

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018

Subject Code:2160102

Date:20/11/2018

Subject Name:Fundamentals of Jet Propulsion

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|------------|-----|--|-----------|
| Q.1 | (a) | Explain Working principle of gas turbine engine. | 03 |
| | (b) | Write a short note on performance of turbojet engine with the change in compressor pressure ratio. | 04 |
| | (c) | With neat sketches explain effect of back pressure in convergent and divergent duct. | 07 |
| Q.2 | (a) | List out different components of turbojet engine. | 03 |
| | (b) | Explain zones of combustion chamber with neat sketch. | 04 |
| | (c) | Derive thrust equation with sketch. | 07 |
| | | OR | |
| | (c) | Explain can type combustion chamber with neat sketch. | 07 |
| Q.3 | (a) | Difference between turbojet and turbofan engine. | 03 |
| | (b) | Working principle of turboprop engine. | 04 |
| | (c) | Derive Mach Area relation for nozzles. | 07 |
| | | OR | |
| Q.3 | (a) | Discuss Supersonic Inlets. | 03 |
| | (b) | Explain Performance characteristics of turbojet engine. | 04 |
| | (c) | Explain Boundary layer separation for diffuser. | 07 |
| Q.4 | (a) | Discuss scramjet engine. | 03 |
| | (b) | List out requirements of combustion chamber. | 04 |
| | | OR | |
| Q.4 | (a) | Explain the need of thrust augmentation. | 03 |
| | (b) | Explain effect of back pressure on convergent nozzle. | 04 |
| | (c) | Explain pulse jet engine with neat sketch | 07 |
| Q.5 | (a) | Explain need for subsonic inlet. | 03 |
| | (b) | Draw simple Brayton cycle for jet engines. | 04 |
| | (c) | Draw and explain Brayton cycle with Intercooling and Reheating | 07 |
| | | OR | |
| Q.5 | (a) | Draw h-s diagram representing nozzle operation and diffuser operation separately. | 03 |
| | (b) | Write in brief about rocket engines | 04 |
| | (c) | Explain solid propellant rockets with neat sketch. | 07 |
