CLASS 10 MATH TEST PAPER 24

Class 10 - Mathematics

Time Allowed: 1 hour **Maximum Marks: 30**

Section A

1. The volume of a cylinder of radius r is 1/4 of the volume of a rectangular box with a square base of side length x. If the cylinder and the box have equal heights, what is r in terms of x? **[1]**

   a) $\frac{x}{2\sqrt{\pi}}$ b) $\frac{x^2}{2\pi}$

   c) $\frac{\pi}{2\sqrt{x}}$ d) $\frac{\sqrt{2x}}{\pi}$

2. A solid sphere is cut into two hemispheres. The ratio of the surface areas of sphere to that of two hemispheres taken together, is: **[1]**

   a) 3 : 2 b) 1 : 1

   c) 2 : 3 d) 1 : 4

3. If the mean of the following distribution is 2.6, then the value of y is **[1]**

Variable (x)	1	2	3	4	5
Frequency	4	5	y	1	2

   a) 24 b) 8

   c) 3 d) 13

4. The mode of 4, 5, 6, 8, 5, 4, 8, 5, 6, x, 8 is 8. The value of x is **[1]**

   a) 5 b) 6

   c) 8 d) 4

5. Cards bearing numbers 3 to 20 are placed in a bag and mixed thoroughly. A card is taken out of the bag at random. What is the probability that the number on the card taken out is an even number? **[1]**

   a) $\frac{1}{2}$ b) $\frac{9}{17}$

   c) $\frac{5}{9}$ d) $\frac{7}{18}$

6. A card is drawn at random from a pack of 52 cards. The probability that the drawn card is not a king is **[1]**

   a) $\frac{9}{13}$ b) $\frac{12}{13}$

   c) $\frac{1}{13}$ d) $\frac{4}{13}$

7. From an external point Q, the length of the tangent to a circle is 5 cm and the distance of Q from the centre is 8 cm. The radius of the circle is: **[1]**

   a) 3 cm b) 7 cm

   c) 39 cm d) $\sqrt{39}$ cm

8. A circle is inscribed in a quadrilateral ABCD in which $\angle B = 90^o$, if AD = 23 cm, AB = 29 cm and DS = 5 cm, then radius of circle is : **[1]**

a) 12 cm

b) 13 cm

c) 14 cm

d) 11 cm

9. **Assertion (A):** Two identical solid cubes of side 5 cm are joined end to end. The total surface area of the resulting cuboid is 350 cm^2. **[1]**

Reason (R): Total surface area of a cuboid is 2(lb + bh + hl)

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section B

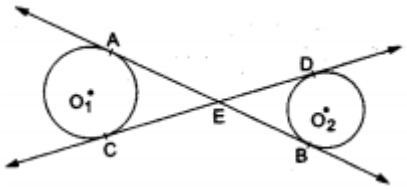
10. From a well-shuffled deck of 52 playing cards, all black queens and red kings are removed. One card is selected at random from the remaining cards. Find the probability that the selected card is: **[2]**

i. an ace.

ii. a jack of red colour.

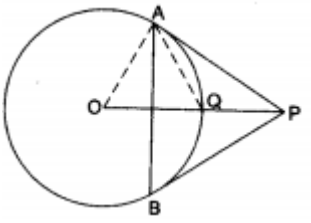
iii. a king of spade.

11. In the given figure, common tangents AB and CD to the two circles with centres O_1 and O_2 intersect at E. Prove that AB = CD. **[2]**



Section C

12. From a point P, two tangents PA and PB are drawn to a circle C(O r). If OP = 2r, show that $\triangle APB$ is equilateral. **[3]**



Section D

13. **Read the following text carefully and answer the questions that follow:** **[4]**

Computer-based learning (CBL) refers to any teaching methodology that makes use of computers for information transmission. At an elementary school level, computer applications can be used to display multimedia lesson plans. A survey was done on 1000 elementary and secondary schools of Assam and they were classified by the number of computers they had.

Number of Computers	1 - 10	11 - 20	21 - 50	51 - 100	101 and more

Number of Schools	250	200	290	180	80

One school is chosen at random. Then:

i. Find the probability that the school chosen at random has more than 100 computers. (1)

ii. Find the probability that the school chosen at random has 50 or fewer computers. (1)

iii. Find the probability that the school chosen at random has no more than 20 computers. (2)

OR

Find the probability that the school chosen at random has 10 or less than 10 computers. (2)

Section E

14. A student was asked to make a model shaped like a cylinder with two cones attached to its ends by using a thin aluminium sheet. The diameter of the model is 3 cm and its total length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model. **[5]**

15. An incomplete distribution is given as follows: **[5]**

Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	10	20	?	40	?	25	15

You are given that the median value is 35 and the sum of all the frequencies is 170. Using the median formula, fill up the missing frequencies.