SAMPLE PAPER (CPA)
For IXth Moving

ICAD
Creating & Nurturing Talent

Duration : 2 Hours **Total Marks : 100**

Instructions :
- There will be two sections:
  Section A (Science) and Section B (Mathematics).
- Each section will have two parts :
  Part 1: 20 Concept based MCQs (1 mark each)
  Part 2 : 10 Critical thinking questions (3 marks each)
- Negative marking :
  For Part 1 of each section there is a negative marking of 0.25 marks for every incorrect answer. For Part 2 of each section there is a negative marking of 1 mark for every incorrect answer.
- Total marks : 100
- Time duration: 120 minutes for 60 questions.
- Use **black ball point pen** only.

SECTION A: SCIENCE (TOTAL MARKS: 50)

PART 1: CONCEPT-BASED QUESTIONS (20 QUESTIONS- 1 MARK EACH)

Q.1) What is the SI unit of pressure?
(a) Newton (b) Pascal
(c) Joule (d) Kilogram

Q.2) Which type of friction is experienced by an object moving through a fluid like air or water?
(a) Static friction (b) Kinetic friction
(c) Rolling friction (d) Fluid friction

Q.3) The force of friction always acts:
(a) In the direction of motion
(b) In the opposite direction of motion
(c) Perpendicular to the direction of motion
(d) At an angle of 45 degrees to the direction of motion

Q.4) Which of the following is a good conductor of electricity?
(a) Wood (b) Rubber
(c) Copper (d) Plastic

Q.5) Which of the following is NOT a type of reflection of light?
(a) Regular reflection (b) Diffuse reflection
(c) Refraction (d) Multiple reflection

Q.6) The splitting of white light into its component colors is called:
(a) Reflection (b) Refraction
(c) Dispersion (d) Diffraction

Q.7) Which of the following is not a primary activity in crop production?
(a) Sowing (b) Harvesting
(c) Composting (d) Weeding

Q.8) Which microorganism causes malaria?
(a) Virus (b) Bacteria
(c) Fungus (d) Protozoa

Q.9) Which type of flame is produced when there is incomplete combustion?
(a) Luminous flame
(b) Non-luminous flame
(c) Blue flame
(d) White flame

Q.10) What is the term for the process in which an egg is fertilized outside the female's body?
(a) Ovulation (b) Fertilization
(c) Gestation (d) Implantation

Q.11) Which of the following is an example of a non-contact force?
(a) Friction (b) Tension
(c) Magnetic force (d) Normal force

Q.12) Which part of the ear amplifies sound vibrations and transmits them to the inner ear?
(a) Pinna
(b) Ear canal
(c) Ear drum (tympanic membrane)
(d) Cochlea

Q.13) What is the unit of measurement for frequency?
(a) Hertz (Hz) (b) Decibel (dB)
(c) Newton (N) (d) Pascal (Pa)

Q.14) Which of the following is not a method of irrigation?
(a) Drip irrigation (b) Furrow irrigation
(c) Rainfed farming (d) Sprinkler irrigation

Q.15) Which microorganism is used in the production of antibiotics like penicillin?
(a) Bacteria (b) Virus
(c) Fungus (d) Protozoa

Q.16) What is the term for the protected areas meant for the conservation and protection of wildlife and their natural habitats?
(a) Zoos
(b) Wildlife sanctuaries
(c) Botanical gardens
(d) Aquariums

Q.17) During puberty, the secondary sexual characteristics in females are primarily controlled by which hormone?
(a) Estrogen (b) Progesterone
(c) Testosterone (d) Insulin

Q.18) What is the term for the first menstrual bleeding experienced by girls during adolescence?
(a) Menopause (b) Puberty
(c) Ovulation (d) Menarche

Q.19) Which of the following factors does NOT affect the force of friction between two surfaces?
(a) Nature of the surfaces
(b) Surface area in contact
(c) Mass of the objects
(d) Temperature

Q.20) When light passes from air into a denser medium, it generally:
(a) Speeds up
(b) Slows down
(c) Changes direction randomly
(d) Remains unaffected

PART 2: CRITICAL THINKING QUESTIONS (10 QUESTIONS - 3 MARKS EACH)

Q.21) In an electrolytic cell, during the process of electrolysis, positive ions move toward the cathode, and negative ions move toward the anode. Which fundamental principle of electrochemistry does this behavior illustrate?
(a) Faraday's First Law of Electrolysis
(b) Ohm's Law
(c) Lenz's Law
(d) Ampere's Law

Q.22) A hydraulic press multiplies a force by a factor of 100. If a small force of 20 N is applied to the smaller piston, what force can be exerted by the larger piston?
(a) 200 N (b) 2,000 N
(c) 100 N (d) 10 N

Q.23) In a vacuum, which of the following statements about the pressure due to a 1 kg mass is true?
(a) It is zero.
(b) It depends on the height.
(c) It is constant everywhere
(d) It decreases with depth.

Q.24) When you rub your hands together, they feel warm. What is the primary source of this heat?
(a) Conversion of kinetic energy into potential energy
(b) Conversion of mechanical energy into heat energy
(c) Conversion of electrical energy into thermal energy
(d) Conversion of potential energy into kinetic energy

Q.25) How does the speed of sound in water compare to its speed in air?
(a) Sound is faster in water.
(b) Sound is slower in water.
(c) Sound travels at the same speed in both.
(d) It depends on the frequency of sound.

Q.26) Organic farming is often considered an environmentally friendly alternative to conventional farming. Which of the following aspects of organic farming contributes to its sustainability?
(a) Use of synthetic fertilizers
(b) Heavy pesticide application
(c) Crop rotation and natural composting
(d) Monoculture farming

Q.27) How do leguminous plants, such as peas and beans, contribute to sustainable agriculture?
(a) They fix atmospheric nitrogen into the soil.
(b) They require heavy pesticide application
(c) They deplete the soil of essential nutrients
(d) They promote soil erosion

Q.28) Bioremediation is a technique that uses microorganisms to clean up environmental pollutants. Which type of microorganisms are commonly used in bioremediation processes?
(a) Disease-causing bacteria
(b) Decomposers
(c) Antibiotics
(d) Viruses

Q.29) In the context of fossil fuels, what is "fractional distillation" used for?
(a) Separating different components of crude oil based on boiling points
(b) Reducing the environmental impact of coal mining
(c) Measuring the carbon content of coal
(d) Enhancing the combustion efficiency of natural gas

Q.30) If a fire extinguisher contains 2 kg of carbon dioxide (CO_2) and is used to extinguish a fire by displacing the oxygen, how many moles of CO_2 are used? (Assume 1 mole of CO_2 is 44 g)
(a) 1 mole (b) 2 moles
(c) 0.5 moles (d) 4 moles

SECTION B: MATHEMATICS (MARKS: 50)

PART 1: CONCEPT-BASED QUESTIONS (20 QUESTIONS- 1 MARK EACH)

Q.31) If you subtract an irrational number from a rational number, what is the result?
(a) Always rational
(b) Always irrational
(c) May be rational or irrational
(d) Always zero

Q.32) What is the reciprocal of the rational number 2/7?
(a) 7/2 (b) 2/7
(c) 1/14 (d) 14/1

Q.33) If you multiply a rational number by its reciprocal, what do you get?
(a) 1
(b) 0
(c) The original rational number
(d) An irrational number

Q.34) If you solve the equation 4x – 6 = 18, what is the value of x?
(a) 5 (b) 6
(c) 7 (d) 8

Q.35) What is the sum of the angles of a quadrilateral?
(a) 90 degrees (b) 180 degrees
(c) 360 degrees (d) 270 degrees

Q.36) Which type of graph is suitable for representing continuous data?
(a) Pie chart (b) Bar graph
(c) Line graph (d) Histogram

Q.37) What does the "median" represent in a set of data?
(a) The most frequently occurring value
(b) The average value
(c) The middle value when data is arranged in ascending order
(d) The range of values

Q.38) If the speed of a car is inversely proportional to the time taken to travel a certain distance, what happens to the speed if the time is doubled?
(a) It remains the same
(b) It becomes half
(c) It doubles
(d) It cannot be determined

Q.39) In a direct proportion, if one quantity doubles, what happens to the other quantity?
(a) It doubles (b) It halves
(c) It remains the same (d) It becomes zero

Q.40) In a bar graph, what does the length or height of a bar represent?
(a) Frequency (b) Angle
(c) Area (d) Perimeter

Q.41) What is the ratio of 4 hours to 2 hours?
(a) 2 : 1 (b) 4 : 1
(c) 1 : 2 (d) 1 : 4

Q.42) What is the cube root of 4096?
(a) –26 (b) 16
(c) –16 (d) 26

Q.43) What is the volume of a cube with a side length of 4 units?
(a) 8 cubic units (b) 16 cubic units
(c) 64 cubic units (d) 32 cubic units

Q.44) If a rectangular piece of paper is rolled along its length a _____ is formed.
(a) Circle (b) Cylinder
(c) Cone (d) Pyramid

Q.45) "Tell me who I am, I shall give a pretty clue . You will get me back, if you take me out of twenty two". What will be the correct equation satisfying above puzzle?
(a) $x = 22$ (b) $22 - x = x$
(c) $x - 22 = x$ (d) $22 \times x = x$

Q.46) Find the central angle of a sector of pie chart representing 20 out of 120
(a) 20 (b) 40
(c) 60 (d) 80

Q.47) By what least number should 72 be multiplied to make it a perfect cube?
(a) 2 (b) 3
(c) 4 (d) 5

Q.48) A school canteen vendor buys 2 toffees for a rupee and sells 5 for Rs 3 . Find his gain %
(a) 10 (b) 20
(c) 30 (d) 40

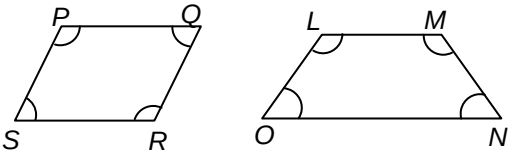
Q.49) Express $1.\overline{23}$ in the form of rational numbers $\left(\frac{p}{q}\right)$
(a) $\frac{123}{100}$ (b) $\frac{122}{100}$
(c) $\frac{122}{99}$ (d) $\frac{122}{90}$

Q.50) Find the last digit of 2^{2020}.
(a) 2 (b) 4
(c) 8 (d) 6

PART 2: CRITICAL THINKING QUESTIONS (10 QUESTIONS - 3 MARKS EACH)

Q.51) I am 97874. Please make me a Palindrome. What number will you add to make me one?
(a) 97879 (b) 500
(c) 50 (d) 5

Q.52) *PQRS* and *LMNO* are quadrilaterals as shown below. Find which of the options given below hold true.



(i) $\angle P + \angle Q + \angle R + \angle S = \angle L + \angle M + \angle N + \angle O$
(ii) $\angle P + \angle Q + \angle R + \angle S < \angle L + \angle M + \angle N + \angle O$
(iii) $\angle P + \angle Q + \angle R + \angle S > \angle L + \angle M + \angle N + \angle O$
(iv) No such relationship exists
(a) (i) (b) (ii)
(c) (iii) (d) (iv)

Q.53) Between which two consecutive numbers does $\sqrt{57}$ lie?

(i) 6 and 7 (ii) 7 and 8

(iii) 8 and 9 (iv) None of these

(a) (i) (b) (ii)

(c) (iii) (d) (iv)

Q.54) Three consecutive odd numbers represent the three sides of a triangle. The shortest side of the triangle is 20% of perimeter of triangle. Find the length of largest side of triangle.

(a) 7 (b) 5

(c) 11 (d) 9

Q.55) Point *X* is having coordinates (*m*, *n*). If $mn < 0$ then point *X* lies in _____ quadrant

(a) II (b) IV

(c) II or III (d) II or IV

Q.56) If 3^n is a number, when $n = 50$ the last digit of 3^n is '*x*'. When n = 100 the last digit of 3^n is 'y'. Find $x + y$.

(a) 5 (b) 10

(c) 3 (d) 9

Q.57) A dice having 9 faces was rolled once. Find the probability of getting a prime number.

(a) $\frac{2}{9}$ (b) $\frac{4}{9}$

(c) $\frac{5}{9}$ (d) $\frac{7}{9}$

Q.58) Solve the given equation to find value of *m*. "$m + 20\%$ of m = 12"

(a) 8 (b) 9

(c) 10 (d) 11

Q.59) If $b + \frac{1}{b} = 3$ find value of $b - \frac{1}{b}$.

(a) 2 (b) 3

(c) 5 (d) $\sqrt{5}$

Q.60) What is the value of $2^4 \times 2^3$?

(a) 8 (b) 16

(c) 64 (d) 128

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