

This question paper is divided into two Sections Section A and Section B.

Attempt **ALL** questions from **Section 'A'** and any **FOUR** questions from **Section 'B'**.

The intended marks for the questions or parts of the questions are given in brackets [].

All workings, including rough works, must be clearly shown and should be done on the same sheet as the rest of the answer. Omission of essential working will result in loss of marks.

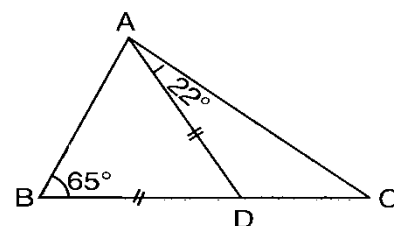
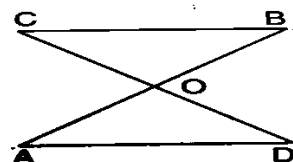
Section – A (40 marks)

(Answer ALL questions)

Question -1

[15 X 1]

- (i) The difference between the compound interest and simple interest on a certain sum deposited for 2 years at 5 % per annum is ₹12. The sum is
 (a) ₹ 4,800 (b) ₹ 1,200 (c) ₹ 360 (d) ₹ 3600
- (ii) If $a + b = \sqrt{7}$ and $a - b = \sqrt{3}$, then $a^2 + b^2$
 (a) 10 (b) 2 (c) 4 (d) 5
- (iii) If $3^{x-1} + 3^{x+1} = 90$, then x^x
 (a) 3 (b) 9 (c) 27 (d) 81
- (iv) In the given figure, $BC \parallel DA$ and $BC=DA$, then
 (a) $\triangle BOC \cong \triangle DOA$ (b) $AO = OC$ (c) $OB=OC$ (d) $AO=OB$
- (v) If $\frac{a}{b} + \frac{b}{a} = 1$, then the value of $a^3 + b^3$
 (a) 1 (b) 0 (c) 3 (d) 8
- (vi) For a particular year the simple interest at 10% is ₹ 800. The compound interest for next year at the same rate is
 (a) ₹880 (b) ₹ 800 (c) ₹720 (d) ₹968
- (vii) The value of $\log_{0.1} 0.0001$
 (a) 4 (b) 3 (c) $1/4$ (d) $1/3$
- (viii) In the given figure, $AD= BD$, then angle ACD is
 (a) 43° (b) 22° (c) 65° (d) 28°
- (ix) If $p + \frac{1}{p} = \frac{5}{2}$, then $p^2 + \frac{1}{p^2} =$
 (a) $\frac{25}{4}$ (b) $\frac{19}{4}$ (c) $\frac{9}{2}$ (d) $\frac{17}{4}$
- (x) Choose the least rationalising factor of $5\sqrt{8}$
 (a) $\sqrt{2}$ (b) $5\sqrt{8}$ (c) $5\sqrt{2}$ (d) $\sqrt{8}$
- (xi) If $a - b - c = 3$ & $a^2 + b^2 + c^2 = 77$, then $ab - bc + ca =$
 (a) 68 (b) 34 (c) 86 (d) 43



- (xii) $7 - 12x - 4x^2$ in the form of factors:
 (a) $(2x - 1)(7 + 2x)$ (b) $(1 - 2x)(7 - 2x)$
 (c) $-1(2x - 1)(2x + 7)$ (d) $(2x + 1)(2x - 7)$
- (xiii) A pair of linear equations which has a unique solution $x = 2$ and $y = 1$ is
 (a) $3x + 2y = 8, 5x - 3y = 7$ (b) $3x - 5y = 1, 2x + 3y = 7$
 (c) Both (a) and (b) (d) none of these
- (xiv) If two sides of a triangle are 7 cm & 5 cm, then the length of third side is between a cm & b cm ($a < b$)
 (a) $a = 7, b = 14$ (b) $a = 5, b = 10$ (c) $a = 2, b = 12$ (d) $a = 1, b = 6$
- (xv) which of the following is not the sides of a right triangle:
 (a) 50 cm, 120 cm, 130 cm (b) 12 cm, 16 cm, 20 cm
 (c) 7 cm, 24 cm, 25 cm (d) 9 cm, 40 cm, 49 cm

Question -2

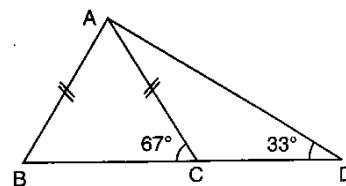
[5×4]

- (a) A sum of ₹5,000 is deposited in a bank for three years. The rate of compound interest for first two years is 10 % p.a. and the third year is 12%. Find the amount at the end of the third year and interest earned in the third year.
- (b) If $a + b = 7$ and $ab = 10$, find the values of the following:
 (i) $a - b$ (ii) $a^2 - b^2$ (iii) $a^2 + b^2$ (iv) $a^4 - b^4$
- (c) Show that: $23 \log \frac{16}{15} + 17 \log \frac{25}{24} + 10 \log \frac{81}{80} = 1$.
- (d) A ladder reaches a window which is 15 m above the ground on one side of the street. Keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 8 m high. Find the width of the street, if the length of the ladder is 17 m.
- (e) Five years ago, A's age was four times the age of B. Five years hence, A's age will be twice the age of B. Find their present ages.

Question -3

[2+3]

- a) If $x = 2 + \sqrt{3}$, find the value of $x^2 + \frac{1}{x^2}$
- b) From the given figure, write BC, AC and CD in ascending order of their lengths with reason.



Section – B (40 marks)

Answer any four

Question -4

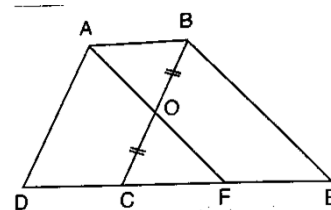
[3+3+4]

- (a) The simple interest on a sum of money for two years at 4 % per annum is ₹ 340. Find the sum of money and the compound interest on this sum for one year payable half-yearly at the same rate.
- (b) If $3^{-p} = 4^{-q} = 12^r$, show that : $\frac{1}{p} + \frac{1}{q} + \frac{1}{r} = 0$
- (c) Factorise: $12 - (x + x^2)[8 - (x + x^2)]$

Question -5

[3+3+4]

- (a) In the given figure, ABCD and ABEF are parallelograms. If O is the mid-point of BC., show that: DC=CF=FE
- (b) If the numerator of a fraction is increased by 2 and denominator is decreased by 1, it becomes $\frac{2}{3}$. If the numerator is increased by 1 and denominator is increased by 2, it becomes $\frac{1}{3}$. Find the fraction.
- (c) The population of a town increases every year at rate of 10%. The present population of the town is 60,500. Find the population of the town (i) 2 years after and (ii) 2 years before.



Question -6

[3+3+4]

- (a) If $x^2 - 5x + 1 = 0$, find the value of $x^3 + \frac{1}{x^3}$.
- (b) Express $\log \sqrt{108}$ in terms of $\log 2$ and $\log 3$.
- (c) If $\sqrt{2} = 1.4$ & $\sqrt{3} = 1.7$, find the value of each of the following, correct to one decimal place.
- (i) $\frac{2+\sqrt{3}}{2-\sqrt{3}}$ (ii) $\frac{3-\sqrt{2}}{3+\sqrt{2}}$

Question -7

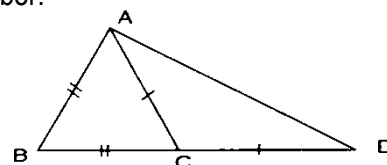
[3+3+4]

- (a) AB is a chord of a circle with centre O. OP perpendicular to AB. Then prove that: AP=PB
- (b) Factorise: $4a^2 - 12a + 9 - 49b^2$
- (c) Prove that : $\frac{1}{1+x^{b-a}+x^{c-a}} + \frac{1}{1+x^{a-b}+x^{c-b}} + \frac{1}{1+x^{b-c}+x^{a-c}} = 1$

Question -8

[3+3+4]

- (a) The ratio between of a two digit number and the number obtained on reversing its digits is 4:7. If the difference between the digits of the number is 3, find the original number.
- (b) In the given figure: AB=BC and AC=CD.
Find the ratio between angle BAD and angle ADB.



(c) If $x = \frac{\sqrt{5}+2}{\sqrt{5}-2}$ & $y = \frac{\sqrt{5}-2}{\sqrt{5}+2}$:

Find: (i) x^2 (ii) y^2 (iii) $(x + y)^2$

Question -9

[3+3+4]

- (a) Factorise: $2a^7 - 128a$
- (b) In quadrilateral ABCD, $AB = BC$ and $CD = DA$, then prove that BD bisect angle ABC
- (b) Solve by cross multiplication method: $4x - 7y + 28 = 0$ & $7x - 5y = 9$

Question -10

[3+3+4]

- (a) In a rhombus, its diagonals are 30 cm and 40 cm. Find its perimeter.
- (b) The difference between the C.I. and the S.I. on ₹ 8,400 for two years is ₹ 21 at the same rate of interest per year. Find the rate of interest.
- (c) Find x in each of the following (i) $\log_7(2x^2 - 1) = 2$ (ii) $2 \log x + 1 = \log 250$

*****ALL THE BEST*****