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Q54

Consider the following actions: 1. Detection of car crash/collision which results in the deployment of airbags almost instantaneously 2. Detection of accidental free fall of a laptop towards the ground which results in the immediate turning off of the hard drive 3. Detection of the tilt of the smartphone which results in the rotation of display between portrait and landscape mode In how many of the above actions is the function of accelerometer required? (a) Only one (b) Only two (c) All three (d) None Official key: C.

UPSC Civil Services Prelims 2023 · General Studies · 2 marks · Art and Culture

Indian art, architecture, culture - Prelims GS Paper I.

Explanation

(a)

Only one. All three detections use an accelerometer.

(b)

Only two. Airbags, HDD free-fall and screen rotation all need acceleration / tilt sensing.

(c) Official key

All three. Crash pulse, free-fall, and portrait-landscape tilt.

(d)

None. MEMS accelerometers do exactly this.

Summary

• **Official key is (c) all three. An accelerometer senses proper acceleration:** airbag crash detection, laptop free-fall (park the head), and phone tilt for display rotation. None of the three is outside that sensor.

Related possible facts

These can be asked in a future Prelims paper.

MEMS accelerometer

Micro-electro-mechanical sensor in phones and vehicles.

Gyroscope

Measures rotation; often fused with the accelerometer in IMUs.

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