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**University Examinations 2015/2016**

FIRST YEAR FIRST SEMESTER EXAMINATION FOR CERTIFICATE IN BRIDGING MATHEMATICS

**SMB 0005: GRAPHS**

 **DATE: NOVEMBER 2015 TIME: 11/2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***three*** *questions*

**QUESTION ONE (30 MARKS)**

1. For each of the following straight line equations, determine the gradient and the y-intercept
2.  (3 Marks)
3.  (3 Marks)
4. Solve the following simultaneous equations graphically.



 (6 Marks)

1. Write the following pairs of inequalities as a combined statement and represent the answer in a number line. (3 Marks)

and 

1. Make r the subject of the formula

 (4 Marks)

1. Given that x varies directly as the square of y and x=2 when y=1, find x when y=4 (3 Marks)
2. (i) State the coordinates of the image of and under the transformation  (3 Marks)

(ii) Draw the triangle ABC and its image on the same axes. (3 Marks)

(iii) Describe fully the transformation that maps the triangle ABC onto triangle  (2 Marks)

**QUESTION TWO (10 MARKS)**

1. Using interval of 300, draw on the same axes the trigonometric graph of the function  and for the value  (7 Marks)
2. By use of the graph find the value of x such that  (3 Marks)

**QUESTION THREE (10 MARKS)**

1. The number of beats per minute of a gong varies directly as the square root of its length. If a gong which is 49 cm long makes 36 beats per minute, how many beats per minute would a gong which is 144cm long make? (6 Marks)
2. Find the equation of a line passing through (-1,3) and having a gradient 3/4 (4 Marks)

**QUESTION FOUR (10 MARKS)**

By completing the table below for the equation draw the graph of and use it to solve the following equations.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | -4 | -3 | -2 | -1 | 0 | 1 | 2 |
| y |  | 0 |  | -6 | -3 |  |  |

1.  (2 Marks)
2.  (4 Marks)

**QUESTION FIVE (10 MARKS)**

1. The table below gives corresponding values of$ x$ and $y $related to the equation $y=mx+c,$ where $m$ and $c $are constant.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
| y | 10 | 16 | 22 | 28 | 34 | 40 | 46 |

Using the appropriate scale, plot the points and draw the graph of $y=mx+c$.(2 Marks)

1. Use your graph to find the value of:
2. $m$ and $c$ (3 Marks)
3. $x$ when $y=35$ (1 Mark)
4. $y $when $x=13$ (1 Mark)
5. Describe the four main fundamental symbols for inequalities. (3 Marks)

**QUESTION SIX (10 MARKS)**

A small company builds two types of decorative materials; type A and type B. Type A requires 2 hours of machine time and 5 hours of craftsman time. Type B requires 3 hours of machine time and 5 hours of craftsman time. Each day there are 30 hours of machine time and 60 hours of craftsman time. The company produces at least each type of decorative material. the profit on each type a decorative material is £60 and on type b is £84:

1. Formulate the linear programming problem and show the objective function that maximizes the profit. (5 Marks)
2. Show the region represented by the inequalities and from the graph, determine the number of each decorative material they should produce daily to maximize profit. (5 Marks)