CBSE Mathematics Guess Paper- 2007
Class-X

- by A.R.REDDY.

Time: 3 hrs   Max. Marks-80

General Instructions:

1. There are 25 questions in this paper. No over all choices, but internal choices for two questions from each section.

2. Section A has 7 questions of 2 marks each; Section B has 12s question of 3 marks each and Section C has 6 questions of 5 marks each.

3. All questions are compulsory.

4. Write the serial number of the question before attempting it.

5. Use of calculator is not permitted.

Section A

01. Solve for x : $\dfrac{x+1}{x+4} = \dfrac{x-3}{x} + \dfrac{1}{8}$; ($x \neq -4, x \neq 0$).

02. Find the value of K if the following system of linear equations has unique solution.
$x + 2y - 3 = 0, \quad 3x + Ky = 2$

03. In fig, P is the centre of circle prove that $\angle XPZ = 2(\angle YXZ + \angle YZX)$
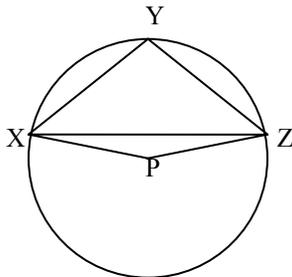
04. How many terms of the AP 17, 15, 13, 11… must be added to get the sum 72? Give reason for the double answer.

OR

Which term of the AP 24, 21, 18, 15… is the first negative term?

05. If (x-2)(x+3) is the HCF of (x^2-3x+2) (ax^2+7x+3) and $(3x^2+8x-3)$ (x^2+6x+b), Find the value of 'a' and 'b'.

06. A washing machine is available at Rs. 9,600 cash or for Rs. 2,100 cash down payment followed by three monthly instalments of Rs. 2,545 each. Find the rate of interest charged under the instalment plan.

07. A pair of dice is thrown once. Find the probability of getting a sum more than 10.

OR

A bag contains 3 red balls , 5 black balls and 4 white balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is :
   a) white   b) red   c) black

Section B

08. If a clock strikes one at 1 O'clock, two at 2 O'clock and so on, but does not strike at half hours, how many times will the bell be struck in the course of (i) 12 hours (ii) 24 hours.

OR

If m times the mth term of an A.P. is equal to n times its nth term, find the $(m+n)^{th}$ term.

09. 300 apples are distributed equally among a certain number of students, had there been 10 more students, each would have received one apple less. Find the number of students.

10. A Man borrowed a certain sum of money at 12% per annum compounded annually. He paid it back in two equal annual installments of Rs.3920 each. What sum did he borrow?

11. Use a single graph and draw the graph of the following equations.
$$2y - x - 8 = 0,$$
$$y - 2x - 1 = 0$$
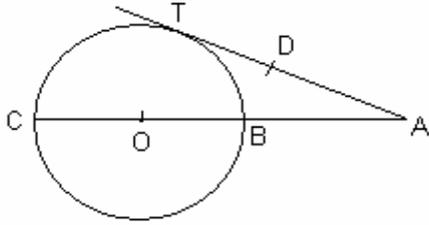Find the coordinates of the points where the lines intersect the 'y' axis.

12. Prove that: $\sqrt{\dfrac{1+\cos\theta}{1-\cos\theta}} + \sqrt{\dfrac{1-\cos\theta}{1+\cos\theta}} = 2\cos ec\theta$

OR

Evaluate:
$$\frac{\sin^2 10^o + \sin^2 80^o}{\cos^2 10^o + \cos^2 80^o} + \left[\frac{\sin(90-\theta)\sin\theta}{\tan\theta} + \frac{\cos(90-\theta)\cos\theta}{\cot\theta} \right]$$

13. In a circle C (o, r), AT is a tangent at T. AC is a line passing through centre. D is the point on AT such that AD = AB, if AT = 2r, show that $AD^2 = AT \times DT$.

14. Find the length of the median through A and the coordinates of the centroid of a triangle whose vertices are A(-1 , 3), B(1 , -1) and C (5 , 1) .

15. Find the ratio in which the line segment joining (2 , -3) and (5 , 6) is divided by the X-axis

16. A solid iron cylinder of radius 2.5 cm and height $3\frac{1}{3}$ cm is melted and recast into a sphere. Find the radius of the sphere.

17. Express the following as rational expression: $\left[\dfrac{2x^2+3}{x-1} + \dfrac{x+4}{x+1}\right] \div \dfrac{3x+2}{x^2-1}$

18. A survey conducted on the consumption of four foods A,B ,C and D , gave the following information

Food type	Consumption by the population
A	50%
B	30%
C	15%
D	5%

Represent the above data as a pie-chart. Hence find the total population if there are 650 people consumes type D food.

19. Construct a triangle ABC in which BC = 3.5 cm, angle B = 60° and AC =2.5 cm and draw its circumcircle.

Section C

20. An aircraft is flying along a horizontal course AB directly towards an observer on the ground at P, maintaining an altitude of 5000 m. when the aircraft is at A, the angle of depression is 30° and when at B, it is 60° respectively. Calculate the distance AB.

OR

The angle of elevation of the top of a tower from a point on the same level as the foot of the tower is α. On advancing p meters towards the foot of the tower, the angle of elevation become β. Show that the height of the tower is $h = \dfrac{p.\tan\alpha.\tan\beta}{\tan\beta - \tan\alpha}$. Also, determine the height of the tower if p = 150 meters, $\alpha = 30^o$ and $\beta = 60^o$.

21. A cylinder container is filled with ice cream, whose radius is 6 cm and height is 15 cm. The whole ice cream is distributed to 10 children in equal cones having hemispherical tops. If the height of the conical portion is four times the radius of its base, find the radius of the base of the ice-cream cone.

OR

Water in a canal, 30 dm wide and 12 dm deep is flowing with a velocity of 10 km/h. How much area will it irrigate in 30 minutes, if 4 cm of standing water is required for irrigation?

22. Prove that the angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

Using the above In Fig, Δ AOB is equilateral triangle and O is the centre of the circle., Find $\angle$ACB.
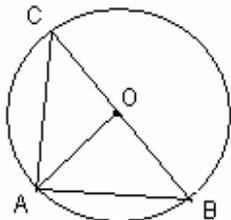
23. The monthly salary of Deepak is Rs 31,000 excluding HRA. He has donated Rs. 10,000 towards Tsunami Victims Relief Fund (100 % exemption) He contributes Rs 3500 per month to his GPF and pays Rs 4,500 as quarterly premium of Life Insurance Policy. How much should he invest in NSC so as to avail of maximum savings? Assuming his investment in NSC, Calculate his income tax liability in the last month of the year if his earlier deduction for 11 months towards income tax were at the rate of Rs 900 per month.

For the financial year 2005-06, the rates of Income tax for Male employees are as given below :

	SLAB	RATE OF TAX
1.	Taxable income upto Rs. 1,00,000	Nil
2.	Taxable income from Rs. 1,00,001 to Rs. 1,50,000/-	10% of the amount by which taxable income exceeds Rs. 100,000.
3.	Taxable income from Rs. 1,50,001 to Rs. 250,000	Rs. 5000 + 20% of the amount by which taxable income exceeds Rs. 150,000
4.	Taxable income above Rs. 250,000	Rs. 25000 + 30% of the amount by which taxable income exceeds Rs. 250,000
5.	Surcharge	10% of the amount of tax payable if the taxable income exceeds Rs. 10,00,000.
6.	Education cess	2% of the amount of tax payable.

Rebate for Savings

Notified savings (P.F, LIC, PPF, Mutual fund etc.) upto a maximum of Rs. 100,000 are exempted from payment of income tax, in case of every individual.

Rebate under section 80 G for donations

Donations to some special funds are exempted from payment of income tax.

a) 100% deduction is allowed for donation to Prime Minister's National relief fund, the national defence fund, the Chief Minister/ Lt. Governor's Relief fund etc.

b) 50% deduction is allowed for donation to Jawaharlal Nehru Memorial fund, National Children fund or some charitable institutions etc.

24. Find, the mean for the above data

Classes	0-9	10-19	20-29	30-39	40-49	50-59	60-69
Frequency	323	135	217	156	534	400	234

25. Prove that in a triangle, the line drawn parallel to one side to intersect the other two sides in distinct points, divides the two sides in the same ratio.

Use this result, solve the following: In figure, ST $\parallel$ QR, PS: SQ = 3: 5 and PR = 28 cm. Find PT.