School of Aeronautics (Neemrana)

I-04, RIICO Industrial Area, Neemrana, Dist. Alwar, Rajasthan

Approved by Director General of Civil Aviation, Govt. of India, All India Council for Technical Education
Ministry of HRD, Govt of India & Affiliated to Rajasthan Technical University, Kota & BTU, Bikaner Rajasthan

Question Paper For Internal Assessment Examination (Theory) - Credit 4 / 6 / SET 1

Question Paper For Internal Assessment Examination (Theory) - Credit 4
• **Instructions For Students / FacultyMid Term I (Total 80 Marks, 2 HRS. Syllabus From Beginning Of Session)**

   ◦ Part A: Total number of questions to be given are ten, 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, out of which student has to answer any four. They are long answer type (**Not More Than 50 Words For Question)**, each carrying 6 marks. Total 24 marks.
   ◦ Part C: Total number of questions to be given are four, out of which student has to answer any three. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question)***, each carrying 12 marks. Total 36 marks.**Mid Term II & III (Total 120 Marks, 2.5 HRS. Syllabus From Beginning Of Session)**
   ◦ Part A: Total number of questions to be given are ten, 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 seven, out of which student has to answer any five. They are long answer type (**Not More Than 50 Words For Question)**, each carrying 8 marks. Total 40 marks.
   ◦ Part C: Total number of questions to be given are five, out of which student has to answer any four. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question)***, each carrying 15 marks. Total 60 marks.
* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: NO SUBJECT UNDER CREDIT FOUR
FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICALELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'C' OF QUESTION PAPER
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 & Student Details

Mid Term	Mid Term 2	**Date of Submission**	21/08/2020
Name of Faculty	Mr. Sidhartha Sondh	**Date of Examination**	25/08/2020
Course	B.Tech (Aeronautical Engineering)	**Semester**	SEMESTER : 3
Batch	Combined Batches 18, 19, SF 2	**Subject**	3 AN4 - 04 Incompressible 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	COURSE OUTCOME Upon completion of the course, Students will be able to CO1: Distinguish different types of fluid, properties and their behavior under various conditions. CO2: Apply scientific method strategies to fluid mechanics: analyse qualitatively and quantitatively the problem situation, propose hypotheses and solutions. CO3: Demonstrate conservation laws to determine velocities, pressures, and accelerations for incompressible and inviscid fluids. CO4: Analyse the relationship between shear stress and pressure gradient for different conditions.

Email I'd	sidharthasondh@soaneemrana.org	**Phone No.**	963-455-7511
Student Name		**Student Reg No.**	

Part A			
Question : 1	What is flow visualization?		
11	Flow visualization	Self	3
Question : 2	Define shear stress.		
16	Shear stress	Self	2
Question : 3	Define transition flow.		

23	Flow	Self	4
Question : 4	What is the a fully developed flow?		
25	Flow	Self	4
Question : 5	What are non-Newtonian Fluids? Give some examples		
3	Non-Newtonian Fluids	Self	1
Question : 6	Give the significance of Hagen Poisseulli equation.		
25	Hagen Poisseulli	Self	4
Question : 7	What is an orifice meter?		
18	Orifice	Self	3
Question : 8	Distinguish between static and stagnation pressure		
4	Presure	Self	1
Question : 9	What is vena contracta?		
19	Orifice	Self	3
Question : 10	Mention the characteristics of ideal fluid.		
2	Fluids	Self	1
Part B			
Question : 1	What are the different types of fluid flows? illustrate them with a neat diagram?		
6	Types of Flow	Self	1
Question : 2	With the help of neat diagram explain: 1. Bernoulli's Equation 2. Meta-center and Metacentric Height 3. Rotational and Vorticity		
18	Fluid Mechanics	Self	3
Question : 3	Prove that intensity of pressure at a point in a fluid at rest is the same in all directions?		
14	Fluid Kinematics	Self	3
Question : 4	Derive Momentum conservation equation. Justify, what is the need of considering control volume for this.		
23	Momentum conservation	Self	3
Question : 5	Find the volume of the water displaced and location of center of Buoyancy for a wooden block of width 4.5 m and depth 1m, when it floats horizontally in water. The density of wooden block is 650 kg/m3 and its lenght 8m.		
10	Center of Buoyancy	Fluid Mechanics and Machinery By R k Rajput	2
Question : 6	What are the conclusion of Reynold's experiment?		
22	Reynold's experiment	Self	4
Question : 7	Explain in detail about the significance of Navier Stokes equation in Fluid Mechanics		
24	Navier Stokes equation	Self	4
Part C			
Question : 1	Derive expression for Bernoulli's equation. Also state the assumptions made.		
20	Bernoulli's equation	Self	4

Question : 2	A venturimeter with a throat diameter of 7.5 cm is installed in a 15 cm diameter pipe. The pressure at the entrance is 70kPa (Gauge) and it is desired that the pressure at any point should not fall below 2.5 m of absolute. Determine the maximum flow rate of water through the meter. Take Cd = 0.97 and atmospheric pressure as 100 kPa.		
18	Venturimeter	Fluid Mechanics and Machinery By R k Rajput	4
Question : 3	Derive the Chezy's formula for loss of head due to friction.		
25	Chezy's formula	Self	4
Question : 4	The rate of flow of water through a horizontal pipe is 0.25 m3/s. The diameter of the pipe which is 200 mm is suddenly enlarged to 400 mm. The pressure intensity in the smaller pipe is 11.772 N/cm2. Determine: (i) loss pf head due to enlargement (ii) pressure intensity in the large pipe, (ii) power lost due to enlargement		
25	Frictional loss	Fluid Mechanics and Machinery By R k Rajput	4
Question : 5	A uniform body of size 3m long X 2m wide X 1m deep floats in water. What is the weight of the body if depth of immersion is 0.5m. Determine the metacentric height also		
10	Metacenter	Fluid Mechanics and Machinery By R k Rajput	2
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.	S S		

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