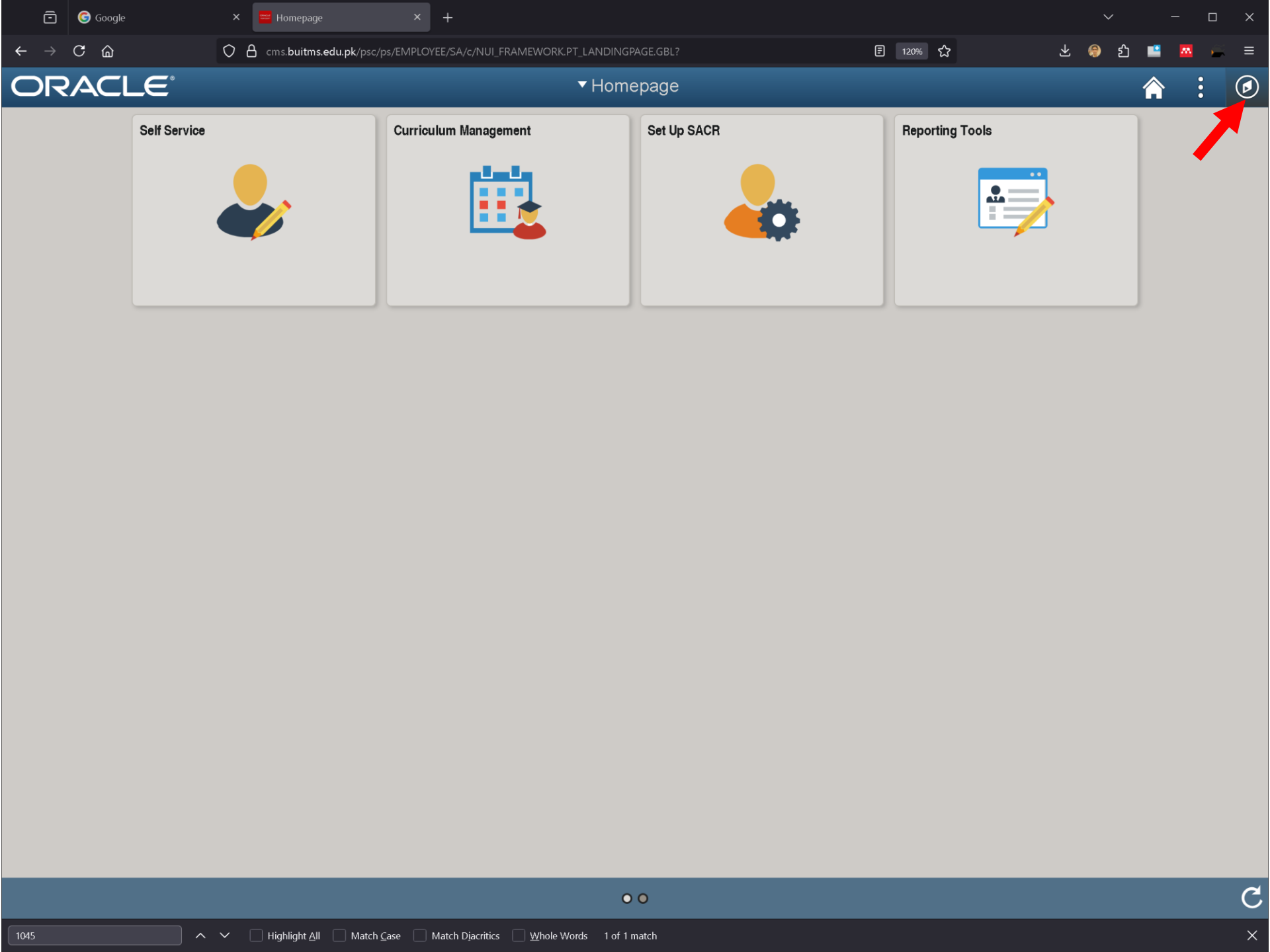


MID TERM



Google

Homepage

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/NUI_FRAMEWORK.PT_LANDINGPAGE.GBL?

120%

Home

Oracle

Homepage

Self Service

Curriculum Management

Set Up SACR

Reporting Tools

NavBar

Recent Places

My Favorites

Navigator

Classic Home

1045

Highlight All

Match Case

Match Diacritics

Whole Words

1 of 1 match

Google

Homepage

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/NUI_FRAMEWORK.PT_LANDINGPAGE.GBL?

120%

ORACLE®

Homepage

Self Service

Curriculum Management

Set Up SACR

Recent Places

My Favorites

Navigator

Classic Home

Self Service

Campus Community

Records and Enrollment

Curriculum Management

Set Up SACR

Reporting Tools

PeopleTools

1045

Highlight All

Match Case

Match Diacritics

Whole Words

1 of 1 match

Google

Homepage

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/NUI_FRAMEWORK.PT_LANDINGPAGE.GBL?

120%

ORACLE®

Homepage

Self Service

Curriculum Management

Set Up SACR

Recent Places

My Favorites

Navigator

Classic Home

Set Up SACR

Product Related

User Defaults

1045

Highlight All Match Case Match Diacritics Whole Words

1 of 1 match

Google

Homepage

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/NUI_FRAMEWORK.PT_LANDINGPAGE.GBL?

120%

Home

Oracle

Homepage

Self Service

Curriculum Management

Set Up SACR

Recent Places

My Favorites

Navigator

Classic Home

Outcome Based Educati...

MAP Courses With CLO & PLO

Assignments

1045

Highlight All

Match Case

Match Diacritics

Whole Words

1 of 1 match

Assignments

cms.buitms.edu.pk/psp/ps/EMPLOYEE/SA/c/X_OBE.X_ASS_CMP.GBL130%

Assignments

HomepageNew Window

Assignments

Enter any information you have and click Search. Leave fields blank for a list of all values.

Find an Existing ValueAdd a New Value

Search Criteria

Academic Institution

begins with

Academic Career

begins with

Term

begins with

Course ID

begins with

Course Offering Nbr

=

Class Nbr

=

Assignment Category

begins with

Description

begins with

☐ Case Sensitive

SearchClear

Basic Search

Save Search Criteria

Find an Existing Value

Add a New Value

Assignments

cms.buitms.edu.pk/psp/ps/EMPLOYEE/SA/c/X_OBE.X_ASS_CMP.GBL130%

Assignments

HomepageNew Window

Assignments

Enter any information you have and click Search. Leave fields blank for a list of all values.

Find an Existing ValueAdd a New Value

Search Criteria

Academic Institution

begins with

BUTMS

Academic Career

begins with

Term

begins with

Course ID

begins with

Course Offering Nbr

=

Class Nbr

=

1063

Assignment Category

begins with

Description

begins with

☐ Case Sensitive

Search

Clear

Basic Search

Save Search Criteria

Find an Existing Value

Add a New Value

Assignments

cms.buitms.edu.pk/psp/ps/EMPLOYEE/SA/c/X_OBE.X_ASS_CMP.GBL130%

HomepageAssignmentsNew Window

Assignments

Enter any information you have and click Search. Leave fields blank for a list of all values.

Find an Existing Value

Add a New Value

Search Criteria

Academic Institution

begins with

BUTMS

Academic Career

begins with

Term

begins with

Course ID

begins with

Course Offering Nbr

=

Class Nbr

=

1063

Assignment Category

begins with

Description

begins with

☐ Case Sensitive

Search

Clear

Basic Search

Save Search Criteria

Search Results

Only the first 3 results can be displayed.

View All

First

1-3 of 3

Last

Empl ID	Academic Institution	Academic Career	Term	Course ID	Course Offering Nbr	Class Nbr	Assignment Category	Description
INS-0543	BUTMS	UGRD	2511	668032	1	1063	FINAL	Final Exam
INS-0543	BUTMS	UGRD	2511	668032	1	1063	MID-TERM	Mid Term Exam
INS-0543	BUTMS	UGRD	2511	668032	1	1063	SESSIONAL	Sessional

Find an Existing Value

Add a New Value

Assignments

MID TERM

Institution: BUTMS
Career: Undergrad
Term: 2511 Spring 2025
Course ID: 668032 **Crse_Title:** Mechanical Vibrations
Offer Nbr: 1 **Subject Area:** MECH **Catalog Nbr:** 461
Class Nbr: 1063 **Class Section:** 8
Assignment MID-TERM
Category:
Description: Mid Term Exam **Total_Marks:** 25.00

Find First 1 of 1 Last

Question ID: Q1 *Mark:

ASSIGNMENTS

Personalize | Find | |

First 1 of 1 Last

CLO	Description	Weight %		
1			+	-

Assignments

Institution: BUTMS
Career: Undergrad
Term: 2511 Spring 2025
Course ID: 668032 Crse_Title: Mechanical Vibrations
Offer Nbr: 1 Subject Area: MECH Catalog Nbr: 461
Class Nbr: 1063 Class Section: 8
Assignment: MID-TERM
Category:
Description: Mid Term Exam

Total_Marks: 25.00

Question ID: Q1 *Mark: 10

ASSIGNMENTS

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Save

Return to Search

Previous in List

Next in List

Notify

Balochistan University of Information Technology, Engineering and Management Sciences, Quetta.

Mid Term (Spring 2025) Examination

Department of Mechanical Engineering

Course Title: Mechanical Vibrations	Course Code: MECH- 442	Instructor: Arshad Ali
Semester: 8th	Time Allowed: 20 Minutes	Total Marks: 10
Student Name: _____	Student ID: _____	Date: 14 Mar 2025

Q. No. 1) OBJECTIVES 10 Marks

1. Who conducted experiments on vibrating strings using a monochord?
a. Aristotle
b. Galileo
c. Pythagoras
d. Newton

2. The world's first seismograph was invented in:
a. Greece
b. Egypt
c. China
d. India

3. Resonance occurs when:
a. Damping is zero
b. External frequency matches natural frequency
c. System is nonlinear
d. Forced vibration is absent

4. The principle of superposition is valid for:
a. Nonlinear systems
b. Linear systems
c. Random vibrations
d. Damped systems

5. The restoring torque in Coulomb's torsional vibration experiment is proportional to:
a. Angular velocity
b. Angle of twist
c. Mass of the cylinder
d. Damping coefficient

6. The spring constant of a helical spring depends on:
a. Wire diameter and coil diameter
b. Shear modulus and number of turns
c. All of the above
d. None of the above

7. Viscous damping force is proportional to:
a. Displacement
b. Velocity
c. Acceleration
d. Mass

8. Coulomb damping arises due to:
a. Fluid resistance
b. Dry friction
c. Material hysteresis
d. Air resistance

9. Hysteresis damping is caused by:
a. Sliding friction
b. Internal material friction
c. Viscous fluid
d. Aerodynamic drag

10. A cam-follower mechanism converts:
a. Rotary to linear motion
b. Rotary to oscillatory motion
c. Linear to rotary motion
d. Random to harmonic motion

11. The decibel (dB) is a measure of:
a. Frequency
b. Logarithmic intensity ratio
c. Amplitude
d. Damping

12. Gibbs' phenomenon is associated with:
a. Random vibrations
b. Fourier series discontinuities
c. Damping effects
d. Nonlinear springs

13. A periodic function can be expressed as a sum of:
a. Exponentials
b. Sines and cosines
c. Polynomials
d. Logarithms

14. Half-range expansions are used to represent functions:
a. With infinite period
b. Defined over half a period
c. With random phases
d. In frequency domain

15. The Fourier coefficient a_n for an even function contains:
a. Only cosine terms
b. Only sine terms
c. Both sine and cosine
d. Exponentials

16. The frequency spectrum shows:
a. Time-domain data
b. Amplitude vs. frequency
c. Phase vs. damping
d. Stiffness vs. mass

17. A system with finite degrees of freedom is called:
a. Continuous
b. Discrete
c. Nonlinear
d. Random

18. Deterministic vibration is characterized by:
a. Random excitation
b. Predictable excitation
c. Chaotic behavior
d. No mathematical model

19. The natural frequency of a system depends on:
a. Mass and stiffness
b. Damping and forcing
c. External load
d. Initial velocity

20. The Tacoma Narrows Bridge collapse was caused by:
a. Material failure
b. Aeroelastic flutter
c. Earthquake
d. Overloading

Entering Question 1 of 10 Marks

Assignments

Institution: BUTMS

Career: Undergrad

Term: 2511 Spring 2025

Course ID: 668032 **Crse Title:** Mechanical Vibrations

Offer Nbr: 1 **Subject Area:** MECH **Catalog Nbr:** 461

Class Nbr: 1063 **Class Section:** 8

Assignment Category: MID-TERM

Description: Mid Term Exam

Department of Mechanical Engineering

Mid Term (Spring 2025) Examination

Course Title: Mechanical Vibrations Course Code: MECH-442 Instructor: Arshad Ali

Semester: 8th Time Allowed: 20 Minutes Total Marks: 10

Student Name: Student ID: Date: 14 May 2025

10 Marks

OBJECTIVES

1. Who conducted experiments on vibrating strings using a monochord?

2. The world's first astrolabe was invented in:

3. Resonance occurs when:

4. The principle of superposition is valid for:

5. The restoring torque in Coulomb's torsional vibration experiment is proportional to:

6. The spring constant of a helical spring depends on:

7. None of the above

8. Viscous damping force is proportional to:

9. Acceleration

10. Mass

11. The Fourier coefficient a_n for an even function contains:

12. The frequency spectrum shows:

13. Phase vs. damping

14. Stiffness vs. mass

15. A system with finite degrees of freedom is called:

16. Discrete

17. Nonlinear

18. Deterministic vibration is characterized by:

19. Random excitation

20. Predictable excitation

MID TERM

Question ID: Q1 *Mark: 10.00

ASSIGNMENTS Personalize Find 1 of 1

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Question ID: Q2 *Mark: 5.00

ASSIGNMENTS Personalize Find 1 of 1

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Question ID: Q3 *Mark: 10.00

ASSIGNMENTS Personalize Find 1 of 1

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Q. No. 1)

1. Who conducted experiments on vibrating strings using a monochord?

2. The world's first astrolabe was invented in:

3. Resonance occurs when:

4. The principle of superposition is valid for:

5. The restoring torque in Coulomb's torsional vibration experiment is proportional to:

6. The spring constant of a helical spring depends on:

7. None of the above

8. Viscous damping force is proportional to:

9. Acceleration

10. Mass

11. The Fourier coefficient a_n for an even function contains:

12. The frequency spectrum shows:

13. Phase vs. damping

14. Stiffness vs. mass

15. A system with finite degrees of freedom is called:

16. Discrete

17. Nonlinear

18. Deterministic vibration is characterized by:

19. Random excitation

20. Predictable excitation

Q. No. 2)

SUBJECTIVE

Derive the equation of motion of a single-degree-of-freedom system by any one of the following suitable technique:

1. Newton's second law of motion

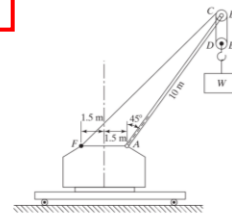
2. D'Alembert's principle

3. the principle of virtual displacements

4. the principle of conservation of energy.

Q. No. 3)

The boom AB of the crane shown in Fig. is a uniform steel bar of length 10 m and area of cross section 2500 mm^2 . A weight W is suspended while the crane is stationary. The cable CDEB is made of steel and has a cross-sectional area of 100 mm^2 . Neglect the effect of the cable CDEB, find the equivalent spring constant of the system in the vertical direction.



Similarly Add other Questions

FINAL TERM

Assignments

MID TERM

Institution: BUTMS
Career: Undergrad
Term: 2511 Spring 2025
Course ID: 668032 **Crse Title:** Mechanical Vibrations
Offer Nbr: 1 **Subject Area:** MECH **Catalog Nbr:** 461
Class Nbr: 1063 **Class Section:** 8
Assignment Category: MID-TERM
Description: Mid Term Exam **Total Marks:** 25.00

Question ID: Q1 *Mark: 10.00

ASSIGNMENTS Personalize Find 1 of 1 Last

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Question ID: Q2 *Mark: 5.00

ASSIGNMENTS Personalize Find 1 of 1 Last

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Question ID: Q3 *Mark: 10.00

ASSIGNMENTS Personalize Find 1 of 1 Last

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Balochistan University of Information Technology, Engineering and Management Sciences, Quetta.

Mid Term (Spring 2025) Examination

Department of Mechanical Engineering

Course Title: Mechanical Vibrations Course Code: MECH-442 Instructor: Arshad Ali

Semester: 8th Time Allowed: 20 Minutes Total Marks: 10

Student Name: Student ID: Date: 14 May 2025

Q. No. 1) OBJECTIVES 10 Marks

1. Who conducted experiments on vibrating strings using a monochord?
a. Aristotle
b. Galileo
c. Pythagoras
d. Newton

11. The decibel (dB) is a measure of:
a. Frequency
b. Logarithmic intensity ratio
c. Amplitude
d. Damping

2. The world's first seismograph was invented by:
a. Greece
b. Egypt
c. China
d. India

12. Gibbs' phenomenon is associated with:
a. Random vibrations
b. Fourier series discontinuities
c. Damping effects
d. Nonlinear springs

3. Resonance occurs when:
a. Damping is zero
b. External frequency matches natural frequency
c. System is nonlinear
d. Forced vibration is absent

13. A periodic function can be expressed as a sum of:
a. Exponentials
b. Sines and cosines
c. Polynomials
d. Logarithms

4. The principle of superposition is valid for:
a. Nonlinear systems
b. Linear systems
c. Random vibrations
d. Damped systems

14. Half-range expansions are used to represent functions:
a. With arbitrary period
b. Defined over half a period
c. With random phases
d. In frequency domain

5. The restoring torque in Coulomb's torsional vibration experiment is proportional to:
a. Angular velocity
b. Angle of twist
c. Phase of the cylinder
d. Damping coefficient

15. The Fourier coefficient a_n for an even function contains:
a. Only cosine terms
b. Only sine terms
c. Both sine and cosine
d. Exponentials

6. The spring constant of a helical spring depends on:
a. Wire diameter and coil diameter
b. Shear modulus and number of turns
c. All of the above
d. None of the above

16. The frequency spectrum shows:
a. Time-domain data
b. Amplitude vs. frequency
c. Phase vs. damping
d. Stiffness vs. mass

7. Viscous damping force is proportional to:
a. Displacement
b. Velocity
c. Acceleration
d. Mass

17. A system with finite degrees of freedom is called:
a. Continuous
b. Discrete
c. Nonlinear
d. Random

8. Coulomb damping arises due to:
a. Fluid resistance
b. Dry friction
c. Material hysteresis
d. Air resistance

18. Deterministic vibration is characterized by:
a. Random excitation
b. Predictable excitation
c. Chaotic behavior
d. No mathematical model

9. Hydraulic damping is caused by:
a. Sliding friction
b. Internal material friction
c. Viscous fluid
d. Aerodynamic drag

19. The natural frequency of a system depends on:
a. Mass and stiffness
b. Damping and forcing
c. External load
d. Initial velocity

10. A cam-follower mechanism converts:
a. Rotary to linear motion
b. Rotary to oscillatory motion
c. Linear to rotary motion
d. Random to harmonic motion

20. The Tacoma Narrows Bridge collapse was caused by:
a. Material failure
b. Aerelastic flutter
c. Earthquake
d. Overloading

Balochistan University of Information Technology, Engineering and Management Sciences, Quetta.

Mid Term (Spring 2025) Examination

Department of Mechanical Engineering

Course Title: Mechanical Vibrations Course Code: MECH-442 Instructor: Arshad Ali

Semester: 8th Time Allowed: 40 Minutes Total Marks: 15

Student Name: Student ID: Date: 14 May 2025

SUBJECTIVE 5 Marks

Q. No. 2) Derive the equation of motion of a single-degree-of-freedom system by any one of the following suitable technique

1. Newton's second law of motion

2. D'Alembert's principle

3. the principle of virtual displacements

4. the principle of conservation of energy.

Q. No. 3) 10 Marks

The boom AB of the crane shown in Fig. is a uniform steel bar of length 10 m and area of cross section 2500 mm^2 . A weight W is suspended while the crane is stationary. The cable CDEB is made of steel and has a cross-sectional area of 100 mm^2 . Neglecting the effect of the cable CDEB, find the equivalent spring constant of the system in the vertical direction.

Good Luck

Course Learning Outcomes (CLO) Mapping with Program Learning Outcomes (PLO) for Excel worksheet*

Question	CLO	Cognitive Level	PLO	Marks
1 Objective	1	C2	1	10
2 Subjective	2	C2	2	5
3 Subjective	2	C2	2	10

* This table is based on the concerned board of studies in accordance with the Higher Education Commission's latest guidelines and Pakistan Engineering Council Accreditation Manual of Outcome Based Education (OBE).

Assignments

cms.buitms.edu.pk/psp/ps/EMPLOYEE/SA/c/X_OBE.X_ASS_CMP.GBL130%

HomepageAssignmentsNew Window

Assignments

Enter any information you have and click Search. Leave fields blank for a list of all values.

Find an Existing ValueAdd a New Value

Search Criteria

Academic Institutionbegins withBUTMS

Academic Careerbegins with

Termbegins with

Course IDbegins with

Course Offering Nbr=

Class Nbr=1063

Assignment Categorybegins with

Descriptionbegins with

☐ Case Sensitive

SearchClear

Basic SearchSave Search Criteria

Search Results

Only the first 3 results can be displayed.

View AllFirst1-3 of 3Last

Empl ID	Academic Institution	Academic Career	Term	Course ID	Course Offering Nbr	Class Nbr	Assignment Category	Description
INS-0543	BUTMS	UGRD	2511	668032	1	1063	FINAL	Final Exam
INS-0543	BUTMS	UGRD	2511	668032	1	1063	MID-TERM	Mid Term Exam
INS-0543	BUTMS	UGRD	2511	668032	1	1063	SESSIONAL	Sessional

Find an Existing ValueAdd a New Value

Assignments

Institution: BUTMS
Career: Undergrad
Term: 2511 Spring 2025
Course ID: 668032
Offer Nbr: 1
Class Nbr: 1063
Assignment Category: FINAL
Description: Final Exam

Crse Title: Mechanical Vibrations
Subject Area: MECH
Catalog Nbr: 461
Class Section: 8

Question ID: Q1

*Mark: 20.00

Find First 1 of 1 Last

CLO	Description	Weight %	
1 C30351	Solve for the physical parameters of single/two/ multi degree of freedom systems	100	

Question ID: Q2

*Mark: 15.00

Find First 1 of 1 Last

CLO	Description	Weight %	
1 C30351	Solve for the physical parameters of single/two/ multi degree of freedom systems	100	

Question ID: Q3

*Mark: 15

Find First 1 of 1 Last

CLO	Description	Weight %	
1 C20114	Analyse the system for stability and vibrational control of vibrating systems	100	

Management Sciences, Faculty of Engineering / Architecture

Course Title: Mechanical Vibrations Course Code: MECH - 442 Instructor: Arshad Ali

Semester: 8th Time Allowed: 2 Hours Total Marks: 50

Student Name: Student ID: Date: 14 July 2025

Instructions: Attempt all Questions, Investigators are requested please observe and establish

Question No. 1

CLO-4	PLOs	SDs	WKs	CL	SDG
CLO 4: Analyze and solve two-degree-of-freedom systems, including both free and forced vibration cases, by applying normal mode analysis and considering damping and coupling effects.	PLO1, PLO3, PLO5	BC3: BC5: BC6: BC13: for	WK2: WK5:	C3, C4, C5	SDG 9:

The Car is subjected to external excitation as shown in the figure.

Determine

- Pitch (angular motion) frequency
- Bounce (up-and-down linear motion) frequency
- Mode Shapes
- Location of oscillation centers (nodes)

Question No.2

CLO-3	PLOs	SDs	WKs	CL	SDG
CLO 3: Apply analytical methods, such as Newton's method and energy method, to solve problems in damped and undamped vibratory systems, including transient and steady-state responses.	PLO4, PLO5	BC4: BC6: BC13: for	WK1: WK3: WK4:	C3, C4, C5	SDG 9: SDG 12:

Find the total response of a single-degree-of-freedom system with $m = 10 \text{ kg}$, $c = 20 \text{ N-s/m}$, $k = 4000 \text{ N/m}$, $x_0 = 0.01 \text{ m}$, and $\dot{x}_0 = 0$ under the following conditions:

An external force $F(t) = F_0 \cos \omega t$ acts on the system with $F_0 = 100 \text{ N}$, and $\omega = 10 \text{ rad/s}$.

Free vibration with $F(t) = 0$

Question No. 3

CLO-3	PLOs	SDs	WKs	CL	SDG
CLO 3: Apply analytical methods, such as Newton's method and energy method, to solve problems in damped and undamped vibratory systems, including transient and steady-state responses.	PLO2, PLO4, PLO5	BC4: BC6: BC13: for	WK1: WK3: WK4:	C3, C4, C5	SDG 9: SDG 12:

The column of the water tank shown in the following figure is **300 ft** high and is made of reinforced concrete with a tubular cross section of inner diameter 8 ft and outer diameter 10 ft. The tank weighs **6 x 10⁶ lb** when filled with water. By neglecting the mass of the column and assuming the Young's modulus of reinforced concrete as **4 x 10⁶ psi**, determine the following:

- The natural frequency and the natural time period of transverse vibration of the water tank.
- The vibration response of the water tank is due to an initial transverse displacement of **10 in**.
- The maximum values of the velocity and acceleration experienced by the water tank.

Good Luck

Add similarly as you done in Mids

SESSIONAL TERM

Assignments

Institution:

BUTMS

Career:

Undergrad

Term:

2511

Spring 2025

Course ID:

668032

Crse Title: Mechanical Vibrations

Offer Nbr:

1

Subject Area: MECH

Catalog Nbr: 461

Class Nbr:

1063

Class Section: 8

Assignment Category:

FINAL

Description:

Final Exam

Total_Mar

Question ID: Q1

*Mark: 20.00

ASSIGNMENTS

Personalize | Find | 1 of 1

CLO	Description	Weight %
1 C30351	Solve for the physical parameters of single/two/ multi degree of freedom systems	100

Question ID: Q2

*Mark: 15.00

ASSIGNMENTS

Personalize | Find | 1 of 1

CLO	Description	Weight %
1 C30351	Solve for the physical parameters of single/two/ multi degree of freedom systems	100

Question ID: Q3

*Mark: 15

ASSIGNMENTS

Personalize | Find | 1 of 1

CLO	Description	Weight %
1 C20114	Analyse the system for stability and vibrational control of vibrational systems	100

Management Sciences, Faculty of Engineering / Architecture

Course Title: Mechanical Vibrations

Course Code: MECH - 442

Instructor: Arshad Ali

Semester: 8th

Time Allowed: 2 Hours

Total Marks: 50

Student Name:

Student ID:

Date: 14 July 2025

Instructions: Attempt all Questions, Invigilators are requested please observe and establish silence.

Question No. 1

Marks 20

CLO-4	PLOs	BOs	Wks	CL	SDGs
CLO4: Analyze and solve two-degree-of-freedom systems, including both free and forced vibration cases, by applying normal mode analysis and considering damping and coupling effects.	PLO1, PLO3, PLO5	BO3: BCS: BCS:	WK2: WK5:	C3, C4, C5	SDG 9:

The Car is subjected to external excitation as shown in the figure.

Determine

- Pitch (angular motion) frequency
- Bounce (up-and-down linear motion) frequency
- Mode Shapes
- Location of oscillation centers (nodes)

Question No.2

Marks 15

CLO-3	PLGs	BOs	Wks	CL	SDGs
CLO 3: Apply analytical methods, such as Newton's method and energy method, to solve problems in damped and undamped vibratory systems, including transient and steady-state responses.	PLO2, PLO4, PLO5	BO4: BCS: BCS: for	WK1: WK3: WK4:	C3, C4, C5	SDG 9: SDG 12:

Find the total response of a single-degree-of-freedom system with $m = 10 \text{ kg}$, $c = 20 \text{ N-s/m}$, $k = 4000 \text{ N/m}$, $x_0 = 0.01 \text{ m}$, and $\dot{x}_0 = 0$ under the following conditions:
An external force $F(t) = F_0 \cos \omega t$ acts on the system with $F_0 = 100 \text{ N}$, and $\omega = 10 \text{ rad/s}$.
Free vibration with $F(t) = 0$

Page 1

Question No. 3

Marks 15

CLO-3	PLGs	BOs	Wks	CL	SDGs
CLO 3: Apply analytical methods, such as Newton's method and energy method, to solve problems in damped and undamped vibratory systems, including transient and steady-state responses.	PLO2, PLO4, PLO5	BO4: BCS: BCS: for	WK1: WK3: WK4:	C3, C4, C5	SDG 9: SDG 12:

The column of the water tank shown in the following figure is **300 ft** high and is made of reinforced concrete with a tubular cross section of inner diameter 8 ft and outer diameter 10 ft. The tank weighs **$6 \times 10^6 \text{ lb}$** when filled with water. By neglecting the mass of the column and assuming the Young's modulus of reinforced concrete as **$4 \times 10^6 \text{ psi}$** , determine the following:

- The natural frequency and the natural time period of transverse vibration of the water tank.
- The vibration response of the water tank is due to an initial transverse displacement of **10 in**.
- The maximum values of the velocity and acceleration experienced by the water tank.

Good Luck

Page 2

Return to search

Assignments

cms.buitms.edu.pk/psp/ps/EMPLOYEE/SA/c/X_OBE.X_ASS_CMP.GBL130%

HomepageAssignmentsNew Window

SESSIONAL

Assignments

Enter any information you have and click Search. Leave fields blank for a list of all values.

Find an Existing Value

Add a New Value

Search Criteria

Academic Institution

begins with

BUTMS

Academic Career

begins with

Term

begins with

Course ID

begins with

Course Offering Nbr

=

Class Nbr

=

1063

Assignment Category

begins with

Description

begins with

☐ Case Sensitive

Search

Clear

Basic Search

Save Search Criteria

Search Results

Only the first 3 results can be displayed.

View All

First

1-3 of 3

Last

Empl ID	Academic Institution	Academic Career	Term	Course ID	Course Offering Nbr	Class Nbr	Assignment Category	Description
INS-0543	BUTMS	UGRD	2511	668032	1	1063	FINAL	Final Exam
INS-0543	BUTMS	UGRD	2511	668032	1	1063	MID-TERM	Mid Term Exam
INS-0543	BUTMS	UGRD	2511	668032	1	1063	SESSIONAL	Sessional

Find an Existing Value

Add a New Value

Assignments

cms.buitms.edu.pk/psp/ps/EMPLOYEE/SA/c/X_OBE.X_ASS_CMP.GBL

120%

Home

Assignments

Home

New Window

Personalize Page

Assignments

Institution: BUTMS

Career: Undergrad

Term: 2511 Spring 2025

Course ID: 668032

Offer Nbr: 1

Class Nbr: 1063

Assignment Category: SESSIONAL

Description: Sessional

Crse_Title: Mechanical Vibrations

Subject Area: MECH

Catalog Nbr: 461

Class Section: 8

Total_Marks: 25.00

Find First 1-3 of 3 Last

Question ID: Q1

*Mark: 10.00

+ -

ASSIGNMENTS

Personalize | Find | [Grid Icon] [Table Icon]

First 1 of 1 Last

CLO	Description	Weight %		
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100	+	-

Question ID: Q2

*Mark: 10.00

+ -

ASSIGNMENTS

Personalize | Find | [Grid Icon] [Table Icon]

First 1 of 1 Last

CLO	Description	Weight %		
1 C30351	Solve for the physical parameters of single/two/ multi degree of freedom systems	100	+	-

Question ID: Q3

*Mark: 5.00

+ -

ASSIGNMENTS

Personalize | Find | [Grid Icon] [Table Icon]

First 1 of 1 Last

CLO	Description	Weight %		
1 C20114	Analyse the system for stability and vibrational control of vibrating systems	100	+	-

Save

Return to Search

Previous in List

Next in List

Notify

Add

Update/Display

SESSIONAL

QUIZ

ASSIGNMENT

SURPRIZE QUIZ

Assignments

Institution: BUTMS
Career: Undergrad
Term: 2511 Spring 2025
Course ID: 668032 **Crse_Title:** Mechanical Vibrations
Offer Nbr: 1 **Subject Area:** MECH **Catalog Nbr:** 461
Class Nbr: 1063 **Class Section:** 8
Assignment Category: SESSIONAL
Description: Sessional **Total_Marks:** 25.00

Find First 1-3 of 3 Last

Question ID: Q1 *Mark: 10.00

ASSIGNMENTS Personalize Find 1 of 1 Last

CLO	Description	Weight %
1 C10132	Discuss key concepts related to mechanical vibrations and locate different elements of a vibrating system	100

Question ID: Q2 *Mark: 10.00

ASSIGNMENTS Personalize Find 1 of 1 Last

CLO	Description	Weight %
1 C30351	Solve for the physical parameters of single/two/ multi degree of freedom systems	100

Question ID: Q3 *Mark: 5.00

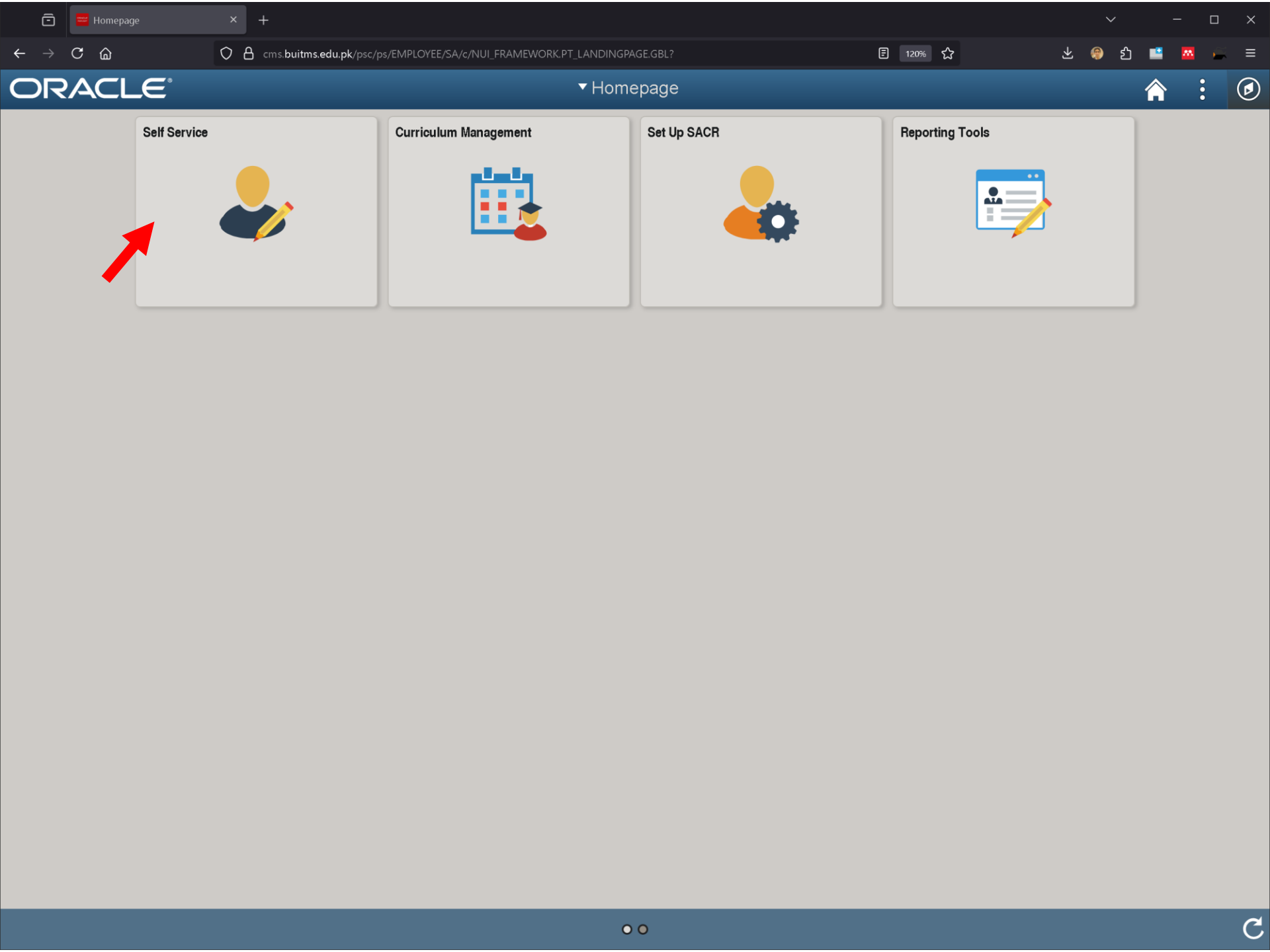
ASSIGNMENTS Personalize Find 1 of 1 Last

CLO	Description	Weight %
1 C20114	Analyse the system for stability and vibrational control of vibrating systems	100

QUIZ

ASSIGNMENT

SURPRIZE QUIZ



Homepage



cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/NUI_FRAMEWORK.PT_LANDINGPAGE.GBL?

120%



ORACLE®

Homepage



Self Service



Curriculum Management



Set Up SACR



Reporting Tools



Marks/Grade Change Request

My Schedule

Class Roster

Grade Roster

Gradebook

Assignments

Students Marks

Homepage

Self Service

New Window

Marks/Grade Change Request

Enter any information you have and click Search. Leave fields blank for a list of all values.

Find an Existing Value

Add a New Value

Search Criteria

Academic Institution

begins with

Academic Career

begins with

Term

=

Class Nbr

=

Empl ID

begins with

Request Type

=

Request ID

=

Request Status

begins with

☐ Case Sensitive

Search

Clear

Basic Search

Save Search Criteria

Find an Existing Value

Add a New Value

Students Marks

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/NUI_FRAMEWORK.PT_AGSTARTPAGE_NUI.GBL?CONTEXTIDPARAMS=TEMPLATE_ID%3aP

120%

Self Service

Marks/Grade Change Request

My Schedule

Class Roster

Grade Roster

Gradebook

Assignments

Students Marks

Institution

BUTMS

Academic Career

UGRD

Term

2511

Spring 2025

Class Nbr

1063

Search

1 row

Classes

1

MECH-461 (Mechanical Vibrations) (8/1063)

Class

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/X_OBE_INSTR_MENU.X_OBE_INSTR_CMP2.GBL?Page=X_OBE_INSTR_PG2&Action=U&For=120%

Self Service

Class

Institution

BUTMS

Career

Undergrad

Term

2511 Spring 2025

Class

MECH-461 (Mechanical Vibrations) (8/1063)

3 rows

	Assignment Category	Assignment	
1	FINAL	Final Exam	>
2	MID-TERM	Mid Term Exam	>
3	SESSIONAL	Sessional	>

Enrollment

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/X_OBE_INSTR_MENU.X_OBE_INSTR_CMP3.GBL?Page=X_OBE_INSTR_PG3&Action=U&For=120%

Class

Enrollment

Academic Institution BUTMS

Academic Career Undergrad

Term 2511

Class MECH-461 (Mechanical Vibrations) (8/1063)

Assignment Category MID-TERM

Description Mid Term Exam

Post

28 rows

Student ID	Name	Q1	Q2	Q3	Obt Mark
1 54741	ZUBAIR AHMED				
2 54807	MUHAMMAD ZOHAIB BHATTI				
3 56694	SYED INAM UD DIN				
4 56738	MUHAMMAD IBRAR ARSHAD				
5 56768	MUHAMMAD TAYYAB AFRIDI				
6 56842	MALIK MUHAMMAD AHMED				
7 56879	FAHAD AKBAR				
8 56992	MUHAMMAD KAZIM ABBAS				
9 57300	ABDUL WASAY				
10 57320	SHAHAB UD DIN				
11 57510	MUHAMMAD HAMZA				
12 57645	NAUMAN				

Enrollment

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/X_OBE_INSTR_MENU.X_OBE_INSTR_CMP3.GBL?Page=X_OBE_INSTR_PG3&Action=U&For=120%

Class

Enrollment

Academic Institution BUTMS

Academic Career Undergrad

Term 2511

Class MECH-461 (Mechanical Vibrations) (8/1063)

Assignment Category FINAL

Description Final Exam

Post

28 rows

Student ID	Name	Q1	Q2	Q3	Obt Mark
1 54741	ZUBAIR AHMED				
2 54807	MUHAMMAD ZOHAIB BHATTI				
3 56694	SYED INAM UD DIN				
4 56738	MUHAMMAD IBRAR ARSHAD				
5 56768	MUHAMMAD TAYYAB AFRIDI				
6 56842	MALIK MUHAMMAD AHMED				
7 56879	FAHAD AKBAR				
8 56992	MUHAMMAD KAZIM ABBAS				
9 57300	ABDUL WASAY				
10 57320	SHAHAB UD DIN				
11 57510	MUHAMMAD HAMZA				
12 57645	NAUMAN				

Enrollment

cms.buitms.edu.pk/psc/ps/EMPLOYEE/SA/c/X_OBE_INSTR_MENU.X_OBE_INSTR_CMP3.GBL?Page=X_OBE_INSTR_PG3&Action=U&For=120%

Class

Enrollment

Academic Institution BUTMS

Academic Career Undergrad

Term 2511

Class MECH-461 (Mechanical Vibrations) (8/1063)

Assignment Category SESSIONAL

Description Sessional

Post

28 rows

Student ID	Name	Q1	Q2	Q3	Obt Mark
1 54741	ZUBAIR AHMED				
2 54807	MUHAMMAD ZOHAIB BHATTI				
3 56694	SYED INAM UD DIN				
4 56738	MUHAMMAD IBRAR ARSHAD				
5 56768	MUHAMMAD TAYYAB AFRIDI				
6 56842	MALIK MUHAMMAD AHMED				
7 56879	FAHAD AKBAR				
8 56992	MUHAMMAD KAZIM ABBAS				
9 57300	ABDUL WASAY				
10 57320	SHAHAB UD DIN				
11 57510	MUHAMMAD HAMZA				
12 57645	NAUMAN				