University of Colombo, Sri Lanka
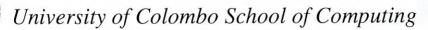
UCSC *University of Colombo School of Computing*   **BIT**

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2022 — 1st Year Examination — Semester 1

EN1106 — Introductory Mathematics

Multiple Choice Question Paper
(One hour)

Important Instructions

- The duration of the paper is **One (1) hour**.

- The medium of instructions and questions is English.

- This paper has **20 questions** on **4 pages**. Answer **all** questions.

- All questions are of the **MCQ** (Multiple Choice Questions) type.

- Each question will have **5 (five)** choices with <u>**one or more**</u> correct answers.

- All the questions will carry equal marks.

- There will be a penalty for incorrect responses to discourage guessing.

- The mark given for a question will vary from -1 (All the incorrect choices are marked & no correct choices are marked) to +1 (All the correct choices are marked & no incorrect choices are marked). However, **the minimum mark per question would be zero**.

- Answers should be marked on the **special answer sheet** provided.

- Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor/invigilator immediately.

- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

- Calculators are **not** allowed.

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1) 0.213×80 in **standard form** is

(a) 17.04×10^1	(b) 1.704×10^2	(c) 1.704×10^1
(d) 0.1704×10^1	(e) 1.604×10^1	

2) If $4^{x-y} = 8^{x+y}$ then

(a) $x = -5y$	(b) $x = 5y$	(c) $x = 3$
(d) $x = -3y$	(e) $x = 4y$	

3) The solution to the equation is/are

$$\frac{x+1}{2} + \frac{2}{x-1} = \frac{x}{2}$$

(a) 3	(b) -6	(c) 6
(d) -3	(e) 4	

4) The sum of three consecutive **odd integers** is 309 then the largest integer is

(a) 107	(b) 105	(c) 103
(d) 101	(e) 99	

5) If $x = 3$ then the following expression is equal to

$$\frac{x}{1 + \dfrac{1}{x + \dfrac{1}{x}}}$$

(a) 20/13	(b) 33/13	(c) 30/13
(d) 13/30	(e) 13/33	

6) If $x = 2$ then the **cube root** of the expression $x^3 - x + 21$ is

(a) -6	(b) -3	(c) 6
(d) 4	(e) 3	

7) If x is added to the numerator and the denominator of the fraction 3/5 then the value is less than 1/2. Which of the following is/are **TRUE**.

(a) $x > -1$	(b) $x < 1$	(c) $x > 1$
(d) $x < -1$	(e) $x > 0$	

8) If $2x - 3 < x \le 3x - 1$ then

(a) $-\frac{1}{2} < x \le 3$ (b) $-\frac{1}{2} \le x < 3$ (c) $\frac{1}{2} \le x < 3$

(d) $\frac{1}{2} < x < 3$ (e) $\frac{1}{2} < x \le 3$

9) The following fraction is equal to

$$\frac{1 - \sqrt{2}}{1 + \sqrt{2}}$$

(a) $2\sqrt{2} - 3$ (b) $2\sqrt{2} + 3$ (c) $\sqrt{2} + 3$

(d) $\sqrt{2} - 3$ (e) $2\sqrt{2} + 1$

10) Rs.19,000 is divided among three children A, B and C. The ratios of the amounts received are A: B = 1:2 and B:C = 3:5. Then the amounts received by A, B and C as a triad (a, b, c) in rupees is

(a) (3000, 6000, 10000) (b) (4000, 5000, 10000) (c) (5000, 6000, 8000)

(d) (3500, 5500, 10000) (e) (4500, 5500, 9000)

11) If an **equilateral triangle** is formed using a wire of length 60 m, then the area of the triangle is

(a) $120\sqrt{3}\ m^2$ (b) $50\sqrt{3}\ m^2$ (c) $60\sqrt{3}\ m^2$

(d) $90\sqrt{3}\ m^2$ (e) $100\sqrt{3}\ m^2$

12) What is/are the solutions to the equation

$$log_{10}(x - 2) = -1$$

(a) 2.2 (b) 2.1 (c) 12

(d) 1.9 (e) 10

13) If a square of side 4 cm is enlarged by 50%, then the area of the new square formed will exceed the area of the original square by

(a) 24 cm² (b) 28 cm² (c) 20 cm²

(d) 16 cm² (e) 12 cm²

14) In a sale of "buy one and get one free" an item is sold at Rs. 1,200. If the profit is 20% on cost, what is the cost of an item to the seller?

(a) Rs. 1,000 (b) Rs. 600 (c) Rs. 500

(d) Rs. 1,200 (e) Rs. 720

15) A square of side $\sqrt{\pi}$ cm is removed from a quarter circle of radius 6 cm. Then the area of the remaining part is

(a) 9π cm^2	(b) 8π cm^2	(c) 10π cm^2
(d) 12π cm^2	(e) 6π cm^2	

16) The ratio of boys to girls in Class A is 4:2 and that in class B is 5:7. If class B has twice the number of children than class A, what is the ratio of boys to girls overall.

(a) 3:4	(b) 4:3	(c) 3:2
(d) 2:3	(e) 1:1	

17) Given that x is inversely proportional to the square root of y. Also $y = 1$ when $x = 2$. What is the value of x when $y = 4$?

(a) 2	(b) 1/2	(c) 4
(d) 1	(e) 1/4	

18) If $54n$ is a positive cubic number then the least value of n is

(a) 1	(b) 2	(c) 3
(d) 5	(e) 4	

19) The solution to $x + \sqrt{x} - 1 = 0$ is/are

(a) $\dfrac{-1-\sqrt{5}}{2}$	(b) $\dfrac{-1+\sqrt{5}}{2}$	(c) $\left(\dfrac{-1+\sqrt{5}}{2}\right)^2$
(d) No Solution	(e) $\left(\dfrac{-1-\sqrt{5}}{2}\right)^2$	

20) $4\log_2 8 - 3\log_4 8$ is equal to

(a) 6	(b) 8	(c) 8.5
(d) 7.5	(e) 7	

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