 16
    B. 20
    C. 24
    D. 28

30. If Sajid can type a page in '*t*' minutes and Salma can type a page in '*s*' minutes, how many pages can both type in 10 minutes?

    A. 10t + 10s
    B. $\frac{10}{t} + \frac{10}{s}$
    C. $\frac{t}{10} + \frac{s}{10}$
    D. $\frac{10}{s+t}$

31. In the given diagram the area of the shaded portion is

    A. $2cm^2$

    B. $4cm^2$

    C. $6cm^2$

    D. $8cm^2$

32. Which of the following figure has the maximum perimeter?
[Note: All squares are of same size]

    A.

    B.

    C.

    D.

33. There are 108 passengers in a railway coach. The ratio of males to females is
5 : 4. The number of females on the coach is

    A.   46

    B.   48

    C.   60

    D.   62

34. If cube *A* has a side of 2cm and cube *B* has a side of 6cm, then how many cubes *A* can be accommodated in cube *B*?
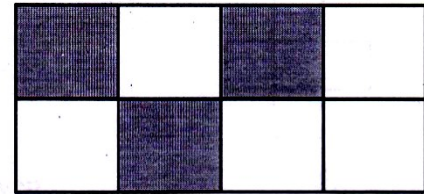
   A.   9
   B.   15
   C.   18
   D.   27

35. If ☐ ☐ ² ☐ = *a*, then ☐ ual to

   A.   *a*
   B.   − *a*
   C. a^2
   D.   − a^2

36. In the given figure, shaded area is less than the un-shaded area by

   A.   10%
   B.   20%
   C.   25%
   D.   30%
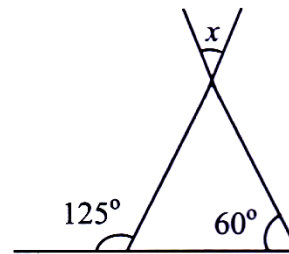

37. *a%* of *b* can be written as

   A. $\frac{ab}{100}$

   B. $\frac{a}{b} \times 100$

   C. $\frac{b}{a} \times 100$

   D. $\frac{a}{a+b} \times 100$

38. How many seconds are there from 4 p.m. to 2 a.m.?

    A.   3600

    B.   5040

    C.   36000

    D.   50400

39. In the given diagram the value of x is equal to

    A.   35°

    B.   45°

    C.   65°

    D.   75°

40. If the ratio between the length of sides of two cubes is 3 : 5, then the ration between their volumes will be

    A.   9: 25

    B.   18: 50

    C.   27: 75

    D.   27: 125

41. Imtiaz supermarket offers a discount of 40% followed by 30% on an item. Which of the following values will be equal to the total discount offered?

    A.   30%

    B.   42%

    C.   58%

    D.   70%

42. Cottage *A* and Cottage *B* are 8 km apart. Cottage *B* and Cottage *C* are 3 km apart. What could be the possible distance/s between cottage *A* and Cottage *C?*

   I.   12km
  II.   11km
III.   8km

A. I only

B. II only

C. I and II only

D. II and III only

43. A teacher gives cubes each of volume 8 cubic centimetres to his students. He then asks his students to divide each side of the cube into half.

The new volume of the cube in cubic centimetres.

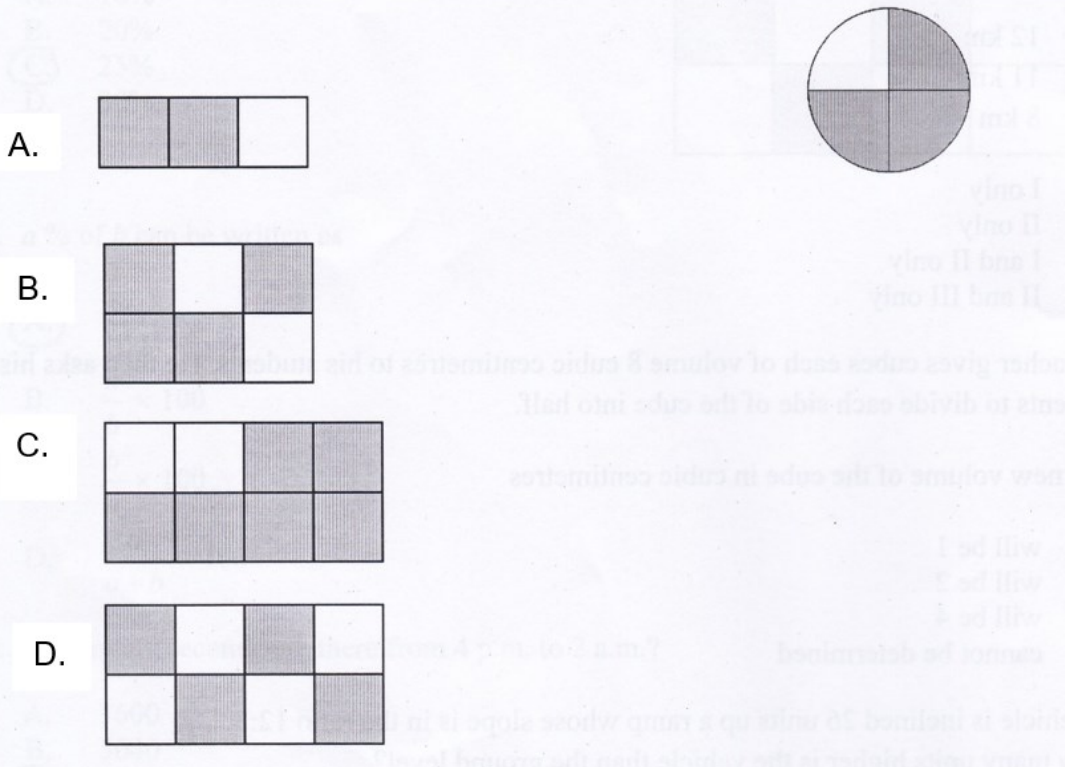A. Will be 1

B. Will be 2

C. Will be 4

D. Cannot be determined

44. A vehicle is inclined 26 units up a ramp whose slope is in the ratio 12:5. How many units higher is the vehicle than the ground level?

A. 10

B. 13

C. 24

D. 26

45. Which of the following quantities is the largest?

A. 45%

B. 0.5

C. $\dfrac{3}{4}$

D. 0.666

46. Which of the following figures has the same shaded area as that of the given circle?

47. Mr. Aslam sold 35% of his magazines. He is now left with 520 magazines. How many magazines did he have at the beginning?

A. 280

B. 338

C. 585

D. 800

48. If 4/5 of the teachers in the meeting occupied 5/6 of the seats in the hall, then the least number of teachers in a meeting could be

A. 5

B. 6

C. 24

D. 25

49. The ascending order of 0.3, $\frac{1}{5}$ and 15% is

    A. 0.3, $\frac{1}{5}$ and 15%

    A. $\frac{1}{5}$, 0.3 and 15%

    B. 0.3, 15% and $\frac{1}{5}$

    C. 15%, $\frac{1}{5}$ and 0.3

50. **What will be the 10th term in the given sequence?**

    3, 7, 11, 15, 19, 23

    A. 27
    B. 35
    C. 39
    D. 43