KLS, Gogte Institute of Technology, Belgaum
Department of Mathematics

Internal Assessment Test - I

Subject: Engineering Mathematics – III **Code: 15MAT31** **Academic Year: 2016-17**
Semester: III **All Branches** **Date: 02 –09 – 2016**
Max. Marks: 25 **Duration: 1 Hr .**

Instructions: All questions are compulsory. (5 marks to each question)

1) Obtain the Fourier series to represent $f(x) = \pi - x$ in the interval $-\pi < x < \pi$ [L2,a]
2) Express $f(x) = x^2$ as the half-range cosine series in the range $(0, \pi)$ [L3,a]
3) The following table gives the variations of periodic current over a period.

t (sec)	0	T/6	T/3	T/2	2T/3	5T/6	T
A (amp)	1.98	1.30	1.05	1.30	-0.88	-0.25	1.98

Obtain the amplitude of the first harmonic. [L2,a]

4) Use Regula falsi method to find a root of the equation $2x - \log_{10} x = 7$ which lies between 3.5 & 4, correct four decimal places. [L3,a]
5) Find a root of the equation $x^3 - 3x + 1 = 0$ using Newton-Raphson method. Perform four iterations. [L2,a]

KLS Gogte Institute of Technology (Autonomous), Belagavi - Department of Mathematics

Subject: **Engineering Mathematics – III** Academic Year: 2016-17 Code: **15MAT31**
Semester: **III** (All Branches) Date: 07 –10 – 2016
Max. Marks: 25 Duration: 1 Hr .

Internal Assessment Test – II

Instructions: Answer all FIVE questions. (each question carries FIVE marks)

1) Find a root of the equation $2x = \cos(x) + 3$ correct to three decimal places by fixed point iteration method. [L3,a]
2) Find y(0.2) for $\frac{dy}{dx} = 2y + 3e^x$ using Taylor's series, given that y(0)= 0. Compare with exact solution. [L2,a]
3) Using fourth order Runge-kutta method find y at x=0.2 in steps of 0.2, if $\frac{dy}{dx} = x + y^2$, given that y(0)=1. [L2,a]
4) If P is pull required to lift a load W by means of a pulley block, find a linear law of the form $P = mW + C$ connecting P and W, using the following data: [L2,a]

P	12	15	21	25
W	50	70	100	120

5) An experiment gives the following values:

v(ft/min)	350	400	500	600
t (min)	61	26	7	2.6

It is known that v and t are connected by the relation $v = at^b$. Find the best values of a and b. [L3,a]

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Subject: **Engineering Mathematics – III** Academic Year: 2016-17 Code: **15MAT31**

Semester: **III** (All Branches) **Improvement Test** Date: 12 –11 – 2016

Max. Marks: 25 Duration: 1 Hr .

Instructions: Answer all FIVE questions. (each question carries FIVE marks)

1) A random variable X has the following probability function:

x	0	1	2	3	4	5	6	7
$P(x)$	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

Find the value of a) k , b) mean, c) evaluate $P(X<6)$, $P(X\geq 6)$. [L3,a]

2) In sampling a large number of parts manufactured by a machine, the mean number of defectives in a sample of 20 is 2. Out of 1000 such samples, how many would be expected to contain at least 3 defective parts. [L3,a]

3) If the probability of a bad reaction from a certain injection is 0.001 determine the chance that out of 2000 individuals more than two will get a bad reaction. [L2,a]

4) In a test on 2000 electric bulbs, it was found that the life of a particular make, was normally distributed with an average life of 2040 hours and S.D. of 60 hours. Estimate the number of bulbs likely to burn for

a) More than 2160 hours, b) between 1920 hours and 2160 hours. [L2,a]

[A(z=2)=0.4772]

5) A joint PDF is:

x\y	-3	2	4
1	0.1	0.2	0.2
3	0.3	0.1	0.1

Find mean of x, variance of y, correlation of (x y). [L3,a]