Question Paper For Internal Assessment Examination (Theory) - Credit 4 / 47 / SET 1

Instructions for Students/FacultyMid 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 3	**Date of Submission**	17/08/2021
Name of Faculty	GOURAV SARDANA	**Date of Examination**	24/08/2021
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	5.To understand concept of laminar flow, turbulent flow. 6. To study the importance of dimension analysis in mechanics of fluid.		
Email I'd	gouravsardana@soaneemrana.org	**Phone No.**	925-566-9668
Student Name		**Student Reg No.**	

Part A

All the questions are compulsory to attend.

1. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			5
Question : 1	Define Reynolds number .		
29	Turbulent Flow	FLUID MECHANICS BY R.K BANSAL	
Question : 2	Explain the term Is friction factor inversely proportional to Reynolds number .		
30	Turbulent Flow	FLUID MECHANICS BY R.K BANSAL	
Question : 3	Define the Prandtl mixing length theory .		
30	Turbulent Flow:	FLUID MECHANICS BY R.K BANSAL	
Question : 4	Explain the disadvantage of turbulent flow .		

31	Turbulent Flow	FLUID MECHANICS BY R.K BANSAL	
Question : 5	Define Buckingham PI method .		
34	Dimensional Analysis	FLUID MECHANICS BY R.K BANSAL	
2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			6
Question : 6	Define the Von Karman momentum equation.		
39	BOUNDARY LAYER	FLUID MECHANICS BY R.K BANSAL	
Question : 7	Define the separation of boundary Layer.		
40	BOUNDARY LAYER	FLUID MECHANICS BY R.K BANSAL	
Question : 8	Explain the range of Reynold's number for laminar and turbulent flow in a pipe.		
41	BOUNDARY LAYER	FLUID MECHANICS BY R.K BANSAL	
Question : 9	Define Drag of Sphere.		
46	Flow Round a Body:	FLUID MECHANICS BY R.K BANSAL	
Question : 10	Explain the induced drag facto		
44	Flow Round a Body:	FLUID MECHANICS BY R.K 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).

3. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			5
Question : 1	Explain the process to find the average velocity in turbulent flow .		
32	TURBULENT FLOW	FLUID MECHANICS BY BANSAL	
Question : 2	Explain friction factor decreases with Reynolds number		
33	TURBULENT FLOW	FLUID MECHANICS BY BANSAL	

Question : 3	Explain the advantages and limitations of dimensional analysis .		
34	DIMENSIONAL ANALYSIS	FLUID MECHANICS BY BANSAL	
4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			6
Question : 4	Drive the expression for Displacement Thickness		
37	BOUNDARY LAYER	FLUID MECHANICS BY BANSAL	
Question : 5	Explain the shape of laminar boundary layer.		
38	BOUDARY LAYER	FLUID MECHANICS BY BANSAL	
Question : 6	Explain the different types of drag		
39	FLOW ROUND A BODY	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).

5. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			5
Question : 1	Drive the expression for Reynolds expression for turbulent shear stress.		
33	TURBULENT FLOW	FLUID MECHANICS BY BANSAL	
Question : 2	A SMOOTH PIPE OF DIAMETER 400mm LENGTH 800m CARRIES WATER AT THE RATE OF 0.0 m3/s .DETERMINE THE HEAD LOST DUE TO FRICTION ,WALL SHEAR STRESS , SHEAR CNTRE -LINE VELOCITY AND THICKNESS OF LAMINAR SUB-LAYER .TAKE KINEMATIC VISCOSITY OF WATER A 0.018STOKES.		
35	TURBULENT FLOW	FLUID MECHANICS BY BANSAL	
Question : 3	Explain the total energy line and hydraulic gradient energy line		
36	DIMENSIONAL ANALYSIS	FLUID MECHANICS BY BANSAL	

6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			6
Question : 4	Drive the expression for lift coefficient for rotating cylinder .		
46	Flow Round a Body	FLUID MECHANICS BY BANSAL	
Question : 5	A THIN PLATE IS MOVING IN STILL ATMOSPHERIC AIR AT A VELOCITY OF 5m/s .THE LENGTH OF THE PLATE IS 0.6 m and WIDTH 0.5 m . CALCULATE a. Thickness of the boundary layer at the end of the plate b. Drag force on one side of plate. Take density of air as 1.24 kg/m3 and kinematic viscosity 0.15 stokes		
41	BOUNDARY LAYER	FLUID MECHANICS BY BANSAL	
Question : 6	THE AIR HAVING A VELOCITY OF 40m/s IS FLOWING OVER A CYLINDER OF DIAMETER 1.5 m AND LENGTH 10m ,WHEN THE AXIS OF THE CYLINDER IS PERPENDICULAR TO THE AIR STREAM .THE CYLINDER IS ROTATED ABOUT ITS AXIS AND A LIFT OF 6867N/m LENGTH OF CYLINDER IS DEVELOPED .FIND THE SPEED OF ROTATION AND LOCATION OF STAGNATION POINTS. THE DENSITY OF AIR IS GIVEN AS 1.25kg/m3 .		
45	Flow Round a Body	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.			

The message has been sent from 157.38.204.169 (India) at 2021-08-17 23:21:16 on Firefox 91.0
Entry ID: 47