SMART SOCIETY INTERNATIONAL SCIENCE OLYMPIAD (SSISO)

Organized by

Department of Basic Science and Humanities
INSTITUTE OF ENGINEERING & MANAGEMENT,
IEM-UEM GROUP and SMART SOCIETY, USA

TOTAL QUESTIONS: 40

DURATION: 1 HOUR

INSTRUCTIONS TO THE CANDIDATES:

1. The question paper is divided into 3 sections.
   Section A - Logical Reasoning (10 Questions)
   Section B - Science (10 Questions)
   Section C- Achiever's Level Science (20 Questions)
2. In section A, each question carries 2 marks. In Section B, each question carries 2 marks. In section C, each question carries 3 marks.
3. All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
4. There is only one correct answer.
5. To mark your choice of correct answer, darken the circles on the OMR sheet. For this purpose, use HB Pencil or Black ball point pen.
6. Rough work should be done in the blank space provided at the end of the booklet.
7. Return the OMR sheet to the invigilator at the end of examination.
8. Please fill in your personal details in the space provided below.

NAME: .....

SCHOOL NAME: .....

CONTACT DETAILS OF GUARDIAN: .....

SECTION A

LOGICAL REASONING

1. A sequence is defined as follows: 2, 6, 12, 20, 30, ...What is the 8th term in this sequence?

   a) 72 b) 80

   c) 92 d) 102

2. Pointing to a photo, a woman says, "He is the son of my mother's only son." How is the woman related to the person in the photo?

   a) Mother b) Aunt

   c) Sister d) Daughter

3. If CAT is coded as 3120 and DOG as 4157, how will PEN be coded?

   a) 1618 b) 16514

   c) 15614 d) 16511

4. The sum of three consecutive odd numbers is 87. What is the middle number?

   a) 27 b) 29

   c) 31 d) 33

5. A cube has all faces painted. It is then cut into 27 smaller cubes of equal size. How many smaller cubes have exactly two painted faces?

   a) 6 b) 8

   c) 12 d) 18

6. A means '×'; B means '÷'; C means '-'; D means '+' then

   17A36B3C6D8 means

   a) 204 b) 156

   c) 98 d) 206

7. If the 2nd of a month falls on Tuesday, what day will the 29th of that month be?

   a) Monday b) Tuesday

   c) Sunday d) Wednesday

8. In a class of 35 students Ramesh's rank is 14th from the top and Parul's rank is 18th from the bottom, if Vishal's rank is exactly between Ramesh and Parul. What is Vishal's rank from the top?

   a) 15th b) 16th

   c) 17th d) 18th

9. Complete the following equation with correct arithmetic signs (+, -, ×, ÷)

   16_22_8=44

   a) ÷and × b) + and -

   c) × and ÷ d) – and ×

10. Select the odd one out number

    a) 529 b) 442

    c) 361 d) 289

SECTION B

SCIENCE

11. Which of the following is a byproduct of refining petroleum?

    a) Kerosene b) Asphalt

    c) Propane d) All of the above

12. Which of the following is the highest grade of coal?

    a) Lignite b) Bituminous

    c) Anthracite d) Peat

13. The gas present in Pepsi is:

    a) Helium

    b) Neon

    c) Carbon dioxide

    d) Argon

14. P is a fossil fuel. It is formed from the remains of tiny sea animals and plants that lived millions of years ago. Q is the major component of P. P is also used as a source of gas R which is further used for the manufacture of nitrogenous fertilizers. P in the form of S is used as a fuel in motor vehicles. P, Q, R and S are respectively

a) Petroleum gas, butane, hydrogen and LPG

b) Petroleum gas, methane, nitrogen and LPG

c) Coal gas, hydrogen, natural gas and CNG

d) Natural gas, methane, hydrogen and CNG

15. A brief information about three substances is given as:

X: Tough porous and black substance

Y: Black liquid with unpleasant smell

Z: Obtained during processing of coal to get coke

X, Y and Z could be respectively

a) Coal, coke and coal tar

b) Coke, coal tar and coal gas

c) Petrol, crude oil and coal tar

d) None of these

16. Friction can be reduced by the use of

a) Rollers b) Levers

c) Lubricants d) Ball bearing

17. Two plane mirrors are placed at an angle of 120 degree and a man combing his hair is standing at an asymmetric position. How many images will he see?

a) 2 b) 3

c) 4 d) 5

18. Which of the following is/ are antibiotic(s)?

a) Streptomycin b) Tetracycline

c) Penicillin d) All of the above.

19. Which converts nitrates to free nitrogen gas?

a) Nitrosomonus b) Pseudomonus

c) Nitrobactor d) Nostoc.

20. What is the significance of the keystone species in an ecosystem?

a) It is the most abundant species that supports others.

b) It has a disproportionate impact on its environment relative to its abundance.

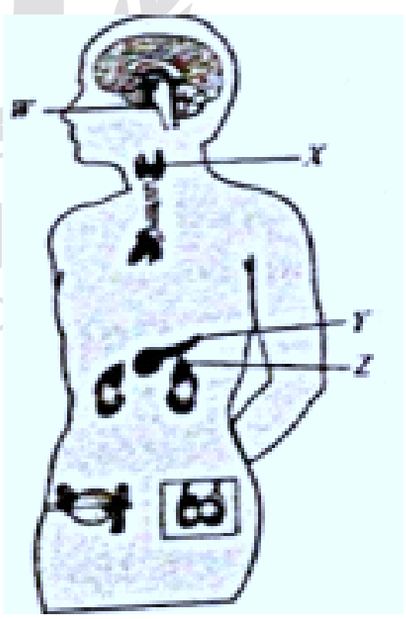
c) It is always an apex predator in the food chain.

d) It is a species that has no natural predators.

SECTION C

ACHIEVER'S LEVEL

21. Identify the glands in the given figure and select the incorrect statement regarding them.



a) W is also called as master gland as it influences functioning of the other glands.

b) X regulates the calcium and phosphate balance in the body.

c) Deficiency of hormone secreted by Y leads to goiter.

d) Hormone produced by Z helps the body to adjust to stress

22. Which of following is a correct sequence of events that occur in human reproduction?

a) Gametogenesis Gestation → Insemination → Fertilisation → Implantation Parturition

b) Gametogenesis → Insemination → Fertilisation Implantation → Gestation Parturition

c) Gametogenesis → Insemination → Gestation → Fertilisation → Implantation Parturition

d) Gestation → Gametogenesis → Insemination → Implantation → Fertilisation → Parturition

23. Rubina took four pieces of clothes of equal size made of different type of fibers and weighed them.

She soaked all the pieces in a beaker filled with water and kept them for 25 minutes. Then she took out these cloth pieces and weighed them one by one again. She noted down her observations in the given table:

Cloth piece	Weight before soaking (g)	Weight after soaking (g)
I	20	25
II	15	18
III	10	11
IV	30	45

I, II, III and IV could be respectively

a) Nylon, cotton, silk and wool

b) Silk, cotton, wool and nylon

c) Nylon, silk, cotton and wool

d) Cotton, silk, nylon and wool

24. A few daily use materials are given in the box.

(I) Paper

(ii) Peels of vegetables and fruits

(iii) Wood

(iv) Iron Pieces

(v) Plastic

(vi) Wool

Which of the following statements is correct regarding these materials?

a) Material (iii) takes 10-12 months for degeneration while material (vi) takes 10-20 years.

b) (iv) and (vi) are non-biodegradable as they take around 10-15 years to degenerate.

c) (i) and (ii) are biodegradable as they take around 10-30 days for degeneration.

d) (i), (ii), (iii), (iv) and (vi) are biodegradable while (v) is non-biodegradable.

25. The innermost region of a candle flame is _____ in colour.

a) Black, due to complete combustion of wax

b) Blue, due to complete combustion of wax

c) Black, due to incomplete combustion of wax

d) Yellow, due to the presence of unburnt wax vapours

26. On a rectangular surface of dimension 3 meter x 2 meter. The force due to atmospheric pressure – (Atmospheric pressure = 105 Pa.)

a) $5x10^5$ N b) $6x10^5$ N

c) $3 x 10^5$ N d) 10^5 N

27. The force on the surface is doubled and area is reduced to half. The pressure will -

a) Become twice

b) Become thrice

c) Become 4 times

d) Remain unchanged

28. Braille system is a

a) Auditory aids

b) Visual aids

c) Tactual aids

d) Electronic aids

29. Light from a laser strikes a plane mirror at an angle of 38° to the normal. If the laser is moved so that the angle of incidence increases by 13°, what is the new angle of reflection?

a) 54 degree b) 52 degree

c) 51 degree d) 45 degree

30. $Al_2O_3 + 2NaOH \rightarrow \ldots\ldots + H_2O$

a) $Al(OH)_3$ b) Na_2O

c) $NaAlO_2$ d) $AlNaO_2$

31. Which of the following is the correct arrangement of the given metals in Descending order of their reactivity?

Zinc, Iron, Magnesium, Sodium

a) Zinc > Iron > Magnesium > Sodium

b) Sodium > Magnesium > Iron > Zinc

c) Sodium > Zinc > Magnesium > Iron

d) Sodium > Magnesium > Zinc > Iron

32. Which practice is most effective for restoring degraded ecosystems?

a) Planting non-native species.

b) Implementing controlled burn.

c) Allowing natural succession processes to occur.

d) Increasing human activities in the area.

33. In which of the following scenarios would a species most likely be considered an "invasive species"?

a) A species that is native and thrives in its environment

b) A non-native species that causes harm to the ecosystem.

c) A species that migrates seasonally.

d) A species that has been protected by law.

34. What is "conservation biology" primarily concerned with?

a) The economic value of natural resource.

b) The study of ecosystems without human influence

c) The preservation and protection of biodiversity.

d) The impact of climate change on agriculture.

35. Which of the following ecological principles explains the importance of maintaining biodiversity in ecosystems?

a) Law of tolerance

b) Competitive exclusion principle

c) Ecosystem stability theory

d) Island biogeography theory

36. When frequency of sound increases time period T---?

a) Becomes negative

b) Constant

c) Also increase

d) Decreases

37. Which of the following does not help in purification of water –?

a) Chlorination

b) Using solar cooker

c) Reverse osmosis

d) Boiling

38. Fertilizers run off from agriculture fields into nearby water bodies leads to –

a) Eutrophication

b) Immediate killing of aquatic lives

c) Acid rain

d) None of the above.

39. Genetically modified (GM) crops are developed to:

a) Be more expensive to produce

b) Increase resilience to pests and environmental conditions.

c) Require more water for growth

d) Be less nutritious than traditional crops

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40. Which nutrient deficiency is most likely to cause stunted growth and yellowing of leaves in plants?

a) Phosphorus b) Nitrogen

c) Potassium d) Calcium

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