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ENGLISH LANGUAGE

PAPER I

(One hour and a half allowed)

Answer **three** questions, **Question 1** and **any two** of the remaining questions.

1. Read the following passage carefully and then answer the questions which follow.

The Town Bus

- The London Transport Executive's decision to reduce its bus services by 5 per cent is symptomatic of a malaise that in time will probably be felt by bus organizations in most of the big towns. The country bus has a vigorous
- (5) present life and a reasonably bright future: it has already won much traffic from branch railway lines and seems likely to win more: it can also depend on regular customers in all villages which are a few miles from the nearest market town. The town bus, however, has to
- (10) meet increasing competition from other forms of transport, and in many cases the services it offers have deteriorated. The main advantage of the bus over suburban or underground railways is in its more frequent stopping places: it is not so many years since
- (15) buses would stop wherever they were hailed, and that, ideally, is what a bus should do. Congestion in the streets and bus crews' dislike of too frequent starting and stopping have combined to push stopping-places farther and farther apart. The bus, like the train, now
- (20) tends to run only between 'stations' and a good electric train service can win passengers from the bus. In London this is in fact happening, and traffic on the underground is increasing as bus traffic declines. High fares are another major discouragement to bus
- (25) passengers; instead of jumping on a bus for a journey of a quarter of a mile or so people now choose to walk.

- The motor-assisted bicycle is often a cheaper means of travelling to work than going by bus, and it offers the additional advantage of independent transport. Buses (30) are still crowded at peak times with passengers, but these are costly crowds to carry, for to provide enough buses at peak periods means spending money on vehicles and crews which are under-employed for much of the rest of the day. More towns may have to follow (35) London's example in reducing their bus services, but if this means less congestion in the streets and slightly faster travel for all other road vehicles (including the remaining buses) it need cause no tears. Some reduction in fares is probably the next essential step if town buses (40) are to avoid running into even greater difficulties.

(With acknowledgement to the *Manchester Guardian*)

- (a) Summarize the above passage in not more than 120 words. State in brackets at the end the number of words you have used.
- (b) Give the meaning of *four* of the following words as they are used in the passage:
- (i) symptomatic (line 2)
 - (ii) vigorous (line 4)
 - (iii) deteriorated (line 12)
 - (iv) peak (line 30)
 - (v) congestion (line 36)
 - (vi) essential (line 39)
- (c) What exactly is (i) a branch railway line (line 6), (ii) a suburban railway (line 13), (iii) a bus crew (line 17), (iv) a motor-assisted bicycle (line 27)?
- (d) Explain the placing of the apostrophe in the phrases:
- (i) London Transport Executive's decision (line 1)
 - (ii) bus crews' dislike (line 17)

MATHEMATICS

PAPER II

(Two hours allowed)

SECTION A

Answer **all** questions.

- (a) Factorize $3x^2 - 7x - 20$

(b) The temperature C° on the centigrade scale is connected with same temperature F° on the Fahrenheit scale by the relation $C = \frac{5}{9}(F - 32)$. Calculate the temperature on the Fahrenheit scale corresponding to a temperature of 15° centigrade.

(c) Solve the equations $4x - 5y = 22$; $2x + 3y = 0$
- (a) Solve the equation $2x^2 - x - 6 = 0$

(b) In a parallelogram ABCD, the perpendicular from D to AB meets AB in M. If $AM = 6\text{cm}$, $MB = 7\text{cm}$ and $AD = 10\text{cm}$, calculate the area of the parallelogram.
- (a) Factorize completely $2ay^2 + ay - 15a$

(b) Solve the equation $3x^2 + 5x - 2 = 0$

(c) The side of a rhombus is 13cm long and the shorter diagonal is 10cm long. Calculate the longer diagonal and the area of the rhombus.
- (a) If v varies directly as t^2 and $v = 180$ when $t = 6$, find the value of v when $t = 1\frac{1}{2}$

(b) If $2l - 1.5d = 12.5$ and $l + 4.5d = 22$, find the value of l

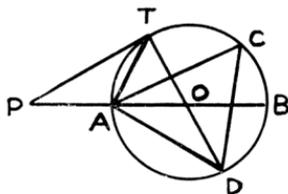


Fig. 2

(c) In Fig. 2, PT is the tangent at T to the circle centre O and AC is parallel to PT. If angle PTA = 32° , calculate the sizes of the angles of the triangle ADC.

5. (a) A class consists of b boys and g girls. The average mark in mathematics for the whole class was m and for the boys alone n . What was the average mark for the girls?

(b) Find the value of t from the formula

$$H = \frac{I^2 R t}{J}$$

when $H = 3,500$, $R = 5$, $J = 4.2$ and $I = 3.5$

(c) A chord of a circle of radius 15in. subtends an angle of 143° at the centre of the circle. Find the length of the chord and its distance from the centre.

SECTION B

Answer **three** questions only from this section.

6. The cost $\pounds y$ of making a batch of articles depends on x , the number of articles in the batch; y is the sum of two numbers, one of which varies directly as x and the other inversely as x . When the number in the batch is 10, the cost is $\pounds 28$, and when the number is 20, the cost is $\pounds 44$. Express y in terms of x and find the number in the batch when the cost is $\pounds 37$.

7. A vessel in the shape of an inverted cone, with axis vertical and semi-vertical angle 30° , contains water to a depth of 12cm. If a metal cube of side 5cm is lowered into the water until completely submerged, calculate, correct to the nearest mm, the height through which the water surface rises, assuming that no water overflows.

[The volume of a cone = $\frac{1}{3}$ (area of base \times height).
Take π as 3.142.]

8. (a) Using ruler and compasses only, construct:
 (i) A triangle ABC in which $BC = 8\text{cm}$, angle $ABC = 75^\circ$, angle $ACB = 60^\circ$
 (ii) the inscribed circle of the triangle
 (b) Find, by measurement, the radius of the circle
 (All construction lines must be shown).

9. An aeroplane flying between two airfields takes 16 minutes less on the outward than on the return journey. If the distance between the airfields is 900 miles find the average speed on the outward journey if it exceeds that on the return journey by 20mph.

10. Fig. 3 shows a key-way cut from a circular plate. Calculate the length of AB.

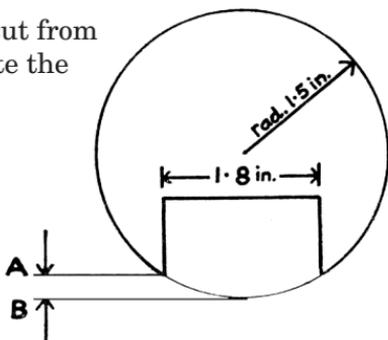


Fig. 3

GENERAL SCIENCE

PAPER 1A

(Two hours allowed)

Answer **all** the questions in Part A and **three** questions from Part B.

PART A

Answer **all** the questions in this part.

You are advised to spend not more than three-quarters of an hour on this part.

- (a) A sound is made in front of a cliff 1000ft away. An echo is heard 2 seconds later. What value does this give for the speed of sound in air?

(b) The flash of a gun is seen and 25 seconds later the sound is heard. Approximately how many miles away is the gun?
- Both steel and soft iron are magnetic substances. Which would you use:

(a) in making a permanent magnet?
Reason:

(b) in making an electro-magnet?
Reason:
- (a) Is air a mixture or a compound?

(b) What are the four main constituents of atmospheric air?

(c) In what proportions are the two chief constituents present?
- Complete the following equations:

(a) Sodium + water \rightarrow +.....

(b) Limestone (on heating) \rightarrow +.....

(c) $\text{CaO} + \text{H}_2\text{O} \rightarrow$

5. A plant is illuminated from one side only. What will be the effect on the following:
- shoot (or stem)?
 - leaves?
 - roots?
6. This is a diagram of a human tooth.



Name A, B, C and D.

7. (a) Complete:
 Light travels in _____ lines as long as it is travelling in _____ medium. The bending of a ray of light as it passes from air to water is called _____.
- (b) What effect does this have on the apparent depth of a pond?
8. Complete the following table:
- | <i>Common Name</i> | <i>Chemical Name</i> | <i>Formula</i> |
|--------------------|----------------------|----------------|
| Common salt | | |
| Washing soda | | |
| Quicklime | | |
9. (a) All acids:
- Contain the element _____
 - React with _____ substances to form salts and water
 - Turn _____ litmus _____
- (b) Name three acids.

GENERAL SCIENCE

PAPER IIA

(Two hours allowed)

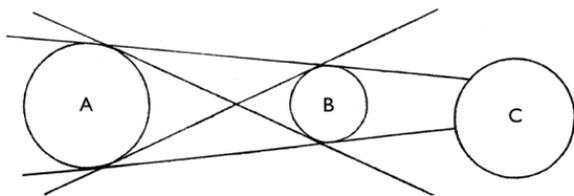
Answer **all** the questions in Part A and **three** questions from Part B.

PART A

Answer **all** the questions in this part. Write your answers in the space provided.

You are advised to spend not more than three-quarters of an hour on this part.

1. The diagram illustrates an eclipse.



- (a) If it is an eclipse of the sun then:
A is the _____
B is the _____
C is the _____
- (b) If it is an eclipse of the moon then:
A is the _____
B is the _____
C is the _____
2. (a) Why does red cloth appear red in ordinary sunlight?
(b) What colour would red cloth appear if the light falling on it were blue?
(c) Why are white clothes worn in hot climates?