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தகவல், தொடர்பாடல் தொழினுட்பவியல்	**I**	20 E I
Information & Communication Technology	**I**	

Instructions:

- *Time for Part I is __two hours.__*
- *Write your name, class, index number/section in the spaces provided.*
- *Each correct answer in Part I carries 2 marks.*
- *For Part I, select the correct or most appropriate answer and underline it clearly on the paper itself.*
- *Use of calculators and correction fluid (e.g. Tipp-Ex) is not allowed.*
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Name: _____ Class: _____ Index No: _____

Part I

(1) Which of the following may not be a component of the Central Processing Unit of a personal computer?
1. L1 cache   2. L2 cache   3. Control Unit   4. ALU   5. Registers

(2) Which of the following statements is/are correct?
   A. Firmware is a software program typically embedded in non-volatile memory.
   B. Firmware is available in fully automatic washing machines.
   C. One of the fundamental tasks of an operating system is to manage firmware.

   1. A only   2. A and B only   3. B and C only

   4. A and C only   5. All A, B and C.

(3) Consider the following statements with regard to data and information:
   A. A large volume of "Big Data" are available as structured data.
   B. Data should always be processed using computers to generate accurate information.
   C. Policy makers should never use structured data to take decisions.
   D. One of the major classifications of data is 'quantitative' & 'qualitative' data.
   Which of the above statements are incorrect?

   1. A and B only   2. C and D only   3. A, B and C only

   4. B, C and D only   5. All A, B, C and D.

(4) Which of the following statements is correct with regard to computer software?
   1. A customer can get the source code of proprietary software only after making a payment.
   2. FOSS cannot be modified without consulting the relevant software developers.
   3. Proprietary software owners can restrict the number of computer systems that a user can use to run the software.
   4. Fedora Linux and MySQL are examples of proprietary software.
   5. Only the users who purchase can modify the proprietary software.

(5) Which of the following lists a computer memory hierarchy in the **ascending order** of access speed?

1. Hard disk, RAM, CD, L2 cache, L1 cache.
2. main memory, L3 cache, L2 cache, L1 cache, registers
3. registers, L1 cache, main memory, hard disk, magnetic tape
4. RAM, ROM, L1 cache, L2 cache, registers
5. optical disk, magnetic tape, SSD, RAM, cache memory

(6) Which of the following gives the correct results of bit-wise XOR and bit-wise OR operations between the two binary numbers 11001011_2 and 11101011_2 respectively?

1. 11010011_2, 10001010_2 2. 11011111_2, 00010100_2

3. 00100000_2, 11101011_2 4. 11001011_2, 11101011_2

5. 11101011_2, 00100000_2

(7) Consider the following statements with regard to SRAM Vs. DRAM:

A. SRAM technology is used to build cache memories.
B. Both SRAM and DRAM are volatile memories.
C. SRAM chip has lower capacity compared with DRAM chip.
D. DRAM memory must be continuously refreshed.

Which of the above statements are correct?

1. A and B only   2. C and D only   3. A, C and D only

4. A, B and C only   5. All A, B, C and D.

(8) Consider the following statements:

A. Major technology used in ENIAC was vacuum tubes.
B. Difference Engine was a mechanical computer.
C. The first known calculating device is Abacus.

Which of the above statements is/are correct?

1. C only   2. A and B only   3. A and C only

4. B and C only   5. All A, B and C

(9) Which of the following answers contains only optical and solid state devices?

1. Floppy disk, Compact Disk, DVD, Flash Drive
2. SSD, HDD, DVD, Blu-ray
3. Compact Disk, Flash Drive, DVD, Blu-ray
4. Floppy Disk, Zip Disk, HDD, optical disk
5. DVD, CD, Pen Drive, Zip Disk

(10) "Stored Program Concept" was introduced by,

1. Charles Babbage   2. John Von Neumann   3. John Mauchly

4. J. Presper Eckert   5. Blaise Pascal

(11) Which of the following represents decimal –13 in two's complement arithmetic using 8 bits?

1. 00001101   2. 10001101   3. 11110010   4. 11110011   5. 11100010

(12) Binary equivalent of octal 65_8 is,

    1. 01000001_2 2. 0100001_2 3. 010000001_2 4. 0110101_2 5. 011001010_2

(13) $25_{10} + 32_{16} =$

    1. 01001011_2 2. 0111001_2 3. 01100110_2 4. 10011101_2 5. 011010110_2

(14) Assume that an 8 bit binary number is converted into a hexadecimal EBCDIC code point as follows.

Character	A	
Decimal value	193	
Binary value	11000001	
EBCDIC hexadecimal code	C	1

Consider the following characters and their corresponding decimal values.

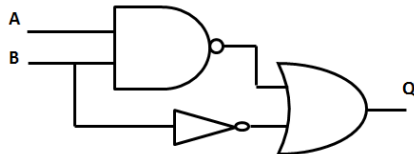| Character	Decimal number
e	133
l	147
H	200
o	150

According to the above table, which of the following represents the word "Hello" in EBCDIC?

    1. C8 85 93 93 96   2. C8 93 85 85 96   3. 96 C8 93 93 85

    4. C8 85 96 96 93   5. D9 82 93 93 96

(15) Which of the following represents octal value 76_8 in decimal?

    1. 65   2. 72   3. 62   4. 82   5. 56

(16) Consider the following logic circuit:

When A = 0, what would definitely be the output at Q?

    1. A   2. B   3. 0   4. 1   5. A+B'

(17) Simplified Boolean expressions help obtain simpler circuits.

    Which of the following is the simplified form of A (AB + A')?

    1. A   2. B   3. AB   4. A+B   5. A' + B

(18) Which of the following Karnaugh map/s is/are in the correct format?

A.

ab / c	00	01	11	10
0	1	1	0	0
1	0	0	1	1

B.

ab / c	01	11	10	00
0	1	1	1	0
1	0	0	0	1

C.

ac / b	11	10	00	01
0	1	1	1	1
1	1	0	0	1

D.

ab / c	01	10	11	00
0	1	0	1	1
1	1	0	1	1

    1. A only   2. A and D only   3. A, B and C only

    4. A, C and D only   5. All A, B, C and D

(19) Consider the following Boolean expressions:

    A.   F = A'BC + AB'C + ABC' + ABC

    B.   F = A(BC)' + (AB)'C + AB'C' + (ABC)'

    C.   F = A + BC' + AC' + B

    D.   F = A(B+C) + A'B'C + AB'C + (A +B)C

    Which of the above are Sum Of Products (SOP) expressions?

    1. A and B only   2. B and D only   3. A and C only

    4. A, C and D only   5. All A, B, C and D.

(20) Consider the following statements with regard to logic circuits:

    A.   Sequential logic circuits consider only the present inputs to determine the output.

    B.   A logic state can only be either one or zero.

    C.   A NOT gate can have only one input.

    Which of the above statements is/are correct?

    1. A only   2. A and B only   3. B and C only

    4. A and C only   5. All A, B and C.

(21) Consider the statements with regard to SR latch flip-flop circuits:

    A.   In an SR latch flip-flop, all digital input combinations are considered as valid combinations.

    B.   SR flip-flop is used in memory storage devices such as registers.

    C.   SR flip-flop circuits can be made by using both NAND and NOR gates.

    Which of the above statements is/are correct?

    1. A only   2. A and B only   3. B and C only

    4. A and C only   5. All A, B and C.

(22) Which of the following statements is incorrect with regard to computer operating systems?

    1.   Time sharing systems were introduced to minimize the response time and maximize the user interaction during program execution.

    2.   Simple batch systems were multi-programming systems.

    3.   The foundation for the central theme of modern operating systems was laid with the multi-programmed batch systems.

    4.   Program scheduling was done manually when there were no operating systems in computers.

    5.   Sub-processes are running in multi-threading operating systems.

(23) A program instance in execution in a computer is called a process. A process transits among several states during its lifetime. Consider the following transition states:

    A.   New > Ready > Running > Exit

    B.   New > Ready-Suspend > Ready > Running > Blocked > Running > Exit

    C.   New > Ready > Running > Blocked > Blocked-Suspend > Blocked > Running > Exit

    D.   New > Ready > Ready-Suspend > Ready > Running > Exit

    Which of the above are valid state transitions?

    1. A and B only   2. C and D only   3. A and D only

    4. A, and D only   5. All A, B, C and D.

(24) The block size of a hard disk is 2KB. A portion of its File Allocation Table (FAT) at a particular time is shown below. The portion shown indicates the blocks allocated for two files X.py and Y.py which is also larger in size than X.py.

FAT address	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514
		506	509	511	−1	512	513		504	505	−1	502	510	508	503

Notes:

I. The last block of a file is indicated by − 1.

II. The directory entry of a file contains the block number of the first block of the file.

Which of the following gives the directory entry of X.py file, disk size allocated for Y.py file and by how much the size of Y.py is larger than X.py respectively?

1. 514, 8KB, 8KB   2. 514, 10KB, 8KB   3. 501, 16KB, 8KB

4. 501, 8KBM 8KB   5. 501, 16KB, 6KB

(25) Consider the following statements with regard to operating system schedulers:

A. Short Term Scheduler has little control over the degree of multi-programming.

B. Long Term Scheduler dispatches processes waiting in the ready queue into the CPU for execution.

C. Mid Term Scheduler swaps the processes in between physical and virtual memories.

D. Long Term Scheduler is the slowest scheduler among long, mid and short term schedulers.

Which of the above statements are correct?

1. A and B only   2. B and D only   3. A, B and D only

4. A, C and D only   5. All A, B, C and D.

(26) Which of the following can be considered as essential when running programs which exceed the available physical memory capacity, in a single processor computer?

A–Virtual memory   B – Context switching   C – HDD

1. A only   2. A and B only   3. B and C only

4. A and C only   5. All A, B and C

(27) Which of the following describes the main characteristic of "Non-preemptive" scheduling policy correctly?

1. A process will continue until it terminates or blocks itself for I/O.

2. A process may be interrupted and moved to the "Ready" state by the OS.

3. All the processes will be served by allocating equal time for each process.

4. CPU will be shared among multiple processes at the same time.

5. CPU time will be allocated for the processes based on the available physical memory size.

(28) Consider the following protocols used in data communication process over computer networks:

A – FTP   B – HTTP   C – TCP   D – DHCP

Which of the above protocols are used in the Application Layer of the OSI reference model?

1. A and B only   2. C and D only   3. A, B and D only

4. A, B and C only   5. All A, B, C and D.

(29) Which layer of the OSI reference model is responsible for encoding, encrypting and compressing of data?

1. Application Layer   2. Presentation Layer   3. Session Layer

4. Transport Layer   5. Network Layer

(30) Consider the following signal modulation techniques:

     A. Frequency Modulation (FM)

     B. Amplitude Shift Keying (ASK)

     C. Manchester Encoding

     Which of the following matches with the A, B and C above, respectively?

1. Analog-Analog modulation, Analog-Digital modulation, Analog-Digital modulation

2. Analog-Analog modulation, Digital-Analog modulation, Digital-Analog modulation

3. Digital-Analog modulation, Analog-Digital modulation, Digital-Digital modulation

4. Analog-Analog modulation, Digital-Analog modulation, Digital-Digital modulation

5. Analog-Digital modulation, Digital-Analog modulation, Digital-Digital modulation

(31) A Protocol Data Unit (PDU) at the Data Link Layer of the OSI model is referred to as,

1. Byte   2. Packet   3. Segment   4. Frame   5. Bit

(32) Consider the following IPv4 addresses:

A – 192.168.10.0/20   B – 10.0.0.0/8   C – 172.16.0.0/16

Which of the above IP addresses is/are considered as private IP address/es?

1. A only   2. A and B only   3. B and C only

4. A and C only   5. All A, B and C.

(33) Consider the following statements with regard to TCP and UDP protocols:

     A. TCP is a connectionless protocol.

     B. UDP is a reliable protocol.

     C. HTTP uses TCP to communicate with servers.

     D. UDP is faster than TCP

     Which of the above statements are correct?

     1. A and B only   2. C and D only   3. A, B and C only

     4. B, C and D only   5. All A, B, C and D.

(34) Which of the following statements is incorrect with regard to IP and MAC addresses?

1. MAC address is 48 bits long.

2. IP address is used in the network layer of the OSI model.

3. MAC address is used in the Transport layer of the OSI model.

4. IPv4 is 32 bits long.

5. MAC addresses are unique addresses assigned to a network interface card.

(35) Which of the following is an IP address assigned to a host in a network?

1. 128.32.64.0/18   2. 192.168.100.64/26   3. 172.31.0.128/25

4. 172.16.254.0/22   5.192.168.10.32/27

(36) Dev has bought an asymmetric key encryption system and wants to transmit some sensitive data with his friend Ushen. Consider the following statements:

    A. Dev has got two similar keys with him.

    B. Dev has to give both his keys to his friend.

    C. Dev encrypts his message by using his friend's private key.

    Which of the above statements is/are incorrect?

    1. A only   2. A and B only   3. B and C only.

    4. A and C only   5. All A, B and C.

(37) Consider the following statements with regard to guided and unguided transmission media:

    A. Unguided media is not as secured as guided media.

    B. Fiber Optics is an example of unguided media.

    C. Guided media support higher data speeds compared with unguided media.

    D. Micro wave transmission is an example of unguided media.

    Which of the above statements is correct?

    1. A and B only   2. C and D only   3. A, C and D only

    4. B, C and D only   5. All A, B, C and D.

(38) You are requested to create 16 subnets with a Class C IP address. Which subnet mask is suited to create these subnets?

    1. 255.255.255.128   2. 255.255.255.16   3. 255.200.200.192

    4. 255.255.255.224   5. 255.255.255.240

(39) Consider the following statements with regard to network topologies:

    A. In star topology, one host is always connected with two neighbouring hosts.

    B. Failure of a single host in a ring topology paralyses the whole network.

    C. A host in a bus topology can be detached from the bus without affecting the data communication.

    D. Mesh topology is reliable than all other topologies.

    Which of the above statements are correct?

    1. A and B only   2. C and D only   3. A, B and C only.

    4. B, C and D only   5. All A, B, C and D.

(40) The main function of a DNS server is,

    1. Translate a web address into an IP address.

    2. Translate an IP address into a MAC address.

    3. Translate a virtual address into a physical address.

    4. Translate a public IP address into a private IP address.

    5. Transform a data packet into a data frame.

(41) Consider the diagram below.
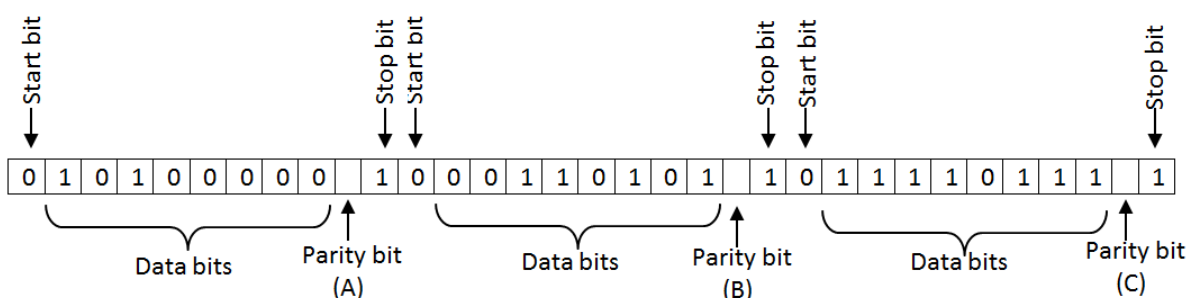
It shows how a data stream is transmitted over a communication line. There is a start bit and stop bit for each set of data bits together with a parity bit at the end of every set of data bits. If "odd parity" is used for checking the flipping of bits, the parity bit values intended for A, B and C are respectively,

1. 0 1 0   2. 0 0 1   3. 1 1 1   4. 1 0 1   5. 1 1 0

(42) Consider the following requirements with regard to a tourist information kiosk available at an airport:

A. System display should go off when the user does not touch the screen for 10 seconds as a power saving technique.

B. System should allow the user to buy tickets of any national park online.

C. System shall allow the user to transfer tourist destination information as a pdf brochure into a smart phone.

Which of the above indicate/s non-functional requirement/s?

1. A only   2. A and B only   3. B and C only

4. A and C only   5. All A B and C.

(43) Consider the following statements:

A. Human nerves system

B. Human respiratory system.

C. Human blood circulatory system.

Which of the above systems is/are closed system/s?

1. A only   2. A and B only   3. B and C only

4. A and C only   5. All A, B and C.

(44) The following details are given about a software project:

A. Requirements can be changed during the development process.

B. Less attention is paid to the planning.

C. Software should be delivered within a very short time.

D. Regular user feedback should be taken.

Which of the above details are relevant for a Rapid Application Development (RAD) model?

1. A and B only   2. C and D only   3. A, B and C only

4. B, C and D only   5. All A, B, C and D.

(45) Which of the following is correct group of feasibility study types conducted with a proposed system?

1. Technical feasibility, Cost-benefit feasibility, Organizational feasibility, Operational feasibility

2. Economic feasibility, Cost-Benefit feasibility, Organizational feasibility, Operational feasibility

3. Technical feasibility, Economic feasibility, Operational feasibility, Organizational feasibility

4. Operational feasibility, Organizational feasibility, Workflow feasibility, Production feasibility

5. Technical feasibility, Organizational feasibility, Economic feasibility, Management feasibility

(46) Which of the following is not available in waterfall software development model?
   1. Feasibility study   2. Requirement analysis   3. Risk analysis
   4. Testing   5. Deployment

(47) Consider the following Data Flow Diagrams and select the correct diagram/s.

A.

B.

C.
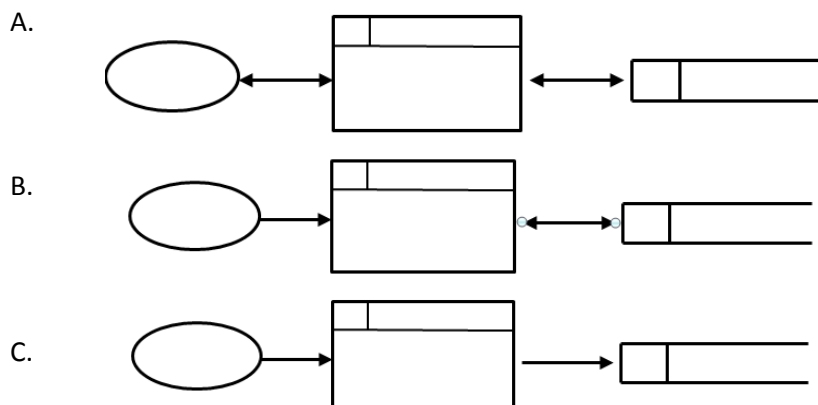
   1. A only   2. A and B only   3. B and C only
   4. A and C only   5. All A, B and C.

(48) In SSADM, which of the following diagrams is used to identify the relationship between the system and its external entities?
   1. Business Activity Model   2. Logical Data Structure
   3. Level 1 Data Flow Diagram   4. Level 0 Data Flow Diagram
   5. Entity Matrix

(49) Which of the following is not available in SSADM?
   1. Feasibility Study   2. Requirement Analysis   3. Requirement Specification
   4. Physical Design   5. Implementation

(50) Consider the following information system types in List A and some examples in List B:

A1 – Transaction Processing System	B1 – Preparing weekly transaction reports
A2 – Content Management System	B2 – Web Development template editing.
A3 – Management Information System	B3 - ATM machine

A good matching between lists A and B is:
1. A1-B1, A2-B2, A3-B3   2. A1-B2, A2-B3, A3-B1   3. A1-B3, A2-B2, A3-B1
4. A1-B1, A2-B3, A3-B2   5. A1-B2, A2-B1, A3-B3