

# 10M Kanyakumari District Common Examination

First Mid Term Test, July - 2012

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## Standard 10

Time: 1.15 Hrs.

## MATHEMATICS

Marks: 50

### Section - A

Note: i] Answer all the 10 questions.

10×1=10

ii] Each question contains four options. Choose the most suitable answer from the four alternatives.

- If  $A = \{5, 6, 7\}$ ,  $B = \{1, 2, 3, 4, 5\}$  and  $f:A \rightarrow B$  is defined by  $f(x) = x-2$ , then the range of  $f$  is
  - $\{1, 4, 5\}$
  - $\{1, 2, 3, 4, 5\}$
  - $\{2, 3, 4\}$
  - $\{3, 4, 5\}$
- Which one of the following is not true?
  - $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
  - $A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$
  - $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
  - $A \cap (B \cup C) = (A \cap B) \cap (A \cap C)$
- If  $A = [a_{ij}]_{2 \times 2}$  and  $a_{ij} = i+j$ , then  $A =$ 
  - $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$
  - $\begin{pmatrix} 2 & 3 \\ 3 & 4 \end{pmatrix}$
  - $\begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$
  - $\begin{pmatrix} 4 & 5 \\ 6 & 7 \end{pmatrix}$
- If  $A$  is of order  $3 \times 4$  and  $AB$  is of order  $3 \times 3$ , then the order of  $B$  is
  - $4 \times 4$
  - $4 \times 3$
  - $3 \times 3$
  - $3 \times 4$
- Three coins are tossed simultaneously. Then the probability of getting three heads is
  - $2/8$
  - $1/8$
  - $3/8$
  - 1
- The probability that a leap year will have 53 Fridays or 53 Saturdays is
  - $2/7$
  - $1/7$
  - $4/7$
  - $3/7$
- The midpoint of the line joining  $(a, -b)$  and  $(3a, 5b)$  is
  - $(-a, 2b)$
  - $(2a, 4b)$
  - $(2a, 2b)$
  - $(-a, -3b)$

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- 8) Area of the triangle formed by the points (0, 0) (1, 0) and (0, 1) is  
 a) 1 sq.units    b)  $\frac{1}{2}$  sq.units    c) 2 sq.units    d) 0 sq.units
- 9) The ratio of curved surface area of two hemi-sphere is 9:25, then what is the ratio of its total surface area  
 a) 81:625    b) 3:5    c) 27:75    d) 9:25
- 10) Diameter and height of a solid right circular cone are 12 cm and 8 cm respectively. Then find the slant height  
 a) 10 cm    b) 20 cm    c) 30 cm    d) 96 cm

**Part - B***Note: i) Answer 5 questions.**ii) Answer any 4 questions from 11 to 16.**iii) Question no. 17 is compulsory.***5×2=10**

- 11)  $A = \{a, b, c, d\}$ ,  $B = \{a, c, e\}$ ,  $C = \{a, e\}$  then find  $A \cap (B \cup C)$
- 12) Let  $A = \{10, 11, 12, 13, 14\}$ ,  $B = \{0, 1, 2, 3, 5\}$  and  $f:A \rightarrow B$ ,  $f = \{(10, 1), (11, 2), (12, 3), (13, 5), (14, 3)\}$  state the type of function give reason.
- 13)  $A = \begin{pmatrix} 3 & 2 \\ 5 & 1 \end{pmatrix}$  and  $B = \begin{pmatrix} 8 & -1 \\ 4 & 3 \end{pmatrix}$  then find  $C = 2A+B$ .
- 14) In tossing a fair coin twice, find the probability of getting  
 (i) two heads    (ii) exactly one tail
- 15) If the centroid of a triangle is at (1, 3) and two of its vertices are (-7, 6) and (8, 5) then find the third vertex of the triangle.
- 16) Total surface area of a solid hemisphere is  $675 \pi$  sq.cm. Find the curved surface area of the solid hemisphere.
- 17) Find the point which divides the line segment joining the points (-3, -4) and (-8, 7) externally in the ratio 7:5.

**(OR)**

Diameter and height of a cylindrical pillar are 3.5 m and 20 m respectively. Find the cost for painting curved surface area of the pillar at Rs. 20/- per square meter.

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**Part - C***Note: i) Answer 4 questions.***4×5=20***ii) Answer any 3 from 18 to 22. Question no. 23 is compulsory.*

- 18) In a town 85% of the people speak Tamil, 40%, speak English and 20% speak Hindi. Also, 32% speak English and Tamil, 13% speak Tamil and Hindi and 10% speak English and Hindi. Find the percentage of people who can speak all the three languages.
- 19) Let  $A = \{4, 6, 8, 10\}$  and  $B = \{3, 4, 5, 6, 7\}$  be two sets. Let  $f:A \rightarrow B$  be a function given by  $f(x) = \frac{1}{2}x+1$ . Represent this function as (i) a set of ordered pairs (ii) table (iii) an arrow diagram (iv) a graph
- 20)  $A = \begin{pmatrix} -2 \\ 4 \\ 5 \end{pmatrix}$  and  $B = (1 \ 3 \ -6)$  then verify  $(AB)^T = B^T A^T$ .
- 21) The probability that a new car will get an award for its design is 0.25, the probability that it will get an award for efficient use of fuel is 0.35 and the probability that it will get both the awards is 0.15. Find the probability that  
(i) it will get atleast one of the two awards  
(ii) it will get only one of the awards.
- 22) If the area of the  $\Delta ABC$  is 68 sq.units and the vertices are  $A(6, 7)$ ,  $B(-4, 1)$  and  $C(a, -9)$  taken in order, then find the value of  $a$ .
- 23) If the total surface area of a solid right cylinder is thrice of its curved surface area, then find the height in terms of its radius. **(OR)**  
Find the area of the quadrilateral formed by the point  $(-4, -2)$   $(-3, -5)$   $(3, -2)$  and  $(2, 3)$ .

**Part - D***Note: Answer any one questions.***1×10=10**

- 24) Draw a circle of radius 3 cm from an external point 7 cm away from its centre, construct the pair of tangents to the circle and measure their length.
- 25) A bus travels at a speed of 40 km/hr write a distance-time formula and draw the graph of it. Hence, the distance travelled in 3 hours.
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