

**SUMMATIVE ASSESSMENT –II (2014-2015)**

**Subject: Mathematics**

**Class: IX**

**Time: 3 Hrs. M.M. 90**

**General Instructions:**

- (i) All questions are compulsory.
- (ii) The question paper consists of **31** questions divided into five sections **A, B, C, D and E**.  
**Section – A** comprises of 4 questions of 1 marks each, **Section – B** comprises of 6 questions of 2 marks each, **Section – C** comprises of 8 questions of 3 marks each and **Section – D** comprises of 10 questions of 4 marks each. **Section E** comprises of two questions of 3 marks each and 1 question of 4 marks from Open Text Theme.
- (iii) There is no overall choice.
- (iv) Use of calculator is not permitted.

**SECTION – A**

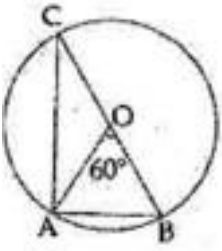
**Question numbers 1 to 4 carry one mark each.**

- 1. If  $2x + ky = 10k$ , intersects x-axis at (2,0), find k.
- 2. Express  $x + 2 = 0$  in the form of  $ax + by + c = 0$ .
- 3. A triangle and a parallelogram are on the same base and between the same parallels. If altitude of triangle is 4 cm and its area is  $8\text{cm}^2$ , find the length of base of parallelogram.
- 4. Find the total surface area of a solid hemisphere with radius 7 cm.

**SECTION – B**

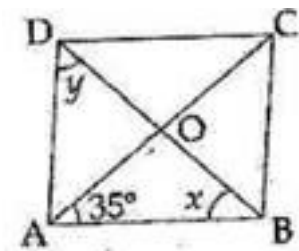
**Question numbers 5 to 10 carry two marks each.**

- 5. In the given figure, O is the centre of the circle. If  $\angle AOB = 60^\circ$ . Find the measures of  $\angle AOC$  and  $\angle ABC$ .



6. Using protractor, draw  $\angle DEF = 60^\circ$ . Construct another angle equal to  $\angle DEF$  using compass.

7. In the figure, ABCD is a rhombus whose diagonals meet at O. Find the values of x and y.



8. A solid right circular cylinder has radius 14 cm and height 8 cm. Find its curved surface area and total surface area.

9. In a class probability that students are in uniform is  $\frac{23}{30}$ . Find the probability that students are not in uniform.

10. A coin is tossed 150 times and the outcomes are recorded as follows:

Outcomes	H	T
Frequency	85	65

Compute the probability of

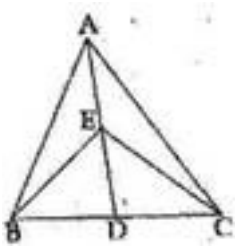
(a) One head

(b) One tail

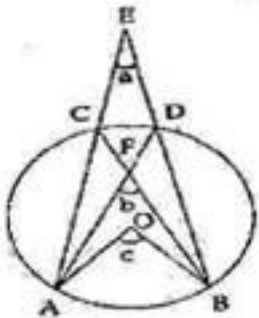
## SECTION –C

Question numbers 11 to 18 carry three marks each.

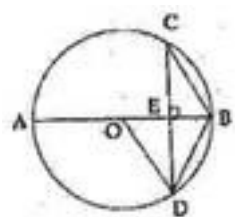
11. Write the equation of a line which is parallel to x-axis and is at a distance of 2 units below x-axis. Represent this graphically also.
12. The auto fare in a city are as follow: for the first kilometer it is Rs. 10 and for subsequent distance it is Rs. 8 per km. taking the distance as y km. and total fare as Rs. x, write a linear equation for this draw and the draw the graph. Also, find the fare of 15 km.
13.  $\triangle PQR$  is right angled at Q. A and B are the mid-points of sides PQ and PR respectively. If PQ=10 cm and PR=26 cm, then find the length of AB.
14. Construct  $\triangle KLM$  in which  $KL + LM + MK = 15$  cm,  $\angle L = 90^\circ$  and  $\angle M = 30^\circ$ .
15. In a triangle ABC, E is mid-point of median AD. Prove that  $ar(\triangle BED) = ar(\triangle AEC)$



16. In the given figure, O is the centre of the circle. Prove that  $\angle a + \angle b = \angle c$ .



17. In the given figure, if O is the centre of the circle,  $BD=OD$  and  $CD \perp AB$ , find  $\angle CAB$  and  $\angle BCD$



18. There is a solid cube which has been cut into two cuboids of equal volumes. Find the

ration of the total surface area of one of the cuboids to that of the given cube.

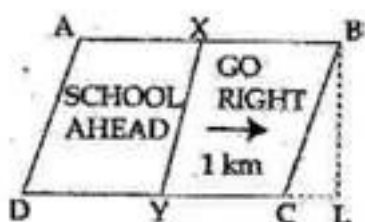
## SECTION – D

**Question numbers 19 to 28 carry four marks each.**

**19.** Draw the graphs of the following equations on the same sheet:  $x = 0, y = 0, x + y = 4$  also, find the area enclosed between these lines.

**20.** Angles of a triangle are  $x, 2x$  and  $y$ . write a linear equation which satisfies this data. Draw the graph for the same.

**21.** In order to guide and help people in reaching school without any problem of finding the way to school, students of the school decided to put up a sign board on main road. The sign board ABCD in the shape of a parallelogram as shown in figure.



**(a)** If  $x$  and  $y$  are the mid-point of sides  $AB$  and  $CD$  respectively, show that

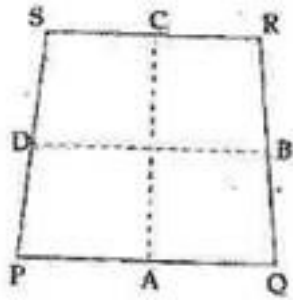
$$ar(AXYD) = ar(BXYC).$$

**(b)** What can you say about this gesture of the students?

**22.** Draw a line segment  $AB = 12.4$  cm. Find  $\frac{1}{4}AB$  using ruler and compass. Write steps of construction.

**23.** Prove that a quadrilateral formed by bisectors of interior angles of a quadrilateral is a cyclic quadrilateral.

**24.** In the figure, PQRS is a quadrilateral in which A, B, C and D are mid – points of the sides PQ, QR, RS and PS respectively. Show that AC and BD bisect each other.



25. The frame of a lampshade is cylindrical in shape. It has base diameter 28 cm and height 17 cm. it is to be covered with a decorative clothe. A margin of 2 cm is to be given for folding it over top and bottom of the frame. If  $\frac{1}{12}$  of cloth is wasted in cutting and pasting, find how much cloth is required to be purchased for covering the frame.

26. A fruit tin has a square base with side 14 cm and height 18.5 cm. another cylindrical tin has a diameter of the base 14 cm and height 17.5 cm. Which tin has more capacity and by how much?

27. The volume of a right circular cone is  $100\pi\text{cm}^3$  and its height is 12 cm. Find its slant height and hence its curved surface area.

28. A coin is tossed for a certain number of times. If the probability of getting a head is 0.4 and the head appeared up for 24 times, find the number – of times the coin was tossed. Hence, find the probability of getting a tail and verify that  $P(H) + P(T) = 1$ .

## SECTION E

### OPEN TEXT BASED ASSESSMENT (OTBA)

(\*Please ensure that open text of the given theme is supplied with this question paper.)

Theme: Empower to learn

29. (a) For the site 'superb' prepare a bar chart showing percentage of campaigns conducted in different subjects (refer figure 3)

(b) In which subjects, students are benefitted least and most?

30. (a) Name the site which has registered more than 80,00,000 students in two years.

**(b)** For this site prepare a frequency distribution table and frequency polygon.

**31. (a)** From which site students can directly ask questions from the academic experts?

**(b)** If number of questions asked during different hours of the day are 150, 175, 400, 220, 150, 300, 160, 500, then find mean, mode and median.

## **OPEN TEXT MATERIAL**

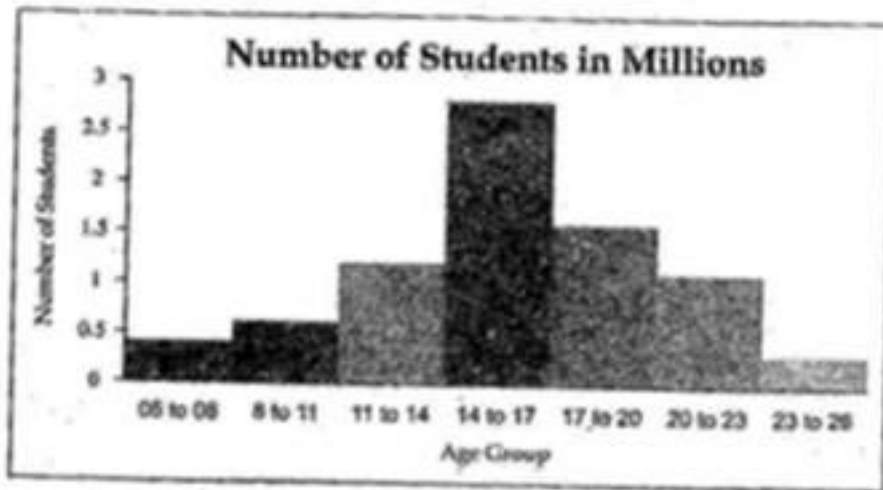
### **1. Theme: Empower to Learn**

#### **Abstract:**

Harshit heard of the social networking sites and started exploring them on the internet. To his surprise he came across various educational as well as social networking sites that give innovative and improved ways of learning. He gradually got prone to the facilities these platforms offer which broadened his perspectives. He realized that this advancement in social networking platform is providing him with much better options to engage with his contemporaries, enhance his skills and access a wide variety of academic tools and resources which most definitely add up to his convenience.

Harshit learn about LEARNOUT, a free social learning network of university and school students. It offers a platform for its users where they can engage in activities like sharing study related materials, counseling or simply connecting through a vast network of existing users from around the world. Within a small time span of two years, more than 80,00,000 students registered for the website and they use the website on daily basis. The distribution of the students in different age groups was graphically presented and he got inspired as he thought himself that maximum number of children of his age is gaining from this site.

Figure 1: Histogram showing the number of students using learn-out in different age groups



The website offers user generated contents in 7 different languages including Italian, English, Spanish, Polish, Russian, Serbian and Portuguese. The website is directly operated from its respective regional head offices thereby providing a direct approach to the users. Learn-out also has its free application available for all android devices. The website also has a dedicated 24/7 support team to assist the students in their matters. He surveyed a number of people and recorded his finding on the percentage of users using this site in different languages:

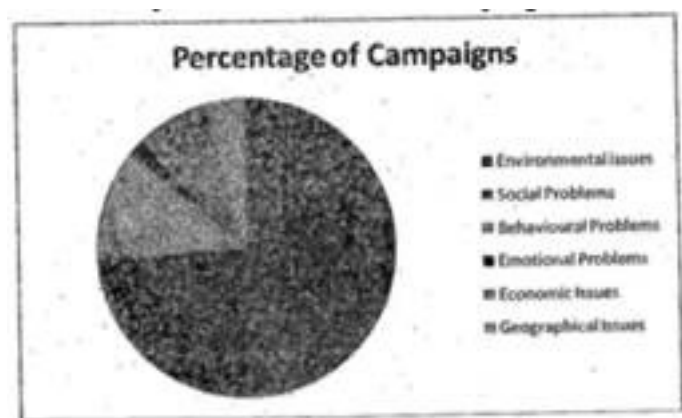
**Table 1:** The percentage of users in different languages of LEAROUT is given in the table below:

Language	Italian	English	Spanish	Polish	Russian	Serbian	Portuguese
Percentage of users	11	57	6	4	10	9	3

He also discovered a site name TWOWAY which provides its students with a different approach towards studies. It offers an interactive way of studying where students get to create and animate flashcards. The website currently has about 1 million study content authored by the students. The website also conducts different quizzical campaigns for the students and tracks the progress of its users. The issues on which the campaigns were conducted are presented in the form of pie chart.

Harshit also got a platform to spread awareness of the issues which he has to record in his project work given by his teacher. He could collect the data globally and interpret it from different perspectives.

**Figure 2:** The pie chart shows the campaigns conducted on TWOWAY in different subjects.



Mathematics was troubling him and he needed a special assistance in various concepts. He received many resource materials to gain more knowledge and achieved higher level of learning. The site name TROUBLE BUBBLE was the answer to his queries. TROUBLE BUBBLE offers a very interactive way to the students looking for answers to the distressing questions. They can ask questions directly from academic experts through their vast network. The following data shows the number of question asked by students between 2:00 pm to 9:00 pm.

**Table 2:** The table below shows the average number of questions asked at different hours of the day on TROUBLE BUBBLE.

Time	2 to 3 pm	3 to 4 pm	4 to 5 pm	5 to 6 pm	6 to 7 pm	7 to 8 pm	8 to 9 pm
Number of questions	180	270	360	440	520	300	190

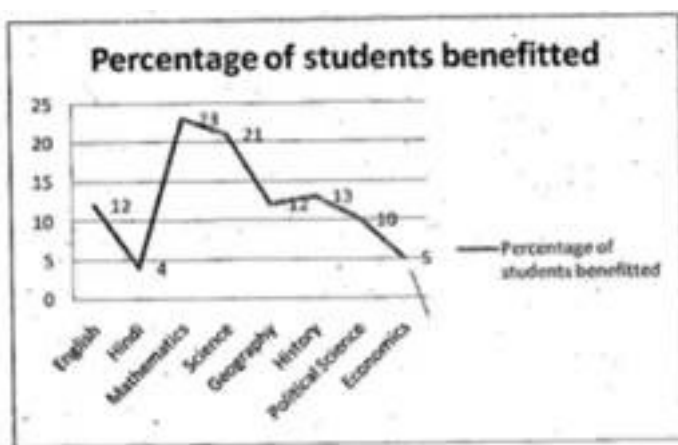
Harshit was pleased to know that he has the facility to get immediate answers to his queries though his site.

SUPERB, another educational networking site, offers its users with a unique way to have interaction. It builds a strong connection between students and renowned teacher from around the world. SUPERB offers a number of free tools and services to the teacher, which literally transforms the way of teaching and helps in the provision of superior quality of services to its users. The website is suitable for students of all ages, whether be a student of middle school or an undergraduate, SUPERB has stored a lot more for its users to achieve their educational goals.



The advancements in technology proved to be a beneficial for Harshit. With social networking platform advancing, they are playing their role to facilitate the students with their needs and benefit them to achieve their goals. The given frequency polygon displayed maximum benefit taken by the students from this site. It was an eye opener for Harshit as he wanted extended learning in all the subjects. Being a smart boy, he always used to check data before taking any decision.

**Figure 3:** Frequency Polygon showing the percentage of campaigns conducted in different subjects



Harshit was empowered by these educational networking sites as they transformed him into a global citizen. He received input from across the world from different teachers who had shared the best of the ways to share their learning through innovative ideas of constructing knowledge with the students accessing their sites. Thus, technology supported Harshit to make the best use of time and energy to equip him to learn at his own pace but with global input in his learning process.