BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MTECH **SEMESTER : II**
BRANCH: SER(AERODYNAMICS) **SESSION : SP/2024**

SUBJECT: SR579 EXPERIMENTAL AERODYNAMICS

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Distinguish between the indraft and blowdown supersonic wind tunnel.	[5]	1	4
Q.1(b)	Construct using a sketch the expected pressure distribution along the supersonic wind tunnel in running condition after the starting shock has been swallowed.	[5]	1	3
Q.2(a)	Define flow visualization. Classify the techniques of visualization both for subsonic and supersonic flows	[5]	2	2
Q.2(b)	Illustrate the techniques of surface flow visualizations which are very commonly executed.	[5]	2	3
Q.3(a)	Prepare a Prandtl's pitot tube from the design and attribute the decided parameters on the sketch of the tube.	[5]	2	3
Q.3(b)	Describe the working principle of a mechanical balance.	[5]	2	2
Q.4(a)	Differentiate between temporal and spatial resolution taking the examples of constant temperature anemometer, laser doppler anemometer and particle image velocimetry.	[5]	2	3
Q.4(b)	Describe the King's Law and demonstrate the calibration process of a hot wire using a constant temperature anemometer(CTA).	[5]	3	4
Q.5(a)	Appraise the significance of speed, reliability, repeatability, Accuracy and Resolution of a ADC Card.	[5]	5	4
Q.5(b)	A typical signal is acquired using a ADC having 8 bit resolution. The card has input range of ±10V. The system used in the acquisition has a gain of 10 using a amplifier. Assess the result and mention if the resulting resolution is sufficient to acquire 5mV?	[5]	5	5

::::::26/04/2024::::::E