UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2019 –1st Year Examination – Semester 1

EN1201: Introductory Mathematics

Multiple Choice Question Paper

23rd June, 2019
(ONE HOUR)

Important Instructions :

- The duration of the paper is 1**(one) hour**.
- The medium of instruction and questions is English.
- The paper has 25 **questions** and 6 **pages**.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 5 (five) choices with **one or more** correct answers.
- All 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 0 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- 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 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) Tom bought items X and Y for Rs. 300 and Rs. 325 respectively. He sold X for Rs. 375 and Y for Rs. 400. Which of the following statements is/are true?

(a) Percentage profit of Y is less than the percentage profit of X
(b) Percentage profit of Y is more than the percentage profit of X
(c) Both items give the same percentage profit
(d) X gives a 25% profit
(e) The percentage profits are not comparable

2) $\frac{0.39 \times (0.04)^2 \times 5}{0.85}$ to 3 significant digits is equal to

(a) 3.67×10^{-4} (b) 3.67×10^{-3} (c) 3.67×10^{-2} (d) 3.67×10^{-1} (e) 3.67

3) The first Rs. 1,600,000 of annual income is exempt from income tax, while there is a rate of 8% for the next Rs. 800,000, 10% for the subsequent Rs. 800,000 and then 12% for the rest of the income. The annual tax payable by an employee with a monthly income of Rs. 600,000 is:

(a) Rs. 640,000 (b) Rs. 632,000 (c) Rs. 624,000
(d) Rs. 656,000 (e) Rs. 608,000

4) If $a = 50$ then $a^0 + a^{-1} + a^{-2}$ is equal to

(a) 50.0402 (b) 1.0204 (c) 50.0024
(d) 1.0024 (e) 50.0204

5) If the same positive integer $\boldsymbol{n}$ is added to both the numerator and the denominator of the fraction $\frac{1}{3}$, then the resulting number is less than 0.72. What are the possible values of $\boldsymbol{n}$?

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

6) Of the following set of numbers: $\frac{5}{8}, \frac{1}{3}, \frac{11}{15}, \frac{7}{4}, \frac{6}{5}$; which is the closest to 1?

(a) 5/8 (b) 1/3 (c) 11/15 (d) 7/4 (e) 6/5

7) The possible solution(s) to $\left|\frac{5x}{2+3x}\right| = 8$ is/are:

(a) -16/29	(b) -16/19	(c) -8/19
(d) -16/17	(e) -8/17	

8) Which of the following is an/are equation/s of lines perpendicular to the line with equation y=7x+4?

(a) $y = -7x + \frac{1}{4}$
(b) $7y + x = 28$
(c) $y = -\frac{1}{7}x + 8$
(d) $4y = -7x + 1$
(e) $7y - x = 28$

9) If $\theta = 120^{o}$, then which of the following has the smallest value?

(a) sin θ	(b) cos θ	(c) tan θ
(d) sec θ	(e) cosec θ	

10) If $216 = 6^{2x-15}$, the value of x is:

(a) 5	(b) 6	(c) 7
(d) 8	(e) 9	

11) If $N = 4\left[\frac{a + c/3}{8}\right]^{1/3}$ then c is equal to

(a) $3\left(\frac{N^3}{8} - a\right)$ (b) $\frac{N^3}{4} - 4a$ (c) $\frac{3}{8}\left(N^3 - 8a\right)$

(d) $N^3 - \frac{3}{8}a$ (e) $N^3 + \frac{1}{8}a$

12) Sam spends 30% of his monthly income on video games and 22% on clothes. If his expenditure on video games is Rs. 20000 more than what he spends on clothes, how much does he earn per month.

(a) Rs. 250,000 (b) Rs. 240,000 (c) Rs. 260,000 (d) Rs. 300,000 (e) Rs. 280,000

13) The 2nd term of an arithmetic progression is -7 and the 9th term is 14. What is the 18th term of this progression?

(a) 35 (b) 38 (c) 47 (d) 44 (e) 41

14) The solution to the inequality $|2x-5|>3$ is:

(a) $x>1$ (b) $x<1$ or $x>4$ (c) $1<x<4$

(d) $x<4$ (e) $-4<x<4$

15) If $(x+4)(x-6)<0$, then all possible values of x are:

(a) $x<6$ (b) $x<-4$ (c) $-4<x<6$

(d) $x<-4$ or $x>6$ (e) $0<x<6$

16) What is/are the solution/s to the following pair of simultaneous equations?

$$x-5y=12$$

$$4x+y=45$$

(a) $x=\frac{75}{7}, y=\frac{3}{7}$

(b) $x=\frac{84}{9}, y=\frac{7}{9}$

(c) $x=\frac{79}{7}, y=-\frac{1}{7}$

(d) $x=\frac{91}{8}, y=\frac{1}{8}$

(e) $x=\frac{83}{7}, y=\frac{2}{7}$

17) Which of the following pairs of equations have graphs which are parallel to each other?

(a) $y - 2x + 4 = 0$ and $3y - 2x = 5$
(b) $y = -2x$ and $4y + 12x = 0$
(c) $y = 6x + 5$ and $y - 6x = 10$
(d) $6y - 12x + 7 = 0$ and $4y - 8x + 3 = 0$
(e) $4y - 3x = 7$ and $5y - 15x + 9 = 0$

18) The graph of a certain equation is a straight line with a gradient of 0. The point (5, 3) lies on this line. Which of the following is/are also point/s on the same line?

(a) (1,3) (b) (1,-3) (c) (5,1) (d) (8,3) (e) (3,-1)

19) Jenny is interested in knowing the volume of liquid her perfectly spherical snow globe, of radius of 8cm, can hold. Further, her little sister Marie has an identical, but smaller, snow globe which has a radius of 5cm. What is the ratio of the capacity of Jenny's globe to that of Marie?

(a) 4.096 : 1 (b) 4.296 : 1 (c) 512 : 125
(d) 64 : 25 (e) 8 : 5

20) Which of the following statements is/are incorrect?

i. $\sin 90° = \cos 90°$
ii. $\cos 60° = \sin 30°$
iii. $\sin 45° > \tan 45°$

(a) I and II only (b) II and III only (c) I only (d) II only
(e) III onlly

21) A pastry shop has strawberry tarts, apple pies and chocolate puffs in the ratio of 5:4:2 respectively at the start of the day. At the end of the day, it has sold a total of 55 pastries in the same ratio. How many apple pies were sold?

(a) 10 (b) 15 (c) 20 (d) $\frac{55\times4}{11}$ (e) $\frac{55\times4}{7}$

22) If 7, a, b, c and 1792 are in a geometric progression, then the a, b and c values are respectively:

(a) -28, 112, -448 (b) -28, -112, -448 (c) 28, 112, 448 (d) 28, -112, 448

(e) 28, -112, -448

23) If $2^2+ 4^2+ 6^2+ 8^2+.....+4n^2 = \frac{2n(n+1)(2n+1)}{3}$, then $2^2+ 4^2+ 6^2+ 8^2+.....+20^2$ is equal to:

(a) 770 (b) 790 (c) 1,540 (d) 1560 (e) 1580

24) If the sum of the first n terms of an arithmetic progression is $n^2 + 2n$, then its common difference is:

(a) 2 (b) -3 (c) -3 (d) 4 (e) -2

25) A sports club's members can be either swimmers, gymnasts or tennis players. Swimmers make up $\frac{1}{8}$ of the total number, while gymnasts make up $\frac{3}{4}$ of the total number. The rest of the members are tennis players, whose number amounts to 20. How many swimmers and gymnasts does the club have?

(a) 20 swimmers and 60 gymnasts
(b) 10 swimmers and 80 gymnasts
(c) 20 swimmers and 100 gymnasts
(d) 20 swimmers and 120 gymnasts
(e) 30 swimmers and 180 gymnasts

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