

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2019 - 20 Examination

Semester: 5**Subject Code: 03101302****Subject Name: PROPULSION-I****Date: 26/11/2019****Time: 10:30am to 01:00pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (Each of one mark)**(15)**

1. Name the main Components of axial flow compressor.
2. An Centrifugal flow compressor is suitable for _____
(a) high volume flow rates with a small pressure rise
(b) high volume flow rates with high pressure rise
(c) low volume flow rates with low pressure rise
(d) low volume flow rates with high pressure rise
3. In axial flow turbine, nozzle blade imparts the _____ energy.
4. Define loading co-efficient.
5. _____ turbines are also called as parallel flow turbine.
6. How many Types of turbomachines?
7. Define Degree of Reaction and state the equation of axial flow turbine.
8. How many types of axial flow turbine?
9. In radial flow turbine, define Cantilever turbine.
10. Define flow Co-efficient.
11. What is a positive displacement machine?
12. What is turbomachines?
13. In radial flow turbine, fluid flow enters _____ and discharged axially.
14. A pair of fixed blade and rotor blade in axial flow compressor is called as _____.
(a) step, (b) pair, (c) stage, (d) state
15. In radial flow turbine, 90 IFR Turbine is similar to the _____ Compressor.

Q.2 Answer the following questions. (Attempt any three)**(15)**

- A) Explain geometry and working principles of Centrifugal flow compressor.
- B) Differentiate turbo-machines and positive displacement machines.
- C) Draw and explain h-s diagram for axial flow compressor.
- D) Explain multi stage velocity and pressure compounded impulse for axial turbine stage.

Q.3 A) Draw sketches of the three types of impellers and the velocity triangles at their entries and exits. (07)

B) Prove the following below relation of axial flow compressor: (08)
 $\tan\alpha_1 + \tan\beta_1 = \tan\alpha_2 + \tan\beta_2$

OR

B) In axial compressor, which factors affecting the Stages Pressure ratio? (08)

Q.4 A) With a neat sketch explain a single stage velocity triangle for axial turbine and derive an expression for the work output. (07)

OR

A) For axial flow turbine stage prove following relation: (07)
 $\Psi = \phi(\tan\alpha_2 + \tan\alpha_3)$

B) What is equilibrium diagram? And explain with sketches the method of finding the equilibrium points. (08)