Grand Quiz Spring 2021

Subject Code MTH603 lecture 1 to 22

Solved By Riz Mughal

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I'm providing 100% correct quiz solution. You can visit my YouTube channel and get more information about all other subjects' quizzes and final year project (CS619).

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RIZ MUGHAL (SQA ENGINEER)

MTH603:Grand Quiz

Quiz Start Time: 09:1

Question # 1 of 30 (Start time: 09:13:05 AM, 28 June 2021)

Which of the following system of equation is diagonally dominant

Select the correct option

Reloa

- $3x + y + z = 3$
  $x + y + 5z = 2$
  $2x + 5y - z = 4$
- $2x + 5y - z = 4$
  $3x + y + z = 3$
  $x + y + 5z = 2$
- $3x + y + z = 3$
  $2x + 5y - z = 4$
  $x + y + 5z = 2$
- $x + y + 5z = 2$
  $3x + y + z = 3$

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MTH603:Grand Quiz

Quiz Start Time: 09

Question # 2 of 30 (Start time: 09:13:33 AM, 28 June 2021)

While using power method, from the resultant normalize vector

$$u^{(5)} = 12.4817 \begin{pmatrix} 0.436521 \\ 0.625431 \\ 1.0 \end{pmatrix}$$

we have the largest eigen value and the corresponding eigenvector as

Select the correct option

Relo

- ○ $\lambda = 0.625431,\ (X) = \begin{pmatrix} 0.436521 \\ 12.4817 \\ 1.0 \end{pmatrix}$
- ● $\lambda = 12.4817,\ (X) = \begin{pmatrix} 0.436521 \\ 0.625431 \\ 1.0 \end{pmatrix}$
- ○ $\lambda = 0.436521,\ (X) = \begin{pmatrix} 12.4817 \\ 0.625431 \\ 1.0 \end{pmatrix}$
- ○ $\lambda = 12.4817,\ (X) = \begin{pmatrix} 1.0 \\ 0.436521 \\ 0.625431 \end{pmatrix}$

MTH603:Grand Quiz

Quiz Start Time: 09:1

Question # 3 of 30 (Start time: 09:14:02 AM, 28 June 2021)

Let [A] be a 3x3 real symmetric matrix with

$$|a_{13}|$$

be numerically the largest off-diagonal element of A, then we can construct orthogonal matrix S1 by Jacobi's method as

Select the correct option

Reloa

- $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\cos\theta \\ 0 & \sin\theta & -\sin\theta \end{bmatrix}$
- $\begin{bmatrix} \cos\theta & 0 & -\sin\theta \\ 0 & 1 & 0 \\ \sin\theta & 0 & \cos\theta \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$
- $\begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$

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Question # 4 of 30 (Start time: 09:14:16 AM, 28 June 2021)

A 3 x 3 identity matrix have three and _____eigen values.

Select the correct option

- (●) same
- ( ) different

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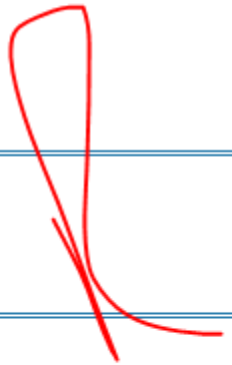
Question # 5 of 30 (Start time: 09:14:33 AM, 28 June 2021)

Back substitution procedure is used in .....

Select the correct option

- (●) Gaussian Elimination Method
- ( ) Jacobi's method
- ( ) None of the given choices
- ( ) Gauss-Seidel method



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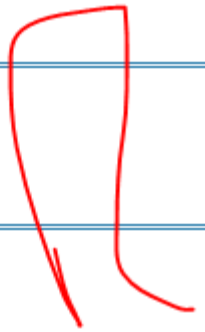
Question # 6 of 30 (Start time: 09:14:47 AM, 28 June 2021)

Which method requires a derivative of the solution?

Select the correct option

- ○ Regula-Falsi method
- ● Newton-Raphson method
- ○ Muller method
- ○ Bisection method



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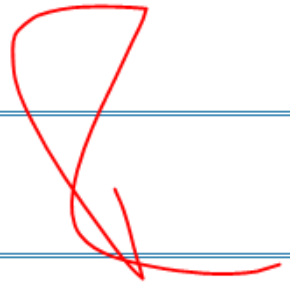
Quiz Start Time: 09:13 AM, 28 June 202

Question # 7 of 30 (Start time: 09:15:05 AM, 28 June 2021) **Total Marks:**

If a system of equations has a property that each of the equation possesses one large coefficient and the larger coefficients in the equations correspond to different unknowns in different equations, then which of the following iterative method id preferred to apply?

Select the correct option

- ○ Crout's method
- ● Gauss-Seidel method
- ○ Gauss-Jordon method
- ○ Gauss elimination method



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Quiz Start Time: 09:

Question # 8 of 30 (Start time: 09:15:28 AM, 28 June 2021)

While using power method, from the resultant normalize vector

$$u^{(3)} = 3.17890 \begin{pmatrix} 1.0 \\ 1.231926 \\ 1.421389 \end{pmatrix}$$

we have the largest eigen value and the corresponding eigenvector as

Select the correct option

Relo

- ○ $\lambda = 3.17890, \ (X) = \begin{pmatrix} 1.231926 \\ 1.0 \\ 1.421389 \end{pmatrix}$
- ● $\lambda = 3.17890, \ (X) = \begin{pmatrix} 1.0 \\ 1.231926 \\ 1.421389 \end{pmatrix}$
- ○ $\lambda = 3.17890, \ (X) = \begin{pmatrix} 1.0 \\ 1.421389 \\ 1.231926 \end{pmatrix}$
- ○ $\lambda = 3.17890, \ (X) = \begin{pmatrix} 1.231926 \\ 1.421389 \\ 1.0 \end{pmatrix}$

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Quiz Start Time: 0

Question # 9 of 30 (Start time: 09:15:55 AM, 28 June 2021)

Which of the following is a forward difference table for the given values of x and y?

x	0.3	0.7	1.1
y	0.067	0.248	0.518

Select the correct option

Re

(●)

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.181	0.089
0.7	0.248	0.27	
1.1	0.518		

( )

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.089	0.27
0.7	0.248	0.181	
1.1	0.518		

( )

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.27	0.089
0.7	0.248	0.181	
1.1	0.518		

( )

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.315	0.1071
0.7	0.248	0.766	

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Quiz Start Time: 09:13 AM, 28

Question # 10 of 30 (Start time: 09:16:10 AM, 28 June 2021)

Tot

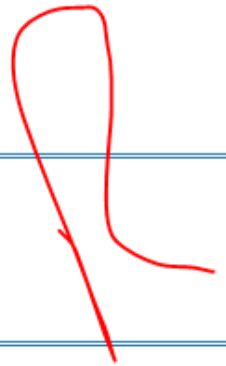
While using the Gauss − Seidel Method for finding the solution of the system of equation, the following system

$$3x + y + z = 11$$
$$2x + 5y + z = 16 \text{ can be rewritten as}$$
$$x + y + 5z = 4$$

Select the correct option

Reload Math E

- $x = 1 - \frac{2}{3}y - \frac{2}{3}z$, $y = 1 - \frac{3}{2}x - \frac{3}{2}z$, $z = 1 - \frac{y}{2} - \frac{x}{2}$
- $x = \frac{1}{3}(11 - y - z)$, $y = \frac{1}{5}(16 - 2x - z)$, $z = \frac{1}{5}(4 - x - y)$
- $x = 16 - 5y + z$, $y = 11 - 3x - z$, $z = 4 - x - y$
- $x = \frac{1}{11}(11 - y - z)$



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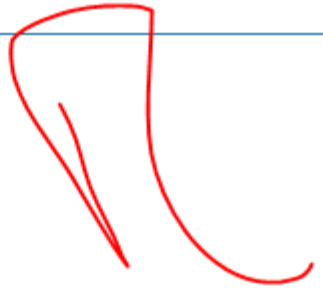
Question # 11 of 30 (Start time: 09:16:27 AM, 28 June 2021)

If the pivot element happens to be zero, then the i-th column elements are searched for the numerically ..... element.

Select the correct option

- (●) Largest
- ( ) Smallest



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Quiz Start

Question # 12 of 30 (Start time: 09:16:44 AM, 28 June 2021)

Which of the following systems of linear equations has a strictly diagonally dominant coefficient matrix?

Select the correct option

- $$6x_1 - 2x_2 + 3x_3 = 1$$
  $$-2x_1 + 7x_2 + 2x_3 = 5$$
  $$x_1 + x_2 - 5x_3 = -13$$
- $$-2x_1 + 7x_2 + 2x_3 = 5$$
  $$6x_1 - 2x_2 + 3x_3 = 1$$
  $$x_1 + x_2 - 5x_3 = -13$$
- $$x_1 + x_2 - 5x_3 = -13$$
  $$6x_1 - 2x_2 + 3x_3 = 1$$
  $$-2x_1 + 7x_2 + 2x_3 = 5$$
- $$-2x_1 + 7x_2 + 2x_3 = 5$$
  $$6x_1 - 2x_2 + 3x_3 = 1$$
  $$x_1 + x_2 - 5x_3 = -13$$

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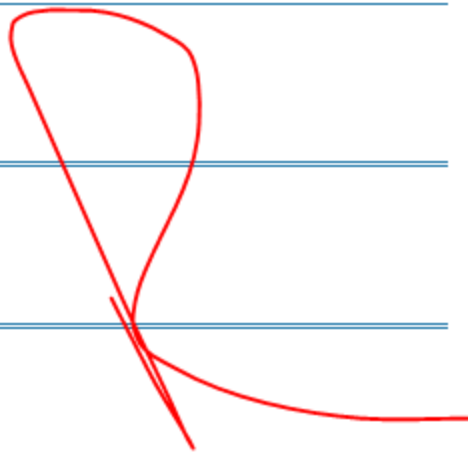
Question # 13 of 30 (Start time: 09:17:00 AM, 28 June 2021)

Which of the following method is not an iterative method?

Select the correct option

- ○ Jacobi's method
- ○ Gauss-Seidel method
- ● Gauss-Jordan elimination method
- ○ Relaxation methods



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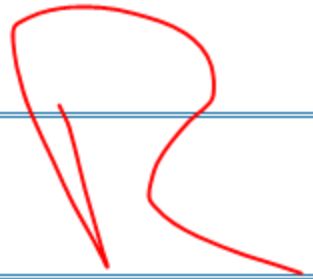
Question # 14 of 30 (Start time: 09:17:16 AM, 28 June 2021)

If the Relaxation method is applied on the system; 2x+3y = 1, 3x +2y = - 4, then largest residual in 1st iteration will reduce to ---------.

Select the correct option

- (●) zero
- ( ) -1
- ( ) 4
- ( ) -1



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Quiz Start Time: 09:

Question # 15 of 30 (Start time: 09:17:31 AM, 28 June 2021)

While using the relaxation method for finding the solution of the following system

$$8x_1 + 3x_2 - 2x_3 = 5$$
$$4x_1 + 7x_2 + 2x_3 = 9$$
$$3x_1 + 5x_2 + 9x_3 = 2$$

with the initial vector $(0, 0, 0)$, the residuals would be

Select the correct option

Relo

- $R_1 = 5, R_2 = 9, R_3 = 2$
- $R_1 = 2, R_2 = 6, R_3 = 3$
- $R_1 = 3, R_2 = 7, R_3 = 6$
- $R_1 = -4, R_2 = 8, R_3 = 9$

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Quiz Sta

Question # 16 of 30 (Start time: 09:17:50 AM, 28 June 2021)

While using power method, the computed vector

$$u^{(1)} = \begin{pmatrix} 12 \\ -6 \\ -2 \end{pmatrix}$$

will be in normalized form as

Select the correct option

- $u^{(1)} = -2 \begin{pmatrix} -12/2 \\ 6/2 \\ 1 \end{pmatrix}$
- $u^{(1)} = -\frac{1}{2} \begin{pmatrix} -2/12 \\ -2/6 \\ 1 \end{pmatrix}$
- $u^{(1)} = \frac{1}{12} \begin{pmatrix} 1 \\ -12/6 \\ -12/2 \end{pmatrix}$
- $u^{(1)} = 12 \begin{pmatrix} 1 \\ -6/12 \\ -2/12 \end{pmatrix}$

Click to Save Answ

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Question # 17 of 30 (Start time: 09:18:05 AM, 28 June 2021)

In full pivoting we interchange rows and columns such that the.....element in the matrix of the variables also get changed.

Select the correct option

- (●) Largest
- ( ) Middle
- ( ) Smallest
- ( ) None of the given choices

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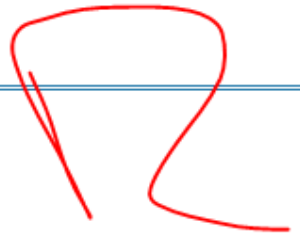
Quiz Start Time: 09:13 AM, 28

Question # 18 of 30 (Start time: 09:18:18 AM, 28 June 2021) To

For the system; 2x+3y = 1, 3x +2y = - 4, if the iterative solution is (0,0) and 'dxi = 2' is the increment in 'y' then which of the following will be taken as next iterative sol

Select the correct option

- ○ (0,3)
- ● (0,2)
- ○ (1,-4)
- ○ (2,0)



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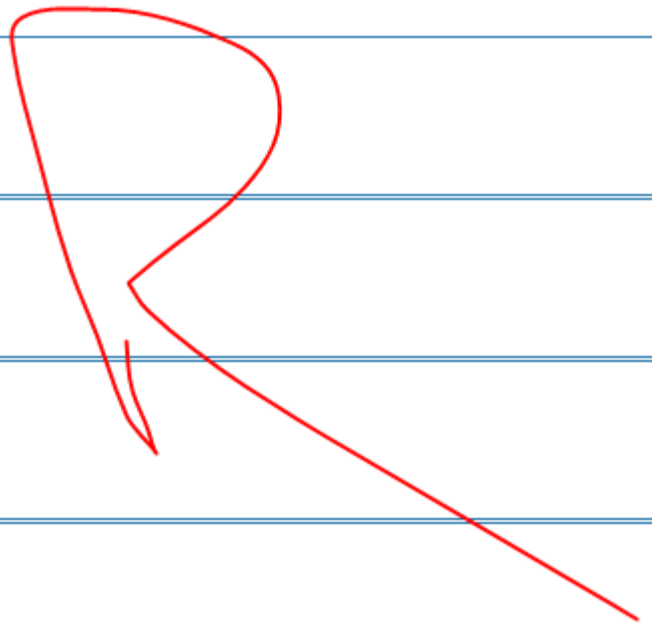
Question # 19 of 30 (Start time: 09:18:33 AM, 28 June 2021)

While using Relaxation method, which of the following is increment 'dxi'corresponding to the largest Residual for 1st iteration on the system; 2x+3y = 1, 3x +2y = - 4 ?

Select the correct option

- ○ 3
- ○ -2
- ○ 4
- ● 2



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Question # 20 of 30 (Start time: 09:18:47 AM, 28 June 2021)

In Jacobi's Method, We assume that the .....elements does not vanish.

Select the correct option

○	Row
○	Column
○	Off-diagonal
●	Diagonal

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Question # 21 of 30 (Start time: 09:19:01 AM, 28 June 2021)

Power method is applicable if the eigen vectors corresponding to eigen values are linearly independent.

Select the correct option

- (●) TRUE
- ( ) FALSE

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Quiz S

Question # 22 of 30 (Start time: 09:19:17 AM, 28 June 2021)

Let [A] be a 3x3 real symmetric matrix with

$$|a_{23}|$$

be numerically the largest off-diagonal element of A, then we can construct orthogonal matrix S1 by Jacobi's method as

Select the correct option

- $\begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$
- $\begin{bmatrix} \cos\theta & 0 & -\sin\theta \\ 0 & 1 & 0 \\ \sin\theta & 0 & \cos\theta \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\cos\theta \\ 0 & \sin\theta & -\sin\theta \end{bmatrix}$
- (●) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$

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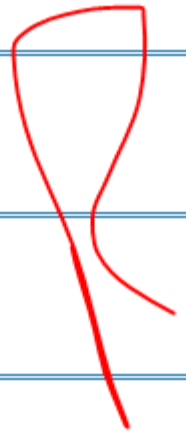
Question # 23 of 30 (Start time: 09:19:32 AM, 28 June 2021)

If the determinant of a matrix A is equal to zero then the system of equations will have.....

Select the correct option

●	no solution or infinitely many solution
○	unique solution
○	infinitely many solution
○	no solution



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Question # 24 of 30 (Start time: 09:19:46 AM, 28 June 2021)

How many Eigen vectors will exist corresponding to the function; Exp(ax) = e^ax, when the matrix operator is of differentiation?

Select the correct option

- (●) Infinite many
- ( ) None
- ( ) Unique
- ( ) Finite Multiple

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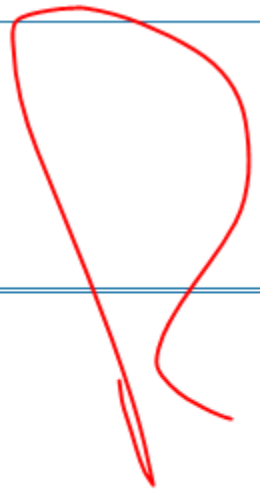
Question # 25 of 30 (Start time: 09:20:03 AM, 28 June 2021)

The Jacobi iteration converges, if A is strictly diagonally dominant.

Select the correct option

- ○ FALSE
- ● TRUE



MTH603:Grand Quiz

Quiz

Question # 26 of 30 (Start time: 09:20:19 AM, 28 June 2021)

Which of the following systems of linear equations has a strictly diagonally dominant coefficient matrix?

Select the correct option

- ○ $x_1 + x_2 - 5x_3 = -13$, $6x_1 - 2x_2 + 3x_3 = 1$, $-2x_1 + 7x_2 + 2x_3 = 5$
- ○ $9x_1 + 5x_2 - 3x_3 = 12$, $2x_1 - 4x_2 + 7x_3 = -15$, $-x_1 + 12x_2 + 5x_3 = 8$
- ● $4x_1 + 2x_2 - 1x_3 = -4$, $x_1 + 5x_2 + 1x_3 = 10$, $x_1 + x_2 + 3x_3 = 9$
- ○ $4x_1 + 2x_2 + 3x_3 = 1$, $-5x_1 + 3x_2 + 2x_3 = 1$, $7x_1 + 5x_2 - 8x_3 = 9$

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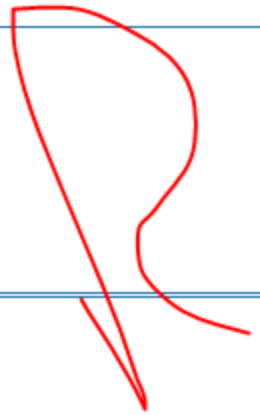
Question # 27 of 30 (Start time: 09:20:36 AM, 28 June 2021

Exact solution of 2/3 is not exists.

Select the correct option

- ○ FALSE
- ● TRUE



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Question # 28 of 30 (Start time: 09:20:51 AM, 28 June 2021)

If

$$A = \begin{bmatrix} 1 & 2 & 1 \\ 0 & 3 & -1 \\ 0 & 1 & 3 \end{bmatrix}$$

then by using Gaussian Elimination method the value of

$$A^{-1}$$

will be

Select the correct option

- $\begin{bmatrix} 1 & -\frac{1}{2} & -\frac{1}{2} \\ 0 & \frac{3}{10} & \frac{1}{10} \\ 0 & -\frac{1}{10} & \frac{3}{10} \end{bmatrix}$
- $\begin{bmatrix} -1 & \frac{1}{2} & \frac{1}{2} \\ 0 & -\frac{3}{10} & -\frac{1}{10} \\ 0 & -\frac{1}{10} & -\frac{3}{10} \end{bmatrix}$
- $\begin{bmatrix} 0 & \frac{3}{10} & \frac{1}{10} \\ 1 & -\frac{1}{2} & -\frac{1}{2} \\ 0 & -\frac{1}{10} & \frac{3}{10} \end{bmatrix}$

MTH603:Grand Quiz

Quiz S

Question # 29 of 30 (Start time: 09:21:06 AM, 28 June 2021)

The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric _____ definite matrices A.

Select the correct option

- positive
- negative

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Quiz Start Tim

Question # 30 of 30 (Start time: 09:21:24 AM, 28 June 2021)

While using Jacobi method for the matrix

$$A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 1 \\ 0 & 1 & 2 \end{bmatrix}$$

the value of 'theta θ' can be found as

Select the correct option

- ○ $\tan 2\theta = \frac{2a_{13}}{a_{33} - a_{11}}$
- ○ $\tan 2\theta = \frac{2a_{13}}{a_{11} - a_{33}}$
- ○ $\tan 2\theta = \frac{2a_{12}}{a_{11} - a_{22}}$
- ● $\tan 2\theta = \frac{2a_{23}}{a_{22} - a_{33}}$

Thank you for watching

Please share it with your friends ☺

RIZ MUGHAL (SQA ENGINEER)