Form A: Paper –Setting Blank Ref No. –Ex/CE/5/T/203/2024(S)

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) SECOND YEAR FIRST SEMESTER SUPPLEMENTARY EXAM-2024. (EVENING)

SUBJECT: COMPUTER PROGRAMMING II

Full Marks 100

Time: Three hours/ (50 marks for each part)

Use a separate Answer-Script for each part

No. of Question	PART – I	Marks
1	Create a structure to specify data about employee. The data to be stored its name, Age, Basic pay and ID no. Assumed maximum 100 no employee. Write a C program to print the details of an employee, if give an ID no. as input.	10
2	**Answer any five questions.** **a)** Write a C program to find out value of $\int_{\frac{\pi}{2}}^{\pi} x \sin x \, dx$ using simson's rule. Given no. of division (k) as an input. b) Write a C program, to product of two Matrices [A] and [B], both of size (2x3) and (3X2) respectively and store the result in a separate matrix [C]. b) Write a C program to interchange the elements of two diagonal of two squire matrix. c) Write a C program to print ascending order form given input as N number integer d) d) Write a C program to the sum of following series for the first N terms, using function subprogram. $y = 1 \quad \frac{x^2}{2!} \quad \frac{x^4}{4!} \quad \frac{x^6}{6!} \ldots\ldots\ldots\ldots$ e) Write a C program to find the value of ${}^{n}c_{r}$, using function subprogram.	5X8=40

[Turn over

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SUBJECT : COMPUTER PROGRAMMING- II

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Full Marks 100
(50 marks for each part)

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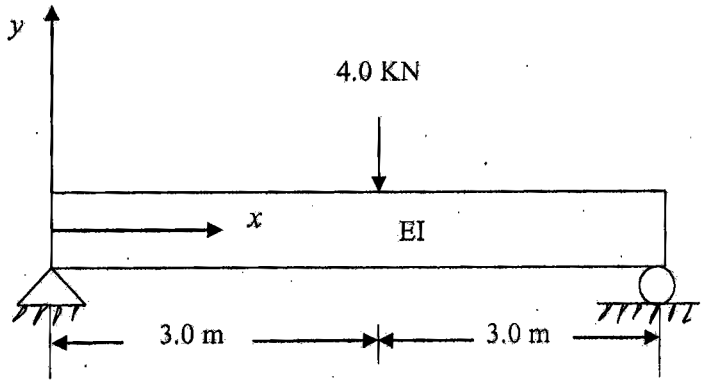
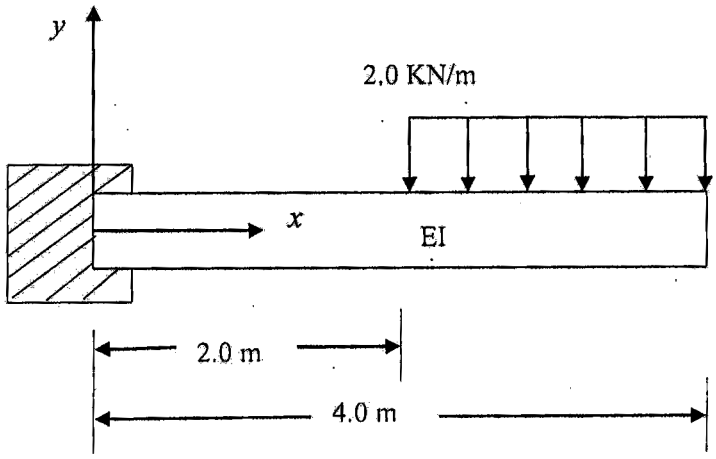
Answer any **Five** Questions.

No. of questions	Part II	Marks
1.	a) Define Eigen value and Eigen vector.	2
	b) Using polynomial method, determine the Eigen values and corresponding Eigen vectors for the matrix $$A=\begin{bmatrix}1 & -1 & 0\\ -1 & 2 & 1\\ 0 & 1 & 1\end{bmatrix}$$	8
2.	a) Explain briefly power and inverse power method in connection with the Eigen value problems.	3
	b) Find the Eigen values and corresponding Eigen vectors using power and inverse power method, using two iterations, for the matrix $$B=\begin{bmatrix}5 & 4\\ 1 & 2\end{bmatrix}$$	7
3.	a) What is the difference between the trapezoidal rule and the Gaussian quadrature rule?	2
	b) Derive composite Simpson's one third rule using first three terms of Newton- Gregory forward formula.	8
4.	a) Using three-point Gauss quadrature rule, estimate the integral. $$\int_0^6 (x^2+4x+1)dx$$ Also, find the absolute relative true error.	7
	b) Use the Trapezoidal rule with no. of segments (n)= 4, evaluate the integral. $$\int_2^{10} (x^3 + 3x + 2)\, dx$$	3

No. of questions	Part II	Marks
5.	a) Derive the finite difference equation for f '(x) and f "(x).	4
	b) Write an algorithm to compute the value of a definite integral using Simpson's one third rule.	4
	c) What is the basic difference between an initial-value problem and a boundary-value problem?	2
6.	Compute the deflection at mid-point and quarter points of the beam shown in figure below using finite difference method. 	10
7.	Find the deflection for the cantilever beam at 1.0m, 2.0m, 3.0m and 4.0m from the fixed end using finite difference method. 	10