

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION MAY 2018
(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 The average of four consecutive even numbers is 27. Find the largest of these numbers.
- 2 The sum of two numbers is 184. If one - third of the one excess one - seventh of the other by 8, find the smaller number.
- 3 Find the value of $(\sqrt[3]{8})^3$.
- 4 Express 6% as a decimal.
- 5 If $A : B = 5 : 7$ and $B : C = 6 : 11$, find $A : B : C$.
- 6 Find the simple interest on Rs. 68,000 at 16% per annum for 9 months.

If $A = \begin{bmatrix} 4 & -2 \\ 3 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$ examine $AB = BA$.

- 8 Find the value of the determinant $\begin{vmatrix} 3 & 4 & 7 \\ 2 & 1 & 3 \\ 7 & 2 & 1 \end{vmatrix}$.

- 9 Define optimal solution.
- 10 Define matrix form of LPP.

SECTION - B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

- 11 a The product of the ages of Ankit and Nikita is 240. If twice the age of Nikita is more than Ankit's age by 4 years, what is Nikita's age?
OR
b A student was asked to find the arithmetic mean by of the numbers 3, 11, 7, 9, 15, 13, 8, 19, 17, 21, 14, and x. He found the mean to be 12. What should be the number in place of x?
- 12 a Evaluate $(28\% \text{ of } 450) + (45\% \text{ of } 280)$.
OR
b Find CP when (i) C.P = Rs. 56.25, Gain = 20% (ii) C.P = Rs. 80.40, Loss = 5%.
- 13 a Reena took a loan of Rs. 1,200 with simple interest for as many years as the rate of interest. If she paid Rs. 432 as interest at the end of the loan period, what was the rate of interest?
OR
b Find the compound interest on Rs. 10,000 in 2 years at 4% per annum, the interest being compounded half - yearly.

Cont...

14 a Evaluate : i

$$\begin{matrix} 2 & 3 & & '2 & 4 \\ & !1 & 4 & & \\ & & & !3 & 1' \end{matrix}$$

OR

b Solve the equations by matrix method:

$$3x + 2y = 14$$

$$3x + 3y = 18$$

15 a A person requires at least 10, 12 and 12 units of the chemicals A, B and C respectively for his garden. A liquid product contains 1, 2 & 4 units of A, B and C respectively per jar. A dry product contains 5, 2 and 1 units of A, B and C per carton. The liquid product sells for Rs. 3 per jar and the dry product sells for Rs. 2 per carton. Formulate this is an LPP for minimizing the cost and ensuring the requirement.

OR

b Solve by graphical method:

$$\text{Minimize } Z = -3x_1 + 4x_2$$

$$\text{Subject to } x_1 + x_2 < 4$$

$$2x_1 + 3x_2 > 48$$

$$\text{and } x_1, x_2 > 0.$$

SECTION - C (30 Marks!Answer any **THREE** Questions

ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16 a) The present age of three persons are in proportions 4 : 7 : 9 , Eight years ago, the sum of their ages was 56. Find their present ages (in years).

b) The average of 11 numbers is 10.9. If the average of the first six numbers is 10.5 and that of the last six numbers is 11.4, find the middle number :

17 a) The CP of 21 articles is equal to S.P of 18 articles. Find the gain or loss percent.

b) Which is larger or ii3 ?

18 a) Divide Rs. 1162 among A, B, C in the ratio 35 : 28 : 20.

b) The difference between the compound interest and simple interest on a certain sum at 10% per annum for 2 years is Rs. 631. Find the sum.

19 Solve the following system of simultaneous equations by Cramer's rule :

$$2x + 3y + 3z = 22$$

$$x - y + z = 4$$

$$4x + 2y - z = 9$$

20 Use simplex method to solve

$$\text{Max } z = x_1 + x_2 + 3x_3$$

$$\text{Sub to } 3x_1 + 2x_2 + x_3 < 3$$

$$2x_1 + x_2 + 2x_3 < 2 \text{ and}$$

$$x_1, x_2, x_3 > 0.$$

Z-Z-Z

END