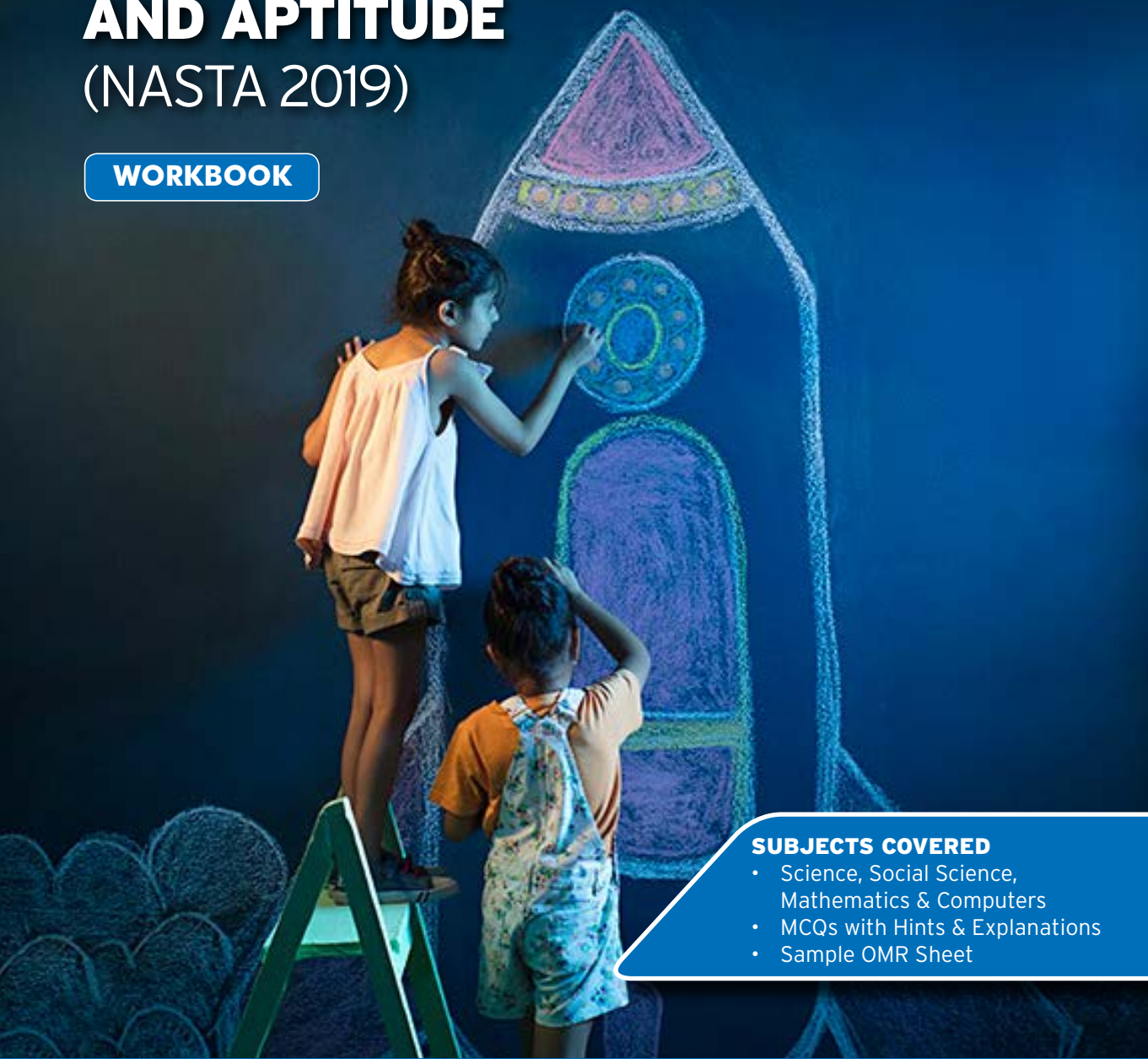
kamp
KNOWLEDGE & AWARENESS MAPPING PLATFORM

GRADE 9

NATIONAL ASSESSMENT FOR SCIENTIFIC TEMPERAMENT AND APTITUDE (NASTA 2019)

WORKBOOK



SUBJECTS COVERED

- Science, Social Science, Mathematics & Computers
- MCQs with Hints & Explanations
- Sample OMR Sheet

KNOWLEDGE AND AWARENESS MAPPING PLATFORM

UNLOCK THE HIDDEN SCIENTIST IN YOUR CHILD WITH KAMP

WHY SCIENTIFIC TEMPERAMENT IS IMPORTANT FOR YOUR CHILD?

Scientific temperament refers to an individual's attitude of logical and rational thinking. An individual is considered to have scientific temper if s/he employs a scientific method of decision-making in everyday life. The term was first coined by India's first Prime Minister, Jawaharlal Nehru, in his book 'The Discovery of India'.

"A Statement on Scientific Temper" prepared by a group of scholars and issued on behalf of the Nehru Centre, Bombay, in July 1981, mentions that "Scientific Temper involves the acceptance, amongst others, on the following premises:

1. The method of science provides a viable method of acquiring knowledge;
2. The human problems can be understood and solved in terms of knowledge gained through the application of the method of science;
3. The fullest use of the method of science in everyday life and in every aspect of human endeavour from ethics to politics and economics is essential for ensuring human survival and progress; and
4. That one should accept knowledge gained through the application of the method of science as the closest approximation of truth at that time and question what is incompatible with such knowledge; and that one should from time to time re-examine the basic foundations of contemporary knowledge."

NATIONAL ASSESSMENT FOR SCIENTIFIC TEMPERAMENT AND APTITUDE (NASTA)

National Assessment for Scientific Temperament and Aptitude (NASTA) is designed and developed for the elementary to middle school students. It is an Attribute Based assessment as against only Subject Based Assessment.

NASTA ASSESSMENT PARAMETERS

PARAMETERS	CONTEXT
Observation and Precision	Students need to be able to develop the most basic skill in science done by using our five senses in surrounding environment. After making observations it is important to group objects according to a purpose. Measuring is important in collecting, comparing, and interpreting data.
Imagination, Creativity and Innovation	Students need to be able to think and work creatively in both digital and non-digital environments to develop unique and useful solutions.
Critical Thinking and Problem Solving	Students need the ability to think critically, which includes proficiency with comparing, contrasting, evaluating, synthesizing, and applying without instruction or supervision. Students need the ability to solve complex problems in real time.
Prediction and Interpretation	Students should be able to predict and interpret situation, events, findings based on multiple observations. An inference is a link between what is observed and what is already known. Whereas, prediction is an educated guess based on good observations and inferences about an observed event or prior knowledge.
Communication and Collaboration	Students must possess the ability to collaborate seamlessly in both physical and virtual spaces, with real and virtual partners globally. Students must be able to communicate not just with text or speech, but in multiple multimedia formats. They must be able to communicate visually through video and imagery as effectively as they do with text and speech.
Social Skills and Empathy	This includes adaptability, fiscal responsibility, personal accountability, environmental awareness, empathy, tolerance, and global awareness.

IMPORTANCE OF ASSESSMENT PARAMETERS

PARAMETERS	DEFINITION AND IMPORTANCE
Observation and Precision	Scientific observation is the central element of scientific method or process. One of the core skills of a science enthusiast is to make observation. Precision and accuracy are two important factors during the course of scientific measurements. Precision is how consistent results are when measurements are repeated.
Imagination, Creativity and Innovation	Imagination is about seeing the impossible, or unreal. Creativity is using imagination to unleash the potential of existing ideas in order to create and valuable ones. Innovation is taking existing, reliable systems and ideas and improving them. These skills serve as an important backbone while solving problems.
Critical Thinking and Problem Solving	Critical thinking and problem solving refer to the ability to use knowledge, facts, and data to effectively solve problems. Scientific scenarios require one to assess the environment, analyze a situation, design a solution, and ultimately win in a competitive scenario. Both critical thinking and creative thinking serve as important pillars for design thinking.
Prediction and Interpretation	A prediction, or forecast, is a statement about a future event. A prediction is often, but not always, based upon experience or knowledge. Interpretation on the other hand is the act of explaining, reframing, or otherwise showing your own understanding of something. Scientific skillsets require honing of both predictability and interpretability skills to extrapolate findings or provide plausible reasons for an observation.
Communication and Collaboration	Collaboration and communication are interpersonal skills that help people work well with one another. These skills involve being able to read the vast number of verbal and nonverbal cues that we all use to communicate our ideas and emotions. In today's working environment, it is important that we proactively share ideas and knowledge to solve the complex and challenging problems that we encounter.
Social Skills and Empathy	Empathy and social skills allow us to function cohesively. We are continuously working towards examining and improving our world. While doing so, we end up judging or critically evaluating others. Empathy and social skills help us to be open-minded and develop a balance between self-confidence and understanding different perspectives.

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KNOWLEDGE & AWARENESS MAPPING PLATFORM

OMR ANSWER SHEET - NASTA 2019

Use HB PENCIL / BALL POINT PEN (BLUE / BLACK) to write and darken the circles.

CORRECT METHOD / सही तरीका ● WRONG METHODS / गलत तरीके ✗ ✓ ⊙ ◐

SCHOOL

KULDEEP INTERNATIONAL

100001

PARTICIPANT'S NAME

AMIT

CLASS	SCHOOL CODE	Roll No.	ENROLLMENT NO.
5	10672 - Paper-1	19100001	1910015947

MARK YOUR ANSWERS WITH HB PENCIL / BALL POINT PEN (BLUE / BLACK)

Qno.	A	B	C	D	Qno.	A	B	C	D	Qno.	A	B	C	D	Qno.	A	B	C	D
1	○	○	○	○	16	○	○	○	○	31	○	○	○	○	46	○	○	○	○
2	○	○	○	○	17	○	○	○	○	32	○	○	○	○	47	○	○	○	○
3	○	○	○	○	18	○	○	○	○	33	○	○	○	○	48	○	○	○	○
4	○	○	○	○	19	○	○	○	○	34	○	○	○	○	49	○	○	○	○
5	○	○	○	○	20	○	○	○	○	35	○	○	○	○	50	○	○	○	○
6	○	○	○	○	21	○	○	○	○	36	○	○	○	○	51	○	○	○	○
7	○	○	○	○	22	○	○	○	○	37	○	○	○	○	52	○	○	○	○
8	○	○	○	○	23	○	○	○	○	38	○	○	○	○	53	○	○	○	○
9	○	○	○	○	24	○	○	○	○	39	○	○	○	○	54	○	○	○	○
10	○	○	○	○	25	○	○	○	○	40	○	○	○	○	55	○	○	○	○
11	○	○	○	○	26	○	○	○	○	41	○	○	○	○	56	○	○	○	○
12	○	○	○	○	27	○	○	○	○	42	○	○	○	○	57	○	○	○	○
13	○	○	○	○	28	○	○	○	○	43	○	○	○	○	58	○	○	○	○
14	○	○	○	○	29	○	○	○	○	44	○	○	○	○	59	○	○	○	○
15	○	○	○	○	30	○	○	○	○	45	○	○	○	○	60	○	○	○	○

FILL UP THE CONTACT DETAILS BELOW

MOTHER'S / FATHER'S NAME

EMAIL ID

MOBILE NO. + 9 1

SIGN OF THE PARTICIPANT
TO BE SIGNED BY STUDENT ONLY

DATE OF EXAMINATION
D D - M M - Y Y Y Y

SIGNATURE OF THE INVIGILATOR

SECTION A

SCIENCE

1. Which of the following is NOT a musical instrument?

[A] Tabla [B] flute
[C] plastic bottle [D] Sitar

2. A scientist is testing an instrument for sound. He plays the instrument in four different places: in air, in water, in vacuum and in a closed room. In which of these cases will he hear no sound?

[A] Air [C] Water
[B] Vacuum [D] Closed room

3. Imagine yourself to be trapped in a house when lightning strikes the city. Which of the following would you likely not do to save yourself from lightning?

[A] Coming out in the open and opening an umbrella
[B] taking shelter under a tree
[C] Standing as far off from the trees as possible
[D] Unplugging the electrical appliances

4. Mira's teacher told her that by studying a wave, scientists can construct the complete map of the earthquake. About which of the following wave is her teacher talking about?

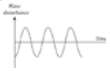
[A] Radio wave [B] Surface wave
[C] Seismic wave [D] none of these

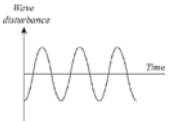
5. Suppose you are sitting in your car and suddenly a thunderstorm occurs. What will you do?

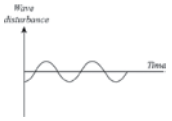
[A] Remain inside the car
[B] Get out of the car and stand under the sky
[C] Get out of the car and stand under a tree
[D] Get out of the car and hold an electrical pole

6. A teacher draws the waveforms for sound on the board asks the students as to identify the waveform for a low-pitch sound.

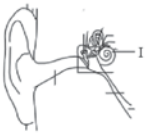
[A]

[B] 

[C] 

[D] 

7. Look at the figure given below.



Identify the labelled part in the figure.

[A] Eardrum [B] Pinna
[C] Iris [D] Cochlea

8. Identify the correct statement.

[A] The nucleus of an atom has a neutral charge.
[B] The nucleus of an atom has protons and neutrons.
[C] The nucleus of an atom has the same volume as that of the atom.
[D] Neutrons in an atom repel protons

9. Rohit's mother made halwa. When he returned from School, he could smell in from outside of his house and was happy. Why could he smell the aroma of his favorite food even without seeing it?

[A] Particle in gases have large space between them and high speed
[B] Because doors were open
[C] Because the sweet dish was yum
[D] Because Rohit was hungry

10. Ishan is a good swimmer. While swimming he easily cuts through water in swimming pool but he cannot cut through a tile or brick. Why?

[A] Tile or Brick is hard
[B] Water being liquid has its particles loosely packed whereas solids has tightly packed particles.
[C] Water is cold.
[D] He knows swimming well.

11. Ammonium Chloride when heated changes directly into vapors and you can smell it from far. The process is called as

[A] Melting [B] Evaporating
[C] Sublimation [D] Boiling

12. Arjun was playing with a torch light. He suddenly shifted the light towards his glass of milk. He was amazed to be able to see the path of light through milk. What type of mixture is milk?

[A] Homogenous solution
[B] Suspension
[C] Heterogeneous solution
[D] Colloidal solution

13. In ammonia, nitrogen and hydrogen are always present in ratio of 14:3 by mass. What mass of nitrogen would be required to react completely with 15gm of Hydrogen?

[A] 26gm of nitrogen
[B] 70 gm of nitrogen
[C] 28 gm of nitrogen
[D] 42 gm of nitrogen

14. According to Rutherford's model of atom, which sub atomic part of the atom is present in the nucleus?

[A] Electrons [B] Molecules
[C] Protons [D] Elements

15. Smith and Peter were on moon. They tried to converse but could not hear each other. Why?

[A] Sound wave can't travel in vacuum.
[B] They were travel in volume
[C] They were not interested in listening
[D] Too much noise on moon

16. The element used as the reference for atomic mass is

[A] Hydrogen [B] Oxygen
[C] Helium [D] Carbon

17. The number of Hydrogen atoms in 1 gram of Hydrogen

[A] 6.0 x10 23 [B] 6.022x10 23
[C] 6.022x10 25 [D] 6.5x10 23

18. The constituents, which make up a pure substance

[A] Are always separated
[B] can be separated by physical means
[C] cannot be separated by physical means
[D] Cannot be separated in any way

19. Smoke and fog both are aerosols. They

[A] Refer to the same matter
[B] Smoke is colloidal but fog is not
[C] Differ in composition
[D] Have same composition

20. A body is moving in a perfectly circular orbit. The work done on the body is

[A] Proportional to the mass of the body
[B] Infinite
[C] Proportional to the radius of the circular path
[D] Zero

21. Every planet has gravity. Consider Earth and Mars

[A] They have same gravity
[B] Earth has more gravity
[C] Mars has more gravity
[D] No determinable gravity

22. Sound waves are examples of

[A] Transverse pressure waves
[B] Longitudinal pressure waves
[C] Longitudinal light waves
[D] Transverse light waves

23. A man is unsuccessfully pushing a wall of height H and thickness T very hard. The work done by him on the wall is (g symbolizes acceleration due to gravity)

[A] Zero
[B] g×T×H
[C] T×H
[D] Indefinite

24. The work done in lifting a body of mass M through a vertical distance H is (g symbolizes acceleration due to gravity)

[A] W=MHg/2
[B] W=MHg
[C] W=MH×Hg
[D] W=2×MHg

SECTION B

SOCIAL SCIENCE

1. What does the term industry mean?
[A] Economic activity concerned with goods and minerals
[C] Economic activity concerned with company balance sheet
[B] Economic activity concerned with finance
[D] none of these

2. Human Resources practices that support strategy include
[A] performance management
[B] rewards practices
[C] staffing practices
[D] policies and procedures

3. Which of the following physical features do not act as a water divide?
[A] Mountain [B] Valley
[C] Plateau [D] Hills

4. What type of drainage pattern is formed by the Ganga River system?
[A] Dendritic Pattern [B] Trellis Pattern
[C] Rectangular Pattern [D] Radial Pattern

5. One day, you decided to speak to your parents to take small step at your home to save water. Which of the following will you adopt?
[A] Reuse water for drinking.
[B] Collecting rain water and using it for cleaning purposes.
[C] Stop watering plants in common area.
[D] Keeping garbage in open area.

6. The revolves round the sun due to
[A] inertia force [C] Centrifugal
[B] Gravitational force [D] Tidal Force

7. Resolution in a map determines
[A] The smallest separation between two objects that can be viewed
[B] The smallest object that can be viewed
[C] The largest separation between two objects that can be viewed
[D] The total area covered by the map

8. India is world's
[A] Largest economy
[B] democracy
[C] Largest land mass
[D] Largest military power

9. The main rainy season for India as a whole is
[A] North-east monsoon
[B] South-east monsoon
[C] South-west monsoon
[D] North-west monsoon

10. The climate over the globe is
[A] Same everywhere
[B] Varies with space and time
[C] Varies only with space
[D] Varies only with time

11. The carrying capacity of earth refers to the maximum
[A] Water it can hold
[B] Maximum population it can support
[C] Maximum vegetation it can support
[D] Maximum air it can hold

12. The natural vegetation of a location depends on
[A] Its climate
[B] Only water available
[C] Only Its temperature
[D] Only Its latitude

SECTION C MATHEMATICS

1. The frequency distribution table shows the number of books sold at a bookstore last week.

Day	Number of books sold
Monday	20
Tuesday	17
Wednesday	19
Thursday	37
Friday	12
Saturday	30
Sunday	15

On which day did the most number of books are sold?

[A] Saturday [B] Monday
[C] Sunday [D] Thursday

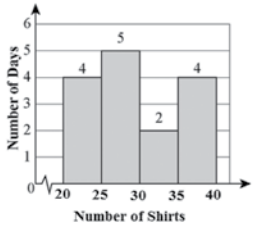
2. Study the following frequency distribution table below.

Height of Students	
Class interval Height (in centimeter)	**Frequency (Number of students)**
100 -120	21
120 - 140	23
140 - 160	9
160 - 180	12
Total	65

Which class interval has the lowest frequency?

[A] 100 - 120 [B] 120 - 140
[C] 140 – 160 [D] 160 - 180

3. The histogram shows the number of shirts sold at a store in the last 15 davs.



On how many days did the store sell 25 or more shirts?

[A] 4 [B] 9
[C] 11 [D] 15

4. A bag has pieces of papers labelled from 1 to 10. Ayush picked a piece of paper at random. What is the probability that the number labelled on the paper is an odd number?

[A] $\frac{1}{5}$ [B] $\frac{1}{2}$
[C] $\frac{1}{4}$ [D] $\frac{1}{9}$

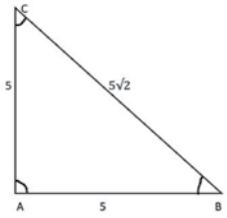
5. If $p(x) = 8 - 5x + 3x^2$, what is the value of $p(-2)$?

[A] 6 [B] 10
[C] 12 [D] 30

6. What is the perpendicular distance of the point M(5, 6) from the y-axis?

[A] 11 units [B] 6 units
[C] 5 units [D] 1 unit

7. What is the area of the with A(0, 0), B(5, 0) and



[A] 50 square units [B] 25square units
[C] 12.5 square units [D] 6.25 square units

8. If m < 0 and n <m, then in which quadrant the point (m, n) will lie?

[A] I [B] II
[C] III [D] IV

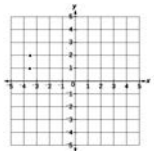
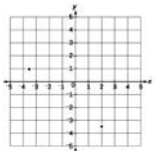
9. The coordinates of the two points A and B are and . If the distance of the point A is same from both the axes, which of these could be the coordinates of the point B?

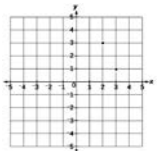
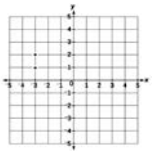
[A] (3, 2) [C] (–1, 4)
[B] (8, 3) [D] (2, –3)

10. Look at the table below.

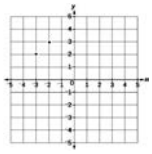
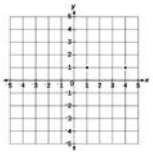
x	-3.5	2
y	1	-3.5

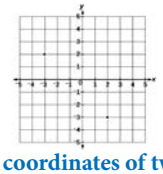
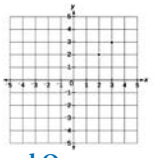
Which coordinate plane shows the ordered pairs plotted correctly?

[A]  [B] 

[C]  [D] 

11. The coordinates of a point P are (a, b) and the coordinates of a point Q are (b, a). Which of these correctly plots the points P and Q?

[A]  [B] 

[C]  [D] 

12. The coordinates of two points P and Q on a coordinate plane are $(2m+1, 4n)$ and $(m+3, 2n+10)$. If the two points coincide, what are the values of m and n?

[A] $m = 2$ and $n = 5$ [C] $m = 5$ and $n = 2$
[B] $m = 4$ and $n = 10$ [D] $m = 10$ and $n = 4$

13. For what value of p does the polynomial $3x^2 + 2x + p$ when divided by $x - 1$ leave the remainder 2?

[A] 1 [B] -3
[C] 2 [D] -5

14. What is the value of k so that $x - 2$ is a factor of the polynomial $2x^2 - kx + 4$?

[A] 6 [C] 4
[B] -3 [D] -2

15. The volume of a cube can be expressed as $27m^3 + 8 + 54m^2 + 36m$. If the volume of this cube is 125 cubic meters, what is the value of m?

[A] 5 [B] 1
[C] 8 [D] 125

16. The degree of the polynomial $x^{2b+6} - 2$ is 0. What is the value of b?

[A] 0 [B] 6
[C] -2 [D] -3

17. Simplify the expression (so that x and y appears only once)

$$\frac{(6x^4)(4y^2)}{(3x^2)(16y)}$$

[A] x^2y [B] $\frac{1}{2}x^2y$
[C] $\frac{1}{2}xy$ [D] $\frac{1}{2}x2y$

18. The height of a cuboid has a base area of 180 cm^2 and volume of 900 cm^3. Its height is

[A] 15 cm [B] 10 cm
[C] 5 cm [D] 7 cm

19. The values of the constant q for which the quadratic equation $x^2 + 2x = -2q$ have two distinct real solutions is

[A] $q < 1/2$ [B] $q = 1/2$
[C] $q > 1/2$ [D] $q = 0$

20. From a circular sheet of radius 4 cm, a circle of radius 3 cm is cut out. The area of the remaining sheet after the smaller circle is removed, is

[A] 7π [B] 9π cm^2
[C] 16π cm^2 [D] 7π cm^2

21. Solution to the equation below $0.1x - 1.6 = 0.2x + 2.3$ is

[A] -39 [B] 39
[C] -3.9 [D] 3.9

22. The equation sqrt(x) = -1

[A] Has many real solutions
[B] Has zero as a solution
[C] Has one real solution
[D] Has No real solutions

23. A cuboidal box of dimensions 1 m × 2 m × 1.5 m is to be painted except its bottom. The area of the box to be painted is:

[A] $1m^2$ [B] $11m^2$
[C] $2m^2$ [D] $10m^2$

SECTION D

DIGITAL LITERACY/IT

1. Playing movie through DVD that allows you to go forward and backward is an example of _____ media.

[A] Non-Contiguous [B] Contiguous
[C] Linear [D] Non-Linear

2. Which of the following statements best describes cutout animations?

[A] Cutouts are created from existing objects. Then these cutouts are automatically moved.
[B] Cutouts are stationary. A moving movie camera is focused on the cut-out and the animated scene is captured.
[C] Cutouts are arranged on flat surfaces. They are then moved and repositioned. This way animation is simulated.
[D] There exists no animation technique such as cutout animations.

3. Which of the following statement(s) is/are true?

[A] Hiding an element can be done by setting the display property to "none"
[B] Hiding an element can be done by setting visibility property to "hidden"
[C] Both A and B above
[D] Only A

4. The _____ rule is used to make sure that the property always be applied whether another property appears in CSS.

[A] #important [B] !important
[C] !first [D] @important

5. Teacher asked Riya "In Photoshop, what does the color mode RGB stand for? Riya gave the following answers:

Answer 1: Red,Grey, Black
Answer 2: Red, Green, Blue
Answer 3: Real Graphic Backgrounds
Answer 4: Reduction Graphic Blending

Choose the correct answer.

[A] Red,Grey, Black
[B] Red, Green, Blue
[C] Real Graphic Backgrounds
[D] Reduction Graphic Blending

6. Where in an HTML document is the correct place to refer to an external style sheet?

[A] At the end of the document
[B] In the <head> section
[C] At the top of the document
[D] In the <body> section

7. A system allows to have more than one program in to main memory for execution is known as?

[A] Uniprocessor System
[B] Multi-processor System
[C] Multi-threading System
[D] Multi programming System

8. Which of the following is not an output device?

[A] Monitor, Keyboard
[B] Printer
[C] Keyboard
[D] Monitor, Printer, Keyboard

9. Raj wish to create a new file in Photoshop using a shortcut. Which of the following shortcut should he use?

[A] File,new [B] Ctrl+N
[C] Shift+N [D] Ctrl+Shift+N

10. 5 friends were discussing about the number of colour modes available in photoshop. Radha and Geeta said that there are 5 modes, Rahul & Ajay

said that there are 3 modes and Harish said that there are 2 modes. Can you tell which among them are correct?

[A] Rahul & Ajay [B] Radha&Geeta
[C] Harish [D] None of them

11. Which tool looks like a pointing finger and blends the pixels within the image creating a blurred/ blended effect in Photoshop?

[A] Gradient Tool [B] Smudge Tool
[C] Move Tool [D] Eraser Tool

12. In the stacking order, which layer would appear first in an image in Photoshop?

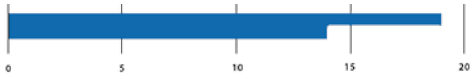
[A] The bottom layer
[B] Any layer which is selected
[C] The background layer
[D] The top layer

13. Wi-Fi stands for?

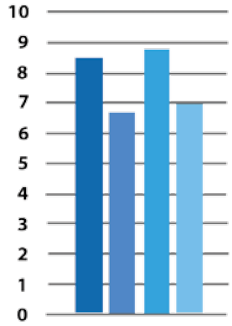
[A] Wired Forwarded Internet
[B] Wireless Forwarded Internet
[C] Wireless Fidelity
[D] Wired Fidelity

14. Which of the following charts does excel supports?

Pie Chart



Bar Chart



Column Chart

[A] Column & Pie Chart
[C] Bar & Column Chart
[B] Pie & Bar Chart
[D] All of these

15. Excel provide various statistical functions. Choose the odd one:

[A] MAX() [B] MIN()
[C] SUM() [D] IF()

16. How a background color can be added for all <hl> elements?

[A] all. h1 {background-color:#FFFFFF}
[B] h1. all {background-color:#FFFFFF}
[C] h1 {background-color:#FFFFFF}
[D] h1 {background-color;#FFFFFF}

17. The given icon is used for which of the following purpose?

AB[1]

[A] To add a line of text below or above a graphical object.
[B] To assign hyperlinks in a document that are created to perform repetitive tasks.
[C] To add a numbered node at the end of a page, which gets automatically renumbered as the text move around the document.
[D] To increase the number of comments that were inserted in a document.

18. Radha wish to match the width of the document with the width of the window. Which of the following options available in View tab will allow her to do so?

[A] Match Width [B] Zoom Width
[C] Page Width [D] Arrange Width

19. Live television, Video on Demand and time shifted television are services offered by _____.

[A] IPTV [B] HTTV
[C] VOTP [D] Colde TV

20. Google Now, an intelligent personal assistant by Google can provide_____.

[A] Weather Information [B] Sports Updates
[C] Nearby Events [D] All of these

21. Which of the following is a command which when typed will clean the DNS Cache stored in a local machine?

[A] ipclean/dns [B] ipflush/dns
[C] ipconfig/ cleandns [D] ipconfig/flushdns

22. When a few similar configuration computers are networked together and they share resources amongst each other without any centralized

system, which type of network architecture is then formed?

[A] Client server network [B] MAN
[C] Peer-to-Peer network [D] WAN

23. A CSS declaration always ends with a _____, and declaration groups are surrounded by _____.

[A] Semicolon and square brackets
[B] Semicolon and curly brackets
[C] Either [A] or [B]
[D] Neither [A] nor [B]

24. Identify the virus.
1. It was distributed by David L. Smith.
2. It was distributed as e-mail attachment.

[A] Melissa [B] Code Red
[C] Blue Whale [D] ILOVEYOU

25. False reports about non-existent viruses, which claims how harmful the effect would be if suggested steps mentioned in the e-mails are not taken are called _____.

[A] Browser Object [B] Exploitholic
[C] Cookies [D] Hoax

26. Shanaya is using an operating system that allows her to click and drag objects with mouse instead of entering commands. Which type of operating system she might be using?

[A] CLI [B] SSI
[C] GUI [D] DSI

27. Network topology provides way for connecting computer to each other. In which of the following topologies if any node fails, it does not affect the entire network.

[A] Star [B] Mesh
[C] Ring [D] Both A and B

28. The operating system creates _____ from the physical computer

[A] Virtual Space
[B] Virtual Computers
[C] Virtual Device
[D] None of these

29. Poor response times are usually caused by?

[A] Process busy [B] High I/O rates
[C] High paging rates [D] Any of these

30. A stand-alone system which produces one page of printed output at a time is?

[A] Page printer
[B] Line printer
[C] Laser printer
[D] Dot-matrix printer

31. Examples of multimedia softwares are

[A] Audio, graphics and video
[B] Only video
[C] Only graphics
[D] Only audio

32. A way of reducing page loading time is

[A] Increase lookups
[B] Increase image size
[C] Increase redirects and caching
[D] HTTP compression

33. Java is based on object-oriented programming; this means the

[A] Only methods describe the state and behavior of an object.
[B] class and methods describe the state and behavior of an object.
[C] class and methods describe only the state of an object.
[D] class and methods describe only the behavior of an object.

34. Message authentication is a service beyond

[A] Message Integrity
[B] Message Splashing
[C] Message Sending
[D] Message Confidentiality

35. In Message Confidentiality, transmitted message must make sense to only intended

[A] Receiver [B] Modulor
[C] Translator [D] Sender

36. A hash function guarantees integrity of a message by ensuring that message not be

[A] Changed [C] deleted
[B] Replaced [D] Violated

37. In computer terminology an example of phishing is an email

[A] directing the recipient to enter personal details on a fake website
[B] warning the recipient of a computer virus threat
[C] directing the recipient to download an attachment.
[D] directing the recipient to forward the email to others

SECTION E

LOGICAL REASONING

1. Explanation –Spot the number of differences between the two cartoon images.

[A] 10
[B] 6
[C] 3
[D] No difference

2. There are five sisters in a House. There is no one else in the house. Rita is reading a book, Shila is cooking, Nirmala is playing chess, and Radhika is cleaning the room. What is the fifth sister Aruna doing?

[A] Aruna is sleeping
[C] Aruna is playing chess with Nirmala
[B] Aruna is talking over phone
[D] Aruna is watching a movie

3. Match the two columns:

A	B
Afforestation	Petroleum
Sandstone	Armour
Metallic Mineral	Flood control
Fossil fuel	Red Fort

[A] Afforestation-Petroleum
Sandstone -Armour
Metallic Mineral- Flood control
Fossil fuel – Red Fort

[B] Afforestation- Armour
Sandstone - Petroleum
Metallic Mineral- Red Fort
Fossil fuel – Flood control

[C] Afforestation- Flood control
Sandstone - Red Fort
Metallic Mineral- Armour
Fossil fuel – Petroleum

[D] Afforestation- Red Fort
Sandstone - Flood control
Metallic Mineral- Petroleum
Fossil fuel –Armour

4. Match the images with the method of data collection

i. The number of pens each student in your class has.

ii. Customers' opinions on the new design of a shop.

iii. Whether students in your school have mobile phones.

iv. The symptoms of hospital patients with cancer.

[A] i – observation, ii-questionnaire survey, iii-interview, iv-medical test reportsrecord

[B] i- questionnaire survey, ii-observation, iii-medical test reports record, iv- interview

[C] i-observation, ii-interview, iii- questionnaire survey, iv- medical test reports record

[D] i-medical test reportsrecord, ii-observation, iii-interview, iv-questionnaire survey

5. Identify the variables

i. Production of tomatoes

ii. Sun light

iii. Genes

iv. Looks

[A] i- independent variable, ii-dependent variable, iii-dependent variable, iv-independent variable

[B] i-dependent variable, ii-independent variable, iii-independent variable, iv-dependent variable

[C] i-independent variable, ii-control variable, iii-dependent variable, iv- control variable

[D] I- control variable, ii-independent variable, iii-dependent variable, iv-control variable

HINTS & EXPLANATION

SECTION-A
SCIENCE

1. (C) Plastic is not a musical instrument.
2. (B) Sound needs a medium to propagate. A vacuum means a place with no air. In such a case there will be no medium and hence sound cannot propagate.
3. (A) Standing in an open area and opening an umbrella makes you more prone to getting struck by lightning
4. (C) By studying the seismic wave, scientists can construct the complete map of the earthquake
5. (A) In case of thunderstorms, you should not come out and say inside the car
6. (D) A low-pitch sound corresponds to a lower number of oscillations that pass a fixed point per unit time.
7. (D)
8. (B) The nucleus of an atom consists of protons and neutron
9. (A) In gaseous state, the particles move freely at high speed. So, particles of aroma of the food mixed with particles of air and spread around
10. (B) In liquid particles are less strongly packed so its easier to cut through water. Solids have definite shape and the force binding the particles is high hence difficult is cut through
11. (C) A change of state from solid to gas without changing in liquid state first is called sublimation. E.g. Camphor
12. (D) Colloidal is a heterogeneous solution with small particle which are uniformly distributed. They tend to scatter beam of light through them.
13. (B) Ratio of Nitrogen and hydrogen in NH3 is 14:3.
    14* __: 3*5
    14*5: 15
    70: 15
14. (C) On the basis of Rutherford's model of atom. Protons form the core (nucleus) of the atom. They are positively charged particle.
15. (A) Sound is a mechanical wave. It needs a medium to travel like air water, metal etc
16. (D) International convention
17. (B) One gram of Hydrogen = 1 Mole = 6.022x10 23
18. (C) The constituents of an impure substance can be separated by physical means. The constituents, which make up a pure substance cannot be separated by physical means
19. (B) Smoke and fog differ by their composition. They both are colloidal mixtures but smoke is consists of air mixed with carbon particles but fog consists of air mixed with water vapour (mostly).
20. (D) No work is done as the force and the displacement are perpendicular to each other
21. (B) Gravity of an object depends on its mass
22. (B) Sound waves are Longitudinal pressure waves resulting from compression and rarefication of a medium
23. (A) No work is done as displacement is zero
24. (B) Work is Force (Mg) x Displacement (H)

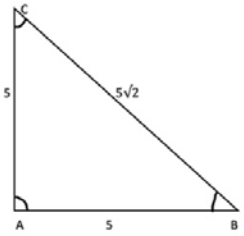
SECTION-B
SOCIAL SCIENCE

1. (A) It is an economic activity concerned with the processing of raw materials and manufacturing of goods in factories.
2. (A) The HR strategy touches all the keys areas in HR. These includes recruitment, learning and development , performance appraisal , compensation and succession planning.
3. (B) Because a water divide is an upland.
4. (A) Because Ganga river and its tributaries form a tree-like pattern.

5. (B) Because collecting rainwater reduces water wastage.
6. (B) The gravitational attraction between sun and earth results in the revolution of earth around the sun
7. (A) Resolution is defined as the smallest separation between two objects that can be viewed
8. (B) With its over 135 crore populations and a well established democratic system India is world's largest democracy
9. (C)
10. (B) Climate refers to long time mean of weather at a place. It changes from location to location and also with time
11. (B) Population uses natural resource. So earth can support only a maximum of population
12. (A) Climate determines all the requirements for a vegetation

SECTION-C
MATHEMATICS

1. (D) By looking at the frequency distribution table, we can observe that the most number of books sold on Thursday.
2. (C) The class 140 – 160 has the lowest frequency, that is, 9.
3. (C) Here, the horizontal axis of the histogram represents the number of shirts sold.
From the histogram, we observe that the last 3 bars represent the number of days on which the number of shirts sold was 25 or more.
Therefore, the number of days on which25 or more shirts were sold is
4. (B) There are 10 possible outcomes of the event.
Out of these, 1, 3, 5, 7 and 9 are odd numbers, that is, there are 5 odd numbers.
So, the probability that the number labelled on the paper is an odd number is
5. (D) $p(x) = 8 – 5x + 3x2$ or, $p(–2) = 8 – 5(–2) + 3(–2)2 = 8 + 10 + 12 = 30$
6. (C) The perpendicular distance of the point M(5, 6) from the y-axis is 5 units as the x-coordinate of the point is 5.
7. (C) The triangle ABC with A(0, 0), B(5, 0) and C(0, 5) is



So, the area = $\frac{1}{2}$ =12.5 square units.

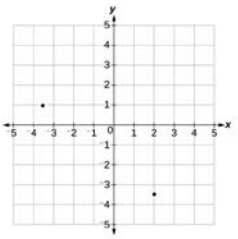
8. (D) Given that m < 0 and n <m, this suggests that both m and n are negative and therefore, the point (m, n) will lie in quadrant IV.
9. (C) The coordinates of the two points A and B are (a + 3, b – 2) and (a, b) .
The distance of the point A is same from both the axes.
So,
$a + 3 = b – 2$
$\Rightarrow a – b = – 2 – 3x$
$\Rightarrow a – b = – 5$

Of the given choices, the coordinates of the point B (a, b) such that $a – b = –5$ are $(–1, 4)$.
10. (B) The table shows the ordered pairs (x, y) .

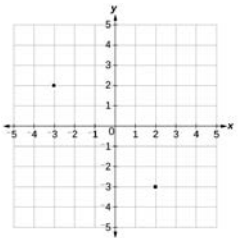
x	-3.5	2
y	1	-3.5

The pairs of numbers given in the table can be represented by the points (–3.5, 1) and (2, –3.5) .

The coordinate plane that represents the two points is shown below.



11.(C) The coordinates of the point P are (a, b) and the coordinates of the point Q are (b, a) .
From the given options, the x-coordinate of the point P is same as the y-coordinate of the point Q and the y-coordinate of the point P is same as the x-coordinate of the point Q is same in the C.



12. (A) The two points P and Q are on a coordinate plane.
When the two points coincide, their coordinates are equal.

For the coordinates of the point P to be equal of the point Q, $2m + 1 = m + 3$ and $4n = 2n + 10$. On solving the two equations, we get, $m = 2$ and $n = 5$

13. (B) Using the remainder theorem, we have

$$3(1)^2 + 2(1) + p = 2$$
$$3 + 2 + p = 2$$
$$p = -3$$

So, the value of p is -3.

14. (A) By the factor theorem,

$$2(2)^2 - k(2) + 4 = 0$$
$$8 - 2k + 4 = 0$$
$$12 - 2k = 0$$
$$k = 6$$

So, the value of k so that $x - 2$ is a factor of the polynomial $2x^2 - kx + 4$ is 6.

15. (B) We have,

$$27m^3 + 8 + 54m^2 + 36m$$
$$= (3m)^3 + 2^3 + 3 \times (3m)^2 \times 2 + 3 \times 3m \times 2^2$$
$$= (3m + 2)^3$$
$$(3m + 2)^3 = 125$$
$$(3m + 2)^3 = 5^3$$
$$3m + 2 = 5$$
$$3m = 3$$
$$m = 1$$

The volume of the cube is 125 cubic meters.

16. (D) A non-zero constant polynomial has degree 0. For the given polynomial to be a non-zero constant polynomial, we have

$$2b + 6 = 0$$
$$2b = -6$$
$$b = -3$$

17. (C)

18. (C) Volume of cuboid = base area × height
900 = 180 × height
So, height = 900/180 = 5 cm

19. (A)

20. (A) The area of the remaining sheet after the smaller circle is removed will be = Area of the entire circle with radius 4 cm – Area of the circle with radius 3 cm
Area of circle = πr^2
Area of the entire circle = $\pi(4)^2 = 16\pi$
And,
Area of the circle with radius 3 cm which is cut out = $\pi(3)^2 = 9\pi$
Thus, the remaining area = $16\pi - 9\pi = 7\pi$

21. (A) 0.1 x - 1.6 = 0.2 x + 2.3
= x -16 -2x – 23
X = -39

22. (D) sqrt(x) = -1 has only imaginary solution

23. (B) Length of box = 2 m, Breadth of box = 1 m
Height of box = 1.5 m
The surface area of cuboid = 2(lb + lh + bh)
But here the bottom part is not to be painted.
So,
Surface area of box = lb + 2(bh + hl)
= 2 × 1 + 2 (1 × 1.5 + 1.5 × 2)= 2 + 2 (1.5 + 3.0)
= 2 + 9.0 = 11
Thus, the required surface area of the box = $11m^2$.

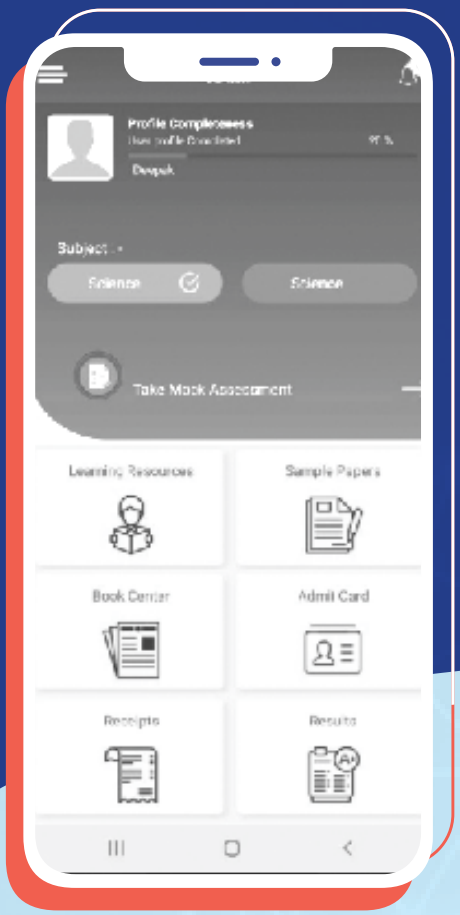
SECTION-D
DIGITAL LITERACY

1. (D) Playing movie through DVD that allows you to go forward and backward is an example of non-linear media.
2. (C) Cutouts are arranged on flat surfaces. They are then moved and repositioned. This way animation is simulated.
3. (C)
4. (B) The !important rule is used to make sure that the property always be applied whether another property appears in CSS.
5. (B) RGB stands for Red, Green, Blue
6. (B) External style sheet can be referred through <head> section
7. (D) If multiple program can be executed at the same time, it is called Multi programming system.
8. (C) Keyboard is an input device
9. (B) Ctrl+N is used to create a new file in photoshop.
10. (B) There are 5 colour modes in photoshop. RGB, CMYK, Gray Scale, Bitmap and Index.
11. (B) Smudge tools performs the above action
12. (D) The top layer appears first in stacking order
13. (C) Wi-Fi is the short form of Wireless Fidelity
14. (D) Excel Supports various chart format like Bubble, Stock, Surface, Radar, Combo ,Column, Line,Pie,Doughnut,Bar,Area,Scatter
15. (D) IF() required a condition. If condition is TRUE the IF() will be executed otherwise IF() will not be executed. Whereas other functions do not require any condition and will always get executed as & when used.
16. (C) h1 {background-color:#FFFFFF} is used to add background color for all <hl> elements
17. (C) Clicking on this icon adds a footnote in the document.
18. (C)

19. (A) IPTV transmits and broadcasts television programs through the Internet using Internet Protocol.
20. (D) Google Now can assist for all the updates.
21. (D) DNS cache stores the locations of web servers that contain web pages which you have recently viewed. When the ipconfig/ flushdns command is executed successfully the system returns the following message: Windows IP configuration successfully flushed the DNS Resolver Cache.
22. (C)
23. (B) Curly brackets are used in CSS
24. (A) Melissa is the spread through email attachment.
25. (D) Hoax are the false reports
26. (C) Graphical User Interface enables a user to interact with a computer system using items such as icons, windows, pointers, etc.
27. (D) In star & mesh topologies, if a node fails it does not affect the entire network.
28. (B)
29. (D) All can be the factors
30. (A) Page printer produces one page of printed output at a time.
31. (A) All the three elements are needed in multimedia
32. (D) Reduced file size due to HTTP compression reduces loading time
33. (B) Both class and methods describe the state and behavior of an object.
34. (A)
35. (A)
36. (A)
37. (B)

SECTION-E
LOGICAL REASONING

1. (B) There are six differences –
   - The stripe on the balloon in the hand of the running person,
   - The colour of the shoe of the person throwing balloon,
   - The same person has a collar in one image but not in another,
   - Stripes on the shoe of the running person on who the balloon is thrown,
   - The number of water drops in front of the running person,
   - The number of strips between the person running and the person chasing him is three in one and four in another.
2. (C) Nirmala must be playing chess with someone and since other sisters are busy with their work, it is Aruna who is playing with her.
3. (C) Afforestation leads to flood control; Red Fort is made of sandstone; Armours are made of iron which is a metallic metal; and Petroleum is a fossil fuel.
4. (C) The number of pens each student in your class can be ascertained by observation. Customers' opinions on the new design of a shop can be gathered through interviews. Whether students in your school have mobile phones can be known from medical test report records.
5. (B) Production of tomatoes depends on sunlight. Hence, sunlight is independent variable and tomato production is dependent variable. Similarly, looks depends on genes. Hence, genes is independent variable and looks and dependent variable. None of the variables is control variable.



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One of the pressing issues of India is that young students are not attracted to opt science as a career, and therefore, there is a strong need to address this issue. In pursuit of the solution in policy advocacy, CSIR-NISTADS has initiated Knowledge and Awareness Mapping Platform (KAMP) in association with M/S Nysa Communications Pvt. Ltd., a CMMI level 5 organization.

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