



Question Paper For Internal Assessment Examination (Theory) - Credit 4 / 42 / SET 1

Instructions for Students/Faculty Mid Term I (Total 80 Marks, 2 HRS. Syllabus from Unit-1)

- Part A: Total number of questions to be given are ten (5 from CO1 and 5 from CO2), each carrying 2 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words For both Question & Answer**), no objective type or fill in the blanks. Total 20 marks.
- Part B: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2). They are long answer type (**Not More Than 50 Words for Question**), each carrying 5 marks. Total 20 marks.
- Part C: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2). They are numerical answer type / fully elaborative type (**Not More Than 70 Words for Question**) *, each carrying 10 marks. Total 40 marks.

Mid Term II (Total 120 Marks, 2.5 HRS., Syllabus from Unit-2)

- Part A: Total number of questions to be given are ten (5 from CO3 and 5 from CO4), each carrying 4 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words For both Question & Answer**), no objective type or fill in the blanks. Total 40 marks.
- Part B: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student has to answer four (2 from CO3 and 2 from CO4). They are long answer type (**Not More Than 50 Words for Question**), each carrying 7 marks. Total 28 marks.
- Part C: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student has to answer four (2 from CO3 and 2 from CO4). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**) *, each carrying 13 marks. Total 52 marks.

Mid Term III (Total 120 Marks, 2.5 HRS., Syllabus from Unit-3)

- Part A: Total number of questions to be given are ten (5 from CO5 and 5 from CO6), each carrying 4 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words For both Question & Answer**), no objective type or fill in the blanks. Total 40 marks.
- Part B: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student must answer four (2 from CO5 and 2 from CO6). They are long answer type (**Not More Than 50 Words for Question**), each carrying 7 marks. Total 28 marks.
- Part C: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student must answer four (2 from CO5 and 2 from CO6). They are numerical answer type / fully elaborative type (**Not More Than 70 Words for Question**) *, each carrying 13 marks. Total 52 marks.

* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: NO SUBJECT UNDER CREDIT FOUR

Instructions For Faculties:

There should be total 6 Course Outcomes (COs) for each subject.

- Mid Term Question Papers are to be submitted as per Course Outcomes (COs) which should be divided equally in Part A, Part B and Part C according to Mid Term Examination and Credit Point.
- In Mid Term-1, the questions are to be given from CO1 and CO2. In Mid Term-2, the questions are to be given from CO3 and CO4. Similarly, in Mid Term-3, the questions are to be given from CO5 and CO6.



- FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'C' OF QUESTION PAPER**

INSTRUCTION FOR STUDENTS

- STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM, AND MAY LEAVE THE EXAM HALL ON EXPIRY OF ATLEAST OF 1 Hr FROM THE STARTING TIME OF EXAMINATION.**

QUESTION PAPER AND STUDENTS DETAILS

| | | | |
|------------------------|-----------------------------------|----------------------------|-----------------------------------|
| Type of Exam | Mid Term 2 | Date of Submission | 21/07/2021 |
| Name of Faculty | GOURAV SARDANA | Date of Examination | 27/07/2021 |
| Course | B.Tech (Mechatronics Engineering) | Semester | SEMESTER : 4 |
| Batch | Fifth (5) | Subject | 4 MH4 - 05 Fluid Mechanics (Cr 4) |

COURSE OUTCOMES FOR REFERENCE TO FRAME QUESTION PAPER

(Faculties are required to mention relevant Course Outcome number against the respective question in QP)

| | | | |
|-----------------------|--|------------------------|--------------|
| Course Outcome | 3.Capable in formulating the basic governing equations applied in fluid mechanics and its applications in fluid motion. 4. To be able to understand the flow through pipes, cylinder, sphere and other aerodynamic shaped body and able to find aerodynamic parameters. | | |
| Email I'd | gouravsardana@soaneemrna.org | Phone No. | 925-566-9668 |
| Student Name | | Student Reg No. | |

Part A

All the questions are compulsory to attend.

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| 1. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE. | 3 | | |
| Question : 1 | Explain assumption in Bernoulli's Equation. | | |
| 14 | Fluid Momentum | fluid mechanics by bansal | |
| Question : 2 | Write the Navier -Stokes equation. | | |
| 14 | Fluid Momentum | fluid mechanics by bansal | |
| Question : 3 | Define the Continuity equation. | | |
| 14 | Fluid Momentum | fluid mechanics by bansal | |



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|--|---|---------------------------|---|
| Question : 4 | Define orifices and mouthpieces . | | |
| 19 | Fluid Momentum | fluid mechanics by bansal | |
| Question : 5 | Write the formula for coefficient of discharge of orifices . | | |
| 20 | Fluid Momentum | fluid mechanics by bansal | |
| 2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE. | | | 4 |
| Question : 6 | Define Darcy's Weisback equation . | | |
| 22 | Flow Through Pipes | fluid mechanics by bansal | |
| Question : 7 | Write Chezy' Formula for loss of head due to friction in pipe | | |
| 23 | Flow Through Pipes | fluid mechanics by bansal | |
| Question : 8 | Define the term losses in head due to sudden Enlargement | | |
| 23 | Flow Through Pipes | fluid mechanics by bansal | |
| Question : 9 | Define the term flow through compound pipes | | |
| 24 | Flow Through Pipes | fluid mechanics by bansal | |
| Question : 10 | Define Laminar Flow . | | |
| 25 | Laminar Flow | fluid mechanics by bansal | |

Part B

FOR MIDTERM 1 - Part B: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2).

FOR MIDTERM 2 - Part B: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student must answer four (2 from CO3 and 2 from CO4).

FOR MIDTERM 3 - Part B: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6).

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| 3. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE. | | | 3 |
| Question : 1 | Drive the expression for Euler's Equation of Motion. | | |
| 15 | Fluid Momentum | FLUID MECHANICS BY BANSAL | |
| Question : 2 | Explain the application of Bernoulli's Equation . | | |



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| 17 | Fluid Momentum | FLUID MECHANICS BY BANSAL | |
| Question : 3 | Drive the expression for coefficient of discharge of orifice meter . | | |
| 18 | Orifice Discharging | FLUID MECHANICS BY BANSAL | |
| 4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE. | | | 4 |
| Question : 4 | Drive the expression for loss of head due to sudden contraction | | |
| 21 | Flow Through Pipes: | FLUID MECHANICS BY BANSAL | |
| Question : 5 | Drive the expression for Flow through pipe line in parallel arrangement. | | |
| 22 | Flow Through Pipes: | FLUID MECHANICS BY BANSAL | |
| Question : 6 | Drive the expression for Losses of head due to obstruction in exit pipe | | |
| 25 | LaminarFlow | FLUID MECHANICS BY BANSAL | |
| Question : 7 (Old Pattern) | | | |
| | | | |

Part C

FOR MIDTERM 1 - Part C: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2).

FOR MIDTERM 2 - Part C: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student must answer four (2 from CO3 and 2 from CO4).

FOR MIDTERM 3 - Part C: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6).

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| 5. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE. | | | 3 |
| Question : 1 | A pipe through which the water is flowing is having a diameter 20cm and 10cm at a cross section 1 and 2 respectively .The velocity of water at a section 1 is 4m/sec .Find the velocity head at section 1 and 2 also find the rate of discharge | | |
| 19 | Fluid Momentum | FLUID MECHANICS BY BANSAL | |
| Question : 2 | A pipe of diameter 400mm carries a water at a velocity of 25 m/s .the pressure at the point A and B are given as 29.43 N /Cm ² respectively while the datum head at A and B are 28 m and 30m . find the loss of head between at A and B . | | |
| 22 | Fluid Momentum | FLUID MECHANICS BY BANSAL | |



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| Question : 3 | An orifice meter with orifice meter with diameter 15 cm is inserted in a pipe of 30cm diameter .the pressure difference measured by mercury oil differential manometer on the two side of the orifice meter gives a reading of 50cm of mercury . Find the rate of flow of oil of sp. gravity 0.9 when coff of discharge of orifice meter is .64 | | |
| 21 | Orifice Discharging | FLUID MECHANICS BY BANSAL | |
| 6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE. | | | 4 |
| Question : 4 | Find the heat loss in due to friction in pipe diameter of 300mm an length 50m ,through which water is flowing at a velocity of 3m/s . Take ν for water .01 stroke using a. Dracy's formula b. Chezy's Formula for which $C = 60$ | | |
| 23 | Flow Through Pipes | FLUID MECHANICS BY BANSAL | |
| Question : 5 | An oil of sp. gravity 0.9 and viscosity 0.06 poise is flowing through a pipe of diameter 200mm at the rate of 600 litre /sec . Find the head lost due to friction for a 500m length of pipe. Find the power required to maintain this flow. | | |
| 24 | Flow Through Pipes | FLUID MECHANICS BY BANSAL | |
| Question : 6 | A sudden enlargement of water main frame from 240mm to 480 mm diameter .the hydraulic gradient rises b 10mm .Estimate the rate of flow. | | |
| 25 | Flow Through Pipes | FLUID MECHANICS BY BANSAL | |
| Upload Scanned Document In Case of Numerical or Diagram For Any of The Above Questions. (Mention question number with relevant fig / numerical / equations. Max 150 KB) | | | |
| I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question. | | | |
| <p align="center">Corporate Office : H 974, Palam Extension, Part 1, Sector 7, Dwarka, New Delhi 110077 Ph. 011-25084354, 9811315363, 9314009020, E-Mail: info@soaneemrana.org, ccashoka@gmail.com Website: www.soaneemrana.org, www.soaneemrana.org, www.soadelhi.com</p> | | | |

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