**Rajasthan Institute of Engineering & Technology, Jaipur**

**IV Year B. Tech. VIISem I Mid Term Examination, Sept-2018**

**University Roll No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **Branch: - …………..MECHANICAL**

 **Subject: - ………… TURBOMACHINES**

 **Set: A**

 **Time: 2 Hrs. [Maximum Marks: -20]**

 **[Min. Pass. Marks: 8]**

**Instructions to Candidates: -**

**Attempt all questions. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.**

Q.1 Explain the construction of Centrifugal Pump.

OR

What is specific speed, what is its importance, and what are the ranges of specific speed for different turbines? Also derive the relation for specific speed.

Q.2 Draw and explain the velocity triangles of axial flow Pump.

OR

Derive the relation for the energy transfer in terms of static head rise, energy imparted in rotation and rise in kinetic energy.

Q.3 Compare between Centrifugal and axial flow Pump.

OR

Explain with Diagram (any two)

1. Priming
2. Cavitation
3. Net Positive suction head

Q.4 The outer dia. of an impeller of a C.P. is 40 cm and outlet width is 5 cm. The pump is running at 800 rpm and working against a head of 16 m. The vane angle at outlet is 14 degree. Assuming the manometric efficiency to be 75%, determine the discharge?

OR

Explain the construction of a vane pump with the help of a neat sketch.

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 **Branch: - …………..MECHANICAL**

 **Subject: - ………… TURBOMACHINES**

 **Set: B**

 **Time: 2 Hrs. [Maximum Marks: -20]**

 **[Min. Pass. Marks: 8]**

**Instructions to Candidates: -**

**Attempt all questions. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.**

Q.1 Derive the relation for minimum starting speed of a pump.

OR

Explain the construction of an axial pump.

Q.2 Explain the principle of similarity and give the various types of similarities.

OR

What is specific speed, what is its importance, and what are the ranges of specific speed for different turbines? Also derive the relation for specific speed.

Q.3 Outer dia of an axial pump pump is 1m and dia of boss is 0.5m. also specific speed is 38, head=6m & axial component of velocity is 2m/s. Determine the rotational speed of the pump and the blade angle at the inlet if the flow is axial at inlet?

OR

Explain with Diagram (any two)

1. Manometric head
2. Flow coefficient
3. Net Positive suction head

Q.4 Draw and explain the performance curves for a radial flow pump.

OR

Explain with Diagram the working of a single acting and double acting piston pump.