Hall Ticket Number :										

R-17

Code: 7GC32

II B.Tech. I Semester Supplementary Examinations June 2024

Engineering Mathematics-III

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) Apply fourth order Runge-Kutta method to $\frac{dy}{dx}=3x+\frac{1}{2}y$, $y(0)=1$ determine $y(0.1)$ correct to four decimal places. 7M

   b) Find a real root of the equation $3x=\cos x+1$ by Newton-Raphson's method correct to four decimal places. 7M

OR

2. Use Milne's method to find $y(0.3)$ from $y'=x^2+y^2$ $y(0)=1$. Find the intial values $y(-0.1)$, $y(0.1)$, $y(0.2)$ from the Taylors series method. 14M

UNIT–II

3. a) Evaluate $\int_0^1 \frac{1}{1+x}\,dx$ by Simpson's 1/3 rule. 7M

   b) Using Lagrange formula find $f(4)$. Given

x	0	2	3	6
y	-4	2	14	158

7M

OR

4. Using Lagrange is interpolation formula find the value of $f(10)$ from the following table

x	5	6	9	11
y	12	13	14	16

14M

UNIT–III

5. Form the partial differential equation by eliminating the arbitrary constants $x^2+y^2+(z-c)^2=a^2$ 14M

OR

6. Form a partial differential equation by eliminating the arbitrary functions $f(x)$ and $g(y)$ from $z=y\,f(x)+x\,g(y)$. 14M

UNIT–IV

7. Find the fourier series expansion of $f(x)=2x-x^2$ in $(0,3)$ and hence deduce that $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\frac{1}{5^2}-\frac{1}{6^2}+\ldots=\frac{®^2}{12}$ 14M

OR

8. a) Find the Fourier series expansion for $f(x)=®-x$ in $0<x<®$ 7M

   b) Expand $f(x)=\cos x, 0<x<®$ in half range sine series. 7M

UNIT–V

9. a) Find the Fourier sin and cosine transform of $f(x)=\frac{e^{-ax}}{x}, a>0$ 7M

   b) Find the Fourier sin and cosine transform of $f(x)=2e^{-5x}+5e^{-2x}$ 7M

OR

10. Find the Fourier cosine transform of $f(x)=\frac{1}{1+x^2}$, hence, derive the Fourier sine transform of $¤(x)=\frac{x}{1+x^2}$ 14M

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Hall Ticket Number :										

R-17

Code: 7G134

II B.Tech. I Semester Supplementary Examinations June 2024

Discrete Mathematics

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks
		UNIT–I	
1.	a)	Define Statement and Explain various Connectives with Example.	7M
	b)	Explain Free and Bound variables with examples.	7M
		OR	
2.	a)	What is Tautology? Prove that the following statement is tautology or not. ((P->R)^(Q->R))->((PVQ)->R)	7M
	b)	Find Principle Conjunctive Normal form for the following formula. P->((P->Q)^ ~(~QV~P))	7M
		UNIT–II	
3.	a)	Explain types of functions with examples.	6M
	b)	Draw the Hasse diagram for the positive divisors for 36.	8M
		OR	
4.		State relation and explain properties of binary relations with examples.	14M
		UNIT–III	
5.	a)	Explain pigeonhole principle with example.	7M
	b)	How many different license plates are there that involve 1, 2 or 3 letters followed by 4 digits?	7M
		OR	
6.		Define Group, monoid, semigroups and subgroups with examples.	14M
		UNIT–IV	
7.		Solve the recurrence relation $a_n = a_{n-1} + f(n)$, $n \geq 1$ by substitution.	14M
		OR	
8.	a)	Determine the coefficient x^5 in $(1-2x)^{-7}$	7M
	b)	Find the sequence generated by the following function. $(3+x)^3$	7M
		UNIT–V	
9.	a)	What is Hamiltonian graph? Explain with an example.	7M
	b)	Explain DFS with example.	7M
		OR	
10.	a)	Define a graph and explain various representations of graph with examples.	10M
	b)	Define Planner graph with examples.	4M

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