S. Thomas' College, Mount Lavinia

Term II Examination – 2015

Mathematics - I

32 | E | I

Upper 6th Forms **Time : 2 hours**

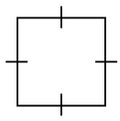
PART A

*Answer **all** questions on this question paper itself.*

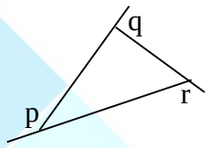
01. Find the price of five books if a book is Rs. 30.

02. Solve : $\frac{x}{2} = 3$

03. If the perimeter of the square is 80cm find the length of a side.



04. Find the value of $p^0 + q^0 + r^0$.



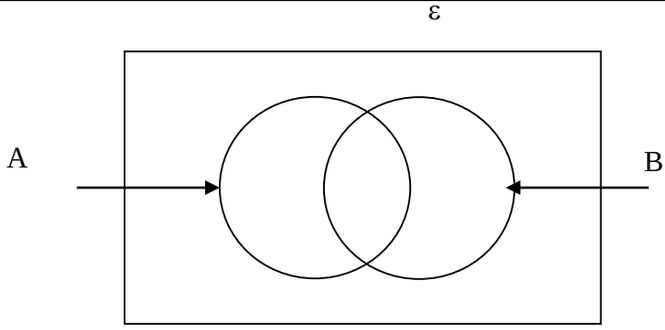
05. Simplify : 1- 0.789

06. Express 2.75km is metres.

07. Simplify : $a^{-3} \div a^5$.

08. The numerical value of a data is eight. Express it in tally marks.

09. Represent the set D where $B \cap D = \{\ \}$ and $D \subset A$.

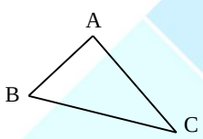


10. Write the positional value of the under lined number: $1\underline{1}01_{two}$

11. A man completes half of a certain work in 8 days. How many men are needed to finish the remaining work in 2 days?

12. Make m the subject. $m = \frac{n-m}{n}$

13. The points A, B and C are located on the sides of triangle PQR such that the perimeter of Δ PQR is twice the perimeter of Δ ABC. Explain how you get the Δ PQR.

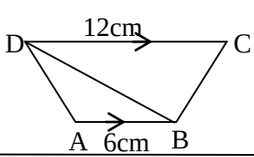


14. Nihal needs to sell part of his Rs. 10 shares of a company at Rs. 12 to obtain Rs. 60 000.
    i. How many no. of shares should he sell for the above purpose?

    ii. Find the nominal value of above shares.

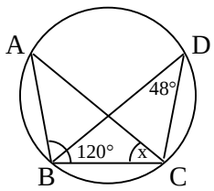
15. Write down the gradient and the intercept of the straight line $3x - 2y + 5 = 0$.
    (i) gradient (ii) intercept

16. If the area of Δ ABD is $15cm^2$, find the area of ABCD trapezium.



17. Simplify using the knowledge of factors $(8.5)^2 - 0.75 \times 85$.

18. Find the value of x.



19. Solve : $2^{x-1} = 4^{x+1}$

20. Mark '√' against the correct relationships out of the following.

i.	$\sqrt{5} \times \sqrt{5} = 5$	
ii.	$\sqrt{5} - \sqrt{2} < 0$	
iii.	$\left(\sqrt{5} + \sqrt{2}\right)\left(\sqrt{5} - \sqrt{2}\right) > 2$	

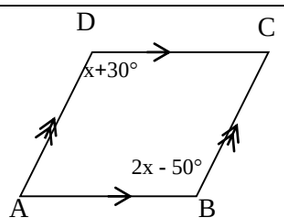
21. Write down the following of the graph of the function.

$y = -(x^2 - 3x) + \frac{3}{4}$

i. Equation of the axis of symmetry.

ii. Maximum value.

22. ABCD is a parallelogram. Find the value of $B\hat{A}D$.

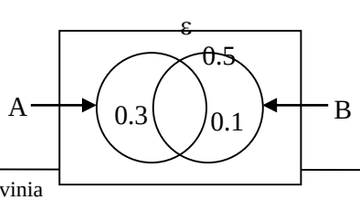


23. $P(B) = 0.5$, $P(A' \cap B) = 0.1$

The probabilities of events A and B are stated in the Venn diagram. Find the probability of the following events.

i. P(A)

ii. P(A∪B)′

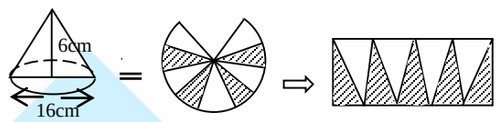


24. Find the total amount to be paid at the end of 2 years who obtain a loan of Rs.50 000 at compound interest 8% per year.

25. A hallow cone made of cardboard having 16cm base diameter, 6cm right height and 10cm slant height is shown below. The sector is obtained by cutting the curved surface of the cone along a straight line from the base to the vertex. Then it is further cut into small strips as shown and made a rectangle by pasting as shown. Write the measurements of the rectangle in terms of π.

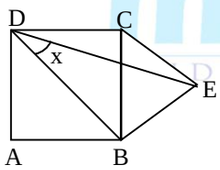
length =

breadth =

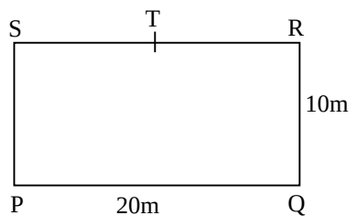


26. Simplify : $\frac{x^2-4}{4x} \div \frac{x-2}{x^2}$

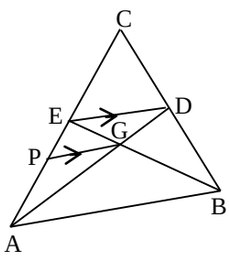
27. ABCD is a square and BCE is an equilateral triangle. Find the value of $B\hat{D}E$.



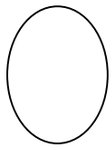
28. A sketch of a rectangular ceiling is shown in the diagram. T is the mid point of side SR. It is required to fix a bulb on the ceiling at 7m from T and equidistant to sides PQ and SR. Using the knowledge of loci, draw a sketch to show the location of the bulb.



29. The median AD and BE meet at G. GP // DE. If AG : GD = 2 : 1, then find $\frac{PE}{AC}$.



30. If P and Q have Rs. 300, Q and R have Rs. 380, P and R have Rs. 320 then how much Q has?



PART - B

1. A person deposited $\frac{3}{5}$ of his money and spent $\frac{1}{6}$ of the remaining to buy an essential equipment. Thereafter Rs.10 000 was remained.

i. Express the money spent to purchase the equipment as a fraction of the total amount of money.

ii. What is the fraction of money remained with him out of the total amount of money?

iii. How much is the total amount of money he had?

iv. Find the price of the equipment he has purchased.

v. Find marked price of the equipment if he received a 10% discount when purchasing the equipment.

2. A new chemical substance is prepared by mixing the chemical substances A, B and C. It is mixed at the ratio of A to B is 1 : 3 and the ratio of B to C is 2 : 3.

i. Find the common ratio of A , B and C.

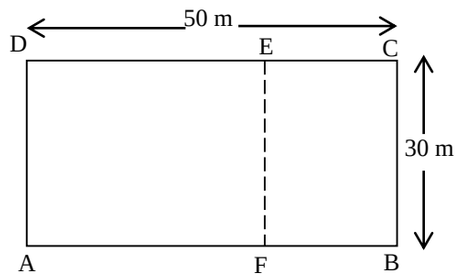
ii. What is the weight of B if the weight of new chemical substance is 85g?

iii. Find the weight of C to mix up with the weight of 7g of A.

iv. If 2g of B and 3g of C are mixed with 51g of the mixture, find the A : B : C ratio of the new chemical mixture.

v. What is the percentage of chemical substance B in the above new mixture?

3. ABCD is a rectangular shaped abandoned paddy field within a certain urban council area is shown in the figure with the measurements.



i. It is decided to fill a land portion of 240m^2 parallel to the boundary BC to allocate as a vehicle parking space. If the allocated parking space is BCEF, what is the breadth of it?

ii. It is decided to construct a 2m width jogging track along the AFED boundary by filling the land. Thereafter it is decided to use the remaining area for paddy cultivation. Mark the measurements (length & breadth) of the section to be used for paddy cultivation on the above diagram.

iii. Find the area of the land portion allocated for jogging track.

iv. It is decided to fix solar power lamp posts along the AFED boundary of the jogging track. A solar cell is needed for each lamp post. To erect a lamp post with a solar cell will cost Rs.15 000. Estimate the total cost only for this purpose. The gap between 2 posts is 6m.

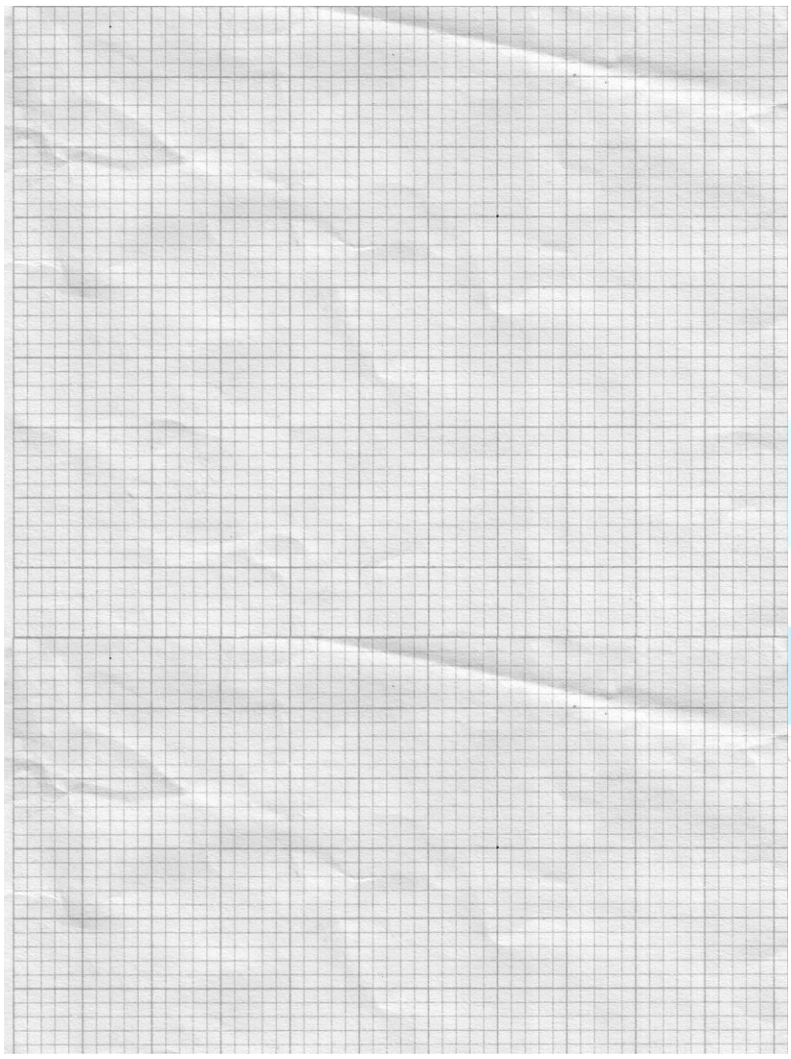
4. The following table is prepared based on the ages of the patients came to a hospital on a certain day.

Age (yrs)	No. of Patients	Cumulative Frequency
35-40	5	
40-45	9	
45-50	18	
50-55	14	
55-60	10	
60-65	4	
	60	

i. Complete the cumulative frequency column using the data given in the table.

ii. How many patients came on that day who are less than 50 yrs ?

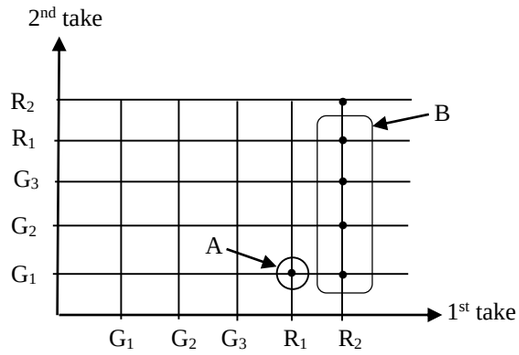
iii. Draw the cumulative frequency curve.



iv. Find median age of a patient using the cumulative frequency curve.

v. It is needed to select 20% of the most oldest patients to carry out a special medical test. Find the lowest age to select the above patients.

5. There were five same size mangoes in a box. Three out of these were in good condition and two were rotten. Kapila takes two mangoes randomly one after one. It is represented in the following incomplete Cartesian plane graph.



G : Mangoes in Good condition

R : Rotten mangoes

i. Complete the above graph using given information.

ii. Describe the event indicated by A.

iii. Describe the set of event denoted by B.

iv. Find the probability that Kapila gets a good condition mango first and a rotten mango secondly.

v. Find the probability of not getting a good condition mango on both occasions.

vi. Amila says the probability of getting a good condition mango at the first time is above 50%. Explain whether you agree with his statement with reasons.

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