SECTION A

[40 marks]

*Answer **all** the questions in this section. All questions carry equal marks.*

1. A jet which flies at an average speed of 850 km/h consumes 5,000 litres of fuel per hour.

(a) If the jet covered a distance of 3,400 km, determine the quantity of fuel consumed?

(b) Find the average speed required to reduce the fuel consumption by 10%.

[Assume that fuel consumption is proportional to speed]

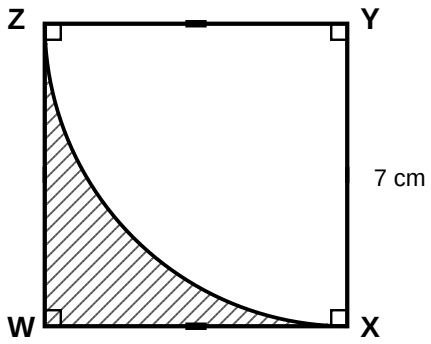
2. A group of engineers completed three-eighths of a project in 6 days, working at the same rate.

(a) How long will it take the group to complete the entire project?

(b) If another group joins them and speeds up the remaining work by 50%, find the time that would be saved?

3. In the diagram, *WXYZ* is a square of length 7 cm. Calculate, correct to three significant figures, the area of the shaded region.

[Take $\pi = 22/7$]



NOT DRAWN TO SCALE

4. Given that $(10^x + 14^x) / (15^x + 21^x) = 2¼$, find the value of *x*.

5. Atakrom, Obokrom and Maakrom are communities in a district. The probability that it will rain in Atakrom is 3/4. The probability that it will rain in Obokrom is two-thirds the probability of raining in Atakrom. The probability that it will rain in Maakrom is half the probability of raining in Obokrom.

(a) Find the probability of raining in:

(i) Obokrom;

(ii) Maakrom.

(b) Calculate the probability that it will:

(i) rain in all communities;

(ii) not rain in any of the communities.

SECTION B

[60 marks]

*Answer **five** questions only from this section. All questions carry equal marks.*

6. Mr Ayensu walks from his house to a bus stop in 80 equal steps while his daughter Emefa walks from the bus stop to her school in 75 equal steps. The total distance between the school and the bus stop is 40 metres. Emefa's steps is two-thirds the length of her father's steps.

(a) Find, in metres, the distance covered by Mr Ayensu.

(b) If Mr Ayensu takes 45 seconds to reach the bus stop, calculate in km/h his average walking speed.

7. A company produces handmade bags at $120.00 and sells each at 30% profit.

(a) Find the selling price of a bag.

(b) If the company wants to make a total profit of $2,700.00, how many bags must be sold?

(c) Suppose the production cost increases by 10% but the selling price remains unchanged, find the:

(i) new profit per bag;

(ii) number of bags that must be sold to make a profit of at least $2,700.00.

8. Three towns *A*(K° S, 20° W), *B*(K° S, 0°) and *C*(15° N, 0°) are on the surface of the earth. The shortest distance between *B* and *C* is 2,560 km.

(a) Illustrate the information in a diagram.

(b) Find, correct to:

(i) the nearest degree, the value of K;

(ii) one decimal place, the shortest distance from *A* to *B*;

(iii) the nearest hour, the time taken for an aeroplane to fly from *B* to *C* at 800 km/h.

[Take $\pi = 22/7$, R = 6,400 km]

9. On a certain day, two shows of a movie premiere was aired. The cost of tickets for the first show was GH¢ *x* each and the total receipts from the tickets was GH¢ 45,000.00. In the second show, the price of each ticket was reduced by GH¢ 5.00 resulting in 300 more tickets being sold. This increased the total receipts by GH¢ 9,000.00. Find the:

(a) price of a ticket for the first show;

(b) number of tickets sold in the first show.

10. (a) A line cuts the *y*-axis at (0, –3) and the *x*-axis at (3, 0). Write in the form $y = mx + c$, the equation of the line.

(b) Two spheres have their surface areas in the ratio 16 : 25. The volume of the smaller sphere is 48 cm³. Find the:

(i) volume of the bigger sphere;

(ii) radius of the bigger sphere.

[Take $\pi = 22/7$]

11. (a) Denkyemkrom is 35 km from Seidukrom on a bearing of 050°. Kyekyekrom is 12 km from Seidukrom on a bearing of 140°.

(i) Illustrate the information in a diagram.

(ii) Find the:

(I) distance between Denkyemkrom and Kyekyekrom;

(II) bearing of Seidukrom from Kyekyekrom.

(b) Solve: $x/(x+1) - (x+1)/(3x-1) = 1/4$.

12. The ages, in years of six students arranged in order of magnitude are $(2x + 1)$, $(4x - 1)$, $5x$, m, n and r. If their ages form an Arithmetic Progression, calculate the:

(a) ages of the students;

(b) standard deviation.

13. (a) Using a ruler and a pair of compasses only:

(i) construct ΔABC such that $|AB| = 8$ cm, $\angle BAC = 45°$ and $\angle ABC = 67.5°$;

(ii) locate the point, O, inside triangle ABC equidistant from A, B and C;

(iii) construct a circle with centre O, which passes through A.

(b) Measure |OA|.

END OF PAPER