Reg.No. | | | | | | | | ✓ |

**B.E./ B.TECH. (FULL-TIME) DEGREE END SEMESTER EXAMINATIONS- APRIL/MAY 2011**
**MECHANICAL ENGINEERING BRANCH**
**(COMMON TO MANUFACTURING ENGINEERING AND PRINTING TECHNOLOGY)**
**VI SEMESTER**
**ME 9352 – MICROPROCESOR AND MICROCONTROLLER**
**(REGULATIONS 2008)**

**Time : 3 Hours** **Max. Marks : 100**

**Answer ALL Questions**

**PART- A ( 10 x 2 = 20 Marks)**

1. Write down the status and control pins of IC 8085.
2. What is meant by POP PSW instruction?
3. Shift the content of the accumulator of IC 8085 to the left by two bits without using rotate instructions.
4. Define opcode fetch.
5. Calculate the value of full scale output for an 8 bit digital to analog converter for the 0 to 10V range.
6. What is the BSR mode in 8255 programmable peripheral interface?
7. Compare microprocessor and microcontroller.
8. What do you understand by short jump with respect to IC 8051?
9. Is it possible to interface a stepper motor directly with IC 8085 without using IC 8255? Justify.
10. How do you interface a sensor, which produces an output of 25V DC, with microprocessor?

**PART - B ( 5 X 16 = 80 Marks)**

11. Explain the architecture of IC 8085 with a neat sketch.

12.a) Describe the timing diagram for the "CALL" instruction of IC 8085. Assume the hexcode of the instruction is stored in the memory location 5000 H and the value of stack pointer is 6000 H.

(OR)

b) Write an assembly language program for the IC 8085 to perform the division of 16 bit binary number by an 8 bit binary number.

13.a) Generate a triangular waveform by IC 8085 with necessary interfacing circuits and program.

(OR)

b) Explain the method of interfacing two "7 segment" displays with IC 8085. Also write an assembly language program to display two digit BCD numbers.

14.a) Describe the architecture of IC 8051 with the help of functional block diagram.

(OR)

b) Explain all the rotate and exchange instructions of IC 8051.

15.a) Describe a microprocessor based temperature control system with suitable interfacing circuits and program.

(OR)

b) Explain the stepper motor interface and traffic light interface with IC 8085.

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2011

MECHANICAL ENGINEERING BRANCH

SIXTH SEMESTER

(REGULATIONS 2008)

**ME 9026 - GAS DYNAMICS & JET PROPULSION**

Time: 3 Hours. Max Marks:100.

Instructions: Use of Gas Tables is spermitted.

Answer ALL Questions

PART - A (10x2=20 Marks)

1. State the basic laws applicable to compressible fluid flow.
2. Explain thermodynamically with a sketch,difference between sound and shock wave
3. Distinguish between Rayleigh and Fanno Flows.
4. Explain Chocking phenomena in a Duct Flow.
5. Define Normal and Oblique shocks.
6. What are the importance of Prandtl –Meyer and Rankine- Hugniot relations?
7. State the difference between Ram Jet and Turbo Jet engine.
8. Define Propulsive Efficiency as applied to jet propulsion.
9. Differentiate between an Air breathing Engine and a Rocket Engine.
10. What is staging as applied to Rocket Engines?

PART- B (5x16=80 Marks)

11. Draw and explain in detail the operating characteristics of a Converging Diverging (CD) Nozzle with decreasing back pressure.

12. a ) Air enters a 15 cm dia horizontal pipe at 1400 KPa and 15 C with a velocity of 55 m/sec. The friction factor is 0.0016. Assume Isothermal flow. What is the Mach Number and the distance from entrance to the section where the pressure is 520 KPa?

(OR)

b). Air flows through a duct 30 cm in dia, with a duct roughness such that the average friction factor is 0.021.At a certain point, the flow velocity is 150 m/sec and the air temperature is 280$^{O}$ C . Find (a) Mach Number at 30 meter downstream (b) The entropy increase between the two points 30 meters apart.

13. a ). A uniform supersonic stream with Mach. Number 3, pressure 1 atm, and Temperature 288 K encounters a compression corner which deflects the stream by an angle of 20 degrees. Calculate the shock wave angle, pressure, temperature, Mach Number, Total temperature and Total pressure behind the shock wave.

(PTO)

(OR)

b). An Airplane having a diffuser designed for subsonic flight has a Normal Shock attached to the edge of the diffuser when the plane is flying at a certain Mach Number. If at the exit of the diffuser, the Mach. Number is 0.3, what must be the flight Mach. Number , assuming Isentropic diffusion behind the Shock. The area at inlet is 0.29 sq. meters and that at the exit is 0.44 sq. meters.

14. a). What are the Design requirements of a Turbo Jet Engine Combustion Chamber and explain with a sketch the working of Turbo annular Combustion Chamber.

(OR)

b). The diameter of the propeller of an aircraft is 2.5 m and it fljes at a speed of 500 km/hr at an altitude of 8000 m (density of air 0.525 $kg/m^3$ ) with a flight to jet sped ratio of 0.75. Determine (a) the air low rate through the propeller, (b) Thrust produced, (c) specific impulse and (d) Thrust power.

15. a) (i) Draw and explain the working of a solid propellant rocket .
(ii) State the advantages and disadvantages of solid and liquid propellants.

(OR)

b). A rocket engine has the following performance details: Velocity of jet 1400 m/sec., flight to jet speed ratio 0.8, oxidiser flow rate 4 kg/sec, fuel flow rate 1 kg/sec., Heat of reaction per kg of exhaust gas 2500 kJ /kg . Calculate the Thrust, Specific Impulse, Propulsive Efficiency, thermal and overall efficiency of the rocket engine.

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