GCET Global College of Engineering and Technology
الكلية العالمية للهندسة والتكنولوجيا

In partnership with

UWE Bristol University of the West of England

GENERAL FOUNDATION PROGRAMME

PLACEMENT TEST
SAMPLE QUESTION PAPER

ACADEMIC YEAR 2018 – 2019

MATHEMATICS A - Engineering

Introductory Remarks:

- You are asked to answer twenty (20) questions.
- Please answer all questions within the allocated time period of 90 minutes.
- Use only calculators CHECKED and APPROVED by the Exam In-Charge.
- If you need extra blank sheets for your scratch work/computations, please ask from the Exam In-Charge and it will be provided for you.
- Mark your answers on the answer booklet which is provided with the question paper. Show your work clearly.
- Please leave all items on the desk at the end of the test.

1. The posts of a hockey net are 6 feet apart. A player attempts to score by shooting the puck along the ice from a point that is 21 feet from one post and 26 feet from the other. Within what angle must the shot be made?

2. Ahmed averaged 82 out of 100 on his first three tests. What was Ahmed's score on the fourth test if his average after the fourth test dropped to 79 out of 100?

3. The sides of the triangle ABC are 3 cm, 5 cm, and 7 cm, respectively. Solve for the largest angle of the triangle.

4. A metal block of dimension 10 mm by 15 mm by 20 mm weighs 8.7 grams. Determine the density ρ of the material from which the block is made.

5. Find the area of the sector of a circle with central angle $\theta = 3$ radians, if the radius of the circle is 6 inches.

6. A board is 28 feet long and is cut into three pieces. The second piece is twice as long as the first piece and the third piece is three feet longer than the second piece. What is the length of each piece?

7. A ball is tossed in the air. Its distance in feet above the ground t seconds later is given by the formula $d(t) = 6 + 96t - 16t^2$. What is the ball's maximum height in feet?

8. A parent rewards a child with 50 cents for each correctly solved mathematics problem and fines the child 30 cents for each incorrectly solved problem. If the child nets \$22.00 after 100 problems. How many problems were solved correctly?

9. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall?

10. Mr. Khalid applied for a small business loan from Bank of Muscat amounting to RO 10, 000 at 9% interest. Find the interest Mr. Khalid will pay after 5 years.

11. A man flies a kite with a 100 foot string. The angle of elevation of the string is $52°$. How high off the ground is the kite?

12. Find the value of x of the equation $3^x = 5$. Write your answer in 3 significant figures.

13. Solve the equation $5^{2x} + 7(5^x) - 30 = 0$. Hint: Let $y = 5^x$.

14. The arc AB of a circle, centre O and radius r cm, is such that ∠AOB = 0.5 radians. Given that the perimeter of the minor sector AOB is 30 cm.

Determine the following:

a. Calculate the value of r.

b. Show that the area of the minor sector AOB is 36 cm^2.

15. Calculate the area of the segment enclosed by the same chord AB and the minor arc AB in question #14.

16. A fenced triangular plot of ground has area 1200m^2. The fences along the two smaller sides are 60 m and 80 m respectively and angles between them is $\theta°$. Perform the following:

a. Show that $\theta = 150$.

b. Work out the total length of the fencing.

17. In Δ ABC, AB =$(x-3)cm$, BC =$(x+3)cm$, and AC = 8 cm and angle BAC = 60°.

a. Use the cosine rule and find the value of x.

b. Find the area of the triangle.

18. Sketch the graph of the sine and cosine functions and complete the table below with increments of $\pi/4$ for $0 \leq \theta \leq 2\pi$.

θ	0								
$y = \cos\theta$									
$y = \sin\theta$									

19. The table shows the age of the people from 11 to 70 years old visiting to a mall in a month.

Age Group	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60	61 – 70
No. of Visitors in a Month	12	8	11	9	6	4

a. Calculate the **mean** for the above grouped data.

b. Calculate the **median** for the given grouped data.

c. Find the **Inter quartile range** of the given grouped data.

20. On the same axes sketch the graph of $y = 2^x$ and $y = 3^x$.

x	-3	-2	-1	0	1	2	3
$y = 2^x$							
$y = 3^x$							

***** END OF EXAMINATION *****