

Sample Questions

Duration : 2 hours

Total Marks : 100

Section A – Logical Reasoning

20

- Q.1 Oxygen is related to Bum in the same way Carbon dioxide is related to –
(a) Bleat (b) howl (c) grunt (d) Bray
- Q.2 Find the next number in the series 1, 2, 6, 24 (----)
(a) 60 (b) 95 (c) 120 (d) 150
- Q.3 If DELHI is coded as 73541 and CALCUTTA as 82589662. How can CALICUT be coded?
(a) 5279431 (b) 5978213 (c) 8251896 (d) 8543691
- Q.4 If the last four letters of the 'CONCENTRATION' are written in reverse order followed by next two in the reverse order and next three in the reverse order and then followed by the first four in the reverse order, counting from the end, which letter be eight in the new arrangement?
(a) N (b) T (c) E (d) R
- Q.5 In a family, a couple has a son and a daughter. The age of father is three times that of his daughter and age of the son is half of his mother. The wife is 9 years younger to her husband and the brother is seven years older than his sister. What is the mother's age?
(a) 40 year (b) 45 year (c) 50 year (d) 60 year

Section B – Mathematics

20

- Q.1 If the elements a and b of a group commute and $O(a) = m$, $O(b) = n$ with $(m, n) = 1$, then
(a) $O(ab) = m$ (b) $O(ab) = n$ (c) $O(ab) = mn$ (d) $O(ab) = m/n$
(e) None of these
- Q. 2 The line $3x - 4y + 16 = 0$ and $3x - 4y = 4$ are tangents to the same circle. The radius of the circle is:
(a) 1 (b) 2 (c) 3 (d) 4
- Q. 3 The function $x^5 - 5x^4 + 5x^3 - 1$ is maximum at
(a) $x = 1$ (b) $x = 2$ (c) $x = 3$ (d) $x = 4$
- Q.4 Area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is,
(a) πab (b) $2\pi ab$ (c) $3\pi ab$ (d) $4\pi ab$
- Q. 5 A five-figure number is formed with digits 0, 1, 2, 3, 4 without any repetition. The probability that the number formed is divisible by 4 is–
(a) $3/15$ (b) $5/16$ (c) $7/16$ (d) $9/16$

Section C – Computer Fundamentals for M.Tech. (CS, SE, IT and VLSI) 30

- Q1. Cache memory is connected to microprocessor through–
(a) Front Side Bus (b) Back Side Bus (c) ISA bus (d) PCI bus
- Q2. What will be the carry flag after executing following 8085 assembly code?
MVI A, 05
MVI B, 23
SUB B
(a) 1 (b) 0
(c) What it was previously (d) Compliment of what it was previously
- Q.3 Which of the following operators has right to left associativity in c-programming language?
(a) ! (b) & (c) , (d) ||
- Q.4 What will be the values of i and j, after executing following statements in a C-Program?
#define max (A, B) ((A) > (B) ? (A) : (B))
int i = 0;
int j = 1;
x = max (i+ , j+);
(a) i=1, j=2 (b) i=1, j=3 (c) i=2,j=1 (d) i=2 , j= 3
- Q.5 How many characters per sec (7 bits + 1 parity) can be transmitted over a 2400bps line if the transfer is asynchronous (1 start and 1 stop bit)?
(a) 300 (b) 240 (c) 250 (d) 275

Section D – Computer Science for M.Tech. (CS, SE, and IT) 30

- Q.1 Dynamic Address Translation –
(a) is part of the operating system paging algorithm
(b) is useless when swapping is used
(c) is the hardware necessary to implement paging
(d) storage pages at a specific location on a disk

Q.2 Match List I with List II

List-I

x : depth-first search

y: breadth first search

List-II

1. heap

2. queue

z: sorting

3. stack

(a) x-1, y-2, z-3

(b) x-3, y-1, z-2

(c) x-3, y-2, z-1

(d) x-2, y-3, z-1

Q.3 Which into files are used during the operation of the DBMS?

(a) Query languages and utilities

(b) Data manipulation language and query language

(c) Data dictionary and transaction log

(d) Data dictionary and query language

Q.4 The solution of recurrence relation $a_n = 2 a_{n-1} + 1$ with $a_1 = 7$ is-

(a) $7 \cdot 2^{n-1} + 2^{n-1} - 1$

(b) $7 \cdot 2^{n-1} + 2^{n-1}$

(c) $3 \cdot 2^{n-1} + 2^{n-1} + 1$

(d) $7 \cdot 2^{n-1} - 2^{n-1} - 1$

Q.5 A language is denoted by a regular expression $L = (x)^* (x | yx)$. Which of the following is not a legal string within L?

(a) zx

(b) xyz

(c) x

(d) xyxyx

Section D – Electronics for M.Tech. (VLSI)

30

Q. 1 A DEPLETION TYPE NMOS has $V_p = -5$ Volts given $V_{as} = -2$ volt. As V_{DS} is increased, i_d becomes nearly constant when V_{DS} becomes

(a) 2 volts

(b) 3 volts

(c) 5 volts

(d) 7 volts

(e) 10 volts

Q.2 Transfer characteristic of FET is

(a) $I_D = I_{DSS} (1 - V_{ds}/V_p)^2$

(b) $I_D = (1 - V_{ds}/V_p)^2$

(c) $I_D = V_{ds}/V_p$

(d) $I_{DS} = V_{ds} V_p$

(e) $I_{DS} = V_{ds} I_{DSS}$

Q. 3 7401 is IC of

(a) Digital circuit

(b) Microprocessor

(c) Micro controller

(d) op amp

(e) AS : C

Q.4 In transistor doping of emitter as compared to base is

(a) longer

(b) equal

(c) less

(d) very less

(e) not comparable

Q.5 Ideal operational amplifier has slew rate

(a) 0

(b) ∞

(c) $-\infty$

(d) 1

(e) none