



M.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

First Semester

DEFENCE TECHNOLOGY

P18DTT1001: Systems and Warfare Platforms

COURSE OUTCOMES

CO1: Understand types of warfare platform used for Army, Air and Marine and their design fundamentals.

CO2: Understand the weapon systems like guns, ordnance, missiles projectiles, mines/ countermines, lasers, undersea weapons, air-launched weapons, anti-aircraft, anti-ship and anti-submarine.

Time: Three Hours

Maximum Marks: 100

**Answer ALL Questions:-
PART C (5 x 20 = 100 Marks)**

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|----|----|--|----|-----|-------------------|
| 1. | a) | Define weapon system. | 4 | CO1 | [K ₃] |
| | b) | Briefly explain how Technology, Threat perception, Enemy capabilities, Budgetary constraints and shifting political priorities affect weapon /or design and selection. | 6 | CO1 | [K ₃] |
| | c) | Name the most commonly used Assault Rifle by the Indian Army. Draw a neat diagram and name the parts and explain intricacies involved in design and manufacture of a good assault rifle. | 10 | CO1 | [K ₃] |
| 2. | a) | Name the latest indigenous gun made in India, name the company who made it and its technology partner and briefly mention its specifications and uses. | 4 | CO1 | [K ₃] |
| | b) | Find the recoil velocity of a gun having mass equal to 5 kg, if a bullet of 25gm acquires the velocity of 500 m/s after firing from the gun. | 6 | CO1 | [K ₃] |
| | c) | What do you understand by the term CBG? What is its purpose? Draw a diagram and explain the function of each element of CBG. | 10 | CO1 | [K ₃] |
| 3. | a) | What are the three principal types of machinery (propulsion) installations found on ships? | 4 | CO2 | [K ₃] |
| | b) | What are the general characteristics of frigate? Define the terms Survivability, Susceptibility, Vulnerability and Recoverability for ships. | 6 | CO2 | [K ₃] |

- c) A ship of 10000t displacement has a GM of 0.4m. Calculate the moment of statical stability when ship is heeled by 5 degree? 10 CO2 [K4]
4. a) Indicate with a line diagram the three axes around which a fixed wing aircraft moves and name the movements. 4 CO2 [K3]
- b) What is Thrust Augmentation? With line diagram, show what particular arrangement is provided in a fighter aircraft for increasing the thrust 6 CO2 [K3]
- c) An airplane has a drag coefficient of 0.06 and a wing area of 20 m². If the velocity is 100 m/s and the air density is 1.2 kg/m³, calculate the drag force acting on the airplane. 10 CO2 [K4]
5. a) What are Symmetrical and Non-Symmetrical aerofoils? 4 CO2 [K3]
- b) With a simple diagram show and explain what is Coning of the helicopter blades? What is its significance for helicopters? 6 CO2 [K3]
- c) What do you understand by term Armour? Define different types of armours? What is the purpose to incorporating armour on armoured personnel carriers and Helicopters? 10 CO2 [K3]
