MACRO VISION ACADEMY, BURHANPUR

Entrance Sample Paper (2019-20)
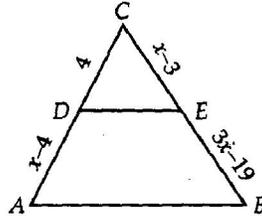
Class: XI Mathematics   **Time: 2:00 Hrs.**   **M.M.: 100**
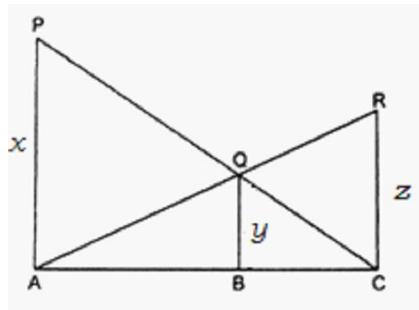

Mathematics (50)

1. Write the value of $\dfrac{5}{\cot^2\theta} - \dfrac{5}{\cos^2\theta}$.   1

2. The point of intersection of the ogives (more than and less than type) is given by (20.5, 30.4). What is the median?   1

3. In Fig. find the values of x if DE||AB.   1

4. If $\dfrac{4}{5}, a, 2$ are three consecutive terms of an A.P., then find the value of a.   1

5. What is the angle of elevation of the Sun when the length of the shadow of a vertical pole is equal to its height?   1

6. If the HCF of 408 and 1032 is expressible in the form $1032m - 408 \times 15$, find m.   2

7. Two different dice are tossed together. Find the probability   2
   i) that the number on each die is even.
   ii) that the sum of numbers appearing on the dice is 5.

8. If A, B, C are interior angles of $\triangle ABC$, show that: 2
$$\cos^2\frac{A}{2} + \cos^2\left(\frac{B+C}{2}\right) = 1.$$

9. The radii of two circles are 19 cm and 9 cm respectively. Find the radius and area of the circle which has its circumference equal to the sum of the circumferences of the two circles.   2

10. Solve: $2^{2x+3} - 65\left(2^x - 1\right) = 57$ 2

11. If the zeros of the polynomial $f(x) = ax^3 + 3bx^2 + 3cx + d$ are in A.P., prove that $2b^3 - 3abc + a^2d = 0$.   3

12. A point O in the interior of a rectangle ABCD is joined with each of the vertices A, B, C and D. Prove that $OB^2 + OD^2 = OC^2 + OA^2$.   3

13. In fig. PA, QB and RC are each perpendicular to AC. Prove that $\dfrac{1}{x} + \dfrac{1}{z} = \dfrac{1}{y}$.   3

14. Solve for $x: 4x^2 - 2\left(a^2 + b^2\right)x + a^2b^2 = 0$.   3

15. If a, b, c are the sides of a right triangle where c is the hypotenuse, prove that the radius of the   3

circle which touches the sides of the triangle is given by $r = \dfrac{a+b-c}{2}$.

16. A well with 10m inside diameter is dug 14 m deep. Earth taken out of it is spread all around to a width of 5 m to form an embankment. Find the height of embankment. 5

17. Points A and B are 70 km. apart on a highway. A car starts from A and another car starts from B simultaneously. If they travel in the same direction, they meet in 7 hours, but if they travel towards each other, they meet in one hour. Find the speed of the two cars. 5

18. The houses of a row are numbered consecutively from 1 to 49. Show that there is a value of x such that the sum of the numbers of the houses preceding the house numbered x equal to the sum of the numbers of the houses following it. Find the value of x. 5

19. Prove that: 5

$$\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$$

Physics (15)

20. An object is placed 50 cm from a lens that produces a virtual image at a distance of 10 cm in front of the lens. Calculate the focal length of the lens. 3

21. Why do we observe difference in colours of the sun during sunrise, sunset and noon? 3

22. The potential difference between the terminals of an electric heater is 30 volt when it draws current of 4 A from the source. What current will the heater draw if the potential difference is increased to 120 volt? 3

23. Explain (A.C. generator) with diagram, construction and working. 3

24. Explain conversion of solar energy in our daily life. Why transparent glass sheet is used as a lid over solar cooker? 3

Chemistry(15)

25. a) Define Combination reaction with example. 3
    b) Define oxidation and reduction.

26. a) Explain Electrolytic refining. 3
    b) Write one example each of acidic and basic salt.
    c) Why does dry HCl gas not change the colour of the dry litmus paper.

27. a) What is water of crystallsation? Give any 2 examples with it. 3
    b) Which gas releases when acid reacts with Sodium bicarbonate and how can you identify this?

28. a) Write two properties of carbon which makes it different from other element. 3
    b) Draw structure of following (any 2)
    $CH_4, C_2H_2, C_3H_8, C_2H_4$

29. 1) Give reasons:- 3
    a) Why Sodium is kept in kerosene
    b) Long term exposure of silver in atmosphere turns its colour black.
    2) How sodium is extracted from its ore

(English 20)

30. Read the following passage carefully and answer the questions that follow: 6

1. Ever since I can remember, I always felt I was stupid, really stupid. I lost my father when I was three. Since I was a sick child, a polio victim, I lived with my grandmother in Mumbai so I could avail of the metro's advanced medical facilities. I remember being on the streets all day, playing or lazing around.

2. When I turned ten, my mother and my sister came to live in Mumbai too. My sister was a bright student, always securing high grades. She and my mother encouraged me to study, but I just could not bring myself to concentrate on any subject. I would get bored and feel sleepy when forced to open my books. After innumerable lectures on the importance of studying had failed, mother tried threats as well, but nothing worked, I truly believed I was stupid; no matter how much I worked, it wouldn't help.

3. One afternoon, as always, I was sitting under a tree in the school premises eating potato wafers when I saw a former classmate approaching me. Aditi and I had been in the same class the year before. I had failed sixth grade and had to repeat the year; Aditi had topped the class and was the brightest student of the seventh grade too. I flinched a little Aditi as I saw her walk towards me. 'Hi,' she said. 'Hi,' I replied, but not with much enthusiasm; I wanted her to leave. I continued to eat my chips. Ignoring my coldness, she sat down next to me. For five minutes

neither of us spoke and then she asked, 'Is Devika your real sister?' 'Yes, she is, 'I answered.

4. 'So how come she doesn't teach you so that you too can do well? she asked. I peered at her, wondering if she was making fun of me, but all I could see on her face was earnestness. No, she is not trying to tease me, I decided. This time I answered a little more warmly, 'She tries to, but I don't like studying.' 'Why not? I'm sure you can get good grades too,' she said emphatically. 'No, I can't. I have no brains. God forgot to give me brains, health or beauty. He gave me nothing.'

5. "That's not true. And anyway, health and beauty can't be helped, but God has given brains to everyone, we only have to learn to use it.' I shook my head, 'No, I have difficulty in concentrating, and books bore me; there is no hope for me. Please leave me alone. I am stupid, and always will be.' With the gentlest tone that she could muster she said, 'I can prove it to you that you are not stupid. Give me one chance, I will teach you to study.'

6. Though I was softening from inside, I still held on to my low self-esteem. 'You'll be wasting your time.I cannot study, I am not as bright as you are nor lucky as my sister,' I said 'Let me try and help you, please. I will show you the right way to study. You just have to cooperate with me. Will you try?' Her belief in me proved more powerful than my doubts about myself. She won and I relented.

1. Give reasons for the following-
a)writer believed that she was stupid.
b) The writer flinched as she saw her friend walking towards her.
c) The writer lacked interest in her studies.
d) The writer was not a very confident or assertive girl.

2. Complete the following.
a) When she had to study she felt ——- and ———.
b) The writer said that God had forgotten to give her brains ——— and ——

31. Fill in the correct passive form of the verb in parentheses.   2
    a) A Picasso ____ from the Metropolitan Museum of Art.(steal)
    b) ____ this washing machine _____in Germany? (make)

32. Rearrange the following words and phrases to form meaningful sentences.   2
    Write each sentence in your answer sheet against the correct number.
    1. pets / much/ are / for people / do not / who / alone / and / for older people / good companions / live / who / go out /
    2. so / responsible / bad / pet / keep / clean and / owners / healthy / they / do not / smell / their pets

33. There is an error in each line. Marks the error and write the correct word.   4

	Incorrect	Correct
Countries near an equator	(a) ---------------	---------------
are much warmer then	(b) ---------------	---------------
countries further to the north and	(c) ---------------	---------------
south we all knows that Kerala	(d) ---------------	---------------
is more warmer than the Punjab	(e) ---------------	---------------
on winter. Why? For the same reason	(f) ---------------	---------------
Italy is cool than India, but	(g) ---------------	---------------
England is cooler than Italy.	(h) ---------------	---------------

34. Draft a poster on the topic 'Saving wild life'   3
35. Write a speech on the topic 'Internet is a boon if used judiciously.'   3