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G.323

DAY GROUP CERTIFICATE EXAMINATIONS 1968

MATHEMATICS (NEW SYLLABUS)
PAPER II

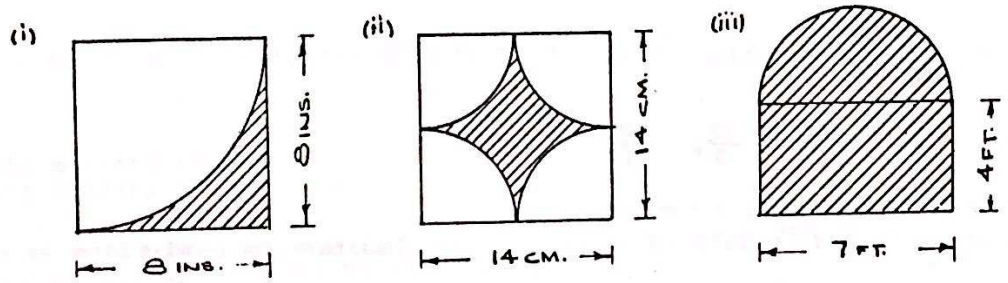
WEDNESDAY, 12th JUNE - 10 to 12 noon

Answer four questions

(All questions carry equal marks.)

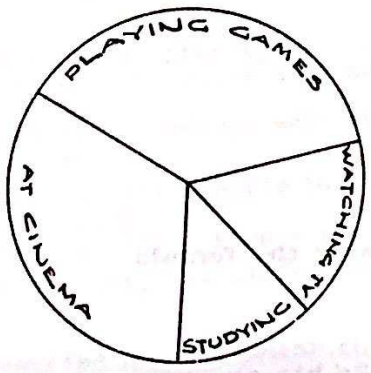
1. (a) Find the cost of 23 tons 11 cwts. of coal at £11. 17s. 6d. per ton.
   (b) A man buys an article for £3. 8s. 0d. and sells it for £4. 5s. 0d. Find his percentage profit.
   (c) Express a speed of 60 m.p.h. in feet per second.
   (d) A concrete mix is made up of cement sand and chippings in the ratio of 1 : 3 : 4. What weight of each is there in $2\frac{1}{2}$ cwt. of the mix ?

2. (a) Find the areas of the shaded portions of the following figures, taking $\pi = \frac{22}{7}$ in all cases.



   (b) Find, in gallons, the capacity of a cylindrical tank, 10 ft. tall and 4 ft. in diameter if $6\frac{1}{4}$ gallons occupy 1 ft.^{3} ($\pi = \frac{22}{7}$)

3. (i)



The pie-chart tells how the boys in a certain school spent a Sunday afternoon.

Explain the diagram, using a protractor if necessary.

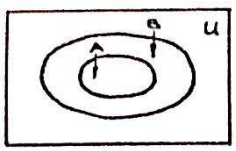
   (ii) In a mathematics examination a total of 25 students were examined and received the following distribution of marks.

Range in marks	$0 - \frac{20}{5}$	$21 - \frac{40}{8}$	$41 - \frac{60}{6}$	$61 - \frac{80}{4}$	$81 - \frac{100}{2}$
Frequency					

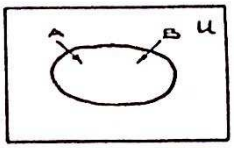
Construct a histogram illustrating the above frequency distribution.

OVER →

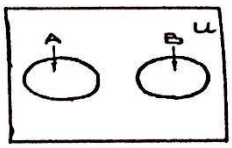
4. (i) Indicate which of the following diagrams illustrates each of the following



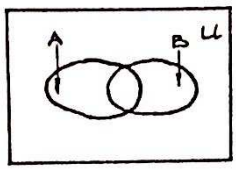
No.1



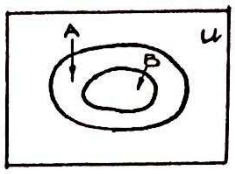
No 2



No 3



No 4



No 5

(a) $A \subset B$ .. .. Diagram No .....

(b) $A \cap B = \phi$ .. .. Diagram No .....

(c) $A \subseteq B$ .. .. Diagram No .....

(d) $A = B$ .. .. Diagram No .....

Draw diagram No. 4 twice and shade in $A \cup B$ and $A \cap B$

(ii) If $U = \{0, 1, 2, \ldots\ldots\ldots 9\}$ and if $X = \{0, 1, 3, 5\}$, $Y = \{3, 5, 7, 9\}$ and $Z = \{5, 8, 9\}$ list the elements of each of the following sets:

(a) $X \cup Y$ (b) $X \cap Z$ (c) $X \setminus Y$ (d) $Y \setminus X$ (d) X' (e) $(X \cup Y)'$ (f) $(X \setminus Y)'$

5. (a) Using the symbols $<$ and $\leq$ write the following set of elements in order of increasing magnitude:

$$\{5, \quad \frac{27}{5}, \quad \frac{100}{20}, \quad \frac{18}{3}, \quad \frac{19}{5}, \quad 6\}.$$

(b) (i) If $x \in N$, what values of x satisfy the simultaneous conditions $3x - 2 < 10$ and $x \geq 1$.

(ii) If $x \in Z$, show on the number line the solution of

$$\{(x \mid x < 3\} \cap \{x \mid x > -3\}.$$

6. (a) Write down the co-ordinates of the points in which the graph of the equation $y = x - 3$ intersects the axes.

(b) Plot the solution set of each of the following:

$$\{(x,y) \mid y = 5 - x\}; \quad \{(x,y) \mid y = x + 1\}.$$

Hence write down the solution set of:

$$\{(x,y) \mid y = 5 - x\} \cap \{(x,y) \mid y = x + 1\}.$$

7. (a) The sum of the first n natural numbers S is given by the formula

$$S = \frac{n}{2}(n + 1).$$

If $S = 55$, find n.

(b) Factorize

(i) $x^2 + xy + 7x + 7y$

(ii) $x^2 - 2x - 35$

(iii) $36a^2 - 49$

(iv) $4a^2 - 20a + 25$.