

Indian Institute of Technology Kanpur
DEPARTMENT OF INDUSTRIAL AND MANAGEMENT
ENGINEERING

M.Tech Admission Test - Sample Questions

SECTION - 1

- Q.1.1** In a two-digit number, the digit in the unit's place is more than the digit in ten's place by 2. If the difference between the number and the number obtained by interchanging the digits is 18, what is the original number?
- [A] 46 [B] 68 [C] 24 [D] Data inadequate
- Q.1.2** 10 men can complete a piece of work in 15 days and 15 women can complete the same work in 12 days. If 5 men and 30 women work together, in how many days will the work get completed?
- [A] 5 [B] 6 [C] 4 [D] None of these
- Q.1.3** Three of the four expressions in the following options are exactly equal. Which expression is not equal to the other three?
- [A] $x(x + y)^2 - 2x^2y$ [B] $x(x - y)^2 + 2x^2y$
[C] $x\{(x + y)^2 - 2xy^2\}$ [D] $x\{(x + y)^2 - 2xy\}$
- Q.1.4** A right circular cone is exactly fitted inside a cube in such a way that the periphery of the base of the cone are touching the edges of one of the faces of the cube and the vertex is on the opposite face of the cube. If the volume of the cube is 343 cm^3 , what is the volume of the cone approximately?
- [A] 80 cm^3 [B] 90 cm^3 [C] 105 cm^3 [D] 110 cm^3
- Q.1.5** Which of the following values of x satisfies the inequality: $2x(x-2) < x+12$?
- [A] $-3/2 < x < 4$ [B] $-3 < 2x < 4$ [C] $x < -3/2; x > 4$ [D] $3/2 < x < 4$
- Q.1.6** Out of 15 students studying in a class, 7 are from Maharashtra; 5 from Karnataka and 3 from Goa. Four students are to be selected at random. What are the chances that at least one is from Karnataka?
- [A] $2/13$ [B] $11/13$ [C] $5/15$ [D] None of these

Q.1.7 A shopkeeper sold an article for Rs.720 after giving 10% discount on the labelled price and earned 20% profit on the cost price. What would have been the percentage profit had he not given the discount?

- [A] 25 % [B] 30% [C] 23% [D] None of these

Q.1.8 If the length of a rectangle is increased by 20% and the breadth is reduced by 20%, what will be the effect on its area?

- [A] 4% increase [B] 6% increase [C] 4% decrease [D] None of these

Q.1.9 Two cars start towards each other from points X km apart. One car travels at a speed of u km/hr and the other car travels at the speed of v km/hr. The distance between two cars after t hours of travelling is given by Y . Which of the following expressions is correct?

- [A] $Y = (u + v)t - X, t \geq X/(u+v)$ [B] $Y = X - (u + v)t, t \geq X/(u+v)$
[C] $Y = X - (u + v)t, t \leq X/(u+v)$ [D] $Y = (u + v)t - X, t \leq X/(u+v)$

Q.1.18 Let $f(x) = ae^{ax}$. Then for the equation $f(x) + \int f(x)dx = f'(x)$, what is the value of a assuming the integration constant is zero.

- [A] 1 [B] $(1 \pm \sqrt{5})/2$ [C] -1 [D] $(2 \pm \sqrt{3})/2$

Q.1.19 Consider five people A, B, C,D and E, each having different age. A is younger than only B. C is older than D. D is not the youngest. Who amongst the following are older than C?

- [A] Only A and B [B] Only E, B and A
[C] Only A and E [D] Only E and B

Q.1.20 Consider the following two quantities marked as (1) and (2).

(1) 0.01 is divided by 0.1

(2) 0.01 times 0.1

Compare the two quantities. Mark answer as

- [A] if quantity in (1) is greater
[B] if quantity in (2) is greater
[C] if the two quantities are equal
[D] if comparison cannot be made from the information given

Q.1.21 Which one of the following are key characteristics of electricity

- [A] Cannot be stored economically
[B] Its flow follows the Kirchoff's Laws
[C] Needs a medium for transmission
[D] All of the above

SECTION – 2

Q.2.1 In a famous experiment, when a dog smelled food, it salivated. Subsequently, a bell was rung whenever food was placed near the dog. After a number of trials, only the bell was rung, whereupon the dog would salivate even though no food was present. Which of the following conclusions may be drawn from the above experiment?

[A] Dogs are easily fooled.

[B] Dogs are motivated only by the sound of a bell.

[C] The ringing of bell was associated with food.

[D] A conclusion cannot be reached on the basis of one experiment.

Q.2.2 There are three given statements (i), (ii) and (iii) followed by four conclusions (1), (2), (3) and (4). You have to take the given statements to be true even if they seem to be at variance from commonly known facts!

Statements: (i) Some streets are roads. (ii) Some roads are lanes.

(iii) Some lanes are highways.

Conclusions: (1) Some roads are not streets.

(2) No highway is a street.

(3) Some streets are not roads.

(4) Some lanes are not roads.

Identify which of the conclusions logically follows from the given statements.

[A] Either (1) or (3) follows

[B] Only (4) and (3) follow

[C] Both (1) and (3) follow

[D] None of these

Q.2.3-2.4 (Common information)

The following steps demonstrate how a set of given numbers (input) is progressively rearranged in each step following a particular rule.

INPUT	25	280	345	36	93	147	550
Step 1	25	550	345	36	93	147	280
Step 2	345	550	25	36	93	147	280
Step 3	345	36	25	550	93	147	280

Q.2.3 Which is the next step?

[A] 345 36 550 25 93 147 280

[B] 345 36 25 550 93 147 280

[C] 345 36 25 93 550 147 280

[D] None of these

Q.2.4 Consider the arrangement given as:

842 485 68 358 236 123 93.

If the above arrangement appears in the second step, which of the steps will generate the following arrangement given as:

842 358 236 485 68 123 93?

[A] Step 1

[B] Step 3

[C] Step 4

[D] Cannot be determined