Mech

SY - mid sem

MGM UNIVERSITY, AURANGABAD
Mid Semester Examination – April. 2022

Course: SY-B. Tech (All)

Subject Name: Engineering Statistics

Sem: IV

Max Marks: 20

Date:-04/03/2024

Subject Code: 20UCC401B

Duration:- 1 Hr.

Instructions to the Students:
1. All questions are compulsory.
2. Use of Non-Programmable calculator is allowed.
3. Figures to the right indicate full marks.

	(Level/CO)	Marks

Q. 1 Attempt the following.

1. The mean and mode of some data are 4 and 10 respectively, it's median will be ....

   (a) 1.5   (b) 5.3   (c) 16   (d) 6   CO1   6

2. If mean and coefficient of variation of the data set is 10 and 5 respectively, then the standard deviation is ...   CO1

   (a) 10   (b) 0.5   (c) 5   (d)none of these

3. A dice is thrown twice. What is the probability of getting sum divisible by three?

   (a) 11/36   (b) 13/36   (c) 1/36   (d) none of these   CO2

4. If X is a continuous random variable with probability density function f(x) then ... which of the following is equal to 1.   CO2

   (a) $\int_{-\infty}^{+\infty} f(x)\, dx$ (b) $\sum f(x)$ (c) both (a) and (b)   (d) none of these

5. Suppose 300 misprints are distributed randomly throughout the book of 500 pages. By Poisson's distribution what is the probability that a given page contains exactly 2 misprints?   CO3

   (a) 0.1313   (b) 0.2313   (c) 0.0988   (d) none of these

6. Suppose 10% of new scooter will require warranty service within the first month of its sale a scooter manufacturing company sales 1000 scooter in a month then standard deviation is.....   CO3

   (a) 100   (b) 200   (c) 10   d) none of these

Q.2 Solve Any Two of the following.

(A) A cyclist pedals from his house to his college at a speed of 10 m.p.h. and back from the college to his house at 15 m.p.h. Find the average speed.   CO1   6

(B) Seven employees in a company of 20 are graduates. If 3 are selected out of 20 at random. What is the probability that there is at least one graduate among them?   CO2

(C) A sample of 100 dry battery cells tested to find length of life produced the following results: M = 12 hours, σ = 3 hours
Assuming the data to be normally distributed, what percentage of battery cells expected to have life   CO3

a) more than 15 hours
b) between 10 and 14 hours.
   Given data: A(0 to 1)=0.3413, A(0 to 0.67)=0.2487

Q. 3 Solve Any Two of the following.

(A) A frequency distribution of heights (recorded to the nearest inch) of 100 male students at MGM   CO1
University is given in the following Table. Find the standard deviation of the heights of the 100
male students at MGM University.

Height (in)	Number of Students
60–62	7
63–65	20
66–68	40
69–71	25
72–74	8

(B) Suppose an item is manufactured by three machines X, Y and Z. All three machines have equal

capacity and operated at same rate. It is known that the percentage of defective items produced   CO2

by X, Y, Z is 2, 7 and 12 percent respectively. All items produced by X, Y, Z are put into one

bin. From this bin one item is drawn at random and is found to be defective. What is the

probability this item was produced on machine Y?

(C) A factory finds that on an average 10% of pens produced by a machine to be defective for certain   CO3
specified requirement. If 10 pens are selected at random from days product, Use binomial
distribution to find the probability that
   a) exactly three pens are defective
   b) 2 or more pens are defective
   c) less than 3 pens are defective.

*** End ***

15 MAR 2024/SY/MECH/MSE/P2/23-24

MGMU JAWAHARLAL NEHRU ENGINEERING COLLEGE

Mid Semester Examination – March 2024

Class: SY (Mechanical/Mech. Mechtronics Engg. (Addi. Mfg.) /Robotics & AI)   **Sem: IV**

Subject Name: Product Design-I

Subject Code: 20UME406D

Max Marks: 10

Date: 09/03/2024   **Duration:-** 45 Min.

	Instructions to the Students: 1. Draw neat diagrams wherever necessary and assume suitable examples if required 2. All question are compulsory	CO	BL	Marks
Q. 1	**Answer the following**			

(A)	The product design covers the end-to-end .... goods that solves a .... for the satisfaction of ....
	  i. planning, method, oneself
	  ii. iterative, detailed plan, useful products
	  iii. creation, specific problem, user
	  iv. planning, statement, process
		CO2	BL1	(1X3)
				1

(B)	.... is level of quality of how well the manufactured product gives its performance in specified conditions.
	  i. Quality of Design
	  ii. Quality of Conformance
	  iii. Quality of Performance
	  iv. None of the above
		CO2	BL2	1

(C)	The characteristics of a good products are:
	  ix. Inflexible, Unfair, Usable, Impactful, Transformational
	  x. Bias, Equitable, Harmful, Impactful, Terminational
	  xi. Adaptable, Equitable, Usable, Impactful, Transformational
	  xii. All of the above
		CO2	BL3	1

Q. 2	**Answer any TWO from the following**			
(A)	Elaborate various stages of Product Design for designing a Tea Cup	CO2	BL2	(2X2) 2
(B)	Elaborate SCAMPER technique	CO2	BL2	2
(C)	Interpret Reverse Engineering approach to product design	CO2	BL2	2
Q. 3	**Answer any ONE from the following**			
(A)	Draw a Mind Map for "How to Finalize a Product Name?"	CO2	BL2	(3X1) 2
(B)	Illustrate the opportunities for improvement in a Ceiling Fan	CO2	BL2	2

*** End ***

SY-... Mid Sem   SY Mechatronics

MGM UNIVERSITY

Jawaharlal Nehru Engineering College,

Mid Semester Examination – March, 2024 (AY 2023-24)

Mechanical and Mechatronics Engineering (Additive Manufacturing) Sem: II

MECHANICS   Subject Code: 22UMM405D

Date:-08/03/2024   Time:- 11:00am-12:00 noon   Duration:- 1 Hr.

Course: S.Y.B. Tech in ...
Subject Name: FLUID ...
Max Marks: 10

Instructions to the Stu...
7. Please check wh...
8. Assume suitable...
9. Figures to the rig...

...ents:
...her you have got the right question paper
...ata wherever necessary.
...t indicate full marks.

		(Level/CO)	Marks
Q. 1	Solve all the foll... ...ing MCQ's.		3
	1. The branch of ... Motion is call... ...cience which deals with the behavior of fluids at rest or in ...		
	a) Fluid Statics ...Fluid Kinematics c) Fluid Dynamics d) Fluid Mechanics	Knowledge/ CO1	
	2. The study of f... ...ds in Motion where Pressure forces are considered is...		
	a) Fluid Statics b ...fluid Kinematics c) Fluid Dynamics d) Fluid Mechanics	Knowledge/ CO1	
	3. The property of ...uid which determines its resistance to shearing stresses is called	Knowledge/ CO1	
	a) Mass Density b ...Weight density c) Specific Gravity d) Viscosity		
	4. Unit of Specif... ...Gravity or Relative Density is...	Knowledge/ CO1	
	b) Kg/m³ b ...Kg/m² c) Unit less Quantity d) N.S/m²		
	5. In Dynamic V... ...osity, The Shear Stress is Proportional to Rate of Change of ...r.t. distance.	Knowledge/ CO1	
	b) Velocity b ...Speed c) Acceleration d) Torque		
	6. One Stoke is eq... ...l to...	Knowledge/ CO1	
	b) 1 cm²/s b ...10 cm²/s c) 100 cm²/s d) None of these		
Q.2	**Solve Any Two of** ...he following.		3 X 1
(A)	Derive the expressi... ...n for Pressure variation in a Fluid at Rest with neat sketch.	Comprehension /CO2	
(B)	Derive the expressi... ...for Pascal's Law with neat sketch.	Comprehension /CO2	
(C)	Explain the term Su... ...ace Tension in detail with neat sketch.	Comprehension /CO2	
Q. 3	**Solve Any One of** th... ...e following.		4
(A)	Determine the Total ... placed vertically in v... the free surface of w... ...ressure on a circular plate of diameter 1.5m which is ...ter in such a way that the centre of the plate is 3m below ...er. Find the position of Centre of Pressure also.	Apply/ CO2	
(B)	A rectangular plane s... that its plane makes a... the Total Pressure an... 1.5m below the free s... ...rface 2m wide and 3m deep lies in water in such a way ...angle of 300 with the free surface of water. Determine ...Position of Centre of Pressure when the upper edge is ...rface of water.	Apply/ CO2	

*** End ***

15 MAR 2024/

MGM UNIVERSITY
JAWAHARLALA NEHRU ENGINEERING COLLEGE,
Chhatrapati Sambhajinagar
Department of Mechanical Engineering
Mid Semester Examination – March 2024

Course: B. Tech in Mechanical Engineering   **Sem: IV**

Subject Name: Mechatronics

Subject Code: 20UME405D

Max Marks: 10   **Duration:** - 1 Hr.   **Date:** 08 / 03 / 2024

	Instructions to the students 1. All questions are compulsory. 2. Draw neat sketches wherever applicable. 3. Assume additional data if necessary	CO	BL	Marks
Q.1	**Solve Any Three of the following.**			2X3 =6
A	Define Mechatronics & explain building blocks of Mechatronics system in detail also enlist the advantages & disadvantages of Mechatronics.	CO1	BL1	
B	Explain in detail the working principle of piezoelectric sensor for force measurement.	CO2	BL1	
C	Differentiate between active sensor & passive sensors also explain hard automation & soft automation.	CO2	BL2	
D	Which proximity sensor will you use out of inductive type & capacitive type for the detection of plastic material? Give reasons for your selected sensor & Explain the working principle of your selected sensor with neat sketch in detail.	CO2	BL3	
E	What are the different types of directional control valve (DCV) used in a pneumatic system? Draw the symbols for all of them also enlist the use case of each DCV.	CO3	BL1	
Q. 2	**Solve Any One of the following.**			4
A	Explain working principle with neat sketch for Stepper Motor & Servo Motor.	CO2	BL1	
B	Draw & explain Electro-Pneumatics circuit for actuation of double acting cylinder.	CO1	BL1	
	*** End ***			

SY Mid Sem

MGM UNIVERSITY

J.N.E.C. AURANGABAD

DEPARTMENT OF MECHANICAL ENGINEERING

Course: S.Y.(Mechatronics)/ R&AI Sem: IV

Subject Name: Microprocessor and Microcontroller   Code: 22UMM404D

Mid Sem Exam(MSE): MARCH 2024

Max Marks: 20   Date: 07.03.2024   Duration:- 1 Hr.

Instructions to the Students:
1. Verify that you got correct question paper.
2. Figures to right indicate full marks.
3. Assume suitable data wherever necessary.

		CO	BL	Marks
Q. 1	Solve the following			6
1	Width of SP in 8085 is ---------- bit.	1	1	
2	When Reset pin is activated the contents of PC becomes --------.	1	1	
3	If crystal frequency is 4MHz, then CLK OUT frequency in 8085 will be ------	1	1	
4	HOLD and HLDA pins are used for ------ operation.	1	1	
5	ADD B is an example of -------- addressing mode.	1	1	
6	--------- is the highest priority interrupt in 8085.	1	1	
Q.2	Solve Any Two of the following.			3 X 2
(A)	What is Stack? Explain working of it with the help of PUSH and POP instructions.	2	2	
(B)	Wrire an ALP to Initialize an 8255 in mode 0 for the following configuration Port A input,port B and C output. Assume the port addresses of 8255 are 08H,09H,0AH and 0BH for Port A,B,C and CWR respectivifely.	3	3	
(C)	How interrupts are classified in 8085 microprocessor	2	2	
Q. 3	Solve Any One of the following.			4*2
(A)	Write an ALP to add two 8 bit numbers and store the result at 2100H.	2	3	
(B)	It is required to generate a time delay of 10 ms in 8085.Give routine for this assume clock period 0.333 µsec.	2	3	
(C)	Write an ALP to find 2's complement of a number stored at memory location 2200 and store the result at 2201	2	3	
	END			

SY _mid sem

MGM University
Jawaharlal Nehru Engineering College, Chh. Sambhajinagar
Mid Semester Examination – March 2024

Program : B. Tech in Robotics and AI
Course Name: Sensors & Actuators
Max Marks: 10   **Date:- 08/03/2024**

Sem: IV (2023-24)
Subject Code: 22URA405D
Duration:- 45 Minutes

Instructions to the students
1. All questions are compulsory

Q No		C.O	B.L	Marks
Q 1	**MCQ's**			3
	1.Infrared wavelength lies between a) 1000 nanometer to 700 nanometer b) 1000 micrometer to 700 micrometer c)700 nanometer to 1 mm d) 1 mm to 1cm	CO1	I	
	2.What is PTC thermistor? a) Positive temperature coefficient thermistor b) Positive transient coefficient thermistor c) Pulse transmit coefficient thermistor d) All the above	CO1	I	
	3. smart sensor is known as a) electronic circuit and sensor to make intelligent work b) microchips and Arduino c) wafers and electronic circuit d) temperature sensor	CO1	I	
Q 2	**Solve any one of the following**			3
(A)	Explain the working principle of potentiometer	CO2	II	
(B)	Explain the working principle of any one type of position sensor	CO2	II	
(C)	Explain the working principle of smart sensor	CO2	II	
Q 3	**Solve any one of the following.**			4
(A)	Explain in detail strain gauge	CO3	III	
(B)	Explain in detail Proximity Sensor	CO3	III	
(C)	Explain in detail MEMS	CO3	III	