

KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(7 Pages)

Reg. No:.....

Question Code: 26E03902

Course Code: 25USH011

UG Degree - End Semester Examinations, April 2026

First Semester
B.COM., HONOURS

Problem Solving Through Aptitude - I

(For those who joined in June 2025 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A ($10 \times 1 = 10$ Marks)

Answer ALL Questions

Choose the correct answer :

- CO:1 1. The smallest 3-digit prime number is
K:1 (a) 100 (b) 101
(c) 103 (d) 107
- CO:1 2. If 180 is divided into 2 parts in ratio 5:4, the smaller part =?
K:1 (a) 80 (b) 90
(c) 100 (d) 120
- CO:2 3. The roots of the equation $x^2 - 7x + 12 = 0$ are:
K:1 (a) Real and equal (b) Real and distinct
(c) Imaginary (d) Equal
- CO:2 4. In the system of equations: $2x + 3y = 12$, $x - y = 1$.
K:1 What is the value of $x + y$?
(a) 2 (b) 3
(c) 4 (d) 5
- CO:3 5. The area of a circle with radius 7 cm is
K:1 (a) 77 cm^2 (b) 44 cm^2
(c) 154 cm^2 (d) 100 cm^2
- CO:3 6. A rectangular garden is 50 m long and 40 m wide? The cost of
K:1 fencing it at ₹25 per meter is:
(a) Rs. 4,500 (b) Rs. 4,250
(c) Rs. 4,800 (d) Rs. 4,000

- CO:4
K:1
7. In a line graph, a student's marks increased from 40 in Term 1 to 60 in Term 2, and 80 in Term 3. The improvement trend can be described as
- (a) Constant (b) Decreasing
(c) Linear increasing (d) Fluctuating
- CO:4
K:2
8. The bar chart shows sales of a company in 4 months:
Jan: ₹20,000; Feb: ₹25,000; Mar: ₹30,000; Apr: ₹35,000 - What is the percentage increase from January to April?
- (a) 65% (b) 55%
(c) 75% (d) 50%
- CO:5
K:2
9. Find out - Cat: Kitten:: Dog : ?
- (a) Cub (b) Puppy
(c) Calf (d) Kid
- CO:5
K:2
10. Pointing to a man, Rita says: "He is the son of my grandfather's only son." How is the man related to Rita?
- (a) Uncle (b) Cousin
(c) Brother (d) Father

PART - B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

- CO:1
K:3
11. (a) Apply the monthly incomes of A and B are in the ratio 5: 4 and their monthly expenses are in the ratio 3: 2. If A saves ₹10,000 and B saves ₹8,000, find their monthly incomes.

(OR)

- (b) Explain the find the smallest 5-digit number which is exactly divisible by 12, 15, and 18.

- CO:2
K:3
12. (a) Determine the approximate $\sqrt{82}$ up to 2 decimal places without calculator.

(OR)

- (b) Find the roots of $x^2 - 6x + 8 = 0$. Also, state the nature of roots.

- CO:3
K:2
13. (a) The rectangular park is 80 m long and 60 m wide. A path 5 m wide runs around the park inside. Find the area of the path and cost of gravelling it at ₹50 per m^2 .

(OR)

- (b) The solid metallic sphere of radius 7 cm is melted and recast into small cones each of radius 3.5 cm and height 7 cm. Find the number of cones formed.

- CO:4 14. (a) A company has recorded the sales of three products (A, B, K:5 C) over four years. The data is given in the table below:

Year	Product A	Product B	Product C
2021	250	300	200
2022	280	320	250
2023	300	350	280
2024	320	400	300

- (i) Draw a bar graph to represent the sales of the three products over the four years.
- (ii) In which year was the percentage increase in sales of Product C over the previous year the highest? Show your calculation.
- (iii) Is the given data sufficient to calculate the average sales of all products in 2022? Justify your answer.

(OR)

- (b) The bar graph below shows the number of books sold by a store in four months:

Month	Books Sold
Jan	400
Feb	500
Mar	300
Apr	600

- (i) Draw the bar graph.
- (ii) In which month was the sale 50% more than January? Show calculation.
- (iii) Is the data sufficient to determine the total number of books sold in all four months? Explain.

- CO:5 15. (a) Find the missing letters: B, E, H, K, N, ?, ?

- (b) Identify the pointing to a man, Rani said: "He is the father of my mother's brother." How is the man related to Rani?

PART - C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 500 words.

- CO:1 16. (a) The Profit and percentage of products in a shop sells two products, A and B.

- Cost price of Product A = ₹800, Selling price = ₹1,000
- Cost price of Product B = ₹1,200, Selling price = ₹1,380

i) Calculate the profit and profit percentage for both products.

ii) During a festive season, Product A is sold at 10% discount on the selling price and Product B at 5% discount.

Find the selling price after discount for each product.

iii) If a customer buys one unit of each product at discounted price, calculate the total profit made by the shopkeeper on this purchase.

(OR)

- (b) The company produces two types of gadgets, P and Q. The production details are as follows

- Gadget P is produced in batches of 120 units.
- Gadget Q is produced in batches of 180 units.

i) Find the HCF and LCM of the batch sizes and explain their significance in production planning.

ii) The company sells Gadget P and Gadget Q in the ratio 3:4. If the company produces 210 gadgets of P, how many gadgets of Q should be produced to maintain the ratio?

iii) The cost price of Gadget P is ₹500 and selling price is ₹600. The cost price of Gadget Q is ₹800 and selling price is ₹1,000. Calculate:

1) Profit percentage for Gadget P

i2) Profit percentage for Gadget Q

- CO:2 17. (a) The following table shows the monthly production (units) of two machines, X and Y, in a factory:

K:6

Month	Machine X	Machine Y
Jan	120	180
Feb	150	210
Mar	180	240

- i) If the production of Machine X and Machine Y continues with the same pattern, let the April production be x and y . Form a linear equation relating x and y .
- ii) The profit per unit of Machine X = ₹50, Machine Y = ₹70. If total profit in April is ₹18,500, form and solve a quadratic equation to find the number of units produced by Machine X.
- iii) Find the range of X if the profit from Machine X in April is at least ₹8,000. Represent this as a linear inequality.

(OR)

- (b) The shopkeeper sells two types of products, A and B. The monthly sales (in units) are given below:

Month	Product A	Product B
Jan	40	60
Feb	50	70
Mar	60	90

- i) If x and y represent the sales of products A and B in April, and they increase by the same pattern as previous months, form a linear equation connecting x and y .
- ii) The profit from Product A is ₹20 per unit and Product B is ₹30 per unit. Write and solve a quadratic equation to find the total profit if total units sold in April are 150.
- iii) Find the range of x if the profit from Product A in April is at least ₹1000. Represent this as a linear inequality.

C0:3 18. (a) The Surface of the rectangular tank of length 12 m, breadth
K:6 8 m, and height 5 m is to be painted from the outside and filled with water inside.

- i) Find the total surface area (TSA) of the tank.
- ii) If painting costs ₹15 per m^2 , calculate the painting cost.
- c) Find the volume of the tank.
- iii) If 1 cubic metre of water costs ₹25, find the cost to fill the tank completely.
- iv) Justify whether the data is sufficient to calculate both painting and filling costs.

(OR)

(b) The playground is in the shape of a rectangular field of length 50 m and breadth 30 m. Inside the field, a circular garden of radius 7 m is constructed at one corner.

- i) Find the area of the rectangular playground.
- ii) Find the area of the circular garden.
- iii) Find the remaining area of the field available for playing.
- iv) A fence is to be built around the circular garden. Find the length of the fence (perimeter).
- v) Justify whether the data is sufficient to calculate both the play area and the fencing requirement.

C0:4 19. (a) The following table shows the marks obtained by 4
K:4 students in three subjects:

Student	Mathematics	Science	English
A	80	70	60
B	60	75	65
C	90	85	80
D	70	65	75

- i) Calculate the total marks of each student.
- ii) Represent the data using a bar graph.
- iii) If the average marks of Student B are represented by X, form an equation and solve for X.

iv) Is the given data sufficient to determine who scored the highest total marks? Justify.

v) Draw one conclusion about the relative performance of the students.

(OR)

(b) Write a letter from the Company Secretary to a shareholder informing about the declaration of dividend.

CO:5 20. (a) Solve and Draw the sales (in ₹ '000) of three products (A, B, K:6 C) in a company over 4 years are given in the table:

Year	Product A	Product B	Product C
2021	120	150	100
2022	140	160	120
2023	160	180	140
2024	200	210	160

(i) Draw a bar graph to represent the sales of all products year-wise.

(ii) Using the data, form and solve an algebraic equation:

If the sales of Product A in 2025 are expected to be x , which is 20 units more than the sales of 2024, find the value of x .

(iii) From the graph, identify the year in which the total sales of all products was maximum.

Interpret the following series is given: 3, 9, 27, 81, 243,?,?, ?

(a) Identify the pattern.

(b) Find the next three terms.

(c) Justify why this series is a type of *Geometric Progression*.

(OR)

(b) Ramesh said: "This girl is the daughter of my mother's only son."

(a) Draw a simple family tree based on the statement.

(b) Identify the relationship between the girl and Ramesh.

(c) Justify your answer.