

PRIFYSGOL CYMRU

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UNIVERSITY OF WALES

Trinity Saint David

Examination Answer Book

24 Pages

Instructions to candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right and seal to hide your name.
3. The answers must be **legibly** written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

1	Student Number	P144281
2	Title of Examination Paper	Mentions
3	Module Code	M6X00944
4	Date and Time of Examination	29 th June 17
5	Examination Venue	UWTSD
6	Seat Number	

7	Number of Answer Books handed in	
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Complete
section,
remove
strip, fold as
indicated
and SEAL

Please complete this section and SEAL before the examination starts.

(Block Capitals) Forename(s)

Surname

PATENT PENDING
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PATENT PENDING

1a) Passive Homing

- Fire and Forget
- The missile seeks a source that the target emits.
eg heat/RADAR
- heatseeking missile is the best example

Semi-Active

- The missile seeks a target that has been 'painted' by either a grant on the ground or by the aircraft.
- Laser guided bombs where the soldiers use a laser designator to show what they want blowing up.

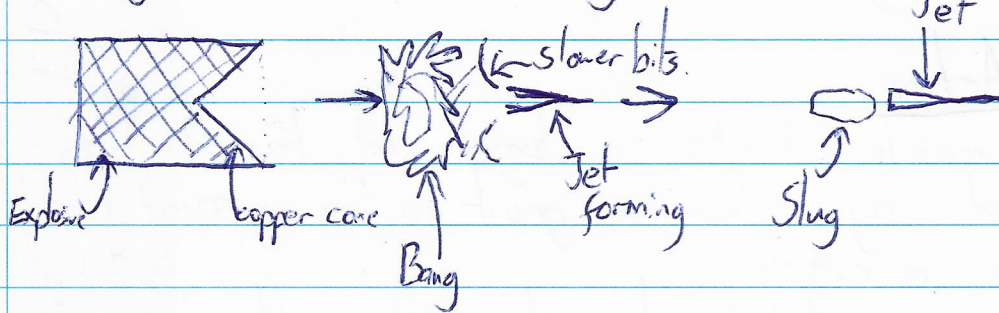
Active

- The missile paints its own target and follows that to impact.

b) Passive homing missiles may be useful to fire into an area where you know enemy RADARS operate for example. Fire them in the RADAR seeking missile into the area of interest, without exposing yourself. And the missile does the rest.

c) Sat nav?

- 2a) The deformation causes the Cone to liquify and forces it outwards towards the target. The pointy bit of the cone becomes the jet and as the rest of the cone falls in behind the jet, it is cooling and clumping together into the slug.



- b) The standoff distance effects shape charge penetration. Too close and the AP jet shan't form. Too far and all of its energy shall be spent by the time it gets to it.

c)

3a) - Delayed fuzes. Found in illuminating rounds, so that the round goes off after a certain time in flight to deploy the parachute etc.

- Proximity fuzes. Used in Airbursting rounds, so that the round goes off a set distance above ground level, to spread frag over as wide an area as possible

- Impact fuzes. Used in other rounds, so that round goes off on impact with a surface. For targetting buildings/bunkers, making craters for cover or lobbing shells into trenches.

b) A HE illuminating mortar round will have a white body colour (indicating illumination) and a golden yellow band (indicating HE). Text on the round will also tell you what the round does, text shall be in golden yellow to indicate HE.

Mortar rounds Achieve dynamic stability by using fins to move the centre of pressure to a position behind the centre of gravity.

(a) Primary Blast effects

- The physical blast wave causing harm.
- Particularly harmful to gas filled organs, lungs, gut etc.
- liquifying your innards essentially.

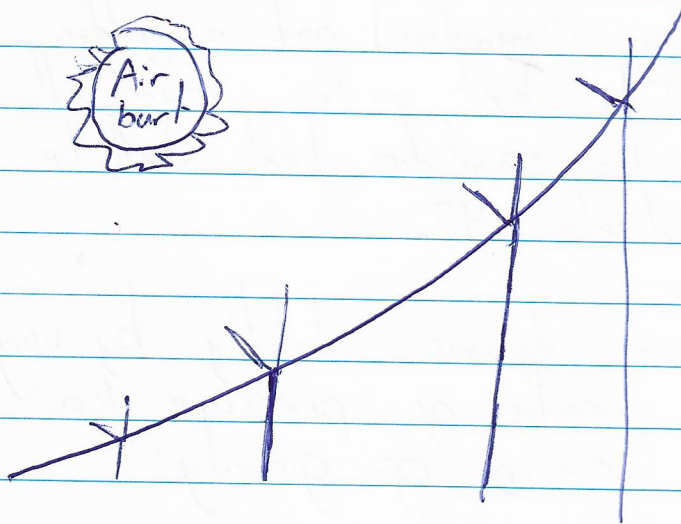
Secondary Blast effects

- Things from the blast hurting you
- Fragments from bomb casing
- Fragments from the environment
- flames

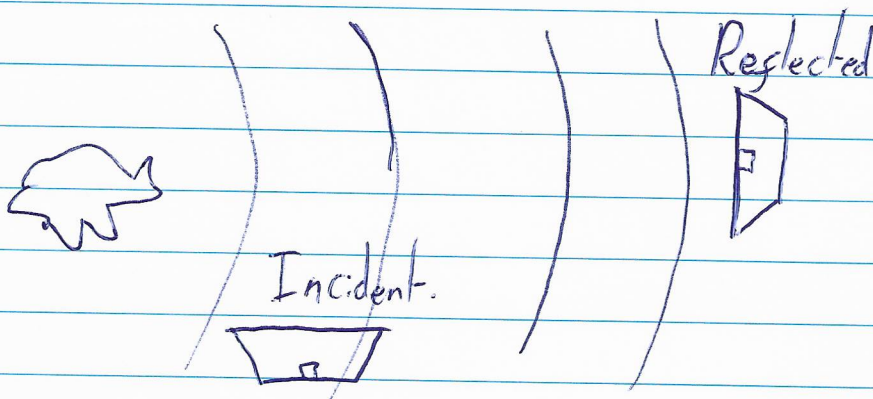
Tertiary Blast effects

- Being ragdolled and thrown into stuff as a result of the blast.

b)



c)



$$m=6$$

$$c=4.5$$

5ai)

$$V_0 D \text{ of RDX} = 8440 \text{ m/s}$$

$$\sqrt{Z_E} = \frac{V_0 D}{2.97}$$

$$\therefore \sqrt{Z_E} = 2841.75 \quad (2 \text{ d.p.})$$

$$V = \sqrt{Z_E} \left(\frac{m}{c} + \frac{1}{2} \right)^{-\frac{1}{2}}$$

$$V = 2841.75 \times \left(\frac{6}{4.5} + \frac{1}{2} \right)^{-\frac{1}{2}}$$

$$V = 2098.77 \text{ m/s} \quad (2 \text{ d.p.})$$

1.5

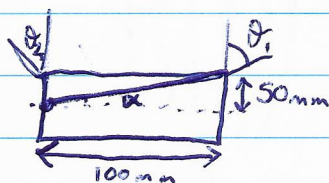
ii) ~~Find~~ $V_0 D \text{ HMX} = 9110 \text{ m/s} \quad \therefore \sqrt{Z_E} = 3067.34 \quad (2 \text{ d.p.})$

$$V = 3067.34 \times \left(\frac{6}{4.5} + \frac{1}{2} \right)^{-\frac{1}{2}}$$

$$V = 2265.38 \text{ m/s} \quad (2 \text{ d.p.}) \quad \theta = \sin^{-1} \left(\frac{V_0 \cos \alpha}{2D} \right)$$

1.5

b)



$$S_H^0 \quad C_H^A \quad T_A^0$$

$$\tan \alpha = \frac{50}{100}$$

$$\alpha = 26.57^\circ \quad (2 \text{ d.p.})$$

✓ 2.5

$$V_0 = 2098.77 \quad V = V_0$$

$$\theta = \sin^{-1} \left(\frac{2098.77 \times \cos(26.57)}{0.2} \right)$$

c)

$$V_d = \sqrt{420^2 + (2098.77)^2} \quad V_d = 2139.63 \text{ m/s.}$$

1.5

5b) Continued from before.

$$\theta_1 = \sin^{-1} \left(\frac{2098.77 \times \cos(26.57)}{2 \times 8840} \right)$$

$$\theta_1 = 6.09^\circ$$

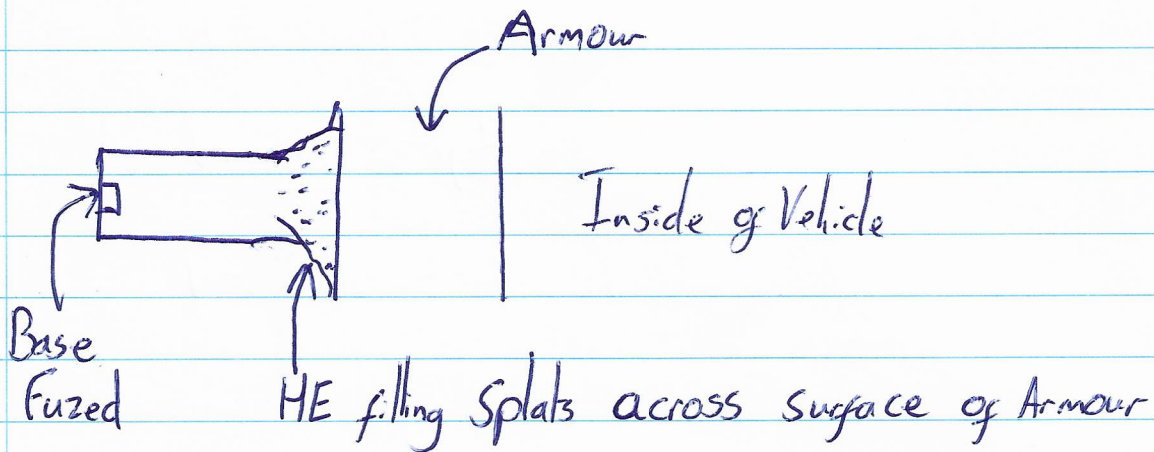
$$\theta_2 = \sin^{-1} \left(\frac{2098.77 \times \cos(\overset{90}{\cancel{26.57}})}{2 \times 8840} \right)$$

$$\theta_2 = 0$$

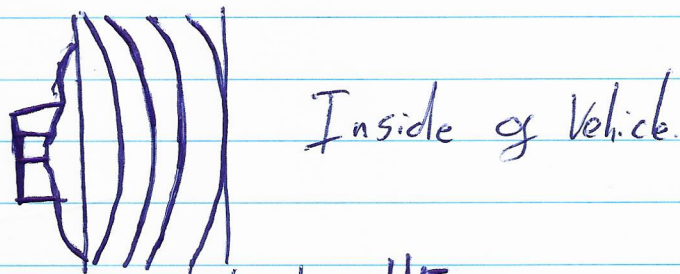
6a) The Nose-pad in HESH ammunition is to hold all the PE in during flight, but to break open when the HESH round strikes the target

(1)

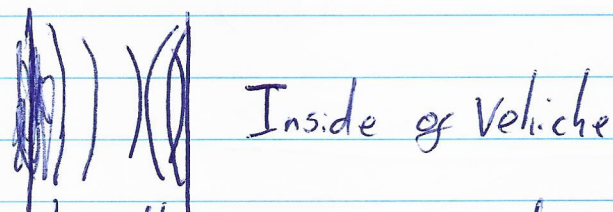
b)



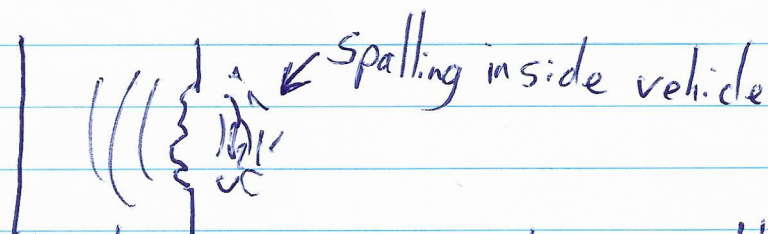
(8)



Fuze detonates HE causing Compression waves to travel through the armour.



when the waves meet the armour/Air change they're reflected and become tension waves.



Because materials are weaker in tension, this causes Scabbing inside the vehicle.

Handwritten notes on lined paper, mostly illegible due to bleed-through from the reverse side. The text appears to be organized into sections or paragraphs, with some lines clearly visible such as "The first part of the paper", "The second part of the paper", and "The third part of the paper".

