PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch – VISUAL COMMUNICATION(ELECTRONIC MEDIA)

MATHEMATICS

Time : Three Hours

Maximum : 75 Marks

SECTION-A (20 Marks)
Answer ALL questions

ALL questions carry EQUAL marks   (10 x 2 = 20)

1. Find the average of all the numbers between 6 and 34 which are divisible by 5.

2. If a number, when divided by 4, is reduced by 21, find the number?

3. Find the value of $(256)^{\frac{5}{4}}$

4. Evaluate : 28% of 450 + 45% of 280.

5. If $(x : y) = 2 : 1$, then find $(x^2 - y^2) : (x^2 + y^2)$.

6. At what rate percent per annum will a sum of money double in 16 years?

7. Define Transpose of a matrix . Give one example.

8. If $A = (3 \ 5 \ 6)$, $B = \begin{pmatrix} 4 \\ 1 \\ 2 \end{pmatrix}$ then find AB.

9. Define slack variable.

10. Define feasible solution

SECTION-B (25 Marks)
Answer All questions

ALL questions carry EQUAL marks   (5 x 5 = 25)

11. a) A pupil's marks were wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half. Find the number of pupils in the class?

(OR)

b) If three numbers are added in pairs, the sums equal 10, 19 and 21. Find the numbers?

12. a) Which is larger $\sqrt{2}$ or $\sqrt[3]{3}$?

(OR)

b) 6. A book was sold for Rs. 27.50 with a profit of 10%. If it were sold for Rs. 25.75, then what would have been the percentage of profit or loss?

13. a) The ratio of third proportional to 12 and 30 . Find the mean proportional between 9 and 25?

(OR)

b) The average weight of A, B and C is 45 kg. If the average weight of A and B be 40 kg and that of B and C be 43 kg. Find the weight of B?

14. a) Use determinants and solve $2x + 3y = 12, x + 5y = 13$ by Cramer's rule.

(OR)

b) Find x if $A = \begin{vmatrix} 1 & x & -4 \\ 5 & 3 & 0 \\ -2 & -4 & 8 \end{vmatrix} = 0$

15. a) Solve graphically   Max. $Z = 7x_1 + 5x_2$

Subject to the constraints $x_1 + 2x_2 \le 6$

$$4x_1 + 3x_2 \le 12 \text{ and } x_1, x_2 \ge 0$$

(OR)

b) Solve graphically   Min. $Z = 3x_1 + 5x_2$

Subject to the constraints $x_1 + x_2 \ge 200$

$$x_1 \le 80$$

$$x_2 \ge 60 \text{ and } x_1, x_2 \ge 0$$

SECTION-C (30 Marks)
Answer any THREE Questions
ALL Questions carry EQUAL Marks (3 x 10 = 30)

16 . i) The average age of 35 students in a class is 16 years. The average age of 21 students is 14. What is the average age of remaining 14 students?
ii) Rohit was 4 times as old as his son 8 years ago. After 8 years, Rohit will be twice as old as his son. What are their present ages?

17. i) Raman's salary was decreased by 50% and subsequently increased by 50%. How much percent does he lose?
ii) An article is sold at a certain price. By selling it at $\frac{2}{3}$ of that price one loses 10%. Find the gain percent at original price?

18. i) The ratio of the incomes of A and B is 5: 4 and the ratio of their expenditures is 3:2. If at the end of the year, each saves Rs. 1600. Find the income of A?

ii) A sum was put at simple interest at a certain rate for 3 years. Had it been put at 2% higher rate, it would have fetched Rs. 360 more. Find the sum?

19. Solve the following equations by matrix method,
$$2x - y + 3z = 1 \; ; \; x + y + z = 2 \; ; \; x - y + z = 4 \; .$$

20. Use Simplex Method to solve
Max. $Z = 10x_1 + x_2 + 2x_3$
Subject to the constraints $x_1 + x_2 - 2x_3 \le 10$
$$4x_1 + x_2 + x_3 \le 20$$
and $x_1, x_2, x_3 \ge 0$.

Z-Z-Z END