

RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2017

COMPUTER SCIENCE (Honours)

Date : 14-06-2017

Full Marks : 50

Time: 01·00 p.m – 2·00 p.m.

Instructions for the candidate

Answer all the questions given below. Tick (✓) the correct option. Each correct answer carries **2 marks**. For every wrong answer **1 mark** will be deducted. Calculator is not allowed.

Name of the student : _____

Application No. : _____

Signature of the invigilator : _____

- Find the value of $\lim_{x \rightarrow 0} \tan^{-1} \frac{a}{x^2}$.
a) $\frac{\pi}{2}$ b) $-\frac{\pi}{2}$ c) 0 d) all of these
- Evaluate $\int_{\alpha}^{\beta} \frac{dx}{\sqrt{(x-\alpha)(\beta-x)}}$, where $\beta > \alpha$.
a) 0 b) $\frac{\pi}{2}$ c) π d) 2π
- Determine the value of x, so that the vectors $\vec{a} = \hat{i} + x\hat{j} + \hat{k}$ and $\vec{b} = 3\hat{i} - 2\hat{j} - 2\hat{k}$ are perpendicular to each other.
a) $\frac{1}{2}$ b) 2 c) $-\frac{1}{2}$ d) None of these
- If $x = a(\cos t + t \sin t)$ and $y = a(\sin t - t \cos t)$, then find $\left. \frac{dy}{dx} \right|_{t=\frac{3\pi}{4}}$.
a) 1 b) -1 c) 0 d) None of these
- If $x = 1! + 2! + 3! + \dots + 99!$, then find the remainder when x is divided by 15.
a) 1 b) 2 c) 3 d) None of these
- Find the minimum value of $\cos^2 \alpha + \sec^2 \alpha$.
a) 2 b) 1 c) 0 d) None of these
- If $2^{2x+2} + 2^{10} = 2^{11}$, then find $x^{\frac{x}{2}}$.
a) 1 b) 4 c) 16 d) None of these
- If the numerator of a fraction is increased by 150% and the denominator of the fraction is increased by 300%, the resultant fraction becomes $\frac{5}{18}$. What is the original fraction?
a) $\frac{4}{9}$ b) $\frac{5}{36}$ c) $\frac{5}{9}$ d) None of these
- The points A(0, -2), B(3, 1), C(0, 4) and D(-3, 1) are the vertices of a
a) rectangle b) square c) rhombus d) None of these

10. If GOOD, BAD and UGLY are coded as 164, 21 and 260 respectively, then what is the code of JUMP?
 a) 200 b) 240 c) 220 d) 250
11. 15 tennis players take part in a tournament. Every player plays twice with each of his opponents. How many games are to be played?
 a) 210 b) 105 c) 450 d) 225
12. What is the next number of the following sequence? 7, 14, 55, 110, —
 a) 171 b) 181 c) 121 d) 151
13. What is the unit digit of the product of prime numbers upto 50?
 a) 1 b) 5 c) 7 d) 0
14. What is the number of possible diagonals in an octagon?
 a) 16 b) 20 c) 18 d) 24
15. A family of 4 brothers and 3 sisters is to be arranged in a row for a photo. In how many ways can they be seated if all the sisters are to sit together?
 a) 120 b) 60 c) 720 d) 6
16. How many binary sequences are there of length 15?
 a) 2^{15} b) $15!$ c) $P(15, 2)$ d) $C(15, 2)$
17. The number of triangles formed out of n points in a plane of which m points are co-linear are :
 a) ${}^n C_3 + {}^m C_3$ b) ${}^n C_3 - {}^m C_3$ c) ${}^n C_3$ d) None of these
18. Which of the following is false?
 a) $\{2, 4, 6, 8\} = \{2, 6, 4, 8\}$ b) $\{2, 4, 4, 6, 8\} = \{2, 4, 6, 8\}$
 c) $\{8, 6, 4, 2\} = \{2, 6, 8, 4\}$ d) None of these
19. How many subsets of the set $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ can be formed?
 a) 512 b) 1024 c) $10!$ d) 10
20. Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if two cards are drawn together.
 a) $\frac{2}{3}$ b) $\frac{1}{3}$ c) $\frac{4}{9}$ d) None of these
21. In the following number series only one number is wrong. Find out the wrong number.
 39, 235, 1647, 13289, 118615
 a) 235 b) 39 c) 118615 d) 13289
22. A clock strike once at 1 O'clock, twice at 2 O'clock, thrice at 3 O'clock and so on. What is the total number of strikings in a day?
 a) 24 b) 72 c) 144 d) 156
23. A man bought 300 guavas at 10 a rupee and 300 more at 15 a rupee and sold them at 25 for 2 rupees. How much did he loose?
 a) Rs. 2 b) Rs. 3 c) Insufficient data d) None of these
24. A shopkeeper purchased 20 dozen notebooks at Rs. 48 per dozen. He sold 8 dozen at 10% profit and remaining 12 dozen at 20% profit. What is his profit percentage in his transaction?
 a) 14% b) 15% c) 16% d) None of these
25. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn bears a number which is a multiple of 3?
 a) $\frac{3}{10}$ b) $\frac{3}{20}$ c) $\frac{2}{5}$ d) $\frac{1}{2}$