

# ACHIEVERS FOUNDATION

CLASS – 9<sup>TH</sup>  
ICSE

## General Instructions

1. Attempt any 3 questions of Section A
2. Attempt any 4 Questions from Section B
3. The intended marks for questions or parts of questions are given in brackets

## SECTION A [40 marks]

### Question 1

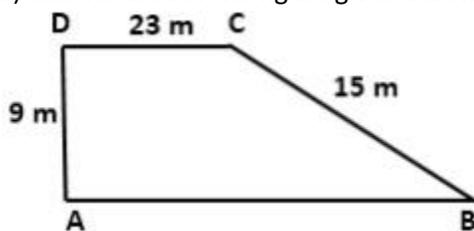
- (a) Rs.50000 is invested for 3 years at the interest rate of 8% per annum. Find the difference in interest earned in each year in case of compound interest and simple interest. [3]
- (b) State True or False: [3]
- i. if  $\log_3 27 = 3$  then  $3^3=27$
  - ii. If  $4^2 = 1024$  then  $\log_4 1024 = 5$
  - iii. If  $\log_{16} 256 = 2$  then  $2^{16} = 256$
- (c) For  $x = 2/(4 + 5\sqrt{2})$  and  $y = 3/(4-5\sqrt{2})$ , Find: [4]
- i.  $x+y$
  - ii.  $X-y$

### Question 2

- (a) Find the value of:
- $$3x+4y = 60$$
- $$5x-2y = 70$$
- (b) Find the value of : i.  $(5a - 3b)^3$  ii.  $(4x - x/4)^3$
- (c) Solve  $(3^2 \times 5^3 \times 45^2)/(15^2 \times 30^3 \times 27)$

### Question 3

- (a)  $3/(64)^{2/3} + 2/(16)^{3/4} + 1/(729)^{1/3}$
- b) find the area of the figure given below.



- c) solve
- $$(y+7)/5 - 3x + 5 = (x-2y)/4$$
- $$(7-5x)/2 + 18 - 5y = (4y - 3)/6$$

### Question 4

- (a) Which is greater among:  $\sqrt[3]{15}$  and  $\sqrt[4]{21}$  [3]
- (b) Determine whether the following are surds or not: [3]
- i.  $\sqrt{125}$
  - ii.  $\sqrt[3]{81}$
  - iii.  $\sqrt[4]{256}$
- (c) Two circles touch externally. The sum of their areas is  $41\pi$  sq. cm and the distance between their centres is 9 cm. Find the radii of the circles. [4]

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## SECTION B [40 marks]

### Question 5

- (a) Graph the equation:  $x + y = 5$  [3]  
(b) Solve: [3]  
i.  $(97)^2$                       ii.  $\{5a/3 + 2b/5\}^2$   
(c) A, B, C and D are points on the sides PQ, QR, RS and SP, respectively, of a square PQRS such that  $SC = RB = QA = PD$ . Prove that ABCD is a square. [4]

### Question 6

- (a) PQ is a segment. The point O is on the perpendicular bisector of segment PQ such that the length of OP exceeds the length of PQ by 5 cm. If the perimeter of  $\Delta POQ$  is 25 cm, find the sides of  $\Delta POQ$ . [3]  
(b) Evaluate :  $(\sin 85^\circ / \cos 15^\circ)^2 + (\cos 85^\circ / \sin 15^\circ)^2 - 2 \sin^2 90^\circ$   
(c) Find the value of : [4]  
i.  $\log 8 + \log 125 - \log 100$   
ii.  $\log 147 - \log 729 + \log 27 - \log 49 + \log 9$

### Question 7

- (a) for  $m = 3/(2+\sqrt{2})$  and  $n = 3/(2-\sqrt{2})$ , find the value of  $mn$  [3]  
(b) solve  $\sqrt[3]{(a^5b^3)} \times \sqrt{(a^6b^4)} \div \sqrt[3]{(a^6b^9)}$  [3]  
(c) The mean marks of 50 students in a class is 58. The mean marks of boys is 55 while that of girls is 60. Find the number of boys and girls in the class. [4]

### Question 8

- (a) Find the value of :  $x$  and  $y$  if  $(\sqrt{3} - \sqrt{5}) / (\sqrt{3} + \sqrt{5}) = x + y\sqrt{15}$  [3]  
(b) Find the value of  $x$  if: [3]  
i.  $\log_x 64 = 2$   
ii.  $\log_x 216 = 3$   
iii.  $\log_x 3125 = 5$   
(c) The depreciation on machinery at the end of 2nd year is 3600 and at the end of 3<sup>rd</sup> year is 3240. Find [4]  
i. Rate of depreciation  
ii. Original cost of machine  
iii. Total depreciation in 3 years  
iv. Depreciation for 4th year.

### Question 9

- (a) Rs.3000 is invested at compound interest of 10% per annum for 3 yrs. Find the amount received after 3 yrs and the total interest if: [3]  
i) The interest is given half yearly  
ii) The interest is given annually  
(b) **Solve:** [3]  $\{56x^{15}/112y^{10}\}^{-2/5}$   
(c) A fraction becomes  $3/2$  if 4 is subtracted from its numerator and 1 is added to the denominator. However, if we double the numerator and add 7 to the denominator, the fraction becomes 2. Find the fraction. [4]