

Admission Test for B.Sc. Computer Science Honours – 2007
St. Xavier's College
30, Park Street
Kolkata – 700016

FORMAT OF THE ADMISSION TEST

Total time : 1½ hours.

Total number of Questions = 50

Topic	No. of questions
A. Reading Comprehension	10
B. Understanding Relationships & Logical Reasoning	30
C. Problem solving : Mathematics	10

INSTRUCTIONS :

1. Do not open this Test Booklet until you are asked to do so.
2. All questions are compulsory.
3. Use of calculator, log table, slide rule, mobile phones etc. are not allowed.
4. The Test Booklet contains 50 multiple choice questions and a separate Answer Sheet. Answers should be marked only on the Answer Sheet.
5. Use fountain pen or ball pen to write on the Answer Sheet.
6. Do not write anything on the Test Booklet.
7. You may do your rough work or calculations in the blank sheets provided at the end of the Test Booklet.
8. Each question carries equal marks. For each correct answer 2 (two) marks are awarded. For an incorrect entry 1 (one) mark will be deducted.
9. Do not leave the Examination Hall unless specifically instructed.
10. The Test Booklet should not be taken outside the Examination Hall under any circumstances during or after the Examination.
11. Submit the Test Booklet along with your Answer Sheet at the end of the Examination.

ANSWERING PROCEDURE

Each question has 4 alternative answers, viz. A, B, C & D. Pick up the most appropriate answer and write the correct number corresponding to the given question.

Example :

31. A man bought a toy for Rs. 112 and sold it for Rs. 164. What fraction of the selling price was his profit ?

- (A) 26/64 (B) 13/35 (C) 13/28 (D) 13/41

The correct answer for the above question is 13/41. Therefore, you are required to mark D in the Answer Sheet against Question No. 31 in the appropriate box.

Question	Answer	Question	Answer	Question	Answer	Question	Answer	Question	Answer
1.		11.		21.		31.	D	41.	

If you decide to change your answer, you must cross it out, and write your answer next to it in the same box.

A. Reading Comprehension. : Read the passages given below and answer questions from 1 to 10.

Human memory, formerly believed to be rather inefficient, is really more sophisticated than that of a computer. Researchers approaching the problem from a variety of points of view have all concluded that there is a great deal more stored in our minds than has generally supposed. Dr. Wilder Penfield, a Canadian neurosurgeon, proved that by stimulating their brains electrically, he could elicit the total recall of specific events in his subjects' lives. Even dreams and other minor events supposedly forgotten for many years suddenly emerged in detail.

The memory trace is the term for whatever is the internal representation of the specific information about the event stored in the memory. Assumed to have been made by structural changes in the brain, the memory trace is not subject to direct observation but is rather a theoretical construct that we use to speculate about how information presented at a particular time can cause performance at a later time. Most theories include the strength of the memory trace as a variable in the degree of learning, retention, and retrieval possible for a memory. One theory is that the fantastic capacity for storage in the brain is the result of an almost unlimited combination of interconnection between brain cells, stimulated by patterns of activity. Repeated reference to the same information supports recall. Or, to say that in another way, improved performance is the result of strengthening the chemical bonds in the memory.

1. The passage above is mainly concerned with
(A) Wilder Penfield (C) Human memory
(B) Neurosurgery (D) Chemical reactions
2. Compared with a computer, human memory is
(A) more complex (C) less dependable
(B) more limited (D) less durable
3. According to the passage, researchers have concluded that
(A) the mind has a much greater capacity for memory than was previously believed
(B) the physical basis for memory is clear
(C) different points view are valuable
(D) human memory is inefficient
4. According to the passage, the capacity for storage in the brain
(A) can be understood by examining the physiology
(B) is stimulated by patterns of activity
(C) has a limited combination of relationships
(D) is not influenced by repetition
5. All of the following are true of a memory trace *except*
(A) it is probably made by structural changes in the brain
(B) it is able to be observed
(C) it is a theoretical construct
(D) it is related to the degree of recall

Directions : Q. No. 6 to 10 consist of incomplete sentences. Following each sentence, you will see four words or phrases marked A, B, C and D. Choose the one word or phrase that best completes the sentence.

6. The consistency of protoplasm and that of glue _____.
(A) they are alike (C) are similar
(B) are similar to (D) the same
7. Nerve impulses _____ to be brain at a speed of about a hundred yards per second.
(A) are sending sensations (C) send sensations
(B) to send sensations (D) sends sensations
8. Although exact statistics vary because of political changes, _____ separate nation states are included in the official lists at any one time.
(A) more than two hundred (C) many as two hundred
(B) as much as two hundred (D) most two hundred
9. According to a recent survey, _____ doctors do not have a personal physician
(A) a large amount (C) a large number of
(B) large amount of (D) large number of
10. _____ the plough is being displaced by new techniques that protect the land and promise more abundant crops.
(A) As a whole (C) On a Whole
(B) Wholly (D) Wholesale

B. Understanding Relationships & Logical Reasoning

11. A number when divided by a certain divisor left remainder 63. When twice the given number was divided by the same divisor, remainder was 55, What the divisor?
(A) 61 (C) 71
(B) 78 (D) 98
12. What is the length of a sheet, 2 m wide, required for making an open tank 15 m long, 10 m wide and 6 m deep ?
(A) 450 m (C) 225 m
(B) 250 m (D) 150 m

Directions : For Q. No. 13 to 16. In each of these questions, there is a pair of capitalized words followed by 4 pairs of words. Select the pair which expresses the relationship similar to that expressed in the capitalized pair of words.

13. LANGUAGE : COMMUNICATION
(A) Car : Transport (C) Tongue : Mouth
(B) Line : Verse (D) Gun: Bullet
14. ARTIST : PAINT
(A) Doctor : Patient (C) Sculptor : Clay
(B) Mechanic : Car (D) Chemist : Discovery
15. BOUQUET : FLOWER
(A) Garland : Beads (C) College : Teachers
(B) Hand : Bangles (D) Party : Cakes
16. COBBLER : HIDE
(A) Farmer : Grain (C) Author : Book
(B) Tailor : Cloth (D) Carpenter : Furniture

Directions : For Q. No. 17 to 20 , read the following information:

- (i) Sarita, Veena, Ramesh and Mohan are sitting round a table. All four have just won first prize in throwing, sprinting, hurdles and high jump.
(ii) The best thrower is sitting on Sarita's left.
(iii) The highest jumper is directly opposite Ramesh.
(iv) Veena and Mohan are next to each other.
(v) There is a girl to the left of the hurdler.
17. Who is the sprint champion?
(A) Sarita (C) Ramesh
(B) Veena (D) Mohan
18. Who is sitting opposite to the best hurdler?
(A) Veena (C) Sarita
(B) Ramesh (D) Mohan
19. Who is the high jump champion?
(A) Veena (C) Mohan
(B) Ramesh (D) Sarita
20. Which of the following are **not** sitting next to each other?
(A) Veena and Sarita (C) Mohan and Ramesh
(B) Veena and Ramesh (D) Ramesh and Sarita

Directions: For Q. No. 21 to 25, read the following information.

- (i) There are 5 persons, A, B, C, D and E.
(ii) All except C have a pencil
(iii) C has a pen and so have A and E
(iv) C, D and E also have an eraser each
21. Who has a pencil, a pen and an eraser as well ?
(A) E (C) C
(B) D (D) A
22. Who has only a pen and a pencil ?
(A) A (C) C
(B) B (D) D

23. Who has only a pencil and an eraser?
 (A) A (C) C
 (B) B (D) D
24. Who has only a pen and an eraser?
 (A) B (C) D
 (B) C (D) E
25. Who has only a pencil ?
 (A) A (C) C
 (B) B (D) D
26. Which of the following should come next in the following letter series LXF, MTJ, NPN, OLR, _____ ?
 (A) PHV (C) PIU
 (B) PPV (D) PJW
27. If rain is called water, water is called air, air is called cloud, cloud is called sky, sky is called sea, sea is called road, where do the aeroplanes fly?
 (A) Water (C) Sea
 (B) Road (D) Cloud
28. You have to spend 1/10 of your income on house rent, 1/10 of the remainder on conveyance, 1/3 of further remainder on children's education, after which you are left with Rs. 648. What is your income?
 (A) Rs. 1100 (C) Rs. 1700
 (B) Rs. 1400 (D) Rs. 1200

Directions: For Q. No. 29 to 30, unscramble the letters in the following words and find the odd man out.

29.
 (A) IHRAB (C) MSASA
 (B) REKLAA (D) LEPAN
30.
 (A) URYB (C) LVIRSE
 (B) LGOD (D) OPCPER
31. Pointing to a photograph of a girl Ram said, "She has no sisters or daughters but her mother is the only daughter of my mother." How is the girl in the photograph related to Ram's mother?
 (A) Grand daughter (C) Daughter-in-law
 (B) Sister-in-law (D) Daughter
32. In a certain code, if XMKIV means TIGER, then how is PONY written ?
 (A) TVMB (C) YNOP
 (B) SCTR (D) TSRC
33. Three-fourths of 220 is more than two-fifths of 315 by
 (A) 36 (C) 93
 (B) 39 (D) 25
34. Find the number that comes next in the sequence 25, 24, 22, 19, 15, _____
 (A) 9 (C) 11
 (B) 10 (D) 12
35. A thief steals a motor car at 2 a.m. and drives it at 60 km an hour. The theft is discovered at 2.30 a.m. and the police sets off in another car at 70 km an hour. When will the police overtake the thief?
 (A) 6.30 a.m. (C) 4.30 a.m.
 (B) 5.30 a.m. (D) 7.30 a.m.

Directions : For Q. No. 36 to 38. Find the number that comes next in the sequence.

36. 1, 3, 7, 15, _____
 (A) 22 (C) 24
 (B) 31 (D) 30
37. 36, 54, 18, 27, 9, _____
 (A) 13.5 (C) 10
 (B) 36 (D) 4.5

38. 3, 8, 15, 24, 35, _____
 (A) 45
 (B) 48

- (C) 59
 (D) 42

Directions: For Q. No. 39 to 40. Choose the correct alternative.

39. If HOT = IPU, COLD =
 (A) CPUI
 (B) RPME

- (C) DPME
 (D) STUV

40. If GOA = EMY, USA =
 (A) DAT
 (B) RAP

- (C) TUV
 (D) SQY

C. Problem solving : Mathematics

41. Value of $\int_0^{\pi/4} \sqrt{\tan \theta} \, d\theta =$

(A) $\frac{1}{2} \log \sqrt{2}$

(C) $\frac{\pi}{2} + \frac{1}{\sqrt{2}} \log(\sqrt{2} - 1)$

(B) $\frac{\pi}{\sqrt{2}} + \frac{1}{3} \log(\sqrt{2} - 1)$

(D) $\frac{\pi}{2\sqrt{2}} + \frac{1}{\sqrt{2}} \log(\sqrt{2} - 1)$

42. Value of $\int_0^{2a} \frac{f(x)}{f(x) + f(2a-x)} \, dx =$

(A) $\frac{1}{2a}$

(C) $\frac{a}{2}$

(B) a

(D) $\frac{a}{3}$

43. If $y = x \log \left(\frac{x-1}{x+1} \right)$ then $y_n =$

(A) $(-1)^n (n-2)! \left[\frac{x-n}{(x-1)^n} - \frac{x+n}{(x+1)^n} \right]$

(B) $(-1)^n (n-1)! \left[\frac{x+n}{(x-1)^n} - \frac{x-n}{(x+1)^n} \right]$

(C) $(-1)^n (n+2)! \left[\frac{(x-n)^n}{(x-1)^n} - \frac{x+n}{(x+1)^n} \right]$

(D) $(-1)^n (n-2)! \left[\frac{x-n}{(x-1)^{n-1}} - \frac{x+n}{(x+1)^{n-1}} \right]$

44. The equation of the tangent to the curve $y^2 = 2x$ parallel to the line $x + y + 1 = 0$ is

- (A) $8x + 4y + 1 = 0$
 (B) $2x + 2y + 1 = 0$

- (C) $2x - 2y - 1 = 0$
 (D) $8x - 4y + 1 = 0$

45.

$$\lim_{x \rightarrow \infty} \left[\frac{a_1^{\frac{1}{x}} + a_2^{\frac{1}{x}} + a_3^{\frac{1}{x}} + \dots + a_n^{\frac{1}{x}}}{n} \right]^{nx}$$

- (A) $a_1 + a_2 + a_3 + \dots + a_n$ (C) $a_1 \cdot a_2 \cdot a_3 \dots a_n$
 (B) $\frac{1}{\sqrt{2}} (a_1 + a_2 + a_3 + \dots + a_n)$ (D) $\frac{1}{2} (a_1 \cdot a_2 \cdot a_3 \dots a_n)$

46. The number of integers between 1 and 250 that are divisible by any of integers 2, 3, 5 and 7 is

- (E) 319 (G) 190
 (F) 153 (H) 193

47. ABC is a triangle, D is the middle point of BC. If AD is perpendicular to AC, then $\cos(A) \cdot \cos(C) = ?$

- (A) $\frac{3(c^2 - a^2)}{2ac}$ (C) $\frac{2(c^2 - a^2)}{3ac}$
 (B) $\frac{2(a^2 - c^2)}{3ac}$ (D) $\frac{3(c^2 + a^2)}{2ac}$

48. A balloon is observed simultaneously from three points A, B and C on a straight road directly beneath it. The angular elevation at B is twice that at A and the angular elevation at C is thrice at A. If the distance between A and B is 'a' and the distance between B and C is 'b', then the height of the balloon in terms of 'a' and 'b' is

- (A) $\frac{b}{2a} \sqrt{(a-b)(a+3b)}$ (C) $\frac{1}{2ab} \sqrt{(b-a)(3b-a)}$
 (B) $\frac{a}{2b} \sqrt{(a+b)(3b-a)}$ (D) $\frac{b}{2a} \sqrt{(a+b)(3b-a)}$

49. If the equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a pair of parallel straight lines, then distance between these parallel lines is

- (A) $\sqrt{\frac{a(a+b)}{g^2 - ac}}$ (C) $2 \sqrt{\frac{g^2 - ac}{a(a+b)}}$
 (B) $\frac{1}{2} \sqrt{\frac{a(a-b)}{g^2 - ac}}$ (D) $2 \sqrt{\frac{g^2 + ac}{a(a-b)}}$

50. The number of permutations when six(6) letters at a time are taken from the word RAMAYANAM is

- (A) 1215 (C) 2115
 (B) 2531 (D) 2517

Admission Test for B.Sc. Computer Science Honours – 2007
St. Xavier's College
30, Park Street
Kolkata – 700016

ANSWER SHEET

[Answer to all questions must be given on this Sheet only]

Date : 17-06-2007

Candidate's Name : _____

Father's / Guardian's Name : _____

Form No. : _____ Phone No. : _____

Address : _____

Pin : _____

Joint / IIT Rank (if any) : _____ e-mail : _____

Question	Answer	Question	Answer	Question	Answer	Question	Answer	Question	Answer
1.		11.		21.		31.		41.	
2.		12.		22.		32.		42.	
3.		13.		23.		33.		43.	
4.		14.		24.		34.		44.	
5.		15.		25.		35.		45.	
6.		16.		26.		36.		46.	
7.		17.		27.		37.		47.	
8.		18.		28.		38.		48.	
9.		19.		29.		39.		49.	
10.		20.		30.		40.		50.	

Signature of Invigilator

Signature of the candidate