2020

COMPUTER SCIENCE (Honours)

Paper Code : I - A & B

[New Syllabus]

Important Instructions for Multiple Choice Question (MCQ)

- Write Subject Name and Code, Registration number, Session and Roll number in the space provided on the Answer Script.

  Example : Such as for Paper III-A (MCQ) and III-B (Descriptive).

  Subject Code : | III | A | & | B |

  Subject Name : | |

- Candidates are required to attempt all questions (MCQ). Below each question, four alternatives are given [i.e. (A), (B), (C), (D)]. Only one of these alternatives is 'CORRECT' answer. The candidate has to write the Correct Alternative [i.e. (A)/(B)/(C)/(D)] against each Question No. in the Answer Script.

  Example — If alternative A of 1 is correct, then write :
  1. — A

- There is no negative marking for wrong answer.

মাল্টিপল চয়েস প্রশ্নের (MCQ) জন্য জরুরী নির্দেশাবলী

- উত্তরপত্রে নির্দেশিত স্থানে বিষয়ের (Subject) নাম এবং কোড, রেজিস্ট্রেশন নম্বর, সেশন এবং রোল নম্বর লিখতে হবে।

  উদাহরণ — যেমন Paper III-A (MCQ) এবং III-B (Descriptive)।

  Subject Code : | III | A | & | B |

  Subject Name : [ ]

- পরীক্ষার্থীদের সবগুলি প্রশ্নের (MCQ) উত্তর দিতে হবে। প্রতিটি প্রশ্নে চারটি করে সম্ভাব্য উত্তর, যথাক্রমে (A), (B), (C) এবং (D) করে দেওয়া আছে। পরীক্ষার্থীকে তার উত্তরের স্বপক্ষে (A) / (B) / (C) / (D) সঠিক বিকল্পটিকে প্রশ্ন নম্বর উল্লেখসহ উত্তরপত্রে লিখতে হবে।

  উদাহরণ — যদি **1** নম্বর প্রশ্নের সঠিক উত্তর **A** হয় তবে লিখতে হবে :

  1. — A

- ভুল উত্তরের জন্য কোন নেগেটিভ মার্কিং নেই।

Paper Code : I - A

Full Marks : 20 Time : Thirty Minutes

Choose the correct answer.

Each question carries 1 mark.

1. The access method used for magnetic tape is _____

   (A) Direct

   (B) Random

   (C) Sequential

   (D) None of the above

2. Which of the following holds the ROM, CPU, RAM and expansion cards?

   (A) Hard Disk

   (B) Floppy disk

   (C) Mother board

   (D) None of the above

3. Which protocol is used for email?

   (A) SMTP

   (B) FTP

   (C) HTTP

   (D) TELNET

4. 2's complement of 11001011 is _____

   (A) 00110101

   (B) 11001011

   (C) 10010001

   (D) None of the above

5. How many bits would be required to encode decimal numbers 0 to 9999 in straight binary codes?

   (A) 12

   (B) 13

   (C) 14

   (D) 15

6. The canonical sum of product form of the function y(A,B) = A + B is _____

   (A) AB + BB + A'A

   (B) AB + AB + A'A

   (C) AB' + A'B + A'B'

   (D) AB + AB' + A'B

7. The 1's complement of 1000_2 is _____

   (A) 0111

   (B) 0101

   (C) 1000

   (D) 0001

8. Which IC is used for the implementation of 3 × 8 DECODER?

   (A) IC 74154

   (B) IC 74155

   (C) IC 74139

   (D) IC 74138

9. Which is the correct order of sequence for representing the input values in K-map?

   (A) (00,01,10,11)

   (B) (00,10,01,11)

   (C) (00,01,11,10)

   (D) (00,10,11,01)

10. Operating System is an _____

    (A) Application Software

    (B) System Software

    (C) Utility Software

    (D) None of the above

11. Which of the following memory is not-volatile?

    (A) ROM

    (B) RAM

    (C) SRAM

    (D) DRAM

12. Name the three leads of common transistor —

(A) Collector Bias Omitter

(B) Base Collector Case

(C) Emitter Collector Bias

(D) Collector Base Emitter

13. A semiconductor is formed by —

(A) Covalent bond

(B) Electrovalent bond

(C) Coordinate bond

(D) None of the above

14. To get an excess 3 code from BCD code —

(A) 0110 is subtracted

(B) 0011 is subtracted

(C) 0011 is added

(D) 0110 is added

15. An ideal OPAMP has —

(A) Infinite output impedance

(B) Zero input impedance

(C) Infinite bandwidth

(D) All of the above

16. A D-Flipflop is said to be transparent when —

(A) The output is low

(B) The output is high

(C) The output follows clock

(D) None of the above

17. The most commonly used semiconductor is —

(A) Germanium

(B) Silicon

(C) Carbon

(D) Sulphur

18. What is used to increase the apparent size of physical memory?

(A) Disks

(B) Hard-disk

(C) Virtual memory

(D) Secondary memory

19. IBM developed a bus standard for their line of computers "PC-AT" called _____

(A) IB bus

(B) M-Bus

(C) ISA

(D) None of the above

20. ANSI Stands for _____

(A) American National Standard Institute

(B) American National Standard Interface

(C) American Network Standard Interfacing

(D) American Network Security Interrupting

_____

2020

COMPUTER SCIENCE (Honours)

Paper Code : I - B

[New Syllabus]

Full Marks : 80 Time : Three Hours Thirty Minutes

The figures in the margin indicate full marks.

Answer any *five* questions taking at least *one* question from each group.

Group - A

(Computer Fundamentals)

1. (a) Define Algorithm. Write its characteristics and give an example.

   (b) What do you mean by Secondary Memory?

   (c) What is Single Error-Detecting and Correcting Code? Explain with an example.

   (d) Simplify the following Boolean function in SOP and POS forms :

   $F(w, x, y, z) = \sum_m (0, 1, 2, 5, 8, 9, 10)$ 4+2+(2+2)+(3+3)=16

2. (a) State and prove De Morgan's Theorem.

   (b) Subtract the followings using 2's complement method :

   (i) $(75)_{10} - (59)_{10}$

   (ii) $(47)_{10} - (92)_{10}$

(c) Solve the expression using K-Map :

(i) $F(A,B,C,D)=\Sigma(1,2,3,5,6,7,9,13,15)$

(ii) $F(A,B,C,D)=\pi(1,3,5,6,7,13,14,15)$

(d) What do you mean by positive and negative logic system?

4+4+(3+3)+2=16

Group - B

(Basic Electronics)

3. (a) State and explain Norton's theorem with illustration.

(b) Draw the circuit diagram of a bridge rectifier.

(c) Define "pinch-off" voltage.

(d) Write down the characteristics of an ideal OP-AMP. What is Zener breakdown? (2+4)+2+2+(3+3)=16

4. (a) Compare between the characteristic of FET and BJT

(b) Why Zener diode is called voltage regulator? Explain briefly.

(c) Define what is Quality factor. Derive the expression of Quality factor and Damping Ratio of a parallel RLC circuit.

(d) Define CMRR and the slew rate of an Operational Amplifier.

2+4+6+4=16

Group - C

(Digital System Design)

5. (a) What is race-around condition?

(b) What are advantages of Master-slave flip-flop over JK flip-flop?

(c) What is full adder? Design and draw the circuit diagram using NAND gates only.

(d) What is BCD addition? Perform BCD addition of 1001 & 0111.

3+3+(2+4)+(2+2)=16

6. (a) Differentiate between level and edge triggering?

(b) Design a decade down counter using JK flipflop.

(c) Why carry output of a full adder is called a majority function?

(d) Implement a circuit that converts a 4-bit Gray Code to it's corresponding Binary code. 3+6+2+5=16

Group - D

(Computer Organisation - I)

7. (a) What is Instruction cycle?

(b) What is cache memory? How does it increase the performance of a computer? What is hit ratio?

(c) What are the significance of the following registers in CPU :

PC, AR, IR 4+(2+2+2)+6=16

8. (a) Differentiate between RAM and ROM.

(b) Explain Polling and Daisy Chaining method of Bus Arbitration?

(c) Explain the working principle of a 1-D RAM. 5+6+5=16

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