

10.1 Describing Fields

Question Paper

Course	DPIB Physics
Section	10. Fields (HL only)
Topic	10.1 Describing Fields
Difficulty	Easy

Time allowed: 20
Score: /10
Percentage: /100

Question 1

Which of the following terms best describes the shape of an electric field created by a point charge?

- A. Radial
- B. Uniform
- C. Inverse
- D. Vector

[1 mark]

Question 2

The gravitational field strength at a point P in a gravitational field is defined as:

The force...

- A. per unit mass on a mass placed at P
- B. on a mass placed at P
- C. per unit mass on a small point mass placed at P
- D. on a small point mass placed at P

[1 mark]

Question 3

An equipotential is perpendicular to a field line:

- A. for both electric and gravitational fields
- B. for electric fields only
- C. for gravitational fields only
- D. for neither electric or gravitational fields

[1 mark]

Question 4

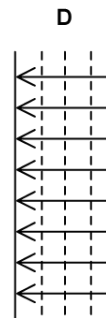
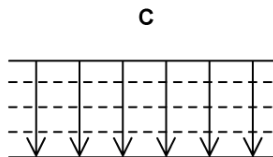
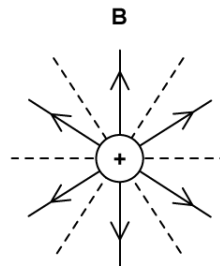
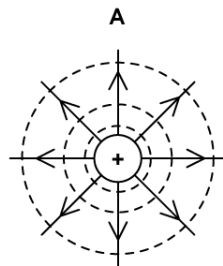
Which of the following correctly describes the value of the gravitational potential at a point infinitely far away from every massive body in the universe?

- A. ∞
- B. $-\infty$
- C. 0
- D. π

[1 mark]

Question 5

Which of the diagrams is not an accurate representation of equipotential lines?



[1 mark]

Question 6

Which of the following statements regarding gravitational potential is incorrect?

- A. It is analogous to the electric potential at a point in an electric field
- B. It is a vector quantity
- C. It is defined as negative because work must be done on a mass to move it to infinity
- D. It is inversely proportional to the distance between masses

[1 mark]

Question 7

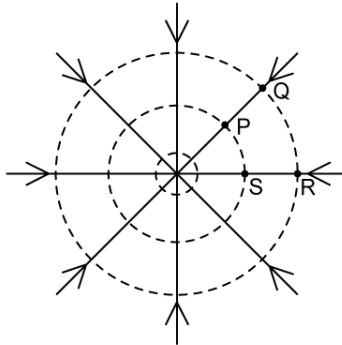
Which of the following statements is not true about equipotential surfaces in a uniform electrostatic field?

- A. The equipotential lines are straight
- B. The equipotential lines are evenly spaced
- C. The equipotential lines become progressively further apart
- D. The equipotential lines are perpendicular to the field lines

[1 mark]

Question 8

The diagram below shows the field lines and equipotential lines around an isolated negative point charge.



Which one of the following statements, when a small charge is moved in the field, is incorrect?

- A. When the small charge is moved from Q to P or R to S the work done is the same in each case
- B. The small charge has a larger potential energy at Q than at S
- C. When the small charge is moved from Q to R it is twice the work done in moving it from P to S
- D. The small charge has a larger electric potential energy at R than at S

[1 mark]

Question 9

Which of the following is incorrect regarding the similarities between gravitational and electrostatic fields?

- A. The field lines around a point mass and negative point charge are identical
- B. The work done in each field is either the product of the mass and change in potential or charge and change in potential
- C. The gravitational potential and electric potential both have a $\frac{1}{r}$ relationship
- D. The gravitational and electrostatic forces are always attractive

[1 mark]

Question 10

What are the standard units of gravitational potential?

- A. J
- B. V
- C. N kg^{-1}
- D. J kg^{-1}

[1 mark]