Sanjay Ghodawat University, Kolhapur

2020-21

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EXM/P/09/00

Year and Program: SY B Tech	School of Technology	Department: Aeronautical Engineering
Course Code: AET202	Course Title: Applied Numerical Methods	Semester : IV
Day: Monday Date: 21.06.2021	End Semester Examination	Time:2 hours Max Marks:50

Instructions: 1) All Questions are compulsory.
2) Use of non programmable calculator is allowed.

		Marks	Bloom's Level	CO
Q.1	**Solve the following (any Two)**–			
a)	Using the bisection method, find an approximate root of the equation$x^3 - 4x - 9 = 0$ that lies between 2 and 3.Carry out computations upto eighth stage.	08	L3	CO1
b)	Solve the following equations by Gausselimination method. $x + 2y + 3z - t = 10$ $2x + 3y - 3z - t = 1$ $3x + 2y - 4z + 3t = 2$ $2x - y + 2z + 3t = 7$	08	L3	CO2
c)	Solve the following equations by Jacobi's iteration method upto four decimal places. Carry out computations upto sixth iteration. $15x + 2y + z = 18$ $2x + 20y - 3z = 19$ $3x - 6y + 25z = 22$	08	L3	CO2
Q.2	**Solve the following (any Two) –**			
a)	Find$f(4.4)$from the following table. x: 0 2 4 6 8 10 12 $f(x)$: 12 7 6 7 13 32 77	08	L2	CO4
b)	Find the first, second and third derivatives of a function tabulated below at $x = 3$. x: 2 2.2 2.4 2.6 2.8 3 $f(x)$: -23 -21.952 -20.376 -18.224 -15.448 -12	08	L2	CO4
c)	Find $f^{\prime}(4)$ from the following data. x: 1 2 4 8 10 $f(x)$: 0 1 5 21 27	08	L2	CO4

Q.3 Answer the following (any Two) –

a)	i.	If 10% bolts produced by a machine are defective, calculate the probability that out of sample selected at random of 10 bolts not more than one will be defective.	09	L3	CO5
	ii.	If the probability that an individual suffers a bad reaction from a certain injection is 0.001,determine the probability that out of 2000 individuals- i) Exactly 3 ii) More than 2 will suffer a bad reaction.			
b)		Using Euler's modified method find the value of y satisfying the equation $\frac{dy}{dx} = \log(x + y)$, $y(1) = 2$, for $x = 1.2$ and $x = 1.4$ taking $h = 0.2$	09	L3	CO6
c)		Using R-K method solve numerically the differential equation $\frac{dy}{dx} = x^2 + y^2$ with $x = 1, y = 1.5$ in the interval (1,1.2) taking $h = 0.1$	09	L3	CO6

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