NAME…… ROLLNO……..

2008 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH SUPPLIMENTARY EXAMINATIONS
AEROSPACE PROPULSION-II
(AERONAUTICAL ENGINEERING)

AUG/SEP 2008

TIME-3 HOUR
MARK-80

ANSWER ANY FIVE QUESTIONS.ALL QUESTIONS CARRY EQUAL MARKS

1. In a single-stage impulse turbine the nozzle discharges the fluid on to the blades at an angle of 250 to the plane of rotation and the fluid leaves the blades with an absolute velocity of 300ms-1 at an angle of 1200 to the direction of motion of the blades. If the blades have an equal inlet and outlet angles and there is no axial thrust, estimate the blade angle, power produced per kgs-1 of the fluid.

2. Discuss in detail about the quasi-steady and periodic fluctuating type of stresses acting on a conventional turbine blade, which could lead to crack initiation and eventual failure of the blade.

3. Explain the basic concepts of thrust augmentation through after burning concept, and discuss in detail about the associated pressure losses.

4. (a) Derive a relationship for the overall efficiency of an ideal ramjet engine.

(b) How actual ramjet engine cycle deviates from an ideal ramjet engine cycle?

5. Explain the rocket engine principle. Classify the rockets and write their salient features.

6. Write notes on the following with respect to the solid propellant rocket motor:

(a) Rocket motor case

(b) Igniters.

7. Explain the following with respect to liquid propellants:

(a) Bipropellant

(b) Storable propellants.

(c) Monopropellants.

(d) Thrusters.

8. What are the sub-systems of a typical electrical propulsion system? How will you relate them to solid propellant rocket motor sub systems?