



**ALUPE UNIVERSITY  
COLLEGE**

*...Bastion of Knowledge...*

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**OFFICE OF THE DEPUTY PRINCIPAL  
ACADEMICS, RESEARCH AND STUDENTS' AFFAIRS**

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## **UNIVERSITY EXAMINATIONS**

### **2018/2019 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER PART-TIME EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF  
EDUCATION (ECPE)**

**COURSE CODE: EPE 413**

**COURSE TITLE: MATHEMATICS II**

**DATE: 26<sup>TH</sup> APRIL, 2019**

**TIME: 2.00 PM – 5.00 PM**

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### **INSTRUCTION TO CANDIDATES**

- SEE INSIDE

**THIS PAPER CONSISTS OF 5 PRINTED PAGES**

**PLEASE TURN OVER**

**EPE 413: MATHEMATICS II****STREAM: BED (Primary Education)****DURATION: 3 Hours****INSTRUCTIONS TO CANDIDATES**

- i. Answer Question **ONE** and any other **TWO** questions.
- ii. Do not write on the question paper.

**Question One**

- a) If A (2,-7), B(2,-2) and C (7,-2) are the vertices of a triangle, find the image of the triangle under a reflection in the line  $y=2.5$   
(3 Marks)
- b) A triangle whose vertices are A'(-1.5,-2.5), B'(-1.5,-1.5) and C'(-3.5,-1.5) is an image of the triangle whose vertices are A(1.5,2.5), B(1.5,1.5) and C(3.5,1.5) under a rotation. Find:
- i. The Centre and the angle of rotation (6 Marks)
  - ii. The image of points (0,3), (2,2) and (0,0) (2 Marks)
- c) The ratio of the area of two similar rooms is  $\frac{4}{25}$ .
- i. Find the area of the bigger room if the area of the smaller room is  $8\text{m}^2$ . (4 Marks)
  - ii. Find the ratio of their lengths (2 Marks)
  - iii. If the length of the larger room is 10m find the length of the smaller one (3Marks)
- d) Find the area of the sector of a circle whose radius is 3cm and the angle subtended at the Centre is  $140^\circ$ . (Take  $\pi = \frac{22}{7}$ ) (3 Marks)
- e) The two arms of a pair of dividers are spread so that the angle between them is  $45^\circ$ . Find the area of the sector formed if the length of an arm is 8.4cm (Take  $\pi = \frac{22}{7}$ ) (3 Marks)

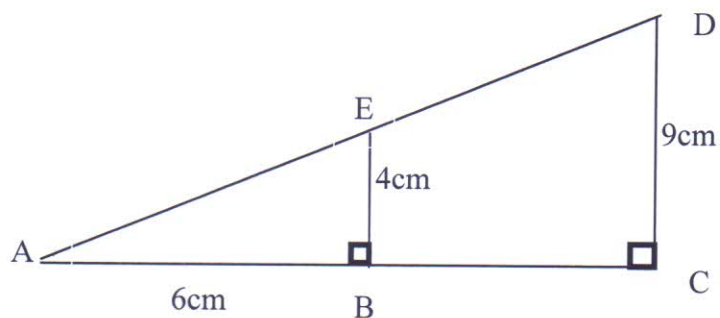
- f) Show the region that satisfy the following inequalities:

$$\begin{aligned} x &\leq 4 \\ x &> -1 \\ y &\geq -4 \\ y+2 &< 5 \end{aligned}$$

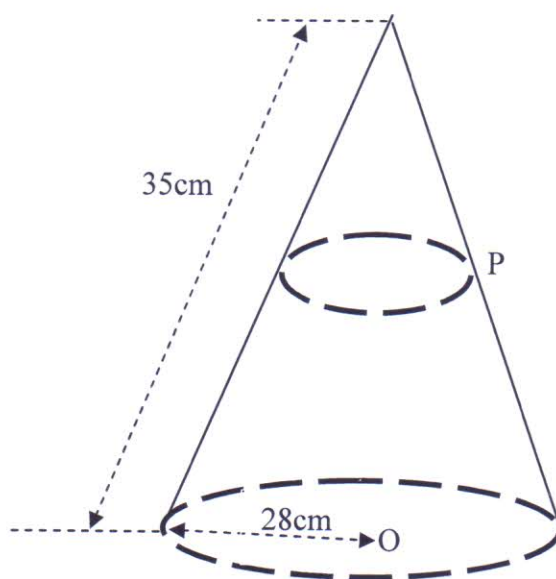
(4 Marks)

**Question Two**

- a) In the figure below, triangle ABE is similar to triangle ACD. Calculate the length of BC (4Marks)



- b) calculate length DE (4 Marks)  
 c) Calculate  $\angle EAB$  (4 Marks)  
 d) The figure below shows a cone of base radius 28cm and the slant side of length 35cm. At a point P, 14cm vertically below the vertex, the cone is cut a cross to form a smaller cone. Calculate the base radius of the smaller cone. (8 Marks)



**Question Three**

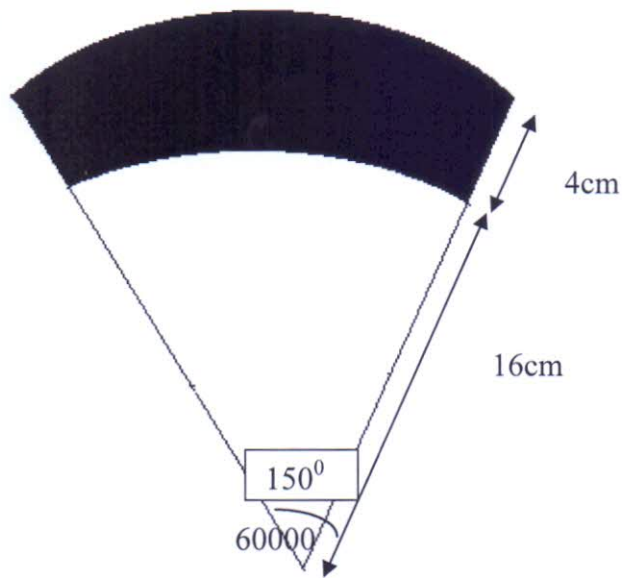
a) If  $\mathbf{a} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$  and  $\mathbf{b} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$

Find

- i.  $3\mathbf{a} + 2\mathbf{b}$  (3 Marks)
- ii.  $4\mathbf{b} - 2\mathbf{a}$  (3 Marks)
- b) The points A(-4,4), B(-2,3), C(-4,1) and D(-5,3) are vertices of a quadrilateral. If the quadrilateral is given the translation defined by the vector  $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$  draw the quadrilateral ABCD and its image under T (8 Marks)
- c) Find the coordinates of P if  $OP = OA + OB - OC$  and the coordinates of points A,B and C are (3,4), (-4,3) and ((-3,-4) respectively (6 Marks)

**Question Four**

- a) A right pyramid has a square base of sides 12cm and slant height of 20cm. calculate:
- i. Its total surface area (4 Marks)
- ii. Its volume (2 Marks)
- b) The shaded region in the figure below shows the area swept out on a flat windscreen by a wiper. Calculate the area of this region. (8 Marks)



- c) The area of a sector of a circle radius  $63\text{ cm}$  is  $4158\text{ cm}^2$ . Calculate the angle subtended at the centre of the circle. ( take  $\pi = \frac{22}{7}$  )  
(6 Marks)

### Question Five

- a) The perimeter of a triangle is  $22\text{ cm}$ . If one of the sides is  $9\text{ cm}$ , find the other sides given that the area of the triangle is  $20.976\text{ cm}^2$ . (5 Marks)
- b) Find the area of a rectangle whose length is  $12\text{ cm}$  and width  $7\text{ cm}$ . (4 Marks)
- c) A trapezium whose two sides are parallel  $PS \parallel QR$ , has  $PS = 15\text{ cm}$ ,  $QR = 20\text{ cm}$ ,  $RS = 8\text{ cm}$  and  $\angle QRS = 35^\circ$ . Calculate the area of the trapezium (5 Marks)
- d) Find the length of the side of a regular heptagon of area  $168\text{ cm}^2$  (6 Marks)

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