ARITHMETIC PAPER II
Time allowed: 1 hour

Answer **EIGHT** questions. Marks will be deducted for untidy or poorly presented work.

1. Rain falls on a flat rectangular roof 4m x 3m. If in 1 hour $\frac{1}{2}$ cm of water falls, calculate the volume of water which falls on the roof in litres. Also calculate the weight of this water if 1 cm^3 weighs 1 gm. (1 litre = 1000 cm^3)

2. A tank can be pumped dry in $1\frac{1}{2}$ hours by two pumps which discharge the water at the rates of 80 litres a minute and 120 litres a minute. If the smaller pump is used alone, how long will it take to empty the tank?

3. In a school of 420 boys the tuck shop sold 240 bottles of Cola and 130 packets of crisps. 130 boys did not by either and no boy bought more than one of each. How many bought a Cola and a packet of crisps? You can use set theory.

4. Express 47 in binary notation (numbers to the base of 2). Express 10101 (which is already in binary) in denary, i.e. numbers to the base of 10.
   Complete the binary multiplication 101 x 101 and then change your answer to numbers to the base of 10.

5. In an alloy 40% is tin, 20% is copper, 25% is aluminium, the remainder is zinc.

   Represent this information as either (a) a pie diagram, angles must be accurate, or (b) a bar diagram or histogram drawn accurately with a scale.
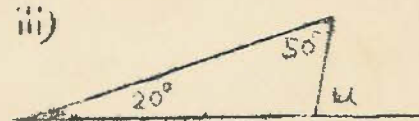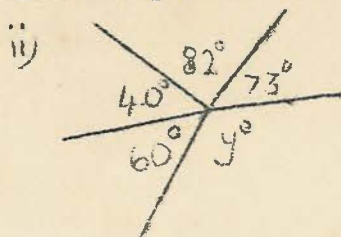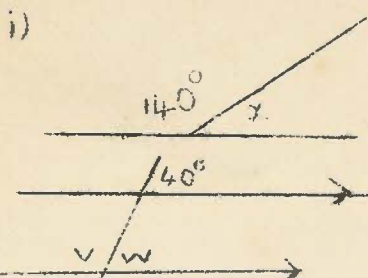
6. 32°F is the same as 0°C
   212°F is the same as 100°C in temperature scales

   Calculate what (i) 40°F becomes in °C

   (ii) 20°C becomes in °F

7. A man starts at Point A and walks 5 km NE to B. He then walks 7 km SE to C and then 4 km North to D. By use of a scale diagram (scale to be clearly stated) estimate how far D is from A.

8. A housewife is calculating the cost of carpeting 3 rectangular rooms of her house. Below **NOT** in correct order are the steps she takes in her calculations:
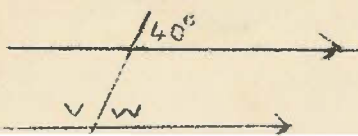
   (a) add together the three areas

   (b) measure the lengths and breadths of the rooms

   (c) multiply by the cost of 1 unit of area of carpet

   (d) multiply each length by its corresponding breadth.

   Write the lestters A, B. C. D in the correct order should would need to do the calculation.
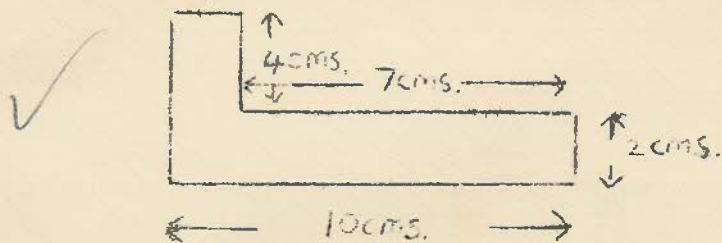
9. Calculate the unknown angles represented by letters

i) 140°, x, 40°

ii) 40°, 82°, 73°, 60°, y°

iii) 50°, 20°, u

iv) v / w

10. Calculate the area of the shape shown below, all angles being rectangles. Lengths in cms.

Also calculate the perimeter.

11. If a = 2, b = 4, c = 1 and d = 3 find the value of

    (a) $a - b - c + 2d$

    (b) $3a - 2b - c + d$

    (c) $ad - bc$

    (d) $a^2 - b^2$

    (e) d^a

12. Find the number represented by x if

    (a) $2x = 6$

    (b) $5 + x = 8$

    (c) $6x = 21$

    (d) $x = 4x = 20$

    (e) $7x = 25 - 5$