NEP 2020 Aligned

e-CODE

Windows 10 & MS Office 2016

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Computational Thinking

Cyber Ethics

Artificial Inteligence

Data Science

Coding

Board Games

Teacher Manual

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Brain Tuner

A. 1. (a) 2. (a) 3. (?) 4. (d) 5. (a)

B. 1. LAN 2. NAC 3. network 4. LAN 5. ring

C. 1. (F) 2. (T) 3. (F) 4. (T) 5. (T)

D. 1. There are different types of network topology such as Star Topology, Bus Topology, Ring Topology. Star Topology is the best cabled network topology for a large businesses.
Star topologies are most commonly used because we can manage the entire network from one location: the central switch. Basically it is used in home networks, where the central convection may be router, switch, or network hub.

2. A hub is basically a multiport repeater. A hub connects multiple wires coming from different branches, for example, the connector in star topology which connects different stations.
Just like Hub and Bridge. Switch is the upgraded version of the Bridge.
A switch is a multiport bridge with a buffer and a design that can boost its efficiency and performance. The switch can perform error checking before forwarding data that makes it very efficient as it does not forward packets that have errors and forward good packets selectively to correct port only.
A router is a device like a switch that routes data packets based on their IP addresses. Routers normally connect LANs and WANs together and have a dynamically updating routing table based on which they make decisions on routing the data packets.

3. NIC stands on the first place. Without this device, networking cannot be done. This is also known as network adapter card, Ethernet Card and LAN card. NIC allows a networking device to communicate with the other networking device.
NIC converts the data packets between two different data transmission technologies. A NIC converts parallel data stream into the serial data stream and the serial data stream into the parallel data stream.

4. The characteristics of a network are
   1. Security is one of the most essential characteristics of a computer network.
   2. Compatability with hardware and software components.
   3. Quality of service.

E. 1. Generally 'LAN' is used in schools buildings etc. LAN is a network that consists access points, cables, routers and switches these are the network devices he would need to set up a network.

2. Austin uses to set up 'MAN' for his city. A 'MAN' may be a network used by municipality or company to interocnnect its public works systems and Internet of thing (I0T) devices.

Fun Time

1. PAN 2. BACKBONE 3. MAN 4. NODES 5. SERVER
6. RING 7. INTERNET 8. LAN

2. BASIC COMPUTER NUMBER SYSTEM

Brain Tuner

A. 1. (d) 2. (a) 3. (b) 4. (c) 5. (c)

B. 1. binary 2. 10 3. 16 4. binary 5. 10, 1, 0

C. 1. (F) 2. (T) 3. (F) 4. (F) 5. (T)

D. 1. **There are four rules of binary addition.**

Case	A + B	Sum	Carry
1	0 + 0	0	0
2	0 + 1	1	0
3	1 + 0	1	0
4	1 + 1	0	1

There are four rules of binary multiplication.

Case	A × B	Multiplication
1	0 × 0	0
2	0 × 1	0
3	1 × 0	0
4	1 × 1	1

2. The technique to represent and work with numbers is called number system. Decimal number system is the most common number system. Other popular number systems include binary number system, octal number system, and hexadecimal number system.

Decimal number system is a base 10 number system having 10 digits from 0 ...to... 9. This means that any numerical quantity can be represented using these 10 digits. Decimal number system is also a positional value system.

Each binary digit is also called a bit. Binary number system is also positional value system, where each digit has a value expressed in powers of 2.

Decimal number system: A number system which uses digits from 0-9 to represent a number with base 10 is decimal numbers system.

Octal number system has eight digits – 0, 1, 2, 3, 4, 5, 6 and 7. Octal number system is also a positional value system with where each digit has its value expressed in powers of 8.

3. To convert 98 and 671 into binary numbers.

2	98	
2	49	0
2	24	1
2	12	0
2	6	0
2	3	0
2	1	1

$(98)_{10} = (1100010)_2$

2	671	
2	335	1
2	167	1
2	83	1
2	41	1
2	20	1
2	10	0
2	5	0
2	2	1
2	1	1

$(671)_{10} = (1010011111)_2$

4. (a) 1111 (b) 110111 5. (a) 100 (b) 10

E. 1 Octal to Decimal Conversion

$(7268)_8 = (?)_{10}$

$= 7 \times 8^3 + 2 \times 8^2 + 6 \times 8^1 + 8 \times 8^0$

$= 7 \times 512 + 2 \times 64 + 6 \times 8 + 8 \times 1$

$= 3584 + 128 + 48 + 8$

$= (3768)_{10}$

Hexa to Decimal Conversion

Hexadecimal Number: $19FDE_{16}$ Calculating Decimal Equivalent–

Step	Hexa Number	Decimal Number
Step 1	$(19FDE)_{16}$	$((1 \times 16^4) + (9 \times 16^3) + (F \times 16^2) + (D \times 16^1) + (E \times 16^0))_{10}$
Step 2	$(19FDE)_{16}$	$((1 \times 16^4) + (9 \times 16^3) + (15 \times 16^2) + (13 \times 16^1) + (14 \times 16^0))_{10}$
Step 3	$(19FDE)_{16}$	$(65536 + 36864 + 3840 + 208 + 14)_{10}$
Step 4	$(19FDE)_{16}$	$(106462)_{10}$

2. Here are four simple steps to keep in memory.

0 – 0 = 0

0 – 1 = 1, borrow 1 from the next more significant bit

1 – 0 = 1

1 – 1 = 0

There are four rules of binary subtraction.

3. WINDOWS 10 FEATURES AND BASIC WORKING

Brain Tuner

A. 1. (d) 2. (c) 3. (b) 4. (a)

B. 1. Windows 10 2. Microsoft Edge 3. start 4. Cortana 5. Virtual desktops

C. 1. (F) 2. (T) 3. (T) 4. (T) 5. (T)

D. 1. There are five different editions are there such as
1. Windows 10 Home 2. Windows 10 Pro
3. Windows 10 Education 4. Windows 10 Enterprise
5. Windows 10T

2. The standout features in windows 10 are Youtube monitoring, geofencing and remote device locking. Family safety apps even keeps tracks of your terns.

3. With Virtual desktops, you can create multiple screens and have different applications open on each screen.

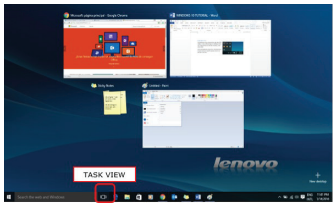
4. **Live Start Menu** The biggest change in Windows 10 from Windows 8 is the return of the Start menu. But unlike the traditional start menus, we got used to in Windows 7 and previous releases, the start menu in Windows 10 features live tiles with live app updates.

Windows Store Another thing that was rethought from Windows 8 is the Windows store. The Windows store is now a standalone application instead of opening in full screen as it does in Windows 8.
Cortana is the Siri or Google Now from Microsoft. It replaces the search function on your computer, and responds to voice commands, and has complete access to your personal information.
Task View It is a nice feature in Windows 10 is task view. Task view allows you see all the programs opened on your computer at once
Virtual Desktops Another cool feature in Windows 10 are Virtual Desktops with virtual desktops, you can create multiple screens and have different applications open on each screen.
Action Center Action center in Windows 10 is basically a notification center. All apps and system notifications are posted in the action center.
Redesigned Core Apps All core apps in Windows 10 like Mail, Calendar, File Explorer, etc. were revamped they look and work much better now.
Microsoft Edge is a new minimalist browser included in Windows 10 by default. It is also the default browser in Windows Mobile, Xbox One, and other Microsoft devices replacing Internet Explorer.

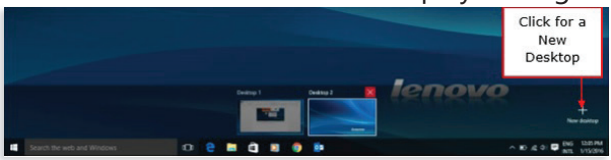
E 1. You can write your search terms with your finger instead of typing the words on the keyboard. As you write your handwritten text converts into words in the search box.

2. To add a virtual desktop, follow these steps –

Step (i) Click Task View on the Taskbar.



Step (ii) Click the "New desktop" option on the lower-right corner. You can access or delete the new Desktop by clicking Task View again.



4. CREATING CHARTS IN EXCEL

Brain Tuner

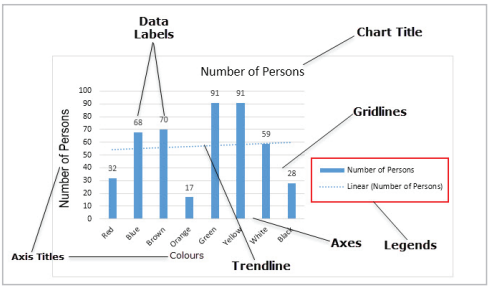
A. 1. (d) 2. (d) 3. (c) 4. (c) 5. (b)

B. 1. line graph 2. Doughnut 3. Illustrations 4. bar 5. legend

C. 1. (F) 2. (T) 3. (T) 4. (T) 5. (F) 6. (F)

D. 1. (i) In your email message, click insert>chart.
(ii) In the insert chart dialog box, click column and pick a column chart option of your choice, and click ok.
(iii) Replace the sample data with your own data.
(iv) Same the worksheet.

2. There are various components of a chart as shown in the following figure.



Axis: A line that serves as a major reference for plotting data in a chart. In two-dimensional charts there are two axes — the X-axis and the Y-axis. In most two-dimensional charts. Excel plots categories (labels) along the x-axis and values (numbers) along the y-axis. Bar charts reverse the scheme, plotting values along the X-axis. Pie charts have no axis.

Three-dimensional charts have an X-axis, Y-axis, and Z-axis. The X and Y axis delineate the horizontal surface of the chart. The Z-axis is the vertical axis, showing the depth of the third dimension in the chart.
Gridlines: Optional lines extending from the tick marks across the plot area, thus making it easier to view the data values represented by the tick marks.
Legend: A key that identifies patterns, colors, or symbols associated with the markers of a chart data series. The legend shows the data series name corresponding to each data marker such as the name of the blue columns in a column chart.
Data Label: A label that provides additional information about a point on a chart.
Plot Area: It is the rectangular area bounded by the two axis. The X-Axis and Y-Axis define the two sides of the rectangular plot area.
Chart Area: It refers to the area within which all chart components are placed, often it is surrounded by borders.
Axis Title: It is the title given to an axis. A 2-D Graph has two axis (x and y) and a 3D Graph has three (x, y and z).
Chart Title: It is usually placed at the top of the chart and helps the user understand what the chart represents.

3. The combination chart is a visualization that combines the features of the bar chart and the time chart. The combination chart displays the data using a number of bars/lines each of which represent a particular category.
4. Doughnut charts are very similar to pie charts in terms of the area in the center cut out. Doughnut charts have several elements. They are suitable for presenting the relationship between proportions of different data groups.
   Scatter Chart are ideal for analyzing non different goals settle around the main topic and their various dimensions. Scatter charts have some different elements: markers, points and straight lines. Radar Chart Radar charts are also known as web charts, star charts or polar charts. Radar chart is useful for showing multiple data group in terms of 2-D diagrams of at least three variables on axes.
5. Sparklines is a tiny chart in a worksheet cell that provides a visual representation of data. Use sparklines to show trends in a series of values such as seasonal, increases or decreases, economic cycles, or to highlight maximum and minimum values.

Brain Tuner

A. 1. (c) 2. (d) 3. (c) 4. (d)

B. 1. Pen 2. Double Headed 3. corner 4. sketch 5. keyframe

C. 1. (T) 2. (F) 3. (T) 4. (F) 5. (T)

D. 1. The keyboard shortcut to break apart the grouped objects is shift + B key board key.

2. We can modify the color properties of a particular instance or change its brightness or transparency. To change color, brightness or transparency, follow these steps.
To modify the gradient fill of an object, follow the steps:

Step (i) To change the size, select an instance on the stage, then go to the Properties panel and expand the Position and Size section, if necessary. To keep the size proportional to the original, click the Lock Width and Height icon at the left, then enter the desired size into either the W or H field.

Step (ii) To change the transparency, select an instance on the stage, then go to the Properties panel and expand the Color Effect section. Select Alpha from the Style menu.

Step (iii) Set the Alpha value to the desired transparency level.

Step (iv) A tint is a reduced value in color saturation that is opaque, as opposed to translucent, like the example above. Tints can also be applied to tone the original color. To change the tint, click the Style menu under Color Effects again and choose Tint.

E. 1. (i) Step (i) Select frame 40 for all three layers.
Step (ii) Choose insert > Timeline > Frame (F5).
Step (iii) Lock the Text layer and glow layer.
Step (iv) Choose insert > Timeline> key frame (F6).
Step (v) Move the red playhead to frame 40.

2. Create a graphic or instance that you want to tween, and then right click a frame and select create motion tween.
Select the graphic or instance that your want to tween, and select Insert> motion tween from the main menu.

Brain Tuner

A. 1. (a) 2. (c) 3. (a) 4. (b) 5. (b)

B. 1. Subtle, Exciting, Dynamic content 2. four
3. Apply to All, timing 4. animation painter
5. Slide master 6. Insert

C. 1. (F) 2. (F) 3. (T) 4. (T) 5. (T)

D. 1. An animation is a special effect that applies to a single element on a slide such as text, a shape, an image, and so on. A transition is the special effect that occurs when you exit one slide and move on to the next during a presentation.

2. There are four types of animation effects in Powerpoint such as:
Entrance: The animation effects of this category control how the object enters the slide. For example, the Bounce animation effect lets the object drop on the slide and bounce many times.
Emphasis: The animation effects of this category occur while the object is on the slide. They often occur on mouse click.
Exit: The animation effects of this category control how the object leaves the slide.
Motion Paths: The animation effects of this category make the object move along a specified path on the slide.

3. Powerpoint supports all common types of audio files including MP3, WAV, FCAC. MIDI and WMA.

4. In normal view, click the slide in which your want to embed the video. On the insert tab, in the media group, click the arrow under video. Select video from fill and then browse to the location of your video and select it. On the insert button, click the down arrow, and then click insert. To preview audio file

5. Step (i) Click an audio file to select it.
Step (ii) Click the Play/Pause button below the audio file. The sound will begin playing, and the timeline next to the Play/Pause button will advance.
Step (iii) To jump to a different part of the file, click anywhere on the timeline. To preview video file
Step (i) From the Insert tab, click the Video drop-down arrow, then select Video on My PC.
Step (ii) Locate and select the desired video file, then click Insert.
Step (iii) The video will be added to the slide.

E. 1. Record Slide show 2. Rehearse Timing Feature

Brain Tuner

A. 1. (c) 2. (d) 3. (c) 4. (c) 5. (a)

B. 1. True 2. order of execution 3. IF THEN and WHILE
4. Goto statements 5. iteration

C. 1. (T) 2. (F) 3. (T) 4. (F) 5. (T)

D. 1. A line number is a method used to specify a particular sequence of characters in a text file. The most common method of assigning numbers to line is to assign every line a unique numbers, starting at 1 for the first line, and incrementing by 1 for each successive line.

2. DO WHILE ....LOOP
It repeats as long as the condition holds true. This loop is used when a condition is to be tested first and if it is true, only then the statements in the body of the loop will be executed.
DO UNTIL....LOOP is similar to the DO WHILE.....LOOP. the only difference between the two loops is that in the DO UNTIL.....LOOP, the processing will continue as long as the condition is false.
This is used to execute a function of instruction for a given number of times.

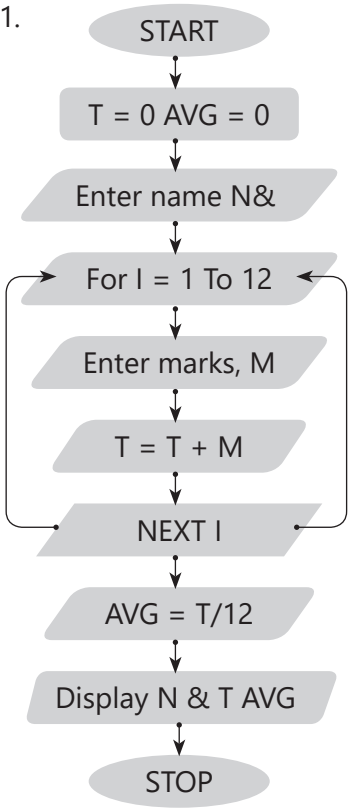
3. In Basic Programming, we can generate a loop by using:
1. Counter Method 2. WHILE-WEND Loop
3. FOR-NEXT Loop 4. Do WHILE Loop

4. A nested loop is a (linear) loop that appears in the loop body of another (outer) loop. Ex- The inner loop can be a while loop, while an outer loop can be a for loop.
Step loop– A step loop is a repeated series of field-blocks in a screen.

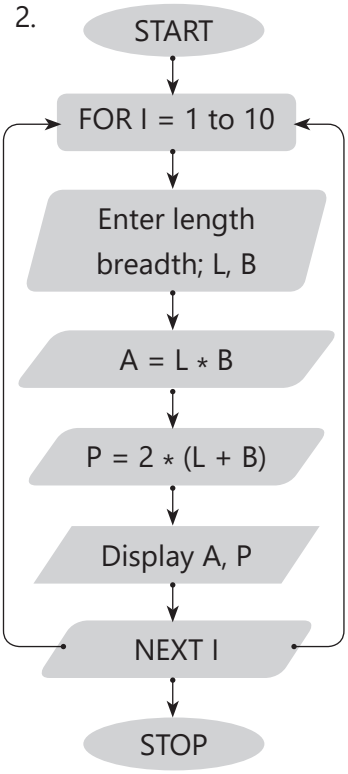
```
Ex- CLS
For I = 1 to 10 STEP 2
PRINT "CONTINUOUS LOOP"
NEXT I
END
```

5. The WHILE.... WEND LOOP is obsolete and you can use the DO LOOP instead.

E. 1.



E. 2.



8. MORE ON TAGS, TABLES, HYPERLINKS AND LISTS IN HTML 5

Brain Tuner

A. 1. (d) 2. (b) 3. (a) 4. (d)

B. 1. <P> 2. main headings 3. 4. <a> 5. <dl>

C. 1. (T) 2. (T) 3. (T) 4. (F) 5. (T)

D. 1. There are different types of tags in HTML such as:
<!DOCTYPE>– Defines the document type.
<html>– Defines an HTML document.
<head>– Contains information for the document.
<title>– Defines a title for the document.
<body>– Defines the document's body.
<h1> to h6>– Defines HTML headings.
<P>– Defines a paragraph.

– inserts a single page break.

2. HTML <a> tag provides you option to specify an email address to send an email. While using <a> tag as an email tag, you will use mailto: binuvargis06 @gmail.com along with href attribute. Following is the syntax of using mailto instead of using http. This code will generate the following link which you can use to send email.
Now, if a user clicks this link, it launches one Email Client (like Lotus Notes, Outlook Express etc.) installed on your user's computer. There is another risk to use this option to send email because if user do not have email client installed on their computer then it would not be possible to send email.

3. Ordered list used to create a list of related items in a specific order. The HTML <OL> tag defines an ordered list. An ordered list can be numerical or alphabetical.
There are five different types of attributes used for an ordered list.

Type	Description
Type "1"	In this type, the lits items are numbered with numbers.
Type "I"	The list items are numbered with upper case roman numbers.
Type "i"	The list items are numbered with lower case roman numbers.
Type "A"	The list items are numbered with upper case letters.
Type "a"	The list items are numbered with lower case letters.

4. **Cellspacing -** This attribute specifies the space between two adjacent cells. The value is specified in pixels. Ex- <TABLE cellspacing = 3>

   Cellpadding - This attribute specifies the space between the edge of a cell (cell wall) and the contents of the cell. The value is specified in pixels. Ex- <TABLE cellspacing = 3>

5. Line Break Tag use the <br /> element, anything following it starts from the next line. This tag is an example of an empty element, where you do not need opening and closing tags, as there is nothing to go in between them.
Non breaking space is a space that will not break into a new line. Two words separated by a non breaking space will stick together (not break into a new line). This is handy when breaking the words might be disruptive.

E. 1. HTML <Ol> start attribute 2. HTML <a> tag

9. AI FOR SDGS (SUSTAINABLE DEVELOPMENT GOALS)

Brain Tuner

A. 1. (c) 2. (c) 3. (c) 4. (a)

B. 1. Data systems 2. 2015 3. climatic 4. food security 5. smart

C. 1. (F) 2. (T) 3. (F) 4. (T)

D. 1. Artificial intelligence develops intelligence based on the instruction it receives.

2. The factors of data science are:
   1. Making data actionable for data science.
   2. Improving operationalization.
   3. Accelerating 'time to value'.
   4. A staggering amount of data growth.
   5. Shortage of data science talent.

3. One of UN Human Rights' goals when the Sustainable Development Goals (SDGs) were created in 2015 was to make human rights guidelines available to guide the national policies required to achieve them. Artificial intelligence is now used to power the Universal Human Rights Index (UHRI), the largest and most complete database of human rights guidance from human rights mechanisms, and to display the connections between this guidance and the SDGs.
   The following are the SDGs:

   1. No Poverty 2. Zero Hunger 3. Good Health & Wellbeing
   4. Quality Education 5. Gender Equality 6. Clean Water & Sanitation
   7. Affordable & Clean Energy 8. Decent Work & Economic Growth
   9. Industry, Innovation & Infrastructure
   10. Reduced Inequalities 11. Sustainable Cities & Communities
   12. Responsible Consumption & Production 13. Climate Action
   14. Life below Water 15. Life on Land
   16. Peace, Justice & Strong Institutions 17. Partnerships for the Goals

4. Artificial intelligence develops intelligence based on the instructions it receives. The computer is fed with datasets for training. The data given into the AI algorithm varies based on the tasks it is being used for.

5. The environmental impacts of AI are:
   Addressing climate change (SDG 13): AI can be helpful in creating a warning in climatic scenarios. It can generate notifications, warn the department about climate change, and encourage correct steps.
   Life below water (SDG-14): The world is suited for all of us because of the important role that animals that live in rivers and the oceans play in regulating temperature.
   Life on Land (SDG - 15): Artificial intelligence systems can also be useful for life on land. Through a variety of channels, including social media, search engines, and others, it can promote the use of ecosystems.
6. One of UN Human Rights' goals when the Sustainable Development Goals (SDGs) were created in 2015 was to make human rights guidelines available to guide the national policies required to achieve them. Artificial intelligence is now used to power the Universal Human Rights Index (UHRI), the largest and most complete database of human rights guidance from human rights mechanisms, and to display the connections between this guidance and the SDGs.
   - No poverty (SDG - 1)
   - Good Health and Well-Being (SDG - 3)
   - Zero Hunger (SDG - 2)
   - Quality Education (SDG - 4)
   - Gender Equality (SDG - 5)
   - Affordably and Cleanly Produced Energy (SDG-7)
   - Sustainable Cities and Communities (SDG - 11)
   - Partnerships for the goals (SDG-17)

REVISION SHEET–1

A. 1. 2 2. sorting 3. Envelop 4. Clock and Region 5. negative

B. 1. (b) 2. (a) 3. (b) 4. (c) 5. (a) 6. (c)

C. 1. (T) 2. (T) 3. (F) 4. (T) 5. (T) 6. (T)

D. 1. Radix– Radix or base is the number of unique digits, including the digit zero, used to represent numbers.
   2. Content view– It is a notion to define all the elements needed to get a list of items and perform their rendering.
   3. Ampersand– It is the address of operator.
   4. Custom filtering– It allows you to define matching logic that cannot be accomplished using the system-provided massage filters.
   5. Flipping– Flipping means rotating an image in a horizontal or vertical axis.

REVISION SHEET–2

A. 1. Constants 2. CIRCLE 3. horizontal rule 4. Facebook 5. bootkits

B. 1. (c) 2. (a) 3. (c) 4. (a) 5. (b) 6. (b)

C. 1. (F) 2. (F) 3. (T) 4. (T) 5. (T)

D. 1. Looping – It is a sequence of instructions that is continually repeated until a certain condition is reached.

2. Resolution – It is a measure used to describe the sharpness and clarity of an image or picture.

3. Attributes – It is a piece of markup language used to adjust the behaviour or display of an HTML element.

4. Bulletin board – A place on the computer system where user share public messages and general information.

5. Vault – Vault is a secret management tool specifically designed to control access to sensitive credentials in a low trust environment.

Cyber Olympiad

1. (a) 2. (c) 3. (b) 4. (b) 5. (b) 6. (c) 7. (d) 8. (b) 9. (c) 10. (b)

11. (d) 12. (b) 13. (c) 14. (d) 15. (d) 16. (b) 17. (b) 18. (a)