

RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2022

COMPUTER SCIENCE (Honours)

Date : 30-06-2022

Full Marks : 50

Time: 01.00 p.m. – 2.00 p.m.

Instructions for the candidate

Answer all the questions given below. Each question carries 2 marks for correct answer and –1 mark for wrong answer. Tick (✓) the correct option on the **OMR SHEET**. The Tick must be very clear — if it is smudgy or not clear, no marks will be awarded. Unanswered questions will not be awarded. Multiple answers will be considered as wrong answer. **Calculator is not allowed.**

- For what value of a, $f(x) = 2ax + 3, x \neq 2$ and $f(2) = 23$ is continuous at $x = 2$?
a) 2 b) 3 c) 4 d) 5
- Given $\lim_{x \rightarrow 5} f(x) = 2$ and $\lim_{x \rightarrow 5} g(x) = -1$ then determine $\lim_{x \rightarrow 5} 3g[f(x) - 2]$.
a) 0 b) -1 c) -3 d) Not enough information
- Solve $\frac{d}{dx} \tan^{-1} \frac{\cos x}{1 + \sin x}$
a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 0 d) -1
- Evaluate the following integral: $\int_0^5 \frac{x+5}{x^2+x-20} dx$
a) $-\ln 2$ b) $\ln 2$ c) $\ln 4$ d) $-\ln 4$
- Find the approximate displacement of an object from $t = 2$ to $t = 3$ if the velocity v of the object at a time t is given by $v = \frac{t^2 + 1}{(t^2 + 3t)^2}$
a) 0.0145 b) 1.045 c) 0.0014 d) 1.045
- In a certain code, CONCEPT is written as TQFDOPC. Then how VICTORY is written in the same code?
a) YROTCIV b) RYOTCIV c) IVCTORY d) YSPUDJV
- How many 8's are there in the following number series which are exactly divisible by its immediately preceding and also divisible by immediately succeeding numbers?
8 2 4 5 1 7 2 8 4 8 4 2 2 8 2 6 9 8 4 5 4 8 3 2 8 4 3 1 8 3
a) 5 b) 2 c) 3 d) 4
- Which number will replace the question mark?

12	19	16
4	3	?
6	3	8
8	19	4

- a) 8 b) 16 c) 4 d) 2

9. Kiran, an eight years old boy has 27 toys. He gave 19 toys to his brother Gourav, while Gourav playing, all but 6 got destroyed. While Kiran playing, all but 3 got destroyed. Finally, how many toys left with both of them?
- a) 10 b) 18 c) 9 d) 8
10. A cube is painted blue on all of its surfaces. It is then cut in to 27 smaller cubes of equal size. Find how many smaller cubes have no color?
- a) 0 b) 1 c) 2 d) 3
11. A family has 2 children. What will be the probability that both are boys, if it is known that one of the children is boy.
- a) $\frac{1}{2}$ b) $\frac{2}{3}$ c) $\frac{1}{3}$ d) $\frac{1}{4}$
12. If $1.3x = 0.8y$, then the value of $(y^2 - x^2)/(y^2 + x^2)$ is
- a) 10.5/23.3 b) 5/11 c) 6.1/6.9 d) 1.05/23.3
13. The value of $\lim_{x \rightarrow 0} \frac{e^{x^2} - 1}{\sin^2 x}$ is
- a) 0 b) -1 c) 1 d) none of these
14. If $y = \log(\sin^{-1}(6 \sin(x/2) \cos(x/2) - 4 \sin^3 x))$, then the value of $\frac{dy}{dx}$ is
- a) $\frac{4}{x^2}$ b) $\frac{\sin 2x - \cos 2x}{\sec 2x}$ c) $\frac{2}{3x}$ d) $\frac{1}{x}$
15. If $y = \sqrt{x + \sqrt{x + \sqrt{x + \dots}}}$, then value of $\frac{dy}{dx}$ is
- a) $\frac{1}{2y}$ b) $\frac{1}{2y-1}$ c) $\frac{2}{3y}$ d) $\frac{1}{2y^{\frac{3}{2}}}$
16. The power set of $\{\{\}\}$ is
- a) $\{\{\}\}$ b) $\{\{\}, \{\}\}$ c) $\{\{\}, \{\{\}\}\}$ d) none of these
17. The value of $\int_0^\pi x \sin^2 x dx$ is
- a) π b) $\pi^2/4$ c) $\pi^2/2$ d) 0

