Primrose Schools

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NATIONAL PRIMTALENT OLYMPIAD EXAMINATIONS
SCIENCE

CLASS 9	Name :
	Section :
	Roll no :

	Guidelines for the Candidates
1	Please check your Name, Class and Section on the OMR sheet provided to you.
2	In case, OMR sheet with your name is missing, please fill in information about yourself in the blank sheet provided before start of exam.
3	All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
4	There is only **ONE** correct answer. Choose only ONE option for an answer.
5	To mark your choice of answers by darkening the circles in OMR sheet, use **HB Pencil or Blue/Black ball point pen** only.
6	Rough work should be done in the blank space provided in the booklet.
7	Return the OMR sheet to the invigilator at the end of the exam
8	Please fill in your personal details in space on the top of this page before attempting the paper

SECTION – A LOGICAL REASONING

1. In a certain code '**256'** means '**you are good'**; '**637'** means '**we are bad'**
    and '**358'** means '**good and bad'**. Which of the following represents
    '**and'** in that code?
    A. 8
    B. 2
    C. 6
    D. 5

2. In a certain language,
    (i) '**sun shines brightly'** is written as '**ba lo sul'**
    (ii) '**houses are brightly lit'** as '**kado ulo ari ba** and
    (iii) '**light comes from sun'** as '**dopi kup lo nor'**
    What words are written for **sun** and **brightly**?
    A. lo, ba
    B. balo
    C. sul, lo
    D. ba,sul

3. Choose same relationship from given four choices as given in original
    pair.
    1. Square : Cube
    A. Triangle : Prism
    B. Line : Cylinder
    C. Circle : Sphere
    D. Sphere : Earth

4. Read the given information carefully and answer the questions given
    below:
    Six lectures on 6 different subjects Physics, Chemistry, Biology, Algebra,
    Geometry and Astronomy have to be scheduled (one on each day)
    across 7 days, starting from Sunday and ending Saturday. The schedule
    has to be drawn out for the subjects such that;

(i) One day has to be a holiday and it can be neither Sunday nor Saturday.

(ii) Geometry has to be scheduled immediately after Algebra.

(iii) Physics cannot start the series in the week and has to be done exactly 2 days before Astronomy.

(iv) Biology has to be scheduled for Thursday and cannot immediately follow Physics.

Which subject will start the series of lectures?

A. Algebra

B. Chemistry

C. Physics

D. Biology

5. If **'light'** is called **'morning'**, **'morning'** is called **'dark'**, **'dark** is called **'night'**, **'night'** is called **'sunshine'** and **'sunshine'** is called **'dusk'**, When do we sleep?

A. Dusk

B. Dark

C. Night

D. Sunshine

SECTION B - EVERYDAY SCIENCE

6. The diagram shows the position of the air particles due to propagation of sound, represented by Straight lines, at a particular instant from P to Q.

P | |||||| | |||||| | | |||||| | | Q

Which of the following statements correctly depict the pressure variation with respect to distance?

A. The lines which are closed to one another represent rarefaction which is a low pressure region.

B. The lines which are far apart from one another represent compression which is a low pressure region.

C. The lines which are far apart from one another represent rarefaction which is high pressure region.

D. The lines which are closed to one another represent compression which is a high pressure region.

7. A student wishes to determine the density of an irregularly-shaped stone. First he finds the mass of the stone. Next he lowers the stone into a measuring cylinder containing water. The diagrams show the measuring cylinder before and after the stone is lowered into it.
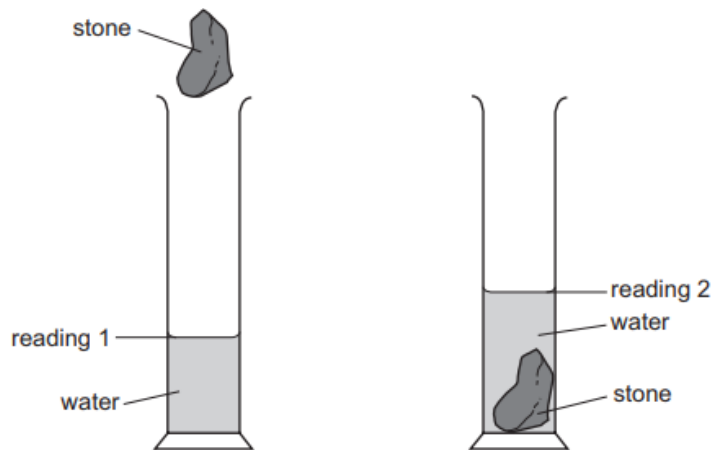
How should the student calculate the density of the stone?

A. mass of stone × reading 2
B. mass of stone × (reading 2 – reading 1)
C. mass of stone ÷ reading 2
D. mass of stone ÷ (reading 2 – reading 1)

8. A strong electromagnet is used to attract pins.
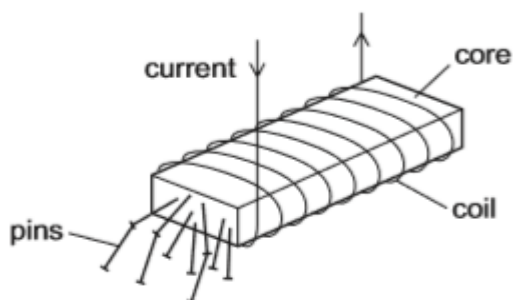
What happens when the current in the coil is halved?
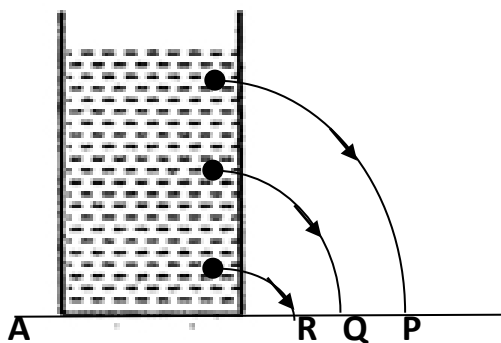
A. No pins are attracted.
B. Some pins are attracted, but not as many.
C. The same number of pins are attracted.
D. More pins are attracted.

9. If you had to program a robot to stop on RED, what wavelength range would you program it to detect;
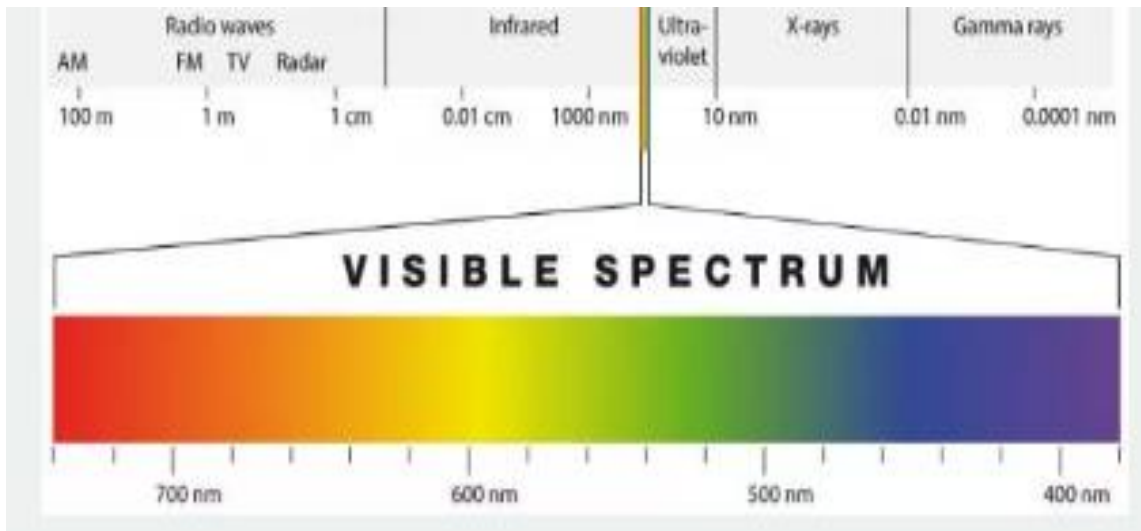

A.450-500nm
B.500-550nm
C.1100-1500nm
D.650-700nm

10. Find out the mistake in this figure?

A. water flowing through hole P will move a smaller distance from A as compared to Q and R
B. No mistakes in the figure
C. water flowing through R will be more than Q but less than P
D. water flowing through all holes will travel same distance

11. The mass of the body is measured to be 12 kg on the earth. If it is taken
to the moon, its mass will be;

    A.   12 kg
     B.   6 kg
    C.   2 kg
    D.   72 kg

12. In the following example, try to identify the number of times the velocity
of the ball changes.
" A football player kicks a football to another player of his team who
kicks the football towards the goal post. The goalkeeper of the opposite
team collects the football and kicks it towards a player of his own team"
    A. two times
    B. four times
    C. no change in velocity
    D. None of the above.

13. Ultrasonic waves are used for detecting objects under water. What
technique is used for this?
    A. Ultrasonography
    B. Echocardiography
    C. LASER
    D. Sonar

14. Flash and thunder are produced simultaneously. But thunder is heard a
few seconds after the flash is seen. This is because:

    A.   speed of sound is greater than speed of light
    B.   speed of sound is equal to the speed of light
    C.   speed of light is much greater than the speed of sound
    D.   none of these

15. The distance – time graph of an object moving in a fixed direction is shown in figure. The object:
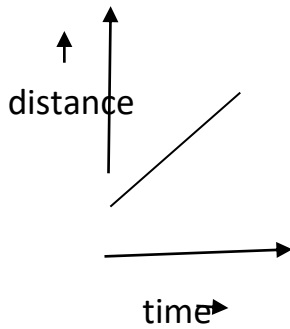
A. is at rest
B. is moving with constant speed
C. is moving with variable velocity
D. is moving with constant acceleration.

SECTION C - HIGHER ORDER THINKING

16 An insect moves along a circular path of radius 10 cm with a constant speed. If it takes 1 minute to move from a point on the path to the diametrically opposite point, then the distance
covered, speed, displacement and average velocity respectively are :
A.   3.14 cm,   3.14 cm/min,   10 cm,   10 cm/min
B.   31.4 cm ,   31.4 cm /min,   20 cm,   0.33 cm/s
C.   0.314 cm, 0.314 cm /min,   1 cm,   1 cm/min
D.   314 cm ,   314 cm/min,   0.1 cm,   0.1 cm/min

17. A tank 2 m high is half filled with water and then filled to the top with oil of density 0.60 g/cc. What is the pressure at the bottom of the tank due to these liquids?   [Take g=10 m/s^{-2}]
A. 0.8×10^2 N m^{-2}
B. 0.8×10^4 N m^{-2}
C. 1.6×10^2 N m^{-2}
D. 1.6×10^4 N m^{-2}

18. Match the following and select the correct answer:

a. Force	i) $kg\ m^2\ s^{-2}$
b. Work	ii) $kg\ m\ s^{-1}$
c. Momentum	iii) $kg\ m^2\ s^{-3}$
d. Power	iv) $kg\ m\ s^{-2}$

A. a-i , b-ii , c-iii , d-iv
B. a-ii , b-iii , c-iv , d-i
C. a-iv , b-i , c-ii , d- iii
D. a-iv , b- ii, c-iii, d-i

19. A force of 1.0 N acts on a body of mass 10 kg. The body covers 100 cm in 4 seconds moving long a straight line. The initial velocity is:
A. 2 cm/s
B. 4 cm/s
C. 6 cm/s
D. 5 cm/s

20. Calculate the force of gravitation between the earth and the sun, Use the given information, mass of the earth = 6×10^{24}kg and mass of sun is = 2×10^{30} kg . The average distance between the two is 1.5×10^{11}m.

A. 3.11×10^{22} N
B. 4.46×10^{22} N
C. 3.57×10^{22} N
D. 4.57×10^{22} N

CHEMISTRY

21. Directions: Two signs in each equation have been interchanged. Find them out to get the right result:

(3×7)+(6+4)−(12÷4)=14

A. ×;+
B. −;+
C. ×;÷
D. ÷;+

22. Find the character or number which replaces the question mark in the series given below.
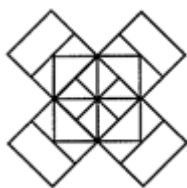2B 4C 8E 14H?
A. 16K
B. 201
C. 20L
D. 22L

23. Identify the rule and find the letter group that replaces the question mark.

IP8   GS11   EV14   ?

A. BX17
B. BY17
C. CY17
D. CY18

24. Identify the number of squares in the figure given.

A. 22

B. 20

C. 18

D. 14

25. What comes next?

7	26	63	124	245	342	ⓘ

A. 511

B. 512

C. 513

D. 521

SECTION B - EVERYDAY SCIENCE

26. The electron affinity of

A. Carbon is greater than oxygen

B. Oxygen is greater than fluorine

C. Iodine is greater than bromine

D. Bromine is less than chlorine.

27. Which of the following ions is the largest in size?

A. Mg^{2+}

B. Na^+

C. O^{2-}

D. F^-

28. Which of the following is true about the e/m value of positive particles?

A.   It is constant.

B.   It depends on the gas taken in the discharge tube.

C.   It depends on the nature of cathode and anode taken.

D.   It depends on the fluorescent material coated on the screen.

29. Which of the following ions has the same number of electrons as a krypton atom with atomic number 36?

A.   Chlorine

B.   Sodium

C.   Rubidium

D.   Xenon

30. Which of the following is a transitional element?

A.   Pb

B.   As

C.   M

D.   Ni

31. According to Newland's law of octaves, which element is the repetition of the first element in the periodic table?

A. Oxygen

B. Nitrogen

C. Chlorine

D. Sulphur

32. The size of nucleus is measured in

A.   amu

B.   Angstrom

C.   Fermi

D.   Cm

33. The example of a pair of isobar is

A. $_1H^1$ and $_1H2$

B. $_1H^2$ and $_1H^3$

C. $_1H^3$ and $_2He^3$

D. $_1He^3$ and $_1He^4$

34. According to JJ. Thomson's atomic model, where are the negative charges of an atom embedded in?
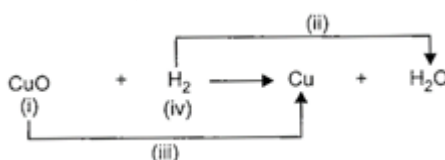
A. A lump of positive charge

B. A lump of small atoms

C. A lump of neutrons

D. The nucleus

35. In a chemical equation, number of atom is written in front of the symbol of the substance. Which one of the following represents the number of molecule of the substance?

A. Valance electrons
B. Atomic number
C. Atomic weight
D. Coefficient

SECTION C - ACHIEVERS SECTION

36. Observe the given reaction carefully and identify (i), (ii), (iii) and (iv).

$$CuO \; (i) \quad + \quad H_2 \; (iv) \quad \longrightarrow \quad Cu \quad + \quad H_2O$$

(with (ii) and (iii) labelling the arrows)

A.

(i)	(ii)	(iii)	(iv)
Undergoes oxidation	Oxidation	Reduction	Undergoes reduction

B.

(i)	(ii)	(iii)	(iv)
Reducing agent	Reduction	Oxidation	Oxidizing agent

C.

(i)	(ii)	(iii)	(iv)
Oxidizing agent	Oxidation	Reduction	Reducing agent

D.

(i)	(ii)	(iii)	(iv)
Undergoes reduction	Reduction	Oxidation	Undergoes oxidation

37. Find X and Y in the given reaction are respectively

x $CaCO_3$ + y H_3PO_4 → $Ca_3(PO_4)_2$ + xH_2O + xCO_2

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

38. Which of the following reactions involve the combination of two elements?
A. $Cao + CO_2$ → $CaCO_3$
B. $4Na + O_2$ → $2Na_2O$
C. $SO_2 + 12O_2$ → SO_3
D. $NH_3 + HCl$ → NH_4Cl

39. When the gases sulphur dioxide and hydrogen sulphide mix in the presence of the reaction $SO2 + 2H2S$ → $2H2O + 3S$ occurs. Here hydrogen sulphide is acting as

_____

A. an oxidising agent
B. a reducing agent
C. a dehydrating agent
D. a catalyst

40. Position of five elements P, Q, R, S and T is shown on the simplified form of the ic table. The element which has maximum tendency to lose electron, the element has maximum tendency to gain electrons and the element which has no tendency to · lose electrons are respectively.
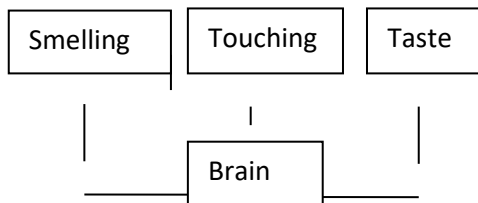

A. P, R and S
B. S, R and T
C. Q, S and P
D. Q, R and T.

BIOLOGY

41.

Smelling	Touching	Taste

Brain

The above flow chart shows different types of functions done by brain. To which type our touch response belongs to?

A. Somatic nervous system
B. Central nervous system
C. Peripheral nervous system
D. Circulatory system

42 A number series is given with one term missing. Choose the correct option that will continue the same pattern.
(2, 3), (3, 5), (5, 7), (7, 11), (11, 13)

A. (13, 15)
B. (15, 16)
C. (13, 17)
D. (13, 26)

43 Which of the following options show the correct mirror image of the given combination of letters and numbers, if the mirror is placed vertically to the left?
A 2 N 6 Z 8 W 9
A. A2N6 Z 8W9
B. A2 N 6Z8W9
C. A2N 6Z 8W9
D. A2N6Z8W9

In the following series, how many 5's are there which are immediately

44. preceded by 9 and followed by 6?
9 6 9 5 8 4 3 2 9 5 6 2 3 5 9 8 7 6 5 9 4 5 6 1

A.   0
B.   1
C.   2
D.   3

45   In a certain code, EXPLAINING is written as PXEALNIGNI. How is PRODUCED written in that code?
A.   ORPBUDEC
B.   ROPUDECD
C.   ORPUDECD
D.   None of these

SECTION B - EVERYDAY SCIENCE

46   Which of the term is associated with rearing fishes?
A.   Pisciculture
B.   Poultry
C.   Apiculture
D.   Sericulture

47   In a biology class the teacher described a cell. She listed the following organelles of a cell-
Endoplasmic reticulum, mitochondria, nucleus, ribosomes, centrioles, centrosomes. Which cell was she referring to?

A.   Prokaryotic cell
B.   Plant cell
C.   Animal cell
D.   It is not possible to predict from the given data.

48   The cytoplasmic projection arises from the cyton

A. Axon
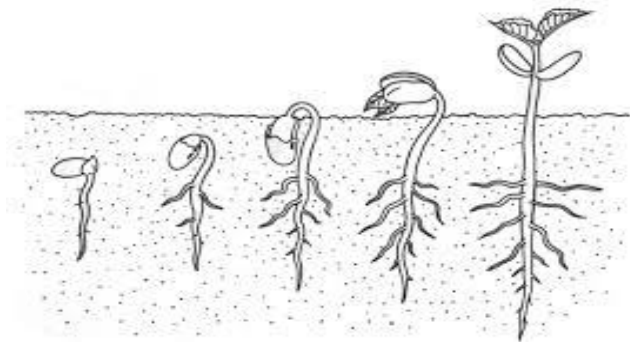
B. Myelian sheath

C. Dendron

D. None of the above

49 The expanded tip of the pedicel bearing floral parts

A. Gynoecium

B. Thalamus

C. Both a and b

D. None of the above

50 Arrangement of ovules in the ovary

A. Placenta

B. Placentation

C. Organisation of ovules

D. None of the above
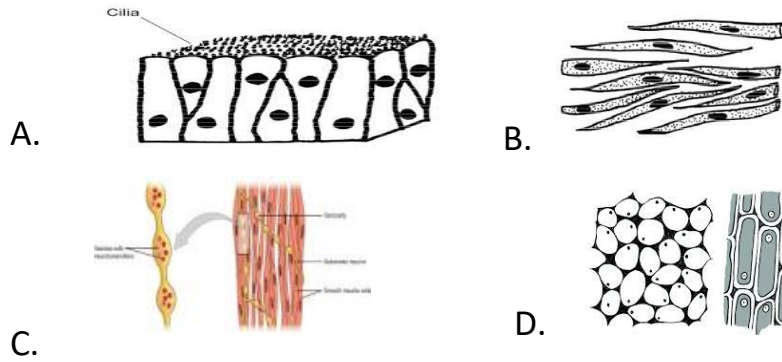

51

The above diagram represents the germination in pea seed. Identify the type of germination.
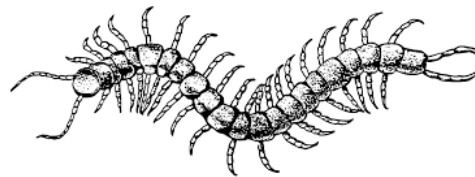
A. Hypogeal

B. Epigeal

C. Hypocotyl

D. Epicotyl

52 Which of these is a plant tissue?

A.

B.

C.

D.

53   To which of the following phyla does the animal given belongs to?

A.   Porifera

B.   Aschehelminthes

C.   Annelida

D.   Arthropoda

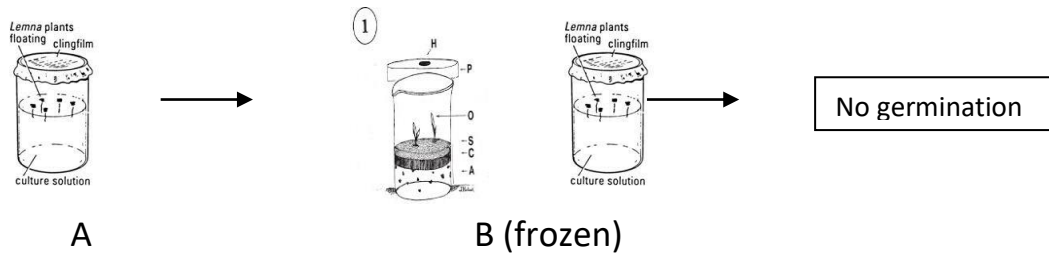54   Which has to be taken to prevent dehydration due to diarrhoea?

A.   Rice

B.   Vitamin pills

C.   Bread

D.   Boiled and filtered water with some salt and sugar

55   Which of these are important components of bones?

A.   Calcium and Phosphorus

B.   Calcium and iron

C.   Calcium and magnesium

D.   Phosphorus and magnesium
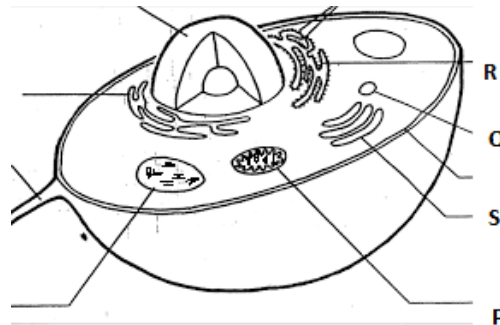
SECTION – C   ACHIEVERS SECTION

56

A   B (frozen)
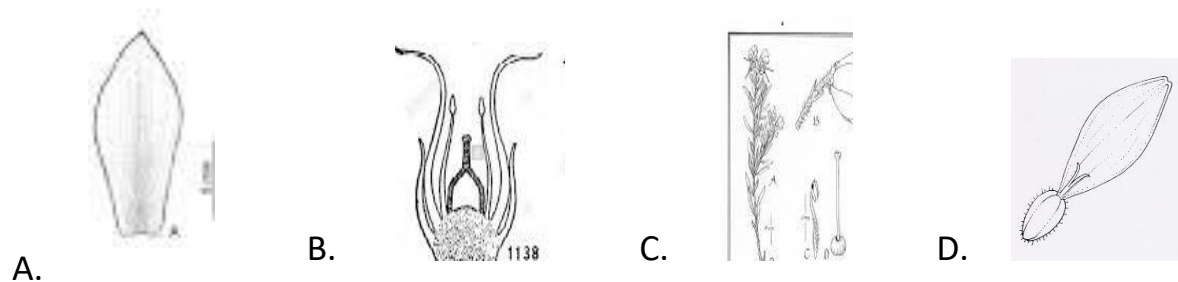
What does above experiment prove

A.   One of the germination factor is unfavourable
B.   Seeds require optimum temperature to germinate
C.   Both a and b
D.   None of the above

57   Energy conversion within a plant cell would be severely limited by
      removal of which of the labelled cell organelles.

A.   P
B.   Q
C.   R
D.   S

58 Identify the picture of neuter of a flower.

A.   B.   C.   D.

59 Insects and birds both have wings for flying, but doesn't belong to same
    phylum. Why?
A. Both are dissimilar in size
B. Insects are invertebrates
C. Their sounds are different
D. None of the above

60 Daily requirement of Vitamin C is
A. 40mg
B. 45 mg
C. 60 mg
D. 30 mg