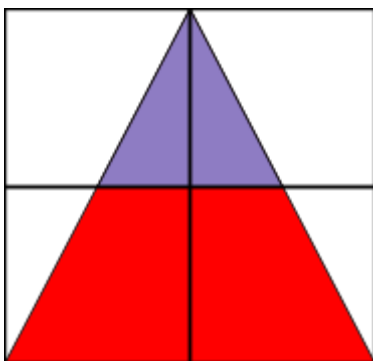# BNAT Sample Paper- Grade10

Mathematical Ability

1. What is the ratio of the area of the purple triangle to the red region, if both the vertical and horizontal lines are perpendicular and divide the square into equal parts?


   a. 1:4
   b. 2:3
   c. **1:3**
   d. 3:5

   Answer: Option (c)

2. In a cylindrical container, circular discs are stacked. The first disc is 1 cm in thickness, the second is 2 cm thick, and consecutive discs increase by 1 cm. If the cylinder is 2 m tall, what is the maximum number of discs that can be completely contained in it?
   a. 18
   b. **19**
   c. 20
   d. 21

   Answer: Option (b)

3. The red portion in the image is removed from the sphere to form a cavity. The centre of the base of the cylindrical cavity and the sphere are the same. If the radius of the sphere is 6 cm and the height and radius of the cavity are equal, what is the volume of the cavity?
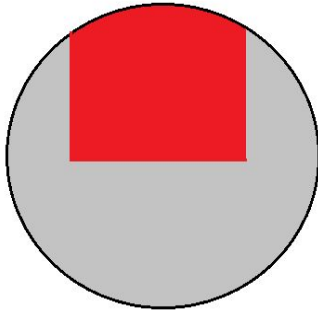
a. $36\sqrt{2}\ \pi\ cm^3$

b. $54\sqrt{2}\ \pi\ cm^3$

c. $27\sqrt{2}\ \pi\ cm^3$

d. $48\sqrt{2}\ \pi\ cm^3$

Answer: Option (b)

4. How many identical metal cones should be melted to form a cylinder that has twice the radius and twice the height of one of those cones?

    a. 4

    b. 8

    c. 12

    d. **24**

Answer: Option (d)

5. 13 points are marked on the circumference of a circle such that the distance between consecutive points are equal. If lines are drawn from each point to all other points, how many chords would be formed?

    a. 72

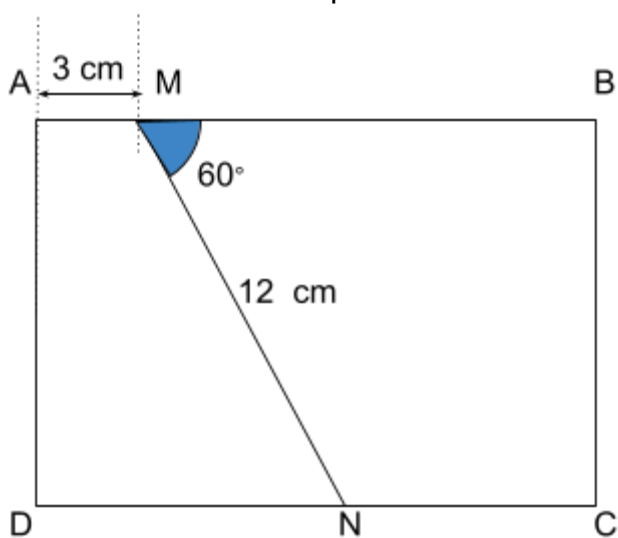   b. **78**

    c. 102

    d. 108

Answer: Option (b)

6. What is the area of the triangle ACB (in sq. units), if A is the centre of the circle?
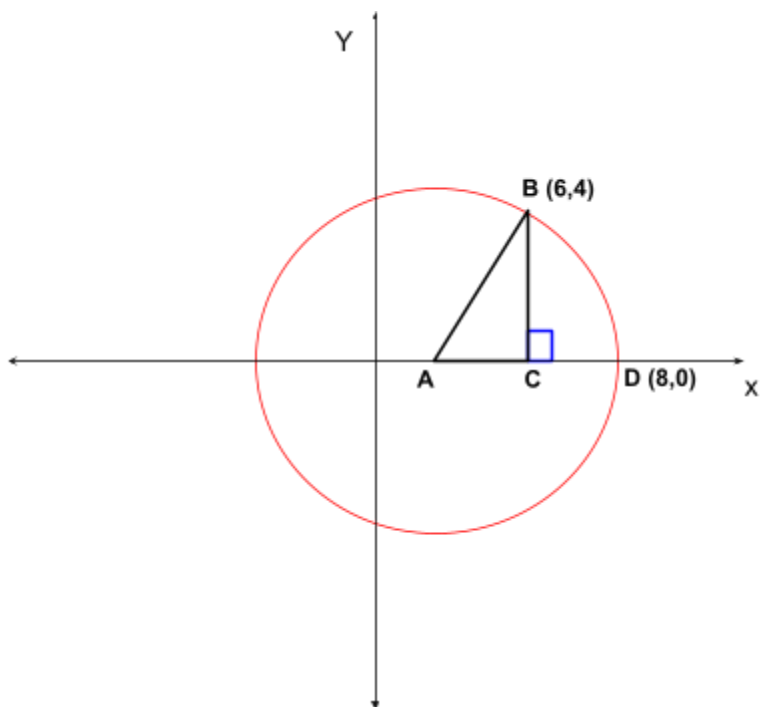
    a. 4
    b. 5
    c. **6**
    d. 8

Answer: Option (c)

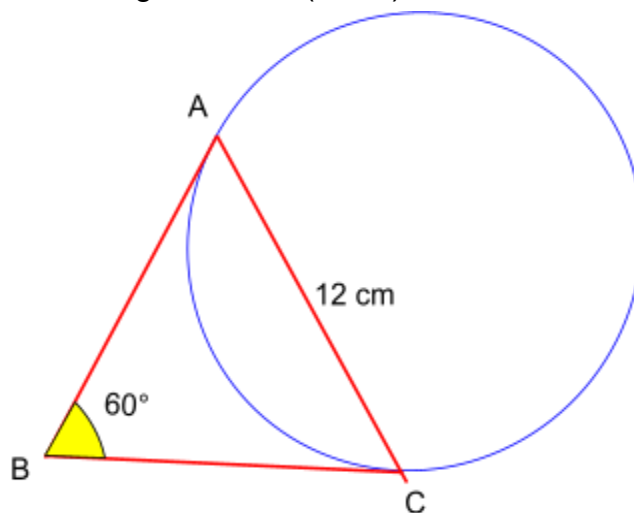7. What is the area of the quadrilateral AMND in the given figure (in cm²)?

    a. 24√3

b. **36√3**

c. 42√3

d. 48√3

Answer: Option (b)

8. In the given figure, BA and BC are the tangents on a given circle from point B. What is the diameter of the given circle (in cm)?

a. 8

b. **8√3**

c. 4√3

d. 12√3

Answer: Option (b)

9. On a cartesian plane, the diagonal of a square lies on the x-axis. Which of the following is the equation of one of its sides?

a. $5x + 3y = 9$

b. **$x - y = -8$**

c. $2x = 7y$

d. $3y = -13$

Answer: Option (b)

10. A frustum of a cone is formed by cutting a right circular cone. The ratio of the smaller and the bigger radius of the frustum is 1:2. The height is equal to the bigger radius 'R'. Which of the following is the volume of the full cone from which the frustum was cut out?

    a. $\frac{8}{3}\pi R^3$

    b. $\frac{2}{3}\pi R^3$

    c. $\frac{16}{3}\pi R^3$

    d. $\frac{1}{3}\pi R^3$
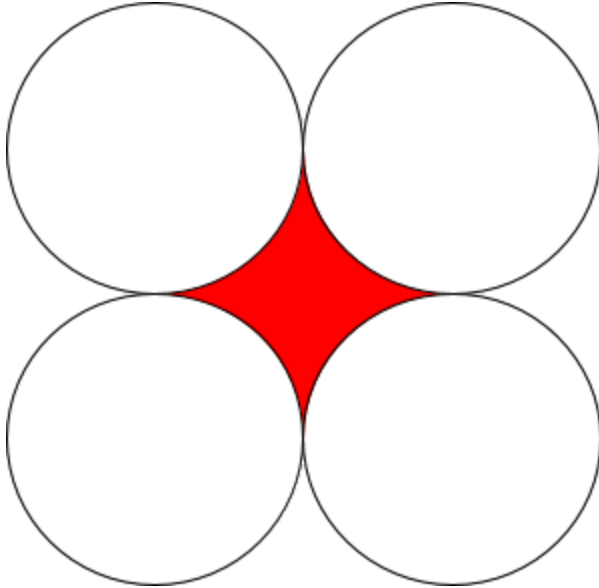
Answer: Option (b)

11. In the given image, the quadrilateral is a rectangle and PQ is the distance between the centre of the circles that measures 8 cm. What is the area of the rectangle (in cm²)?
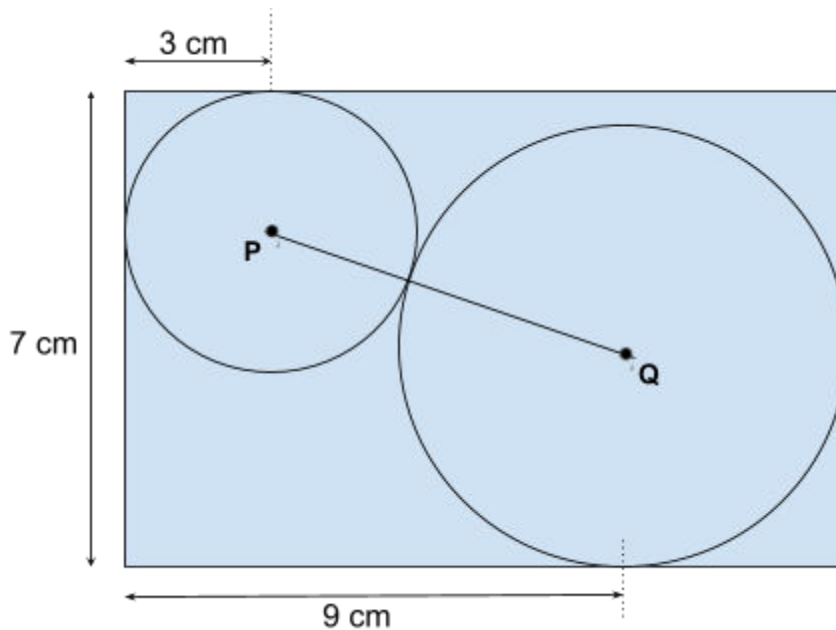
    a. 63

    b. 84

    c. **98**

    d. 105

Answer: Option (c)

12. The circles in the given image are identical. If the area of the red region is 42 cm², what is the diameter of the circles (in cm)? (Take π = 22/7)

a. 6
b. 12
c. **14**
d. 16

Answer: Option (c)

13. If a cube of volume V cubic units is completely opened up, then what is the area of the surface (in sq units) it will cover on a floor?

a. $4V^{2/3}$
b. $6V^{2/3}$
c. $V^{1/3}$
d. $V^{2/3}$

Answer: Option (b)

14. The sector in the given image is half of a quarter circle. The radius of the sector is 10 cm. If it rotates 90° clockwise about its centre, what is the total area swept by it?

a. 25π
b. **37.5 π**
c. 42.5π
d. 50π
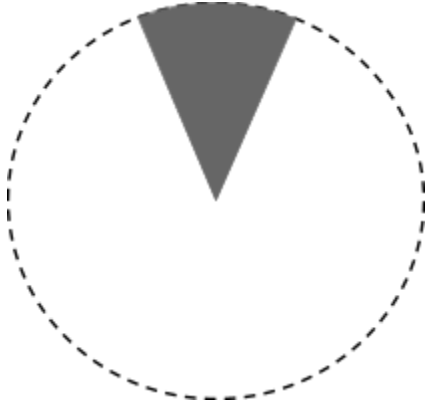
Answer: Option (b)

<mark>Verbal Ability</mark>

1. Choose the correct sentence from the options
   An artist who explored Indian Cultural themes, Raja Ravi Varma was world renowned for his art.
   a. Raja Ravi Varma is an artist whose art explores world renowned Indian cultural themes.
   b. Artist Raja Ravi Varma has explored Indian cultural themes, the art of whom is world renowned.
   c. Raja Ravi Varma is a world renowned artist whose art explored Indian cultural themes.
   d. No Change

   Answer: Option (d)

2. Choose the option which best replaces the underlined portion of the sentence
   <u>To travel to Paris and London have always</u> been Jose's dream.
   a. Traveling to Paris and London has always
   b. To travel to Paris and London has
   c. To travel to Paris or London has always
   d. No Change

Answer: Option (a)

3. Choose the correct determiner.
   There are shops on _____ sides
      a. neither
      b. either
      c. these
      d. that

   Answer: Option (b)

4. Choose the option which best replaces the sentence:
   Jose, a 28-year-old man, asked Christina to marry him and were devastated
   when she turned down his proposal
      a. Jose asked Christina, who is a 28-year-old man, to marry him and was
         devastated when she turned his proposal down.
      b. Jose, who is a 28-year-old man, asked Christina to marry him and was
         devastated when she turned down his proposal.
      c. Jose, who is 28-year-old man, asked Christina to marry him and was
         devastated when she turned down his proposal.
      d. No Change

   Answer: Option (b)

5. Choose the option which best replaces the sentence:
   Priya often wears high heels, who is just five feet tall.
      a. Priya wears high heels, who is five feet tall.
      b. Priya, who is just five feet tall, often wears heels.
      c. Priya, who is just five feet tall, often wears high heels.
      d. No Change

   Answer: Option (c)

6. Choose the correct underlined portion of the sentence from the options
   Police officers should abide and protect the law, and represent justice and
   consideration.
      a. abide by and protect the law as well as represent consideration and justice
      b. abide by and protect the law, and represent consideration as well as
         justice

c. abide by and protect the law, and represent consideration and justice

d. No Change

Answer: Option (c)

7. Complete the following statement in the future perfect continuous tense.
I _____for 4 hours by the time you reach home

    a. will has been working
    b. will have been working
    c. will have worked
    d. shall been working

Answer: Option (b)

8. Convert the following active voice to a passive voice.
His parents will send him to a boarding school.
    a. He will be sent away to a boarding school by his parents.
    b. He will be send away to a boarding school.
    c. He will be send to a boarding school by his parents.
    d. He would be sent by his parents to a boarding school.

Answer: Option (a)

9. Rearrange the jumbled parts P, Q, R and S to make a meaningful statement.
P. while I understand
Q. your concern
R. I'd like to
S. make it clear that
T. you are abjectly wrong

    a. P, T, R, S, Q
    b. R, S, P, Q, T
   c. T, R, S, P, Q
   d. T, P, Q, R, S

Answer: Option (b)

10. Choose the option which best replaces the underlined portion of the sentence:
By the time the son gets home from work, his mother will have finished cooking dinner.
   a. will be finishing
   b. will finish
   c. would be finishing
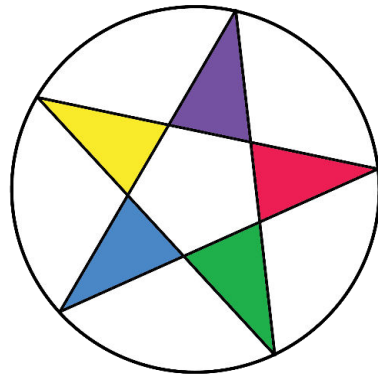   d. No change

Answer: Option (d)

Logical Ability

1. Which of the following will be the new orientation of the wheel with the pentagram after it completes 2.25 rotations in the clockwise direction?
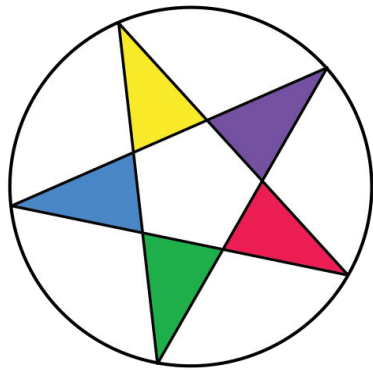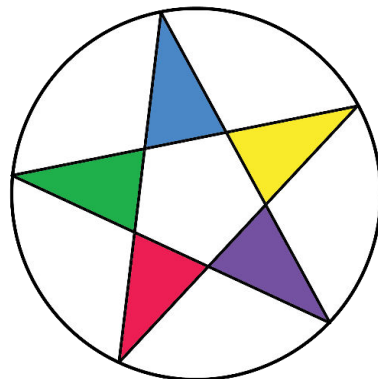
a.

b.
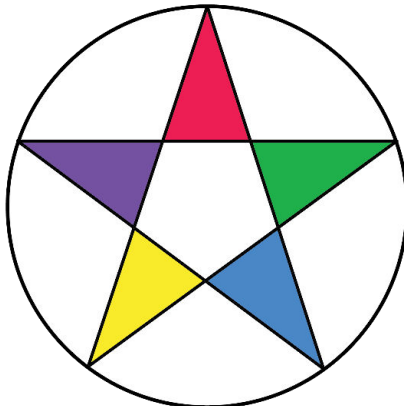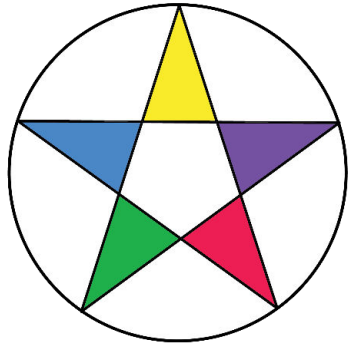
c.

d.

Answer: Option (b)

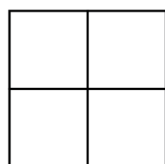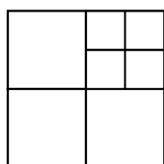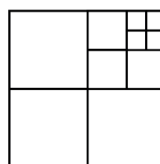2. In this progression, how many squares would be there in figure 10?

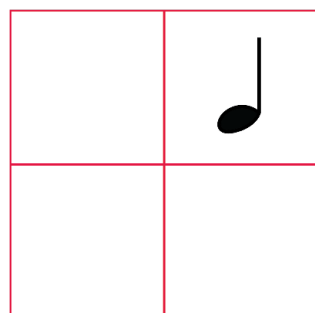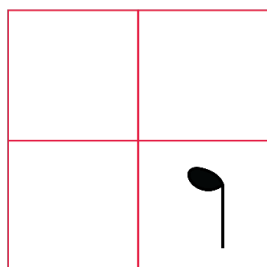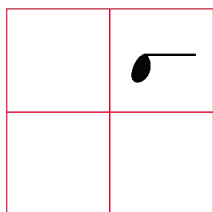| Figure 1 | Figure 2 | Figure 3 | Figure 10 |

a. 36
b. 40
c. 41
d. 50

Answer: Option (c)

3. Which of the following will be obtained if the given image is flipped horizontally thrice and rotated 90° clockwise once?
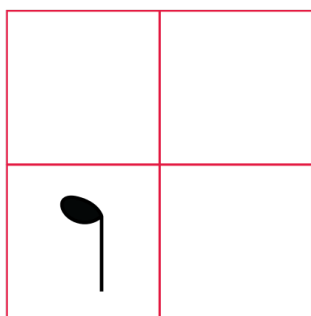
a.

b.

c.
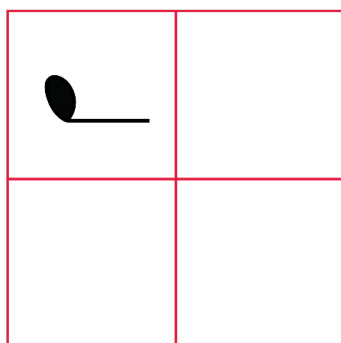
d.

Answer: Option (b)

4. Which of the following will balance the second balance in equilibrium?

a.
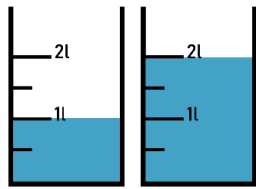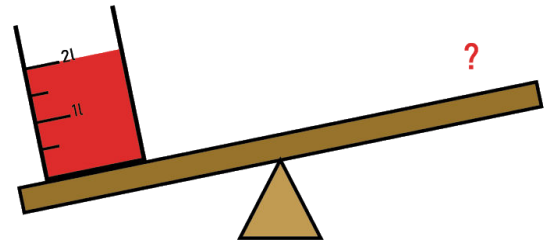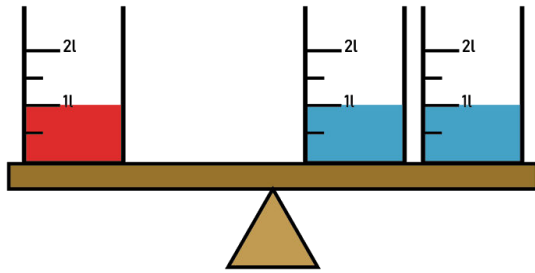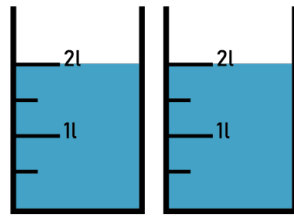
b.
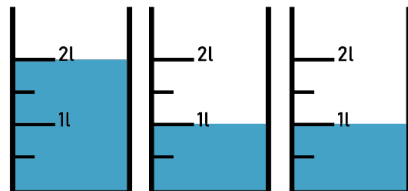
c.
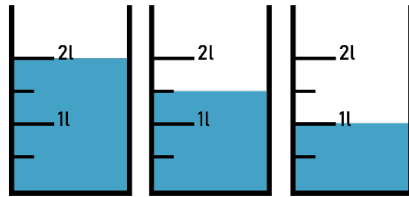
d.

Answer: Option (c)

5. There are 3 decks of cards, each deck has 6 cards marked 2, 3, 4, 5, 6 and 7. What is the total number of possible ways of drawing one card from each deck, such that the sum of the three cards drawn is 8?

    a. 4
    b. 6
    c. 8
    d. 10

Answer: Option (b)

6. The triangle ABC is a right isosceles triangle having right angle at C with equal sides measuring 12 cm. If the area of the region 'I' equals the area of region 'II', then what is the area of the circle which the sector AEF is in?
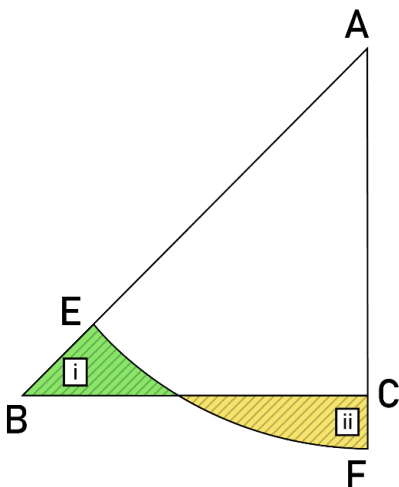
a. 72 cm²
b. 96 cm²
c. 144 cm²
d. 576 cm²

Answer: Option (d)

7. If a clock is designed such that the hour hand completes four revolutions and a minute hand completes 24 revolutions in a day, what is the minor angle between them after 3 hours 45 minutes if both hands started from 12?
   a. 45°
   b. 60°
   c. 90°
   d. 150°

Answer: Option (b)

8. Study the following pie chart and the table to answer the question.
   School wise details of the number of students in the top 5 schools of a city.
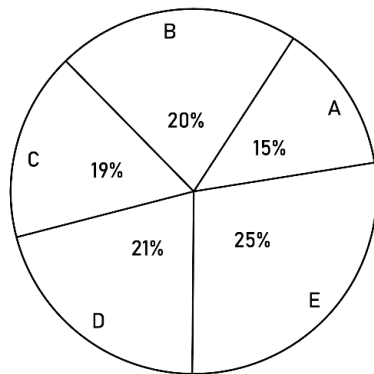
Total students in all the five schools = 78,500

Male:female ratio

States	M:F
A	5:3

B	3:2
C	3:1
D	4:3
E	2:3

What is the ratio of male students in school D to female students in school E?

    a. 3:5
    b. 3:4
    c. 4:5
    d. 1:2

Answer: Option (c)

9. A fan can spin at a speed of 15 revolutions per minute. After one second from switching on the fan, if each blade is in the original position of the next blade, how many blades are there in the fan?
    a. 2
    b. 3
    c. 4
    d. 6

Answer: Option (c)

10. In a school, 5/7th of students like football and 3/5th of the students like cricket. If 500 students like both sports and 60 students are not interested in sports, find the number of students in the school.

    a. 840
    b. 900
    c. 1000
    d. 1400

Answer: Option (d)

11. A = {$\sqrt{101}$, $\sqrt{2}$, $\sqrt{3}$, 1.21345437…, ..} Area of which shape belongs to this set A?
    a. Square

b. Triangle
c. **Circle**
d. Rectangle

Answer: Option (c)

12. If the dial of a magnetic compass is divided into 24 sectors and if you count in the anticlockwise direction from the sector containing N, what direction will correspond to the 14th sector?
   a. **Southeast**
   b. Southwest
   c. Northeast
   d. Northwest

Answer: Option (a)

Science

1. A member of the hydrocarbon family gives 3 moles of CO_2 and 4 moles of H_2O per mole of the compound on combustion. What is the formula of the compound?
   a. C_3H_6
   b. C_3H_4
   c. **C_3H_8**
   d. C_6H_6

Answer: Option (c)

2. Which of the following observations for the electric circuit shown below are correct?
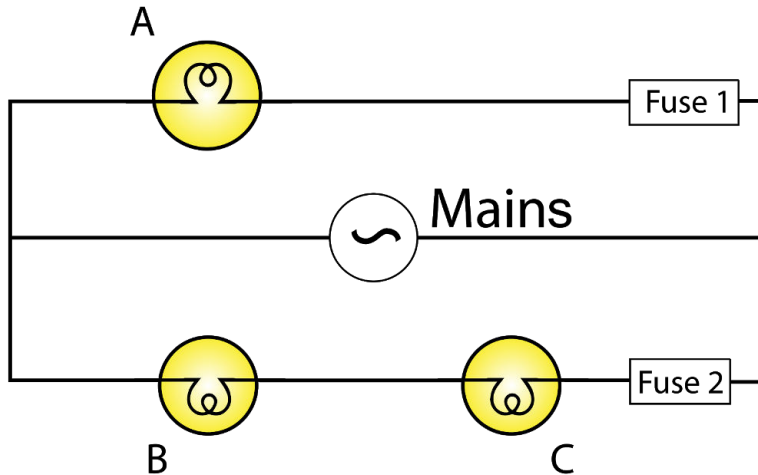
(i) Fuse 1 blows up before fuse 2, in case of excessive current.
(ii) Bulb C glows if bulb B gets fused.
(iii) Bulbs B and C glow if bulb A gets fused.

    a. Only (i)
    b. Only (iii)
    c. Both (i) and (ii)
    d. **Both (i) and (iii)**

Answer: Option (d)

3. He was a pacifist, naturalist, and a very good observer. On his journey of the world, he gave the famous theory of natural selection. Who was he?
    a. Francis Darwin
    b. Hugo de Vries
    c. Gregor Mendel
    d. **Charles Darwin**

Answer: Option (d)

4. You are growing a plant but its shoot growth is very slow even though you are giving it proper manure, water and light exposure. What will you use to promote its growth?
    a. Abscisic acid
    b. Cytokinin
    c. **Gibberellin**

d. Ethylene

Answer: Option (c)

5. Molecule Na_2X on treatment with dilute sulphuric acid forms a molecule 'Y' and liberates a rotten smelling gas. The liberated gas undergoes a double decomposition reaction with molecule 'Z', forming a black precipitate and vinegar. *Identify the groups in Y and Z.*
    a. Bisulphate, formate
    b. **Sulphate, acetate**
    c. Bisulphate, acetate
    d. Sulphate, formate

Answer: Option (b)

6. In the figure given below, coil 1 is connected to an AC source and bulb B_1, whereas, coil 2 is connected to the bulb B_2. Which among the bulbs B_1 and B_2 will glow?
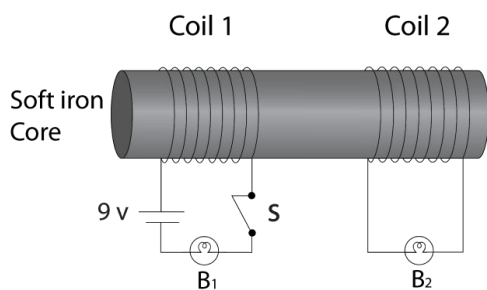
    a. Only B_1
    b. **Both B_1 and B_2**
    c. Only B_2
    d. Neither B_1 nor B_2

Answer: Option (b)

7. A universal indicator paper is dipped separately in each of the solutions in the given test tubes. Which solution will have the highest pH?

| A | B | C | D |
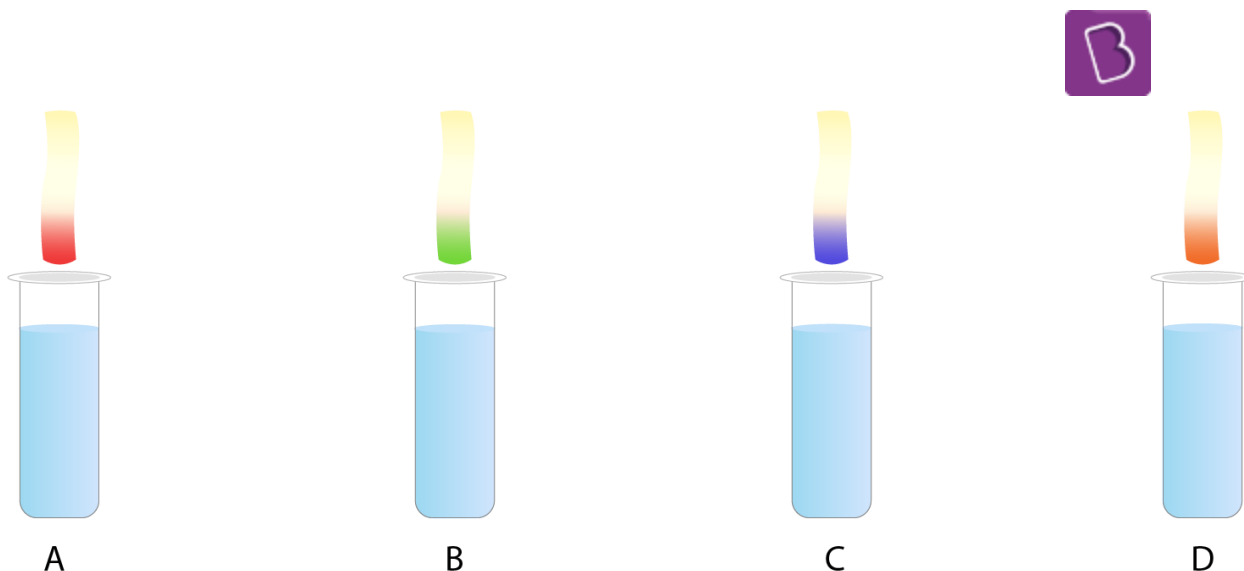
a. A

b. B

c. **C**

d. D

Answer: Option (c)

8. What will happen if all the deers are killed in the given food chain?

Bamboo → Deer → Bear

a. The population of bamboo decreases and bears increases.

b. **The population of bamboo and bears remains the same.**

c. The population of bamboo increases and bears decreases.

d. The population of both bamboo and bears increases.

Answer: Option (b)

9. Which of the following saturated compounds contains an alcohol group?

a. **$C_4H_{10}O$**

b. C_4H_8O

c. C_3H_6O

d. C_4H_9ONa

Answer: Option (a)

Hydroelectric power plant A   Hydroelectric power plant B

10.

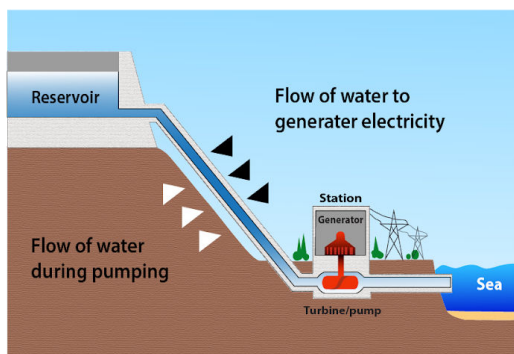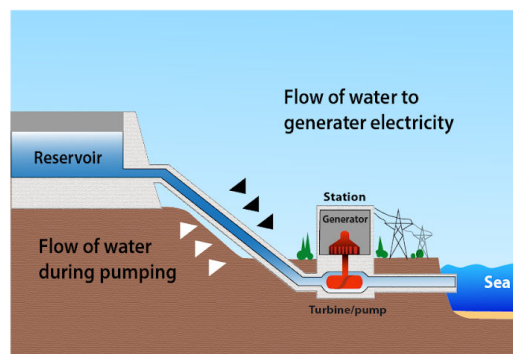Assertion: The amount of electric power generated in hydroelectric power plant A is more than that of hydroelectric power plant B.

Reason: The potential energy possessed by the stored water is converted into electricity.

   a. **Both assertion and reason are true and the reason is the correct explanation of the assertion.**

   b. Both assertion and reason are true but the reason is not the correct explanation of the assertion.

   c. The Assertion is true but the reason is false.

   d. The assertion is false but the reason is true.

Answer: Option (a)

11. Identify the enzymes catalysing the reactions below:

(i) Starch --------------> Maltose

(ii) Proteins ----------------> Peptides

(iii) Fat ---------------> Fatty acids and glycerol

   a. **Salivary amylase; Pepsin; Lipase**

   b. Lipase; Pepsin; Salivary amylase

   c. Pepsin; Lipase; Salivary amylase

   d. Salivary amylase; Lipase; Pepsin

Answer: Option (a)

12. Prateek's mother decided to cook food in a solar cooker. She used a concave mirror while designing the solar cooker. What could be the possible reason for this?

    a. Sun rays diverge and increase the area of projection.
    b. **Sun rays converge and focus on one single point.**
    c. Sun rays are completely absorbed by the mirror.
    d. Sun rays get reflected parallel to each other.

Answer: Option (b)

13. Rajat is asked to choose the correct figure among the following options based on the phenomenon of dispersion of light. Which figure should he choose?
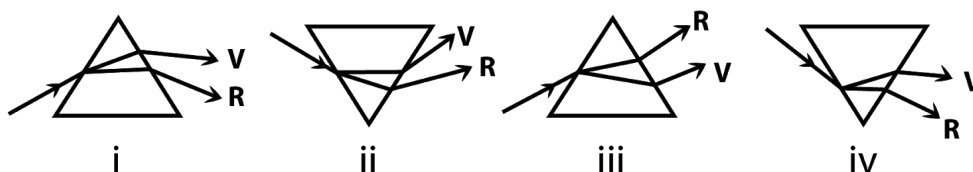
    i   ii   iii   iv

    a. i
    b. ii
    c. iii
    d. iv

Answer: Option (b)

14. A homozygous round yellow seed is crossed with a wrinkled green seed. What will be the ratio of round green, wrinkled green, round yellow, and wrinkled yellow seeds produced in the F2 progeny?

a. **3:1:9:3**
b. 1:3:3:9
c. 9:3:3:1
d. 1:3:9:3

Answer: Option (a)

<mark>Social Science</mark>

1. Identify the rock mineral that is usually established in sedimentary rocks and acts as a basic raw material for the cement industry.

   a. Sodium
   b. **Limestone**
   c. Mica
   d. Potash

   Answer: Option (b)

2. In 2006, Nepal witnessed a mass movement. Which amongst the following had triggered the people of Nepal to protest?
   a. Restoration of the Parliament
   b. Power to an all-party government
   c. **Dismissal of the Prime Minister**
   d. Formation of a new constituent assembly

   Answer: Option (c)

3. Bhakra Nangal Dam is a multipurpose project. Which amongst the following is not TRUE about the significance of this project?
   a. Water for irrigation
   b. Generation of hydroelectricity
   c. Flood prevention

d. **Aquatic animals conservation**

Answer: Option (d)

4. The golden quadrilateral is a network of six-lane roads connecting India's four major cities Delhi, Mumbai, Kolkata, and Chennai. Which government organisation implemented this project?
    a. **National Highway Authority of India**
    b. Central Public Works Department
    c. Public Works Department
    d. Border Roads Organisation

Answer: Option (a)

5. Banks play an important role in the economy. Which of the following statements is NOT true about the functioning of banks?
    a. Banks charge a high-interest rate on loan than what they provide on deposits.
    b. A major portion of the depositor's money is used to extend loans.
    c. **Banks maintain about 40 per cent of their total deposits as cash.**
    d. Banks facilitate transactions without payment of cash.

Answer: Option (c)

6. A country 'X' is considered to be more developed than a country 'Y'. Which of the factors make the country 'X' more developed?
    a. Higher total income
    b. **Higher average income**
    c. Higher population
    d. Higher infant mortality rate

Answer: Option (b)

7. Sarita belongs to a place called Palampur, which is a town situated in the northern part of India. What will be the chairperson of her local government called?
    a. Sarpanch
    b. **Mayor**

   c. Zilla Parishad chairperson

   d. Municipal chairperson

Answer: Option (b)

8. In Europe, handwritten manuscripts could not satisfy the ever-increasing demand for books. Who brought the technology of woodblock printing to Europe from China?

   a. Vasco Da Gama

   b. Gutenberg

   c. Marco Polo

   d. Martin Luther

Answer: Option (c)

9. Some countries in the world have a government where the power exists between both the central authorities and the state governments. Such a government is known as _____. While some other countries exist where the control rests the central authority, and such a government is known as a/the _____.

   a. unitary government, federations

   b. federations, unitary government

   c. unitary government, central government

   d. federations, central government

Answer: Option (b)

10. Durg-Bastar -Chandrapur belt has large reserves of_____ which lies in states of Chhattisgarh and _____.

   a. bauxite, Karnataka

   b. coal, Jharkhand

   c. hematite, Maharashtra

   d. magnetite, Odisha

Answer: Option (c)