ADAMAS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B. Tech
Stream: ME
PAPER TITLE: Sensor and Actuators
Maximum Marks: 40
Total No of questions: 08

Semester: VIII

PAPER CODE: EEE44104
Time duration: 3 hours
Total No of Pages: 01

Instruction for the Candidate:

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a)** What is an actuator?
b) Define Calibration.
c) What is the detection limit of a signal? Express mathematically.
d) What is an ultrasonic sensor?
e) Define the frequency response.

GROUP –B
(Short Answer Type Questions)

Answer *any three* of the following $3 \times 5 = 15$

2. What is inductance with short-circuited sleeve type transducer?
3. Write a short note on the capacitive sensor. What is the applicability of quartz resonators?
4. What is a nuclear thermometer?
5. What is the temperature dependency of thermometric sensors on resistance change?

GROUP –C
(Long Answer Type Questions)

Answer *any two* of the following $2 \times 10 = 20$

6. What are the types of resistive strain gauge available? Explain the working principle of each type briefly. (2+8)
7. Describe the basic principle of a Hall Device. Show how it can be used for a magnetic field sensor. How is the performance of a hall sensor evaluated? What are its Primary and Secondary sensitivities? (3+2+3+2)
8. What are the coefficients related to piezoelectric elements? What is an acoustic temperature sensor? (5+5)

ADAMAS UNIVERSITY

END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech. Semester : VIII
Paper Title : Vibration & Noise Control **Paper Code : EME44102**
Maximum Marks : 40 Time duration : 3 hrs
Total No of questions : 08 Total No of Pages: 02

Answer all the Groups

Group A

Answer all the questions of the following $\mathbf{5 \times 1 = 5}$

1. **a)** Why does the amplitude of free vibration gradually diminish in practical systems?
b) A gas turbine rotor consists of a shaft and a single stage of turbine blades. Name the physical properties of the rotor required to determine its natural frequency.
c) Identify the object shown in the figure and mention its function.

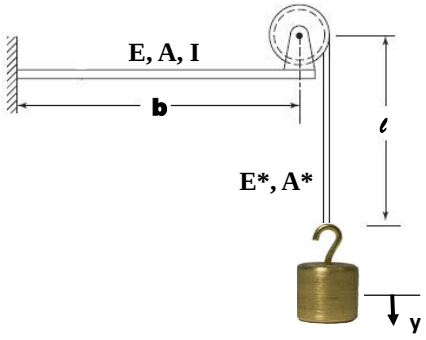
d) Will the force transmitted to the base of a spring mounted machine decrease with the addition of damping? Give your explanation.
e) Why the natural frequency of a vibrometer is generally kept low?

GROUP –B

(Short Answer Type Questions)

Answer *any three* of the following $\mathbf{3 \times 5 = 15}$

2. Find the natural frequency of the above system. The pulley is assumed to be massless and rigid.



3. A vibrometer having a natural frequency of 4 rad/s and damping ratio of 0.2 is attached to a structure that performs a harmonic motion. If the difference between the maximum and the minimum recorded values is 8 mm, find the amplitude of motion of the vibrating structure when its frequency is 40 rad/s.

4. A torsional pendulum has a natural frequency of 200 cycles/min when vibrating in a vacuum. The mass moment of inertia of the disc is 0.2 kg-m^2. It is then immersed in oil and its natural frequency is found to be 180 cycles/min. Determine the damping constant.

5. An air compressor of mass 100 kg is mounted on an elastic foundation. It has been observed that, when a harmonic force of amplitude 100 N is applied to the compressor, the maximum steady-state displacement of 5 mm occurred at a frequency of 300 rpm. Determine the equivalent stiffness and damping constant of the foundation.

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GROUP –C
(Long Answer Type Questions)

Answer *any two* of the following $\mathbf{2 \times 10 = 20}$

6. A spring-mass-damper system is defined by following parameters M=10 kg, K=150 N/m, C=30 Ns/m. Determine the free damped vibration response of the above system for the initial displacement of 5 cm, and zero initial velocity.

7. The seat of a helicopter as shown in the figure, with the pilot, weighs 1000 N and is found to have a static deflection of 10 mm under self-weight. The vibration of the helicopter rotor is transmitted to the base of the seat as harmonic motion with frequency 4 Hz and amplitude 0.2 mm. The acceptable levels of displacement, velocity and acceleration are 1 mm, 15 mm/s and 300 mm/s2, respectively.

i. What is the level of vibration felt by the pilot?
ii. How the seat can be redesigned to reduce the effect of vibration?

8. A machine of mass 120 kg is mounted on isolators having stiffness of 1.0 MN/m and a damping factor 0.1. A piston of mass 2 kg within the machine has a reciprocating motion with a stroke length of 8 cm and a speed of 2000 cycles per minute with the motion assumed to be simple harmonic. Determine:

i. The amplitude of motion of the machine.
ii. Force transmitted to the foundation.
iii. The phase angles of the transmitted force and the machine motion with respect to the excitation force.

ADAMAS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
END SEMESTER EXAMINATION (JULY 2020)

Name of the Program: B.Tech **Semester:** VIII
Course Name: Renewable energy resources **Course Code: EME44108**
Maximum Marks: 40 **Time duration: 3 Hours**
Total No of questions: 12 **Total No of Pages: 2**

Instruction to the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
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GROUP –A

1. Answer all the *five* questions of the following: **5 x 1 = 5**

i. Which turbine is used in a tidal range plant?

ii. What is the typical open circuit voltage of solar cell?

iii. What is the average thickness of the crust?

iv. What is the minimum tidal range required for power generation?

v. What do you understand by Energy Payback Period (EPP) of a solar cell?

GROUP –B

(**Short Answer Type Questions**)

Answer *any three* of the following **3x5 = 15**

2. What is the principal of solar photo voltaic? Explain solar cell characteristics? (3+2)

3. Explain a solar stand-alone system and explain how it could be connected to grid system.

4. a) Explain the I-V characteristics of a solar cell.

b) Define the fill factor.

c) What is the significance of fill factor? (2+1+2)

5. a) What is the importance of MPPT in a solar photo voltaic system?

b) Explain various strategies used for operation a MPPT. (2+3)

GROUP –C

(**Long Answer Type Questions**)

Answer *any two* of the following

2x10=20

6. a) Explain pitching and oscillating water column type wave energy technology.

b) What are the surge devices? (8+2)

7. What is torque co-efficient and how it s related to power coefficient?

8. What are the losses of solar cell? Describe vertical axis wind turbine with different component. (5+5)

(END)

ADAMAS UNIVERSITY
END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B. Tech — Semester: VIII
Stream: ME
PAPER TITLE: Management II (Entrepreneurship development)
PAPER CODE: MBA44142
Maximum Marks: 40 — Time duration: 3 Hours
Total No of questions: 00 — Total No of Pages: 00

Instruction to the Candidate:

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
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Answer all the Groups

Group A

Answer all the questions of the following $\mathbf{5 \times 1 = 5}$

1. **a)** Define marketing management.
   b) What is the main difference between centralization and decentralization?
   c) Define an initiative.
   d) What did Taylor want to communicate through mental revolution?
   e) Define Unity of direction.

GROUP –B
(**Short Answer Type Questions**)

Answer *any three* of the following $\mathbf{3 \times 5 = 15}$

2. Explain briefly 'Remuneration of Employees' and 'Scalar Chain' as principles of general management.
3. What are the differences between Fayol's and Taylor's approach of management?
4. Explain 'unity of command' and 'equity' as principles of general management.
5. Write down few differences between unity of command and unity of direction.

GROUP –C
(**Long Answer Type Questions**)

Answer *any two* of the following $\mathbf{2 \times 10 = 20}$

6. Pawan is working as a Production Manager in CFL Ltd. which manufactures CFL bulbs. There is no class-conflict between the management and workers. The working conditions are very good. The company is earning huge profits. As a policy, the management shares the profits earned with the workers because they believe in the prosperity of the employees.

a) State the principle of management described in the above paragraph.
b) Identify any two values which the company wants to communicate to society.

7. Volte India Ltd. is manufacturing LED bulbs to save electricity. However, it is running under heavy losses. To revive from the losses, the management shifts the unit to a backward area where labour is available at a low cost. The management also asks the workers to work overtime without any additional payments and promises to increase the wages of the workers after achieving its mission. Within a short period, the company starts earning profits because both the management and workers honour their commitments.

a) State the principle of management described in the above paragraph.
b) Identify any two values which the company wants to communicate to society.

8. Explain work study techniques that help in developing standards to be followed throughout the organization.