**MATHS-X (SA-II)**

**[Time Allowed: 2.30 Hours] [Maximum Marks: 90]**

**General Instructions:**

**(i) All questions are compulsory.**

**(ii) The question paper consists of 31 questions divided into four sections A,B,C and D .Section A**

**comprises of 4 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each,**

**section C comprises of 10 questions of 3 marks each and Section D comprises of 11 questions of**

**4 marks each.**

**(iii) There is no overall choice.**

**(iv) Use of calculators is not permitted.**

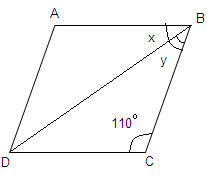
**(v) An additional 15 minutes time has been allotted to read this question paper only.**

**Section -‘A’**

1.The radill of two cylinders are in the ratio 2:3 and their heights in the ratio of 5: 3.Find the ratio of

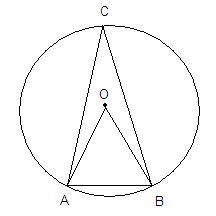
their volumes.

2. In figure, ABCD is a rhombus in which .Find the value of (x + y).



3. In figure, O is the centre of the circle and 4.If the volume of a sphere is

numerically equal to its surface area ,then find the radius of the sphere.



**Section-‘B’**

5. A cube of 6 cm edge is immersed completely in a rectangular vessel containing water .If the

dimensions of the base are 12 cm and 9 cm, find the rise in water level in the vessel.

6. Find the length of a chord which is at a distance of 5 cm from the centre of a circle of radius 13 cm.

7. Express x in terms of y, given that 3x + 4y = 6.Check whether the point (3, 2) is on the given line

8. D and E are points on sides AB and AC respectively of ∆ABC such that ar (DBC) = ar(EBC).Prove that



9. Find the mode of the following data:

5,7,6,5,9,8,6,7,11,10,5,7,6,8,6,9,10

10.On a page of a telephone directory ,there are 200 telephone numbers. The frequency distribution of the digits at their unit’s place is given below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Unit digit | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Frequency | 22 | 26 | 22 | 22 | 20 | 10 | 14 | 28 | 16 | 20 |

Without looking at the page, a number is chosen at random from the page .What is the probability that the digit at the unit’s place of the number chosen is greater than 6?

**Section’C’**

11. Give the geometric representation of equation 5x + 15 = 0

(i)in one variable (ii)in two variables.

12. Draw the graph of y = x and y = -x .What is the point of intersection of two lines representing the

above equations?

13. If O is the circumcentre of a 

14. In figure, E and F are points on the sides DC and BC respectively of a parallelogram ABCD .Prove that

ar (∆AEB)=ar

15. In figure, ABCD is a parallelogram and E is the mid-point of AD. meets AB produced at

F.Prove that B is the mid-point of AF and EB =LF.

16. Three solid spheres of RDX whose diameters are 2 cm, 12 cm and 16 cm are fused to form a bigger

sphere of RDX.This solid sphere slipped into a cylindrical container of radius 9 cm and height 18 cm

full of concentrated nitric acid, by the terrorists handling this project .Show that the acid spilled out of

the cylinder is twice the acid left inside.

After a few seconds, an explosion took place. All the persons nearly were injured .What steps should

be taken to check terrorism?

17. Prove that the diagonals of a square are equal and perpendicular to each other.

18.A village having a population of 1500 needs 120 litres of water per head per day .It has a tank measuring 20m X 15m X 16m full of fresh water .Due to some fault ,the tank is not getting water .For how many days will the water of this tank last?

If fault is not removed and there is water in the tank even after 5 days, will you recommend villagers to drink this stagnant and stale water? Explain.

19. Find the mean of the following data by short-cut method:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 20 | 20 | 25 | 30 | 35 | 39 | 45 | 50 | Total |
| Frequency | 4 | 6 | 8 | 10 | 8 | 7 | 5 | 2 | 50 |

20.An organization selected 3000 families at random and surveyed tem to determine a relationship between income level and number of vehicles in family .The information is listed below:

Vehicles per family

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Monthly Income (in Rs) |  |  |  |  |
|  | 0 | 1 | 2 | Above 2 |
| Less than 8000  8000-12000  12000-15000  15000-20000  20000 or more | 20  0  2  3  1 | 250  405  635  568  679 | 45  37  48  89  82 | 0  2  1  25  88 |

If a family is chosen ,find the probability that the family is:

(i) earning Rs 12000-15000 per month and owning exactly 2 vehicles.

(ii) earning Rs 20000 or more per month and owning more than 2 vehicles.

(iii) earning less than Rs8000 per month and owning at least 1 vehicle.

**Section’D’**

21. Draw the graph of two lines whose equations are 3x -2y + 6 = 0 and x + 2y – 6 = 0 on the same graph

paper. Also, find the co-ordinates of the point where the two lines intersect each other.

22.Prove that the quadrilateral formed by the angle-bisectors of a cyclic quadrilateral is also cyclic .

23. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any

point on the remaining part of the circle. Using the above result:

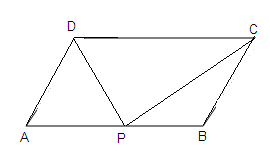
In figure, where P, Q and R points on a circle with centre O.Find 

24.A and B are friends. A is elder to B by 5 years .B’s sister C is half the age of B while A’ s father D is 8

years older than twice the age of B.If the present age of D is 48 years ,find the present ages of ,AB

and C.

25. In figure, ABCD is a parallelogram .If AB =2AD and P is the mid-point of AB, then find 



26. In figure, ABCD is a trapezium in which and AD = BC .Show that

(i)  (ii) 

27. Construct a triangle with base of length 5 cm.The sum of the other two sides is 7 cm ,and one base

angle is of 600.

28. The volume of the space inside a right circular conical tent is and its vertical height is 4

m.Find the canvas required to make the tent and also find the cost of the canvas at the rate of Rs

120 per m2.

29.A storage tank is in the form of a cube .When it is full water ,the volume of the water is 15.625 m3 .If

the present depth of the water is 1.3 m ,find the volume of water already used from the tank.

30.Draw a histogram for the following data:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 10-15 | 15-20 | 20-25 | 25-30 | 30-40 | 40-60 | 60-80 |
| Number of candidates | 7 | 9 | 8 | 5 | 12 | 12 | 8 |

31. The number of hours spent by a school boy on various on a working day are given below:

|  |  |
| --- | --- |
| Activity | No. of Hours |
| Sleep  School  Homework  Play  Others | 7  8  4  3  2 |

Present the above information by a pie-chart.

1.Whcih mathematical concepts have been covered in this?

2.How will you rate his activities hours on a working day?

In your opinion, which activity has been given(i)more than it deserve and (ii)less than it deserve.

3.Which values are depicted in his activity?