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GIET UNIVERSITY, GUNUPUR – 765022
 B. B. A (First Semester) Examinations, February – 2023
21BBAPC11003 – Business Mathematics

Time: 3 hrs

Maximum: 60 Marks

(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**Q.1. Answer **ALL** questionsa. Find the value of k from the following:

$$\frac{x^2}{\sqrt{x}} = x^k$$

b. Show that $9^{-\frac{1}{2}} \times \frac{1}{27} = 3^{-4}$ c. If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, then what is the value of x .

d. Given 4 flags of different colours, how many different signals can be generated, if a signal requires the use of 2 flags one below the other?

e. How many 2 digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if the digits can be repeated?

f. What is Transpose of a matrix?

g. Differentiate between Diagonal and Scalar matrix.

h. If $A = \begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} a & b \\ 3 & 5 \end{bmatrix}$ find a and b such that $AB=BA$.

i. Raju bought a car for ₹400,000. He took a ₹200,000 loan from a bank at an interest rate of 15% per year for a 3-year period. What is the total amount (interest and loan) that he would have to pay the bank at the end of 3 years?

j. Find the amount to be paid back on a loan of ₹18,000 at 5.5% per annum for 3 years.

PART – B**(8 x 5 = 40 Marks)**Answer ALL the questions

2. a. Length of a rectangle is 3 feet less than 2 times of its width and its perimeter is 60 feet. Calculate the width and length of the rectangle.

(OR)

b. Find the roots of the following quadratic equations, if they exist, using the quadratic formula:

$$x^2 + 4x + 5 = 0$$

3.a. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, find x

(OR)

b. In how many ways can 4 red, 3 yellow and 2 green discs be arranged in a row if the discs of the same colour are indistinguishable ?

- 4.a. Use Cramer's rule to find the solution of the following system of equations: 8 CO 4 L3
- $$4x - 3y + z = -10$$
- $$2x + y + 3z = 0$$
- $$-x + 2y - 5z = 17$$
- (OR)
- b. If $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ find A^{-1} . 8 CO 3 L3
- 5.a. The difference between the interest received from two different banks on ₹500 for 2 yrs is ₹2.5. Find the difference between their rates. 8 CO 2 L3
- (OR)
- b. Find the compound interest on ₹25625 for 12 months at 16% per annum, compound quarterly. 8 CO 2 L3
- 6.a. A person wishes to have a future sum of Rs. 1,00,000 for his son's education after 10 years from now. What is the single-payment that he should deposit now so that he gets the desired amount after 10 years? The bank gives 15% interest rate compounded annually. 8 CO 2 L3
- [Given (P/F, 15%, 10 = 0.2472); (F/P, 15%, 10 = 4.046); (A/F, 15%, 10 = 0.0493)]
- (OR)
- b. A person who is now 35 years old is planning for his retired life. He plans to invest an equal sum of Rs 10,000 at the end of every year for the next 25 years starting from the end of the next year. The bank gives 20% interest rate, compounded annually. Find the maturity value of his account when he is 60 years old. 8 CO 2 L3
- [Given (P/F, 20%, 25) = 0.0105; (F/A, 20%, 25) = 471.981; (F/P, 20%, 25) = 95.396]
- End of Paper ---