G.PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY

Accredited by NAAC with "A" Grade, Recognized by UGC under 2(f) & 12(B)

(Affiliated to JNTUA & Approved by AICTE)

SET-1

B.Tech II Year I Semester (R15) MID-I Descriptive Examinations Nov-2017

MATHEMATICS-III (15A54301)

(Common to All Branches)

Date: 06/11/2017

Time: 90 minutes Max.Marks:30

QUESTION NO 1 IS COMPULSORY. ANSWER ONE FROM 2 (OR) 3 AND ONE FROM 4 (OR) 5

PART-A

S. No	Questions	Marks	UNIT	CO	Cognitive level
1	A)Write Gauss's Backward& Gauss's Forward Interpolation Formula	2	III	C201.4	Remember
	B) Write Trapezoidal rule& Simpson's (1/3) Rule	2	IV	C201.5	Remember
	C) Write normal equations to fit a straight line&parabola	2	IV	C201.5	Remember
	D) Write R-K second order& R-K fourth Order formulae	2	V	C201.6	Remember
	E) Solve numerically using Euler's method $y' = y^2 + x$, $y(0) = 1$.Find $y(0.1)$	2	V	C201.6	Apply

PART-B

S. No	Questions	Marks	UNIT	CO	Cognitive level
2	A)Using Gauss's Backward difference formula, find $y(8)$ from the following table x: 0, 5, 10, 15, 20, 25 y: 7, 11, 14, 18, 24, 32	5	III	C201.4	Apply
	B) Using Newton's Forward Interpolation Formula find the value of f (1.6) for the following data x: 1, 1.4, 1.8, 2.2 f(x): 3.49, 4.82, 5.96, 6.5	5	III	C201.4	Apply
3	A) Find $y(10)$,$given\ that\ y(5) = 12, y(6) = 13$ $y(9) = 14, y(11) = 16\ using Lagrange's formula$	5	III	C201.4	Analyze
	B) Use Stirlings interpolation formula to find the value of y at $x = 35$ from the following table x: 20, 30, 40, 50 y: 512, 439, 346, 243	5	III	C201.4	Apply
4	A) Fit a parabola of the form $y = a + bx + cx^2$ to the following data x: 0, 1, 2, 3, 4 y: 1, 1.8, 1.3, 2.5, 6.3	5	IV	C201.5	Evaluate
	B) Find the first and second derivatives of the function tabulated below at the point $x = 1.5$ x: 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 y: 3.375, 7.0, 13.625, 24.0, 38.875, 59.0	5	IV	C201.5	Analyze
5	A) Solve $y' = y - x^2$, $y(0) = 1$ by Picard's method up to the fourth approximation. Hence find the value of $y(0.1)$,$y(0.2)$	5	V	C201.6	Apply
	B) Find $y(0.1)\ and\ y(0.2)$ using R-K fourth order formula given that $y' = x^2 - y\ and\ y(0) = 1$	5	V	C201.6	Analyze

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SET-2

B.Tech II Year I Semester (R15) MID-I Descriptive Examinations Nov-2017

MATHEMATICS-III (15A54301)

(Common to All Branches)

Date: 06/11/2017

Time: 90 minutes Max.Marks:30

QUESTION NO 1 IS COMPULSORY. ANSWER ONE FROM 2 (OR) 3 AND ONE FROM 4 (OR) 5

PART-A

S. No	Questions	Marks	UNIT	CO	Cognitive level
1	A) Write Stirling's formula	2	III	C201.4	Remember
	B) Write Gauss'sForward& Backward Interpolation Formula	2	III	C201.4	Remember
	C) Write Simpson's (3/8) & Simpson's (1/3)Rule	2	IV	C201.5	Remember
	D) Write normal equations to fit a parabola & Straight line	2	IV	C201.5	Remember
	E) Write the general formula of Picard's method of successive approximations	2	V	C201.6	Remember

PART-B

S. No	*Questions*	Marks	UNIT	CO	Cognitive level
2	A) . Using Gauss's backward difference formula, find $y(8)$ from the following table x: 0, 5, 10, 15, 20, 25 y: 7, 11, 14, 18, 24, 32	5	III	C201.4	Apply
	B) Applying Newton's forward interpolation formula, compute the value of $\sqrt{5.5}$, given that $\sqrt{5} = 2.236, \sqrt{6} = 2.449, \sqrt{7} = 2.646$ and $\sqrt{8} = 2.828$ Correct up to three places of decimal	5	III	C201.4	Apply
3	Find $y(12.2)$ by Stirlings formula from the following data x: 10, 11, 12, 13, 14 y: 0.23967, 0.28060, 0.31788, 0.35209, 0.38368	5	III	C201.4	Analyze
4	*A)Fit a least squares quadratic curveto the following data* *x*: *1, 2, 3, 4* *y*: *1.7, 1.8, 2.3, 3.2* *Estimate $y(2.4)$*	5	IV	C201.5	Evaluate
	B)) Dividing the range into 10 equal parts , find an approximate value of $\int_0^{\frac{\pi}{2}} sinx\ dx$by a) Trapezoidal rule b) Simpson's rule	5	IV	C201.5	Evaluate
5	*A) Solve $y^I = x^2 - y$, $y(0) = 1$ using Taylor's series method and compute $y(0.1)$, $y(0.2)$, $y(0.3)$ and $y(0.4)$ (correct to 4 decimal places)*	5	V	C201.6	Apply
	B)Solve $\frac{dy}{dx} = x - y$, $y(1) = 0.4$ ..Find $y(1.2)$ using R-K method	5	V	C201.6	Apply

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SET-3

B.Tech II Year I Semester (R15) MID-I Descriptive Examinations Nov-2017

MATHEMATICS-III (15A54301)

(Common to All Branches)

Date: 06/11/2017

Time: 90 minutes Max.Marks:30

QUESTION NO 1 IS COMPULSORY. ANSWER ONE FROM 2 (OR) 3 AND ONE FROM 4 (OR) 5

PART – A

S. No	Questions	Marks	UNIT	CO	Cognitive level
1.	A) Write Newton's Forward& Backward Interpolation Formula	2	III	C201.4	Remember
	B) Write Gauss's Forward& Backward Interpolation Formula	2	III	C201.4	Remember
	C) Write Trapezoidal rule & Simpson's Rule	2	IV	C201.5	Remember
	D) Write normal equations to fit a straight line & parabola	2	IV	C201.5	Remember
	E) Write R-K second& fourth order formula	2	V	C201.6	Remember

PART-B

S. No	Questions	Marks	UNIT	CO	Cognitive level
2	A) Find by Gauss's Backward interpolating formula the value of y $when$ $x = 1936$ Using the following table X: 1901, 1911, 1921, 1931, 1941, 1951 Y: 12, 15, 20, 27, 39, 52	5	III	C201.4	Analyze
	B) Given u_1 = 22 , u_2 = 30, u_4= 82,u_7 = 106, u_8= 206, $find u_6$. Using Lagrange's formula	5	III	C201.4	Apply
3	Find $f(16)$ by Stirlings formula from the following data x: 0, 5, 10, 15, 20, 25, 30 y: 0, 0.0875, 0.1763, 0.2679, 0.364, 0.4663, 0.5774	10	III	C201.4	Analyze
4	A) Fit a straight line to the following data X: 0, 1, 2, 3, 4 Y: 1, 1.8, 3.3, 4.5, 6.3	5	IV	C201.5	Evaluate
	B)Evaluate $\int_0^{0.6} e^{-x^2} dx$ using Simpson's one third rule Taking seven ordinates	5	IV	C201.5	Evaluate
5	A) Using Modified Euler's method find $y(0.2) and y(0.4)$ given $y' = y + e^x$, $y(0) = 0$	5	V	C201.6	Apply
	B)Given that $\frac{dy}{dx} = \frac{xy}{1+x^2}$, $y(0) = 1, h = 0.1$. Find y at x=0.1 Using Runge-Kutta method	5	V	C201.6	Apply

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SET-4

B.Tech II Year I Semester (R15) MID-I Descriptive Examinations Nov-2017

MATHEMATICS-III (15A54301)

(Common to All Branches)

Date: 06/11/2017

Time: 90 minutes Max.Marks:30

QUESTION NO 1 IS COMPULSORY. ANSWER ONE FROM 2 (OR) 3 AND ONE FROM 4 (OR) 5

PART-A

S. No	Questions	Marks	UNIT	CO	Cognitive level
1	A) Write Newton's Forward &Backward Interpolation Formula	2	III	C201.4	Remember
	B) Write Gauss's Forward & Backward Interpolation Formula	2	III	C201.4	Remember
	C) Write Simpson's (1/3) & Simpson's (3/8)Rule	2	IV	C201.5	Remember
	D) Write normal equations to fit a parabola & Straight line	2	IV	C201.5	Remember
	E) Write Taylor's series expansion	2	V	C201.6	Remember

PART-B

S. No	Questions	Marks	UNIT	CO	Cognitive level
2	A)) Applying Newton's forward interpolation formula, compute the value of $\sqrt{5.5}, given\ that\ \sqrt{5} = 2.236,\ \sqrt{6} = 2.449, \sqrt{7} = 2.646\ and\ \sqrt{8} = 2.828$ Correct up to three places of decimal	5	III	C201.4	Apply
	B) Find $f(22)$ from the Gauss's Forward difference formula x: 20, 25, 30, 35, 40, 45 $f(x)$: 354, 332, 291, 260, 231, 204	5	III	C201.4	Apply
3	A))Find the parabola passing through points (0,1), (1,3) , (3,55) using Lagrange's interpolation formula	5	III	C201.4	Analyze
	B)) Using Simpson's $\frac{3}{8}$ rule evaluate $\int_0^6 \frac{1}{1+x^2}dx$ by dividing the range into 6 equal parts	5	IV	C201.5	Evaluate
4	A) Compute $f'(1)$ using the data y: 1.0, 1.5, 2.0, 2.5, 3.0 x: 27, 106.75, 324, 783.75, 1621	5	IV	C201.5	Evaluate
	B) Obtain a relation of the form $y = ae^{bx}$ for the following data by the method of least squares x: 2, 3, 4, 5, 6 y: 8.3, 15.4, 33.1, 65.2, 127.4	5	IV	C201.5	Evaluate
5	Given $\frac{dy}{dx} = 1 + xy, y(0) = 1$.Findy(0.1),y(0.2),y(0.3) using Taylor's series method	5	V	C201.6	Apply
	B)Given that $\frac{dy}{dx} = y - x, y(0) = 2, h = 0.2$. Find y(0.2) UsingRunge-Kutta method	5	V	C201.6	Apply