BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session:2021-22 (Winter Semester)

B. Voc. Program, 1st Semester,

2st In-Sem. Examination

Course Code: ITN 1101 **Time: 1 Hour**

Course Name: Introduction to Computer **Max. Marks: 20**

Instruction: (if any)

Section – A

05X01 = 05 Marks

Q1. The binary number 10011101 is equal to the hexadecimal number.

(A) 9E

(B) 9F

(C) 9D

(D) FF

Q2. The Binary code for decimal 7 is.

(A) 0111

(B) 1011

(C) 0100

(D) 0101

Q3. Convert in to decimal: $(214)_8$ = ?

(A) $(140)_{10}$

(B) $(141)_{10}$

(C) $(142)_{10}$

(D) $(130)_{10}$

Q4. Which of the following is the correct representation of a binary number?

A) $(124)_2$

B) 1110

C) $(110)^2$

D) $(001)_2$

Q5. What is the binary equivalent of decimal number 75?

A) 1101001

B) 101001

C) 100101

D) 1001011

Section – B

03X02 = 06 Marks

Q1. What is a Number system? Explain types of number system.

A number system is defined as a system of writing to express numbers. It is the mathematical notation for representing numbers of a given set by using digits or other symbols in a consistent manner.

Types of Number System

There are various types of number systems in mathematics. The four most common number system types are:

1. Decimal number system (Base- 10): The decimal number system has a base 10 because it uses ten digits from 0 to 9. In the decimal number system, the positions successive to the left of the decimal point represent units, tens, hundreds, thousands and so on. This system is expressed in decimal numbers. Every position shows a particular power of the base (10).
2. Binary number system (Base- 2): The base 2 number system is also known as the Binary number system wherein, only two binary digits exist, i.e., 0 and 1. Specifically, the usual base-2 is a radix of 2. The figures described under this system are known as binary numbers which are the combination of 0 and 1.
3. Octal number system (Base-8): In the octal number system, the base is 8 and it uses numbers from 0 to 7 to represent numbers. Octal numbers are commonly used in computer applications.
4. Hexadecimal number system (Base- 16): In the hexadecimal system, numbers are written or represented with base 16. In the hex system, the numbers are first represented just like in decimal system, i.e. from 0 to 9. Then, the numbers are represented using the alphabets from A to F.

Q2. What are the 5 types of Computer Generation?
This development period of electronic computing technology is called Computer Generation. There are five generations of computers identified, although the sixth generation could be in development now in the early 21st century.

During the evolutionary timeline, each generation of computers has improved a lot by undergoing considerable changes in their size, type, and functionality.

At present, the computer is playing a significant part in human existence because today's digital computer is being used for every work in each field. If someday an issue occurs in the computer or the server is down, at that point all the work stops. This is how significant it is for technology development!

- First Generation Computers (1940-1956)
- Second Generation Computers (1956-1963)
- Third Generation Computers (1964-1971)
- Fourth Generation Computers (1971-Present)
- Fifth Generation Computers (Present and Beyond)

Q3. Complete the following tables.

Solution:

Binary Numbers	Octal Numbers	Decimal Numbers	Hexadecimal Numbers
0000	0	0	0
0001	1	1	1
0010	2	2	2
0011	3	3	3

0100	4	4	4
0101	5	5	5
0110	6	6	6
0111	7	7	7
1000	10	8	8
1001	11	9	9
1010	12	10	A
1011	13	11	B
1100	14	12	C
1101	15	13	D
1110	16	14	E
1111	17	15	F

Section – C

03X03 = 09 Marks

Solve following conversions:

Q1.

a) Convert $(11011)_2$ to decimal number.

Solution: Given $(11011)_2$ a binary number.

We need to multiply each binary digit with the decreasing power of 2. That is;

$1\times2^4+1\times2^3+0\times2^2+1\times2^1+1\times2^0$

$=16+8+0+2+1$

$=27$

Therefore, $(11011)_2 = (27)_{10}$

b) Convert 121_8 into the equivalent decimal number.

Solution: Given $(121)_8$ is an octal number

Here, we have to multiply each octal digit with the decreasing power of 8, such as;

$1\times8^2+2\times8^1+1\times8^0$

$=64+16+1$

$=81$

c) Convert 1010101_2 to octal.

Solution:

Given binary number is 1010101_2

First, we convert given binary to decimal

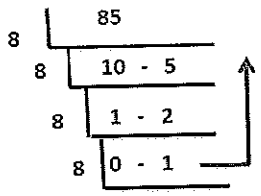
$1010101_2 = (1 * 2^6) + (0 * 2^5) + (1 * 2^4) + (0 * 2^3) + (1 * 2^2) + (0 * 2^1) + (1 * 2^0)$

$= 64 + 0 + 16 + 0 + 4 + 0 + 1$

$= 64 + 21$

$010101_2 = 85$ (Decimal form)

Now we will convert this decimal to octal form



Therefore, the equivalent octal number is 125_8.

Q2. Solve following conversions

a) Convert 12_{16} into a decimal number.

Solution: Given 12_{16}

Multiply each digit with decreasing power of 16 to obtain an equivalent decimal number.

$1\times16^1+2\times16^0$

$=16+2$

$=18$

b) Convert 26_{10} into a binary number.

Solution: Given 26_{10} is a decimal number.

Divide 26 by 2

26/2 = 13 Remainder $\rightarrow$0 (MSB)

13/2 = 6 Remainder $\rightarrow$1

6/2 = 3 Remainder $\rightarrow$0

3/2 = 1 Remainder $\rightarrow$1

½ = 0 Remainder $\rightarrow$1 (LSB)

Hence, the equivalent binary number is $(11010)_2$

c) Convert decimal number 49 into hexadecimal.

Solution: Let us create a table to solve the problem.

Divide by 16	Quotient	Remainder	Hex Value
49 ÷ 16	3	1	1
3 ÷ 16	0	3	3

Therefore, $49_{10} = 31_{16}$.

Q3. Solve following conversions:

a) Convert 65_{10} into an octal number.

Solution: Given 65_{10} is a decimal number.

Divide by 8

65/8 = 8 Remainder →1 (MSB)

8/8 = 1 Remainder →0

⅛ = 0 Remainder →1 (LSB)

Hence, the equivalent octal number is $(101)_8$

b) Convert 127_{10} to a hexadecimal number.

Solution: Given 127_{10} is a decimal number.

Divide by 16

127/16 = 7 Remainder →15

7/16 = 0 Remainder → 7

In the hexadecimal number system, alphabet F is considered as 15.

Hence, 127_{10} is equivalent to $7F_{16}$

c)Convert $A2B_{16}$ to an equivalent binary number.

Solution: Given hexadecimal number = $A2B_{16}$
First, convert the given hexadecimal to the equivalent decimal number.
$A2B_{16} = (A \times 16^2) + (2 \times 16^1) + (B \times 16^0)$
$= (A \times 256) + (2 \times 16) + (B \times 1)$
$= (10 \times 256) + 32 + 11$
$= 2560 + 43$
$= 2603$(Decimal number)
Now we have to convert 2603_{10} to binary

2 | 2603
2 | 1301 -- 1
2 | 650 -- 1
2 | 325 -- 0
2 | 162 -- 1
2 | 81 -- 0
2 | 40 -- 1
2 | 20 -- 0
2 | 10 -- 0
2 | 5 -- 0
2 | 2 -- 1
2 | 1 -- 0
2 | 0 -- 1

The binary number obtained is 101000101011_2
Hence, $A2B_{16} = 101000101011_2$

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Course Name: Introduction to Computer **Max. Marks: 20**

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Section – A

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Section – B

03X02 = 06 Marks

Q1. What is a Number system? Explain types of Number system.

Q2. What are the 5 types of Computer Generation?

Q3. Complete the following tables.

Binary Numbers	Octal Numbers	Decimal Numbers	Hexadecimal Numbers
0000	0	0	0
0100			4
0101			5
1000		8	8
		9	

1101		13	
1110		14	
		15	

Section – C

03X03 = 09 Marks

Solve following conversions:

Q.1

a) **Convert $(11011)_2$ to decimal number.**
b) **Convert 121_8 into the equivalent decimal number.**
c) **Convert 1010101_2 to octal.**

Q2.

a) **Convert 12_{16} into a decimal number.**
b) **Convert 26_{10} into a binary number.**
c) **Convert decimal number 49 into hexadecimal.**

Q3.

a) **Convert 65_{10} into an octal number.**
b) **Convert 127_{10} to a hexadecimal number.**
c) **Convert $A2B_{16}$ to an equivalent binary number.**

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Computing Skills

B. Voc. Program, 1st Semester (2022)

2nd In-Sem. Examination

Course Code: ITN1104 | **Time: 1 Hour**

Course Name: Basics of Networking | **Max. Marks: 20**

Instruction: Attempt all questions

Section-A

05X01 = 05 Marks

Q.1 Identify the class of the following IP address: 4.5.6.7.

A) class A

B) class B

C) class C

D) none of the above

Q.2 The number of addresses in a class B block is _____.

A) 65,534

B) 16,777,216

C) 256

D) none of the above

Q.3 The number of addresses in a class A block is _____.

A) 65,534

B) 16,777,216

C) 256

D) none of the above

Q.4 The number of addresses in a class C block is _____.

A) 65,534

B) 16,777,216

C) 256

D) none of the above

Q.5 Identify the class of the following IP address: 229.1.2.3.

A) class A

B) class B

C) class D

D) none of the above

Section - B

03X02 = 06 Marks

Q.1 What is Internet protocol?

Q.2 What do you mean by protocol ?

Q.3 How are IP address distributed?

Section - C

03X03 =09 Marks

Q.1 Difference between IPV4 and IPV6 ?

Q.2 Explain different types of IP classes ?

Q.3 Solve the questions with steps .

(A) find out subnet mask of 120.15.10.100

(B) Find out broadcast ip of 120.15.10.100

(C) Find out usable host of 180.168.10.100

(D) Find out Network and host id of 192.168.100.10

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School of Computing Skills

B. Voc. Program, 1st Semester (2022)

2nd In-Sem. Examination

Course Code: ITN1104 **Time: 1 Hour**

Course Name: Basics of Networking **Max. Marks: 20**

Instruction: Attempt all questions

Solution Answer sheet

Section 1

Q.1 = Class A

Q.2 = 65,534

Q.3 = 16,777,216

Q.4 = 256

Q.5= Class D

Section B

Answer 1 IP stands for internet protocol. It is a protocol defined in the TCP/IP model used for sending the packets from source to destination. The main task of IP is to deliver the packets from source to the destination based on the IP addresses available in the packet headers. IP defines the packet structure that hides the data which is to be delivered as well as the addressing method that labels the datagram with a source and destination information.

The first version of IP (Internet Protocol) was IPv4. After IPv4, IPv6 came into the market, which has been increasingly used on the public internet since 2006.

Answer 2 :Protocol, a set of rules or procedures for transmitting data between electronic devices, such as computers. In order for computers to exchange information, there must be a preexisting agreement as to how the information will be structured and how each side will send and receive it. Without a protocol, a transmitting computer, for example, could be sending its data in 8-bit packets while the receiving computer might expect the data in 16-bit packets. Protocols are established by international or industrywide organizations. Perhaps the most important computer protocol is OSI (Open Systems Interconnection), a set of guidelines for implementing networking communications

between computers. Among the most important sets of Internet protocols are TCP/IP (Transmission Control Protocol/Internet Protocol), HTTPS (Secure HyperText Transmission Protocol), SMTP (Simple Mail Transfer Protocol), and DNS (Domain Name System).

Answer 3 : IP addresses are managed by the Internet Assigned Numbers Authority (IANA), which has overall responsibility for the Internet Protocol (IP) address pool, and by the Regional Internet Registries (RIRs) to which IANA distributes large blocks of addresses.

The RIRs manage, distribute, and publicly register IP addresses and related Internet number resources, such as Autonomous System Numbers (ASN) and reverse Domain Name System (DNS) delegations within their respective regions. They do this according to policies which are developed within their respective regional communities, through open and bottom-up processes.

There are currently five RIRs:

AfriNIC – African region

APNIC – Asia Pacific region

ARIN – North America and several Caribbean and North Atlantic islands

LACNIC – Latin America and the Caribbean

RIPE NCC – Europe, the Middle East, and parts of Central Asia

Section 3 :

Answer 1 :

IPv4	IPv6
IPv4 has a 32-bit address length	IPv6 has a 128-bit address length
It Supports Manual and DHCP address configuration	It supports Auto and renumbering address configuration
In IPv4 end to end, connection integrity is Unachievable	In IPv6 end to end, connection integrity is Achievable
It can generate 4.29×10^{9} address space	Address space of IPv6 is quite large it can produce 3.4×10^{38} address space
The Security feature is dependent on application	IPSEC is an inbuilt security feature in the IPv6 protocol
Address representation of IPv4 is in decimal	Address Representation of IPv6 is in hexadecimal
Fragmentation performed by Sender and forwarding routers	In IPv6 fragmentation performed only by the sender
In IPv4 Packet flow identification is not available	In IPv6 packet flow identification are Available and uses the flow label field in the header

IPv4	IPv6
In IPv4 checksum field is available	In IPv6 checksum field is not available
It has broadcast Message Transmission Scheme	In IPv6 multicast and anycast message transmission scheme is available
In IPv4 Encryption and Authentication facility not provided	In IPv6 Encryption and Authentication are provided
IPv4 has a header of 20-60 bytes.	IPv6 has header of 40 bytes fixed

Answer 2 :

Class	Address Range	Subnet masking	Example IP	Leading bits	Max number of networks	Application
IP Class A	1 to 126	255.0.0.0	1.1.1.1	8	128	Used for large number of hosts.
IP Class B	128 to 191	255.255.0.0	128.1.1.1	16	16384	Used for medium size network.
IP Class C	192 to 223	255.255.255.0	192.1.11.	24	2097157	Used for local area network.
IP Class D	224 to 239	NA	NA	NA	NA	Reserve for multi-tasking.
IP Class E	240 to 254	NA	NA	NA	NA	This class is reserved for research and Development Purposes.

Solution 3 :

Answer A : **answer : first check class range**

120 = class A (1 network 3 host)

120.15.10.100 = network host host host

so put 255 on network bit and others put 0

Final answer : 255.0.0.0

Answer B :

120	**15**	**10**	**100**	**first check class range 120= CLASS A**
120	0	0	0	120 is network id
N	H	H	H	1 NETWORK 3 HOST
120	255	255	255	PUT 0 AS A 255
120	255	255	255	FINAL BROADCAST IP

Answer C :

180	168.	10	100	CHECK IP CLASS RANGE = CLASS B MEAN 2 NETWORK 2 HOST
180	168	0	0	CLASS B
N	N	H	H	
N	N	2^8	2^8	PUT 2^8 ON HOST POSTION
				SO FONAL 2^16 – 2 = 65534

Answer D :

192.	168	100	10	QUESTION

192	168	100	10	CLASS C
N	N	N	H	NETWORK AND HOST ID
255	255	255	0	SUBNET MASK
192	168	100	255	BROADCAST IP
192	168	100	255	IP ADDRESS CONSTRCTION HOST = 255 (1 TO 255 BIT ANY)