**QUANTITATIVE ABILITY WORKSHOP HANDOUT**

(Geometry and Mensuration, Data Interpretation)

**Ref: QWHO2502504**

***Directions for questions 1 to 30:*** Select the correct alternative from the given choices.

**1.** In triangle XYZ, T is a point on the side YZ such that XT YZ, then which of the following options is true?

(1) + = +

(2) + = +

(3) + = +

(4) + = +

**2.** In PQS and UTR, QPS = 75°, QS = TR, PQS   
= UTR = 80°, and PQ = UT. Find the ratio of   
QPS :

(1) 7 : 3 (2) 3 : 7 (3) 5 : 1 (4) 3 : 1

**3.** The points K and N are on the same side of the line segment LM, such that = 90°, = 90° and KL = NM. Select the correct statement:

(1)

(2)

(3)

(4)

**4.** If such that = 60°, = 45°, = 75°, = (7a – 10)°, DE = 25 cm,   
AB = (3a + b) cm, then find the value of (2a + b).

(1) 10 (2) 15 (3) 25 (4) 30

**5.** Line L cuts two concentric circles. The length of chords formed by this line on the circles is 8 cm and 20 cm. Find the difference in the squares of the radii of two circles.

(1) 84 cm (2) 78 cm (3) 72 cm (4) 64 cm

**6.** A pair of straight lines from an external point P intersects a circle at X and Y (PX < PY) and touches the circle at S. O is the centre of the circle. Given that XPS = 60° and XSP = 40°, find XOY.

(1) 40° (2) 80° (3) 120° (4) 160°

**7.** Let S be a circle with centre O and X be an external point to S. Let XY and XZ be two tangents to S with Y and Z being the points of tangency, respectively.   
If XY and XZ are inclined to each other at an angle of 50°, then find XOY.

(1) 40° (2) 75° (3) 65° (4) 25°

**8.** Two circles intersect each other, and the centres of the two circles are 23 cm apart. If the radii of these two circles are 10 cm and 15 cm, respectively, then what is the length of the common chord of the two circles?

(1) 8 cm (2) 6 cm (3) 12 cm (4) 16 cm

**9.** If the length of a common external tangent to two circles is 10 and that of a common internal tangent is 6, then the product of the radii of the two circles is:

(1) 14 (2) 16 (3) 18 (4) 20

**10.** X and Y are the centres of two circles whose radii are 6 cm and 4 cm, respectively. If the direct common tangent to the circles meets XY extended at A, then A divides XY –––––.

(1) externally in the ratio 3 : 2

(2) internally in the ratio 3 : 2

(3) externally in the ratio 2 : 3

(4) internally in the ratio 2 : 3

**11.** A circular arc whose radius is 9 cm makes an angle of 60° at the centre. Find the perimeter (in cm) of   
the sector formed. (Use = 3.14)

(1) 33.83 (2) 31.82 (3) 29.46 (4) 27.42

**12.** A two-eleventh of a circular pizza of radius 14 cm was removed from the whole pizza. What is the perimeter (in cm) of the remaining pizza? (Use = )

(1) 532 (2) 100 (3) 275 (4) 428

**13.** In a circle of radius 24 cm, a chord of length 24 cm is drawn. What is the length of the smaller arc intercepted by the chord (in cm)?

(1) 8 (2) 16 (3) (4) 8

**14.** Two circles, with centres at M and N, intersect at points X and Y. A line KL is tangent to both circles at K and L. If = 56°, then = ––––.

(1) 132° (2) 124° (3) 112° (4) 102°

**15.** X and Y are centres of two circles with radii 4 cm and 6 cm respectively, where XY = 10 cm. Z is the centre of another circle of radius r cm, which touches each of the above two circles externally. If = 90°, then the value of r is:

(1) 2 cm (2) 3 cm (3) 4 cm (4) 5 cm

**16.** A chord of the larger among two concentric circles is of length 30 cm and it is tangent to the smaller circle. What is the area (in cm2) of the annular portion between the two circles?

(1) 144 (2) 169 (3) 196 (4) 225

**17.** From a circle with a radius of 12.25 cm, a sector with an arc length of 16 cm is cut off. Find the area   
(in sq. cm) of this sector.

(1) 98 (2) 86 (3) 78 (4) 70

**18.** The length, breadth and height of a room are 12 m,  
8 m, and 6 m respectively. From each can of paint,   
a 48 sq. m area is painted. How many cans of paint will be needed to paint only the walls of the room?

(1) 5 (2) 10 (3) 15 (4) 20

**19.** If three cubes of volume 729 cm3 each are joined end to end, find the surface area of the resulting cuboid.

(1) 1134 cm2 (2) 1314 cm2

(3) 1413 cm2 (4) 1431 cm2

**20.** A cuboid of dimensions 48 cm, 72 cm, and 96 cm can be divided into how many identical largest cubes?

(1) 12 (2) 15 (3) 24 (4) 30

**21.** A cylindrical tank of radius 2 m is full of water, if   
1540 litres of water is drawn out from the tank, then the water level in the tank is dropped by \_\_\_\_\_\_ cm. (Take = )

(1) 5 cm (2) 10 cm

(3) 15 cm (4) 12.25 cm

**22.** A right-angled triangle with sides 5 cm, 12 cm and   
13 cm is rotated about the side of 5 cm to form a cone. What is the volume of the cone?

(1) 280 3

(2) 240 3

(3) 200 3

(4) 100 3

**23.** Study the table below carefully to answer the question that follows. The table shows the percentage of the population

above the poverty line in four towns, along with the ratio of males and females.

|  |  |  |  |
| --- | --- | --- | --- |
| **Town** | **Percentage of the population above the poverty line** | **Ratio of males to females** | |
| **Below poverty line** | **Above poverty line** |
| **M : F** | **M : F** |
| **A** | 14% | 2 : 3 | 2 : 5 |
| **B** | 20% | 4 : 7 | 5 : 7 |
| **C** | 12% | 4 : 5 | 3 : 10 |
| **D** | 16% | 2 : 7 | 8 : 5 |

If the population of states A and C is 18,200 each, what is the total number of females above the poverty line in these states?

(1) 2,000 (2) 2,500 (3) 3,000 (4) 3,500

**24.** Study the table below carefully to answer the question that follows. The table shows the expenditure (in ₹ crores) and the profit percentage of three companies in different years.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Company–X** | | **Company–Y** | | **Company–Z** | |
| **Expenditure** | **Profit** | **Expenditure** | **Profit** | **Expenditure** | **Profit** |
| **2021** | 16 | 20% | 18 | 25% | 40 | 12% |
| **2022** | 24 | 40% | 26 | 45% | 28 | 50% |
| **2023** | 30 | 55% | 32 | 60% | 34 | 65% |
| **2024** | 36 | 70% | 38 | 75% | 40 | 80% |

**Note:** Income = Expenditure (

What is the ratio of income of company Y (in ₹ crores) in the year 2023 and that of company Z in 2021?

(1) 6 : 7 (2) 5 : 6 (3) 4 : 5 (4) 8 : 7

**25.** Study the pie chart and the table given below carefully to answer the question that follows. The pie chart shows the percentage-wise distribution of a total of 15000 students studying six different UG courses in a university. The table shows the ratio of male to female students in each of the UG courses.

|  |  |
| --- | --- |
| **COURSE** | **Males: Females** |
| **BBA** | 7 : 8 |
| **BCom** | 5 : 4 |
| **BA** | 7 : 3 |
| **BSc** | 7 : 6 |
| **Others** | 3 : 5 |

What is the percentage of the number of students in BSc out of the total number of male students in all given UG courses taken together in the university?

(1) 45%

(2) 56%

(3) 51%

(4) 64%

**26.** Study the bar graph below carefully to answer the question that follows. The bar graph shows the profit of Company ABC in the four quarters for each of the years from 2020 to 2023.

What was the percentage increase in the annual profit of Company ABC from 2021 to 2023?

(1) 50% (2) 25% (3) 100% (4) 125%

**27.** Study the given pie charts carefully to answer the question that follows. The first pie chart shows the different sources of funds for an NGO and the second pie chart shows the utilization of the funds that it received.

If the utilities must be paid out of only donations, what is the percentage of donations used for this purpose?

(1) 25% (2) 30% (3) 8% (4) 15 %

**28.** Study the table below carefully to answer the question that follows. The table shows the percentage of the number of managers among the total number of employees in four companies, along with the ratio of males and females among managers and non-managers.

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Percentage of managers** | **The ratio of males to females** | |
| **Managers** | **Non-Managers** |
| **M : F** | **M : F** |
| **P** | 25% | 3 : 2 | 4 : 1 |
| **Q** | 20% | 3 : 7 | 5 : 3 |
| **R** | 32% | 9 : 7 | 7 : 10 |
| **S** | 24% | 5 : 7 | 10 : 9 |

If the total number of employees in Q is 8,000 and that in S is 10,000, what is the difference between the number of females who are managers in Q and the number of males who are non-managers in S?

(1) 2,400 (2) 2,880 (3) 2,640 (4) 3,200

**29.** Study the table below carefully to answer the question that follows. The table shows the total amount spent by   
a company on advertising across various newspapers and the total number of advertisements given by the company from 2020 to 2024.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Total money spent on advertising (in** ₹) | | | **Total number of advertisements** | | |
| **Local** | **Regional** | **National** | **Local** | **Regional** | **National** |
| **2020** | 4,95,000 | 3,40,000 | 6,50,000 | 15 | 17 | 20 |
| **2021** | 7,60,000 | 1,26,000 | 4,40,000 | 19 | 21 | 22 |
| **2022** | 8,40,000 | 1,25,000 | 8,20,000 | 20 | 25 | 41 |
| **2023** | 15,40,000 | 11,50,000 | 10,40,000 | 22 | 23 | 26 |
| **2024** | 17,20,000 | 17,25,000 | 17,50,000 | 43 | 23 | 35 |

What is the ratio of the total amount spent per advertisement in local, regional and national newspapers in 2023 to the corresponding amount in 2021?

(1) 7 : 6 (2) 7 : 5 (3) 15 : 13 (4) 4 : 3

**30.** Study the following table given below carefully to answer the question that follows. The table shows the classification of 500 students based on the marks obtained by them in Section A and Section B in a competitive examination.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Marks out of 200** | | | | | |
| **Section** | **160 and above** | **120 and above** | **80 and above** | **40 and above** | **0 and above** |
| **Section A** | 75 | 180 | 420 | 485 | 500 |
| **Section B** | 40 | 155 | 350 | 430 | 500 |
| **Aggregate** | 60 | 170 | 390 | 460 | 500 |

If at least 60% marks in aggregate in the examination are required to clear the cut-off marks, how many students clear the cut of marks?

(1) 335 (2) 170 (3) 180 (4) 230