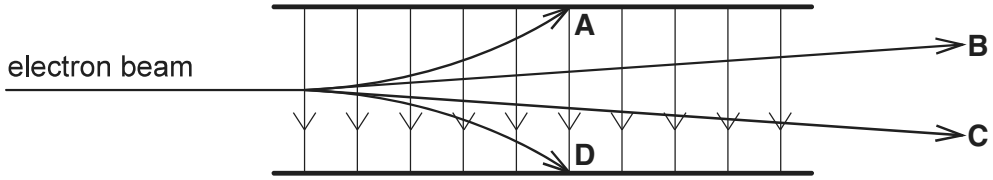
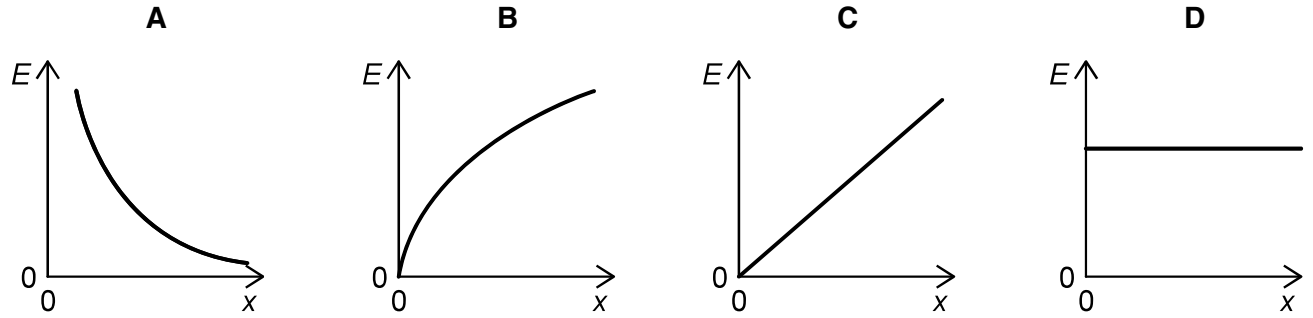
1 Which path shows a possible movement of an electron in the electric field shown? 9702/1/M/J/02/Q36

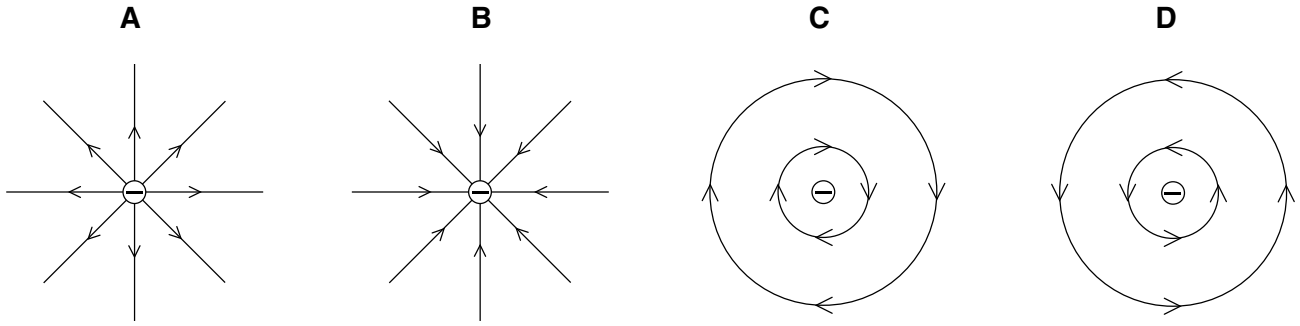


2 Two parallel conducting plates are connected to a battery, one plate to the positive terminal and the other plate to the negative. The plate separation is gradually increased, the plates remaining connected to the battery. 9702/1/M/J/02/Q37

Which graph shows how the electric field E between the plates depends on the plate separation x?

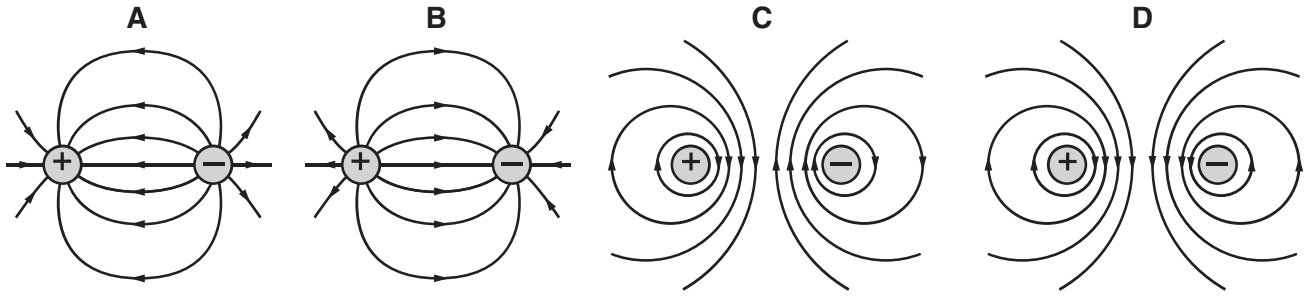


3 Which diagram shows the electric field pattern of an isolated negative point charge? 9702/1/O/N/02/Q37

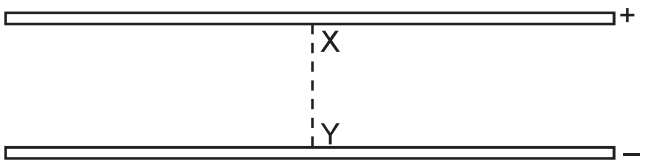


4 A positive charge and a negative charge of equal magnitude are placed a short distance apart. 9702/01/M/J/03/Q37

Which diagram best represents the associated electric field?

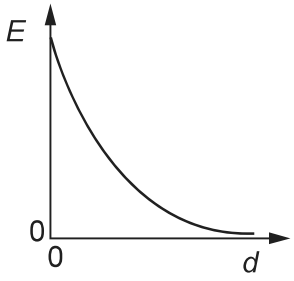


5 An electric field exists in the space between two charged metal plates. 9702/01/M/J/03/Q35

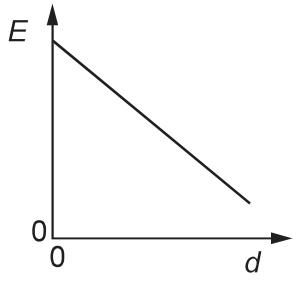


Which of the following graphs shows the variation of electric field strength *E* with distance *d* from X along the line XY?

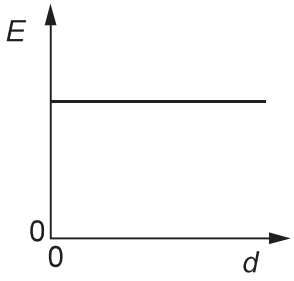
A



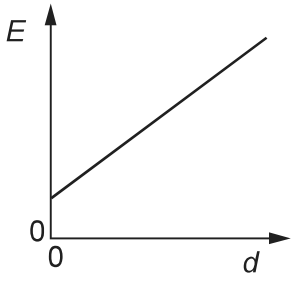
B



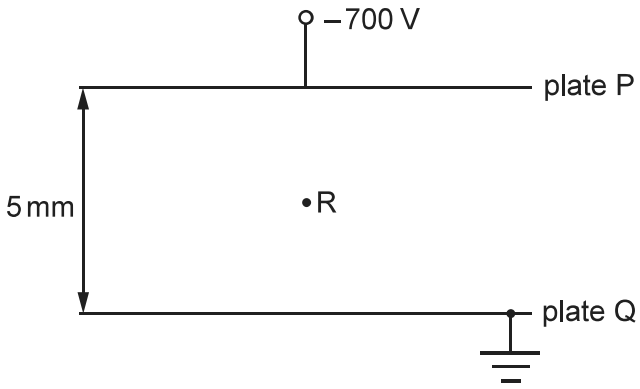
C



D



6 The diagram shows two metal plates P and Q between which there is a potential difference of 700 V. Plate Q is earthed. 9702/01/M/J/03/Q36



What is the magnitude and direction of the electric field at point R?

A $1.4 \times 10^2\ \text{N C}^{-1}$ from P towards Q

B $1.4 \times 10^2\ \text{N C}^{-1}$ from Q towards P

C $1.4 \times 10^5\ \text{N C}^{-1}$ from P towards Q

D $1.4 \times 10^5\ \text{N C}^{-1}$ from Q towards P

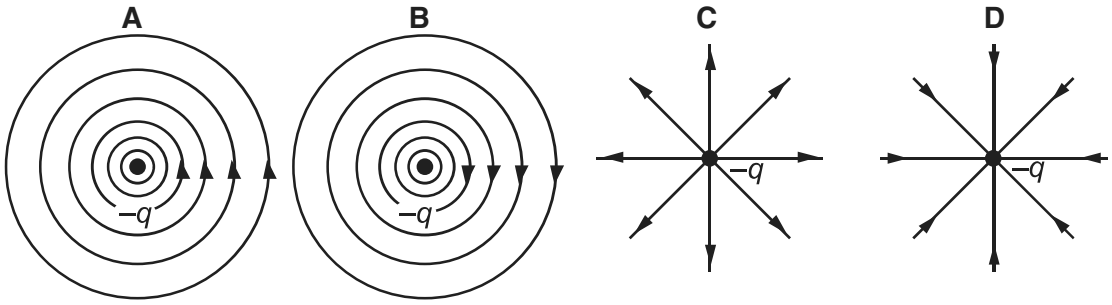
7 **e e ectric ie strengt et een a air o ara e ates is e se aration o t e ates is ou e an t e otentia i erence et een t e ates is increase a actor o our**

97 2 1 7/Q30

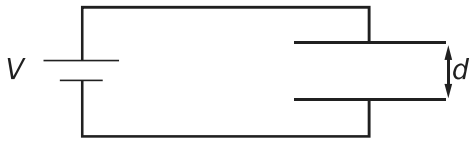
at is t e ne e ectric ie strengt

A B 2 C 4 D 8

8 Which diagram represents the electric field of a negative point charge $-q$? 9702/01/O/N/03/Q35



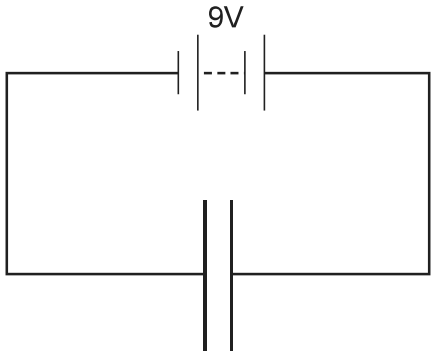
9 A potential difference V is applied between two parallel plates a small distance d apart, and produces an electric field of strength E between the plates. 9702/01/O/N/03/Q36



What is the electric field strength between the plates when both V and d are doubled?

A $E/4$ **B** E **C** $2E$ **D** $4E$

10 In the circuit below, the distance between the two parallel plates is 2.0 10^{-3} m. An electron is situated between the plates. 9702/01/O/N/03/3Q7



What is the force on the electron?

A 3.2 10^{-22} N

B 2.9 10^{-21} N

C 8.9 10^{-18} N

D 7.2 10^{-16} N

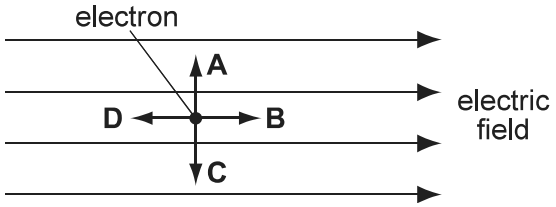
11 **at is an e ui a ent unit to 1 o t**

97 2 1 4/Q32

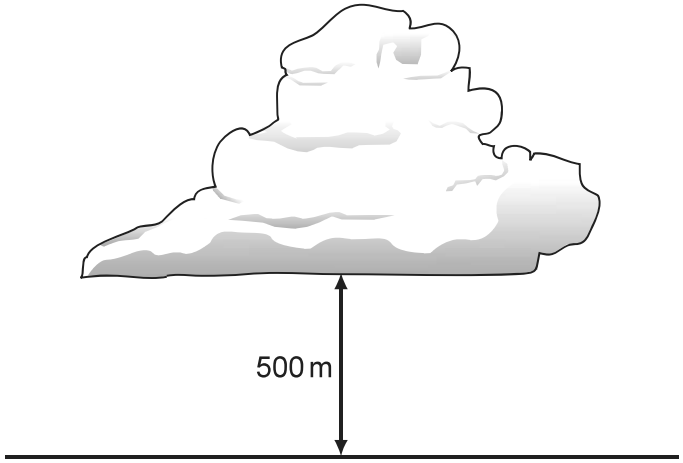
A 1 A ^{1} **B 1 C** ^{1} **C 1 C** ^{1} **D 1 s** ^{1}

12 e iagram s o s an e ectron in a uni orm e ectric ie 97 2 1 4/Q29

n ic irection i t e ie acce erate t e e ectron



13 e iagram s o s a t un erc ou ose ase is 5 m a o e t e groun 97 2 1 4/Q30



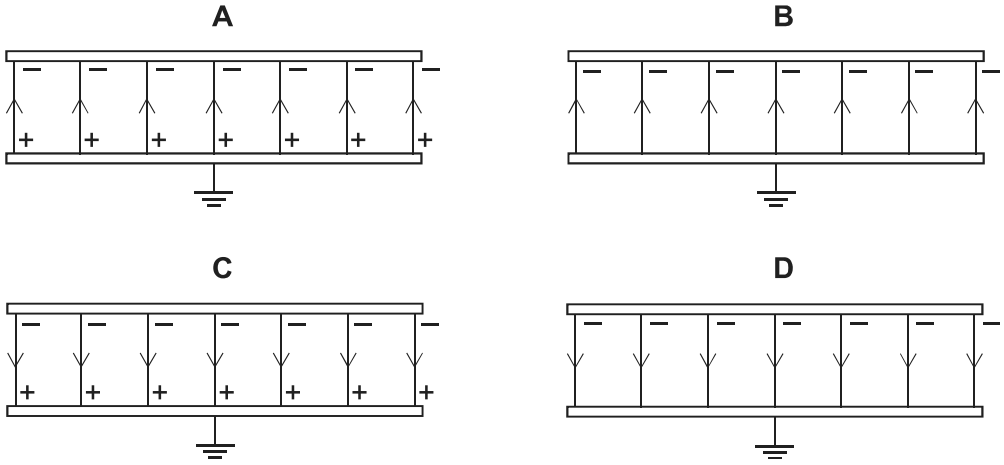
e otentia i erence et een t e ase o t e c ou an t e groun is 2 A rain ro it a c arge o 4 1 ^{12}C is in t e region et een t e c ou an t e groun

at is t e e ectrica orce on t e rain ro

A 1 6 1 ^{6} B 8 1 ^{4} C 1 6 1 ^{3} D 4

14 o ara e con ucting ates it air et een t em are ace c ose to one anot er e to ate is gi en a negati e c arge an t e ottom one is eart e 97 2 1 4/Q29

ic iagram est re resents t e istri ution o c arges an t e ie in t is situation



15 n a uni orm e ectric ie ic statement is correct 97 2 1 4/Q30

A A c arge artic es e erience t e same orce

B A c arge artic es mo e it t e same e ocit

C A e ectric ie ines are irecte to ar s ositi e c arges

D A e ectric ie ines are ara e

16 ic o t e o o ing escri es t e e ectric otentia i erence et een t o oints in a ire t at carries a current 97 2 1 4/Q31

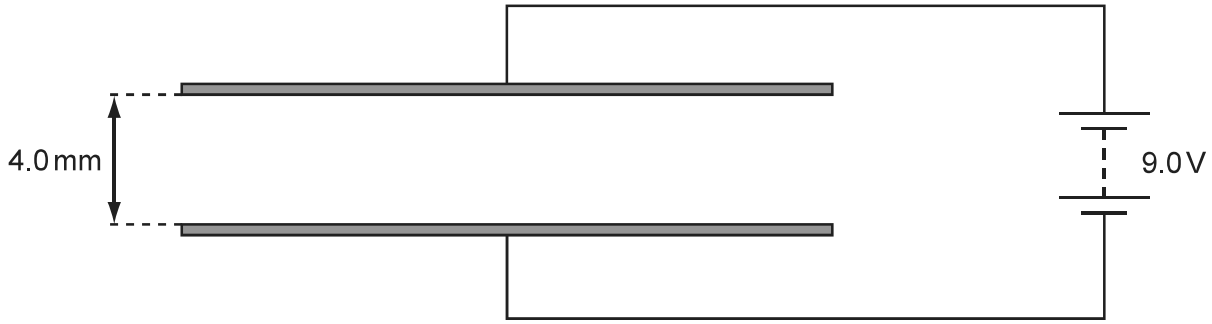
A t e orce re uire to mo e a unit ositi e c arge et een t e oints

B t e ratio o t e energ issi ate et een t e oints to t e current

C t e ratio o t e o er issi ate et een t e oints to t e current

D t e ratio o t e o er issi ate et een t e oints to t e c arge mo e

17 e iagram s o s a air o meta ates 4 mm a art connecte to a 9 atter 97 2 1 5/Q30



at is t e e ectric ie et een t e ates

A 4 4 1 ^{4} C ^{1}

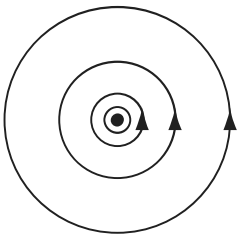
B 3 6 1 ^{2} C ^{1}

C 36 C ^{1}

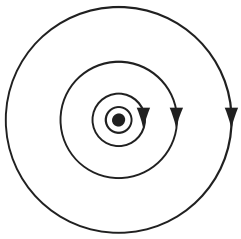
D 2 3 1 ^{3} C ^{1}

18 ic iagram re resents t e e ectric ie o a negati e oint c arge s o n 97 2 1 7/Q28

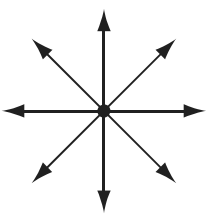
A



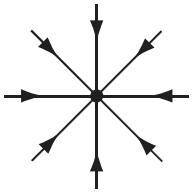
B



C

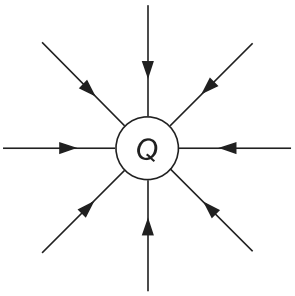


D

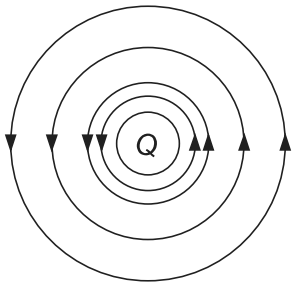


19 **ic iagram re resents t e e ectric ie in t e icinit o a ositi e e ectric c arge o magnitu e** 97 2 1 5/Q31

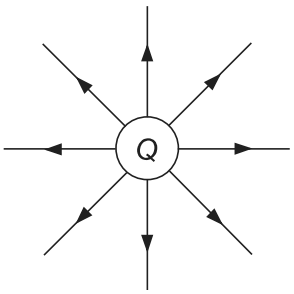
A



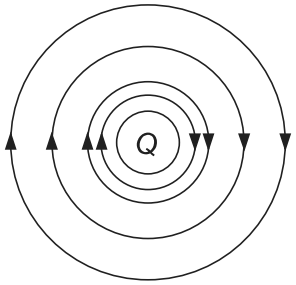
B



C



D

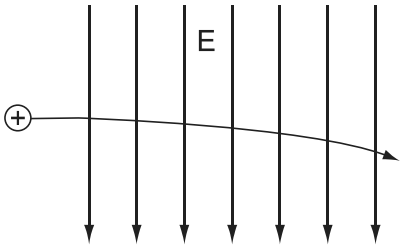


20 **A ositi e c arge artic e is ro ecte into a region o uni orm e ectric ie** 97 2 1 5/Q30

ic iagram re resents t e motion o t e artic e in t e e ectric ie

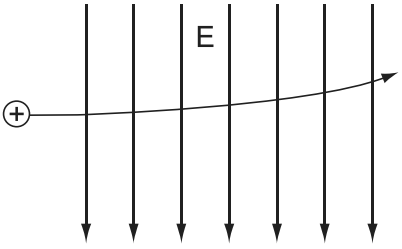
A

electric field in plane of the paper



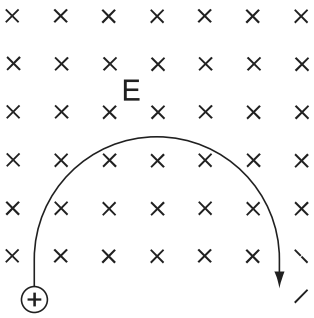
B

electric field in plane of the paper



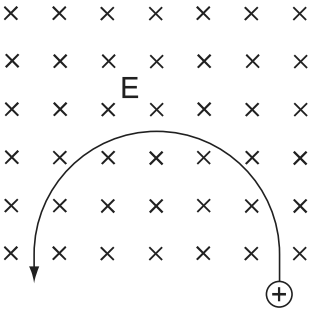
C

electric field into paper

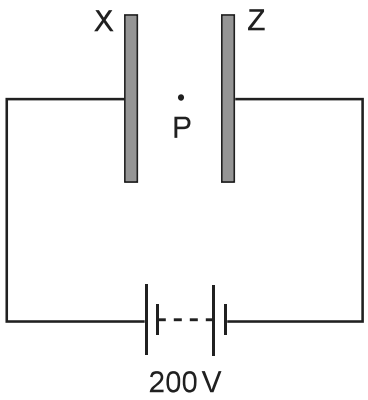


D

electric field into paper



21 o arge ara e ates an are ace 5 mm a art an connecte as s o n to t e termina s o a 2 o t c su 97 2 1 5/Q31



A sma oi ro at carries one e cess e ectron

at is t e magnitu e o t e e ectrostatic orce acting on t e oi ro ue to t e e ectric ie et een t e ates

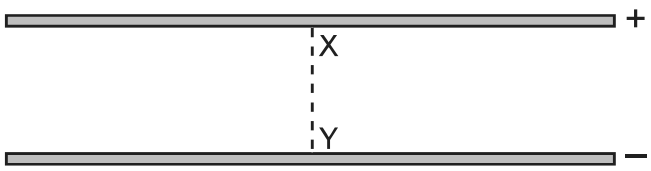
A 6 4 1 ^{15}

B 6 4 1 ^{18}

C 1 6 1 ^{19}

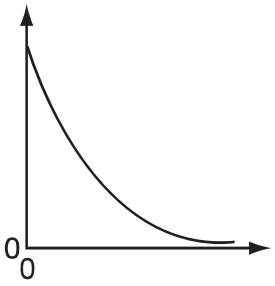
D 4 1 ^{24}

22 An e ectric ie e ists in t e s ace et een t o c arge meta ates 97 2 1 6/Q30

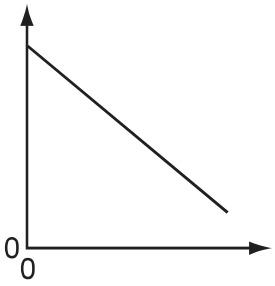


ic gra s o s t e ariation o e ectric ie strengt it istance rom a ong t e ine

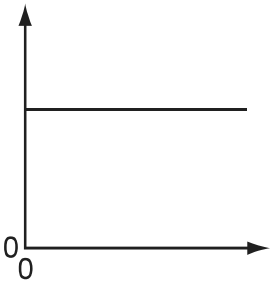
A



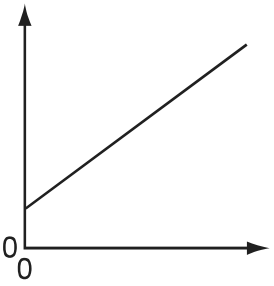
B



C



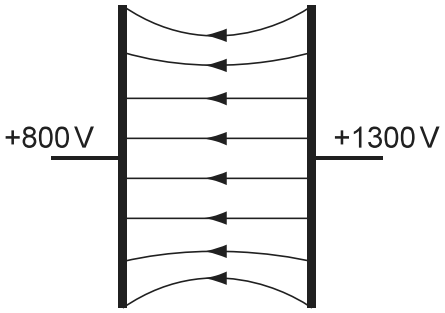
D



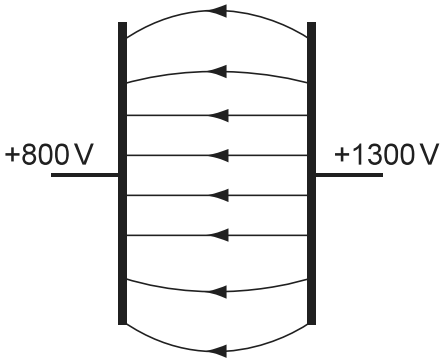
23 o ara e meta ates are at otentia s o 8 an 13 97 2 1 6/Q29

ic iagram est s o s t e e ectric ie et een t e meta ates

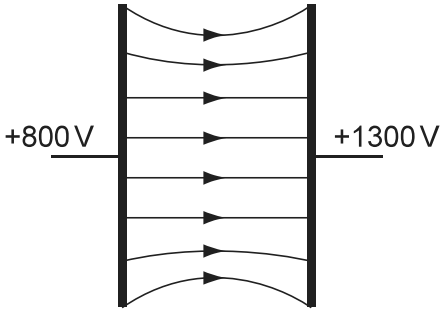
A



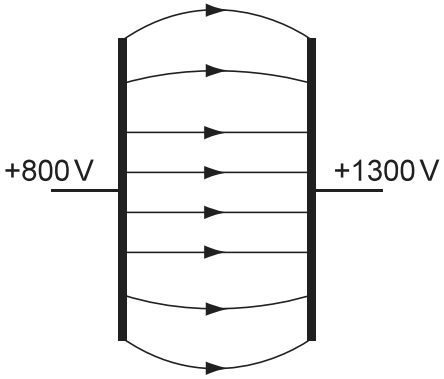
B



C

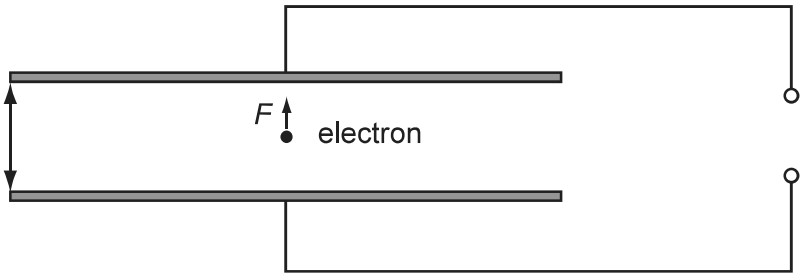


D



24 An e ectron o c arge e is intro uce et een t o meta ates a istance a art 97 2 1 6/Q30

A otentia i erence is a ie to t e ates as s o n in t e iagram



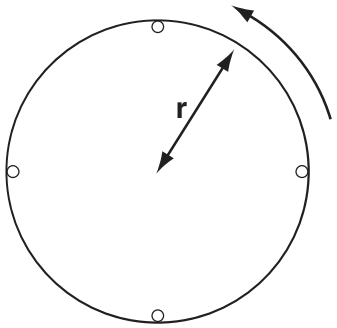
ic e ression gi es t e e ectric orce on t e e ectron

A $\frac{e}{\quad}$ B e C $\frac{\quad}{e}$ D $\frac{\quad}{e}$

25 our oint c arges eac o c arge are ace on t e e ge o an insu ating isc o ra ius r

e re uenc o rotation o t e isc is

97 2 1 6/Q31

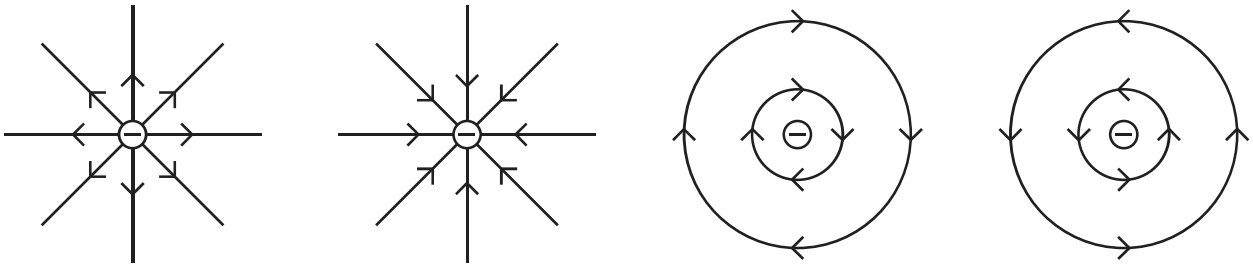


at is t e e ui a ent e ectric current at t e e ge o t e isc

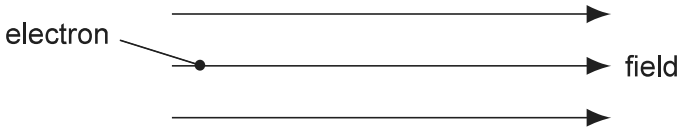
A 4 B $\frac{4}{\quad}$ C 8πr D $\frac{2}{\pi r}$

26 ic iagram s o s t e e ectric ie attern o an iso ate negati e oint c arge 97 2 1 6/Q29

A B C D



27 An e ectron is situate in a uni orm e ectric ie as s o n in t e iagram 97 2 1 7/Q26



at is t e irection o t e e ectric orce acting on t e e ectron

A o n ar s into t e a er

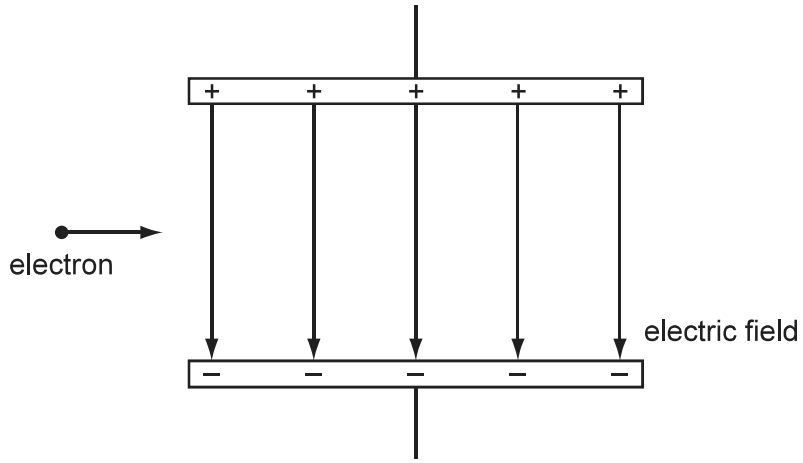
B u ar s out o t e a er

C to t e e t

D to t e rig t

28 An e ectron tra e ing ori onta at constant s ee in a acuum enters a ertica e ectric ie et een t o c arge ara e ates as s o n

97 2 1 7/Q29



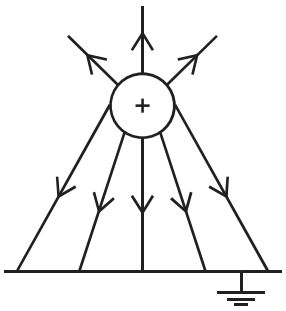
at are t e ori onta an ertica com onents o t e motion o t is e ectron en it is in t e ie

	ori onta com onent o motion	ertica com onent o motion
A	constant s ee	acce eration u ar s
B	constant s ee	acce eration o n ar s
C	acce eration to t e rig t	acce eration o n ar s
D	acce eration to t e rig t	acce eration u ar s

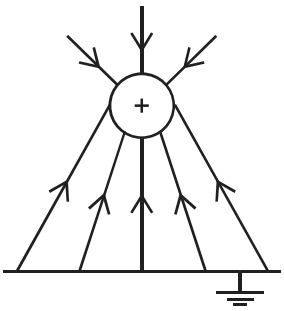
29 ic iagram s o s t e e ectric ie et een a ositi e c arge meta s ere an an eart e meta ate

97 2 1 7/Q27

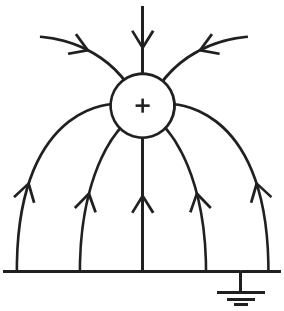
A



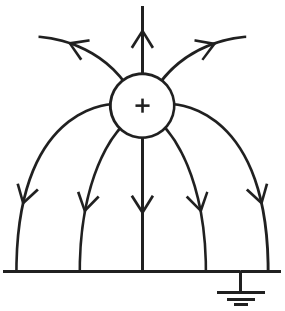
B



C

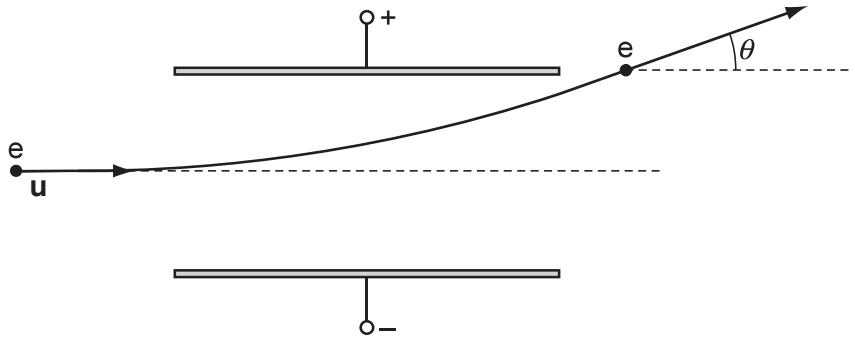


D



30 An e ectron enters t e s ace et een t o ara e c arge ates it an initia e ocit u

97 2 1 8/Q30



i e in t e e ectric ie its irection c anges θ an it emerges it a e ocit

at is t e re ation et een an u

A $\frac{u}{\cos\theta}$ B $u\cos\theta$ C $\frac{u}{\sin\theta}$ D $u\sin\theta$

31 ic e ectrica uantit ou e t e resu t o a ca cu ation in ic energ trans er is i i e c arge

97 2 1 7/Q28

A current

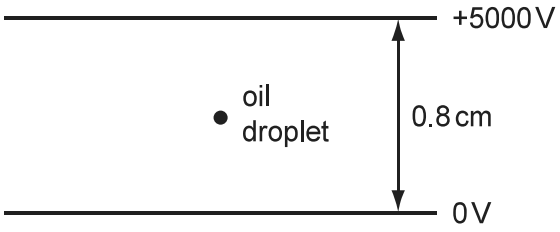
B otentia i erence

C o er

D resistance

32 e iagram s o s an oi ro et t at as ecome c arge gaining i e e ectrons e ro et remains stationar et een c arge ates

97 2 1 8/Q31



at is t e magnitu e an irection o t e e ectrostatic orce on t e oi ro et

A 5 1 ^{15} u ar s

B 5 1 ^{15} o n ar s

C 5 1 ^{13} u ar s

D 5 1 ^{13} o n ar s

33 A artic e as a c arge o 4 8 1 ^{19}C e artic e remains at rest et een a air o ori onta ara e ates a ing a se aration o 15 mm e otentia i erence et een t e ates is 66 97 2 1 8/Q30

at is t e eig t o t e artic e

A 2 1 1 ^{14}

B 2 1 1 ^{15}

C 2 1 1 ^{17}

D 1 1 1 ^{23}

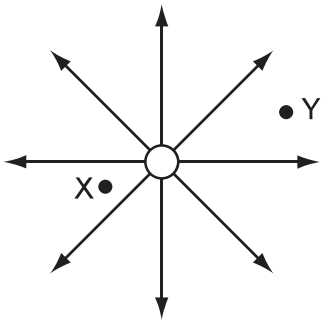
34 A sma c arge is ace in t e e ectric ie o a arge c arge 97 2 11 9/Q27

Bot c arges e erience a orce

at is t e e ectric ie strengt o t e c arge at t e osition o t e c arge

A — B — C D —

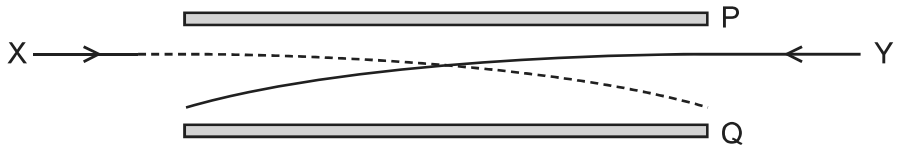
35 e iagram s o s t e e ectric ie near a oint c arge an t o e ectrons an 97 2 1 8/Q29



ic ro escri es t e orces acting on an

	irection o orce	magnitu e o orce on
A	ra ia in ar s	ess t an orce on
B	ra ia in ar s	greater t an orce on
C	ra ia out ar s	ess t an orce on
D	ra ia out ar s	greater t an orce on

36 e iagram s o s t e at s o t o c arge artic es an uring t eir assage et een a air o o osite c arge meta ates an 97 2 1 9/Q27



e ates are c arge suc t at t e e ectric ie et een t em is irecte rom to

ic c arges on an i ro uce t e o ser e at s

A		
B		
C		
D		

37 ere is a otentia i erence et een a air o ara e ates 97 2 1 9/Q28

ic a ues o otentia i erence an se aration o t e ates i ro uce an e ectric ie strengt o t e greatest a ue

	otentia i erence	se aration
A	2	2
B	2	$\overline{2}$
C	$\overline{2}$	2
D	$\overline{2}$	$\overline{2}$

38 e e ectric ie at a certain istance rom an iso ate a a artic e is 3 1 ^{7} C ^{1} 97 2 11 9/Q29

at is t e orce on an e ectron en at t at istance rom t e a a artic e

A 4 8 1 ^{12}

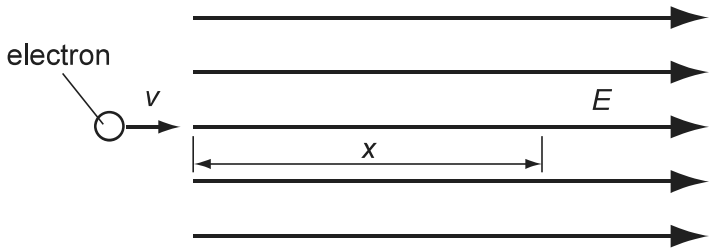
B 9 6 1 ^{12}

C 3 1 ^{7}

D 6 1 ^{7}

39 e iagram s o s an e ectron it c arge e mass m an e ocit entering a uni orm e ectric ie o strengt

97 2 1 9/Q29



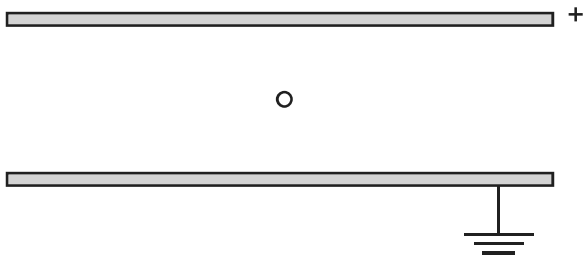
e irection o t e ie an t e e ectron s motion are ot ori onta an to t e rig t

ic e ression gi es t e istance t roug ic t e e ectron tra e s e ore it sto s momentari

A $\frac{m}{\quad}$ B $\frac{m}{e}$ C $\frac{m^2}{2}$ D $\frac{m^2}{2e}$

40 e iagram s o s t o ara e ori onta meta ates e at a otentia i erence

97 2 11 9/Q28



A sma c arge i ui ro mi a et een t e ates is e in e ui i rium t e com ination o its eig t an t e e ectric orce acting on it

e acce eration o ree a is g an t e e ectric ie strengt is

at is t e ratio o t e c arge to mass o t e ro an t e o arit o t e c arge on t e ro

	$\frac{\text{c arge}}{\text{mass}}$	o arit
A	$\frac{g}{\quad}$	ositi e
B	$\frac{g}{\quad}$	negati e
C	$\frac{\quad}{g}$	ositi e
D	$\frac{\quad}{g}$	negati e

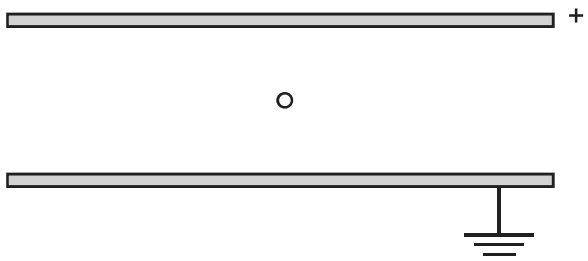
41 A sma c arge is ace in t e e ectric ie o a arge c arge 97 2 12 9/Q26

Bot c arges e erience a orce

at is t e e ectric ie strengt o t e c arge at t e osition o t e c arge

A — B — C D —

42 e iagram s o s t o ara e ori onta meta ates e at a otentia i erence 97 2 12 9/Q27



A sma c arge i ui ro mi a et een t e ates is e in e ui i rium t e com ination o its eig t an t e e ectric orce acting on it

e acce eration o ree a is g an t e e ectric ie strengt is

at is t e ratio o t e c arge to mass o t e ro an t e o arit o t e c arge on t e ro

	$\frac{\text{c arge}}{\text{mass}}$	o arit
A	$\frac{g}{}$	ositi e
B	$\frac{g}{}$	negati e
C	$\frac{}{g}$	ositi e
D	$\frac{}{g}$	negati e

43 e e ectric ie at a certain istance rom an iso ate a a artic e is 3 1 ^{7} C ^{1}

at is t e orce on an e ectron en at t at istance rom t e a a artic e 97 2 12 9/Q28

A 4 8 1 ^{12}

B 9 6 1 ^{12}

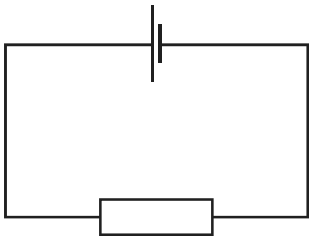
C 3 1 ^{7}

D 6 1 ^{7}

44 A ce is connecte to a resistor

97 2 12 9/Q29

At an gi en moment t e otentia i erence across t e ce is ess t an its e ectromoti e orce



ic statement e ains t is

A e ce is continua isc arging

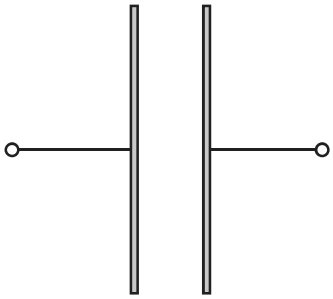
B e connecting ire as some resistance

C nerg is nee e to ri e c arge t roug t e ce

D o er is use en t ere is a current in t e resistor

45 o o osite c arge ara e ates are arrange as s o n

97 2 11 1 /Q28

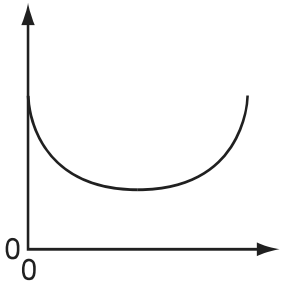


An e ectron is re ease rom rest rom t e sur ace o t e negati e c arge ate

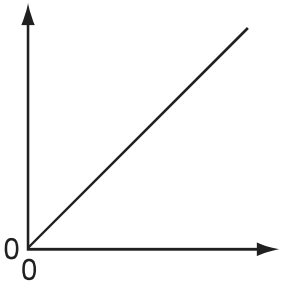
e e ectron tra e s rom t e negati e c arge ate to ar s t e positi e c arge ate

ic gra s o s o t e orce on t e e ectron aries it its istance rom t e negati e ate

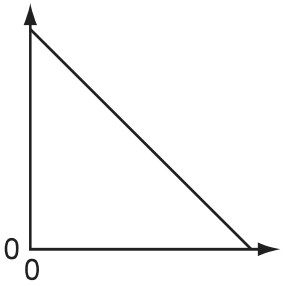
A



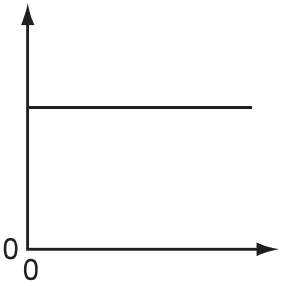
B



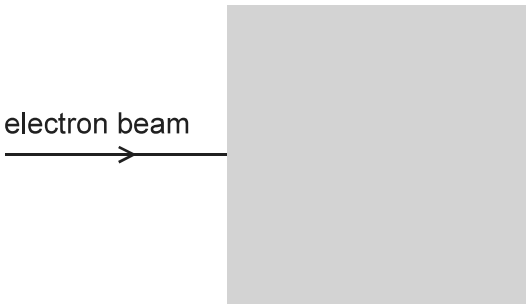
C



D



46 n t e iagram t e s a e area re resents a uni orm e ectric ie irecte a a rom t e o ser er at rig t ang es into t e ane o t e a er 97 2 11 1 /Q29



A ori onta eam o e ectrons enters t e ie tra e ing rom e t to rig t n ic irection is t is eam e ecte t e ie

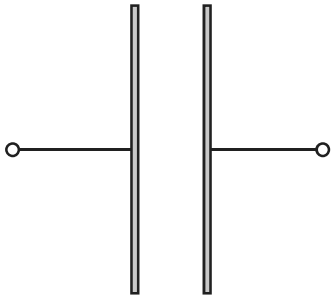
A u ar s in t e ane o t e a er

B o n ar s in t e ane o t e a er

C a a rom t e o ser er

D to ar s t e o ser er

47 o o osite c arge ara e ates are arrange as s o n 97 2 12 1 /Q26

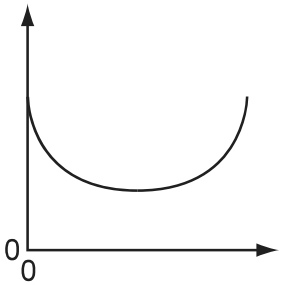


An e ectron is re ease rom rest rom t e sur ace o t e negati e c arge ate

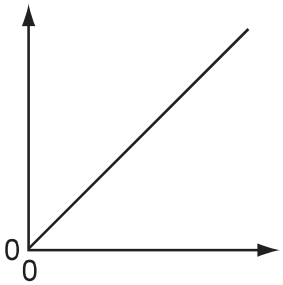
e e ectron tra e s rom t e negati e c arge ate to ar s t e ositi e c arge ate

ic gra s o s o t e orce on t e e ectron aries it its istance rom t e negati e ate

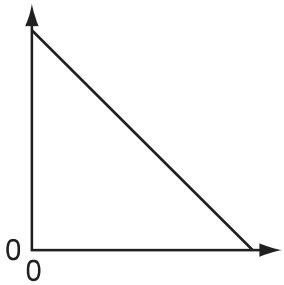
A



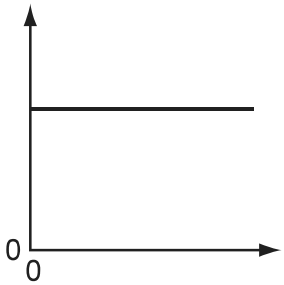
B



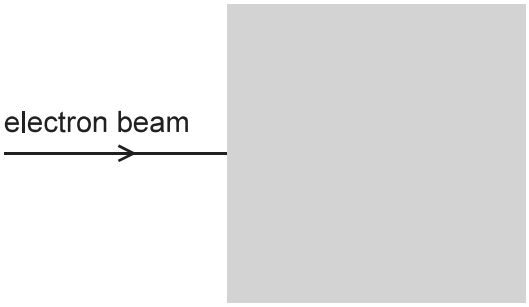
C



D



48 n t e iagram t e s a e area re resents a uni orm e ectric ie irecte a a rom t e o ser er at rig t ang es into t e ane o t e a er 97 2 12 1 /Q27



A ori onta eam o e ectrons enters t e ie tra e ing rom e t to rig t

n ic irection is t is eam e ecte t e ie

A u ar s in t e ane o t e a er

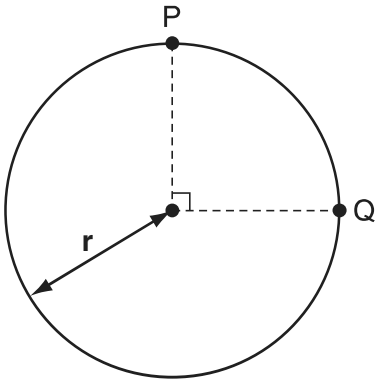
B o n ar s in t e ane o t e a er

C a a rom t e o ser er

D to ar s t e o ser er

49 e iagram s o s t o oints an ic ie 9 a art on a circ e o ra ius r 97 2 12 1 /Q28

A ositi e oint c arge at t e centre o t e circ e creates an e ectric ie o magnitu e at ot an



ic e ression gi es t e or one in mo ing a unit ositi e c arge rom to

A B r C $\left(\frac{\pi r}{2}\right)$ D πr

50 en i 1 C o c arge ass a oint in an e ectrica circuit 97 2 12 12/Q32

A en 1 A mo es t roug a otentia i erence o 1

B en a o er o 1 is use or 1 s

C en t e current is 5 mA or 2 s

D en t e current is 1 A or 1 s

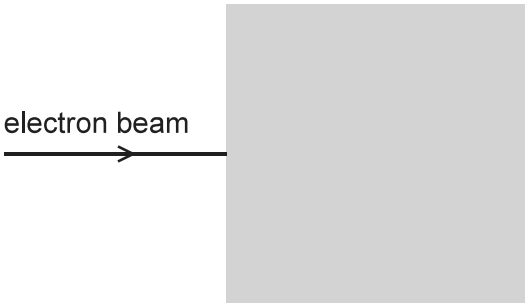
51 ic ro escri es t e circumstances un er ic orces act on a c arge artic e in a uni orm e ectric ie

97 2 12 1 /Q29

	c arge artic e	irection o orce
A	mo ing c arges on	ara e to t e ie
B	stationar c arges on	er en icu ar to t e ie
C	stationar an mo ing c arges	ara e to t e ie
D	stationar an mo ing c arges	er en icu ar to t e ie

52 n t e iagram t e s a e area re resents a uni orm e ectric ie irecte a a rom t e o ser er at rig t ang es into t e ane o t e a er

97 2 13 1 /Q26



A ori onta eam o e ectrons enters t e ie tra e ing rom e t to rig t

n ic irection is t is eam e ecte t e ie

A u ar s in t e ane o t e a er

B o n ar s in t e ane o t e a er

C a a rom t e o ser er

D to ar s t e o ser er

53 An e ectron is in an e ectric ie o strengt 5 1 ^{4} m ^{1} e ie is t e on in uence on t e e ectron

97 2 11 1 /Q28

e mass an c arge o an e ectron are no n

ic uantit can e ca cu ate it out an more in ormation

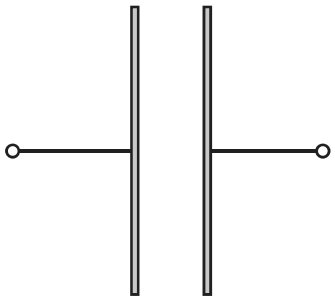
A t e orce on t e e ectron

B t e momentum o t e e ectron

C t e inetic energ o t e e ectron

D t e s ee o t e e ectron

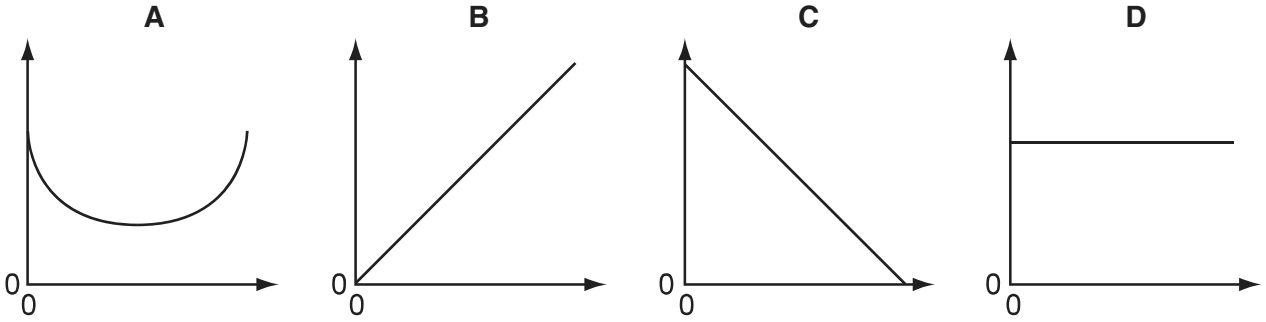
54 o o osite c arge ara e ates are arrange as s o n 97 2 13 1 /Q27



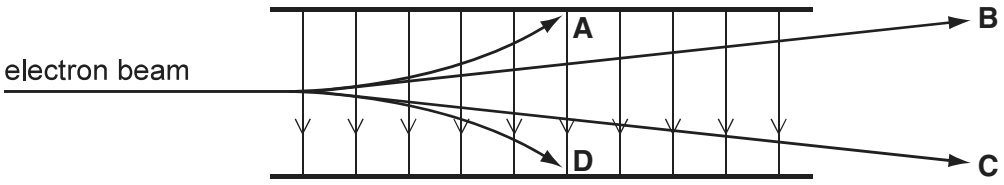
An e ectron is re ease rom rest rom t e sur ace o t e negati e c arge ate

e e ectron tra e s rom t e negati e c arge ate to ar s t eositi e c arge ate

ic gra s o s o t e orce on t e e ectron aries it its istance rom t e negati e ate



55 ic at s o s a ossi e mo ement o an e ectron in t e e ectric ie s o n 97 2 12 11/Q30

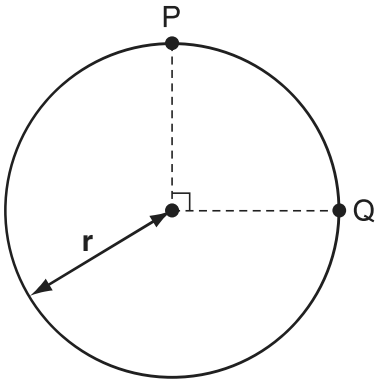


56 ic ro escri es t e circumstances un er ic orces act on a c arge artic e in a uni orm e ectric ie 97 2 13 1 /Q28

	c arge artic e	irection o orce
A	mo ing c arges on	ara e to t e ie
B	stationar c arges on	er en icu ar to t e ie
C	stationar an mo ing c arges	ara e to t e ie
D	stationar an mo ing c arges	er en icu ar to t e ie

57 e iagram s o s t o oints an ic ie 9 a art on a circe o ra ius r 97 2 13 1 /Q29

A ositi e oint c arge at t e centre o t e circe creates an e ectric ie o magnitu e at ot an

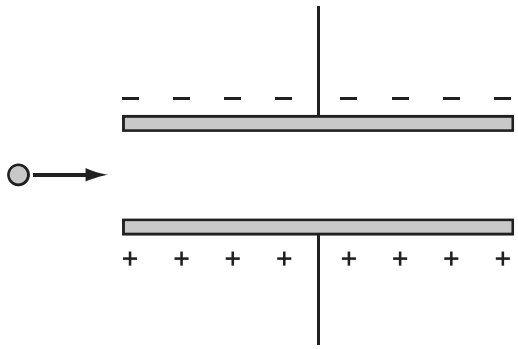


ic e ression gi es t e or one in mo ing a unit ositi e c arge rom to

A B r C $\left(\frac{\pi r}{2}\right)$ D πr

58 e iagram s o s a c arge artic e as it a roac es a air o c arge ara e ates in a acuum

97 2 13 11/Q30

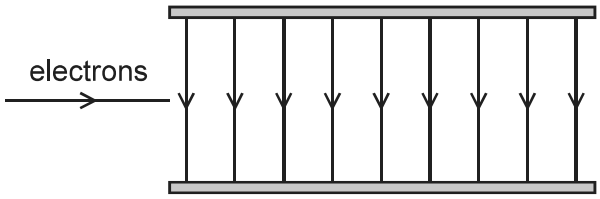


ic ro escri es t e ori onta an ertica com onents o its motion as it tra e s et een t e ates

	ori onta com onent	ertica com onent
A	constant acce eration	constant acce eration
B	constant acce eration	constant e ocit
C	constant e ocit	constant acce eration
D	constant e ocit	constant e ocit

59 ectrons are acce erate an t en irecte into t e uni orm e ectric ie et een t o ara e ates in a acuum

97 2 11 1 /Q29



at est escri es t e s a e o t e at o o e t e e ectrons in t e ie

A a o n ar s cur e a ong a ine t at is art o a circ e

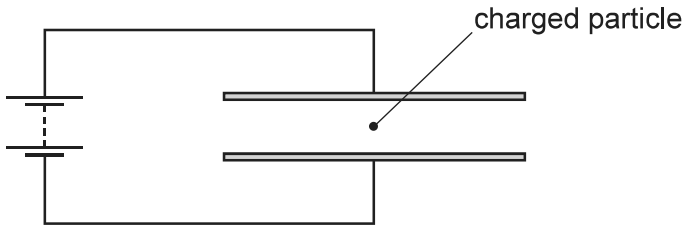
B a o n ar s cur e a ong a ine t at is not art o a circ e

C an u ar s cur e a ong a ine t at is art o a circ e

D an u ar s cur e a ong a ine t at is not art o a circ e

60 A c arge artic e is in t e e ectric ie et een t o ori onta meta ates connecte to a source o constant otentia i erence as s o n ere is a orce on t e artic e ue to t e e ectric ie

97 2 11 1 /Q30



e se aration o t e ates is ou e

at i e t e ne orce on t e artic e

A $\frac{}{4}$ B $\frac{}{2}$ C D 2

61 at escri es t e e ectric otentia i erence et een t o oints in a ire t at carries a current

97 2 12 11/Q32

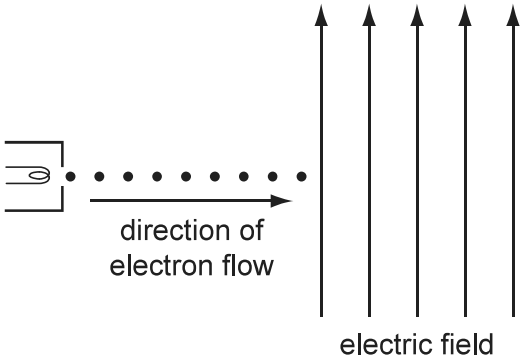
A t e orce re uire to mo e a unit ositi e c arge et een t e oints

B t e ratio o t e energ issi ate et een t e oints to t e current

C t e ratio o t e o er issi ate et een t e oints to t e current

D t e ratio o t e o er issi ate et een t e oints to t e c arge mo e

62 e iagram s o s a ertica uni orm e ectric ie in a acuum 97 2 12 1 /Q28

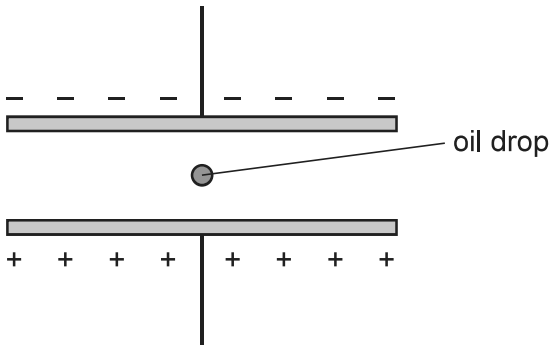


An e ectron gun in ects a eam o e ectrons ori onta into t e ie

ic c anges i an a e occurre to t e at an s ee o t e e ectrons t e time t e eam ea es t e ie

	at o e ectrons	s ee o e ectrons
A	e ecte o n ar s	increase
B	e ecte o n ar s	unc ange
C	e ecte u ar s	increase
D	e ecte u ar s	unc ange

63 A er sma oi ro o mass m carries a c arge 97 2 12 1 /Q29



e otentia i erence across t e ates is an t e se aration is

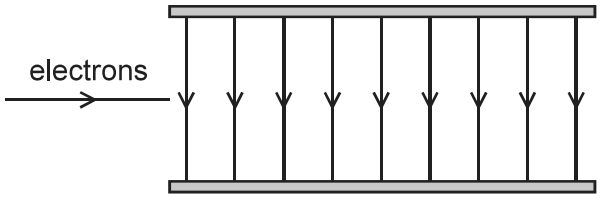
e eig t o t e ro is a ance t e e ectric orce Buo anc orces ma e consi ere to e neg igi e

ic ormu a gi es t e c arge on t e ro

A $\frac{mg}{\quad}$ B $\frac{mg}{\quad}$ C $\frac{\quad}{mg}$ D $\frac{\quad}{mg}$

64 ectrons are acce erate an t en irecte into t e uni orm e ectric ie et een t o ara e ates in a acuum

97 2 13 1 /Q28



at est escri es t e s a e o t e at o o e t e e ectrons in t e ie

A a o n ar s cur e a ong a ine t at is art o a circ e

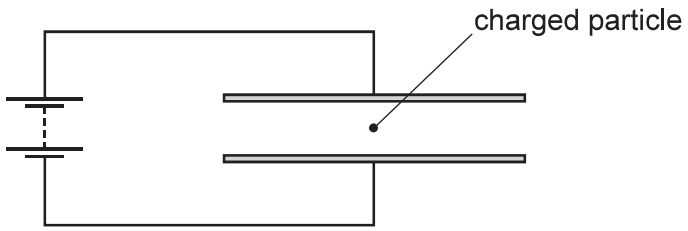
B a o n ar s cur e a ong a ine t at is not art o a circ e

C an u ar s cur e a ong a ine t at is art o a circ e

D an u ar s cur e a ong a ine t at is not art o a circ e

65 A c arge artic e is in t e e ectric ie et een t o ori onta meta ates connecte to a source o constant otentia i erence as s o n ere is a orce on t e artic e ue to t e e ectric ie

97 2 13 1 /Q29



e se aration o t e ates is ou e

at i e t e ne orce on t e artic e

A $\frac{}{4}$ B $\frac{}{2}$ C D 2

66 An e ectron is in an e ectric ie o strengt 5 1 ^{4} m ^{1} e ie is t e on in uence on t e e ectron

97 2 13 1 /Q30

e mass an c arge o an e ectron are no n

ic uantit can e ca cu ate it out an more in ormation

A t e orce on t e e ectron

B t e momentum o t e e ectron

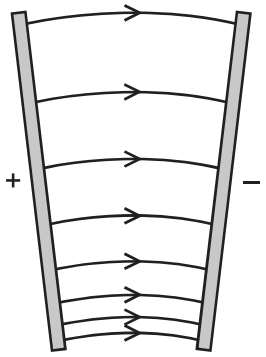
C t e inetic energ o t e e ectron

D t e s ee o t e e ectron

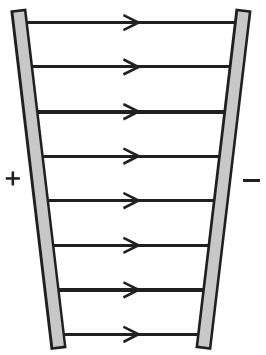
67 **A otentia i erence is a ie et een t o meta ates t at are not ara e** 97 2 11 11/Q28

ic iagram s o s t e e ectric ie et een t e ates

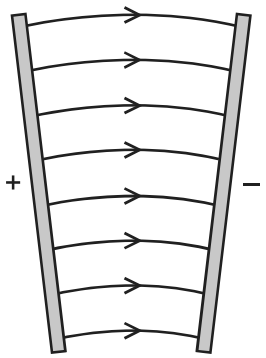
A



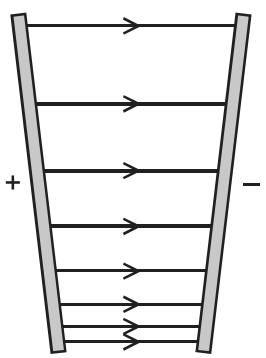
B



C

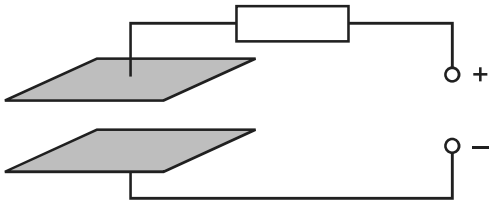


D



68 **e iagram s o s t o ara e meta ates connecte to a c o er su t roug a resistor**

97 2 12 11/Q30



ere is a uni orm e ectric ie in t e region et een t e ates

ic c ange ou cause a ecrease in t e strengt o t e e ectric ie

A a sma increase in t e istance et een t e ates

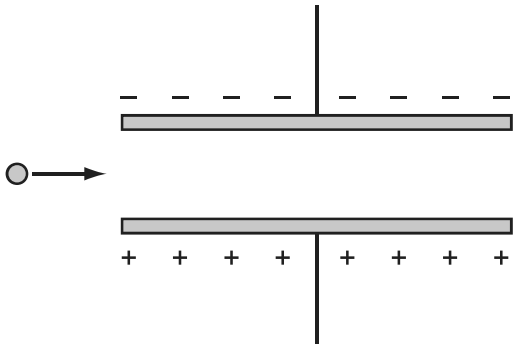
B a sma increase in t e otentia i erence et een t e ates

C a sma increase in t e a ue o t e resistor

D a sma increase to t e area o ot ates

69 e iagram s o s a c arge artic e as it a roac es a air o c arge ara e ates in a acuum

97 2 11 11/Q29



ic ro escri es t e ori onta an ertica com onents o its motion as it tra e s et een t e ates

	ori onta com onent	ertica com onent
A	constant acce eration	constant acce eration
B	constant acce eration	constant e ocit
C	constant e ocit	constant acce eration
D	constant e ocit	constant e ocit

70 o ara e ates a istance 25 mm a art a e a otentia i erence et een t em o 12

97 2 11 11/Q30

at is t e orce on an e ectron en it is in t e uni orm e ectric ie et een t e ates

A 4 8 1 ^{2}

B 7 7 1 ^{2}

C 4 8 1 ^{17}

D 7 7 1 ^{14}

71 A atter is mar e 9

97 2 13 11/Q31

at oes t is mean

A ac cou om o c arge rom t e atter su ies 9 o e ectrica energ to t e o e circuit

B e atter su ies 9 to an e terna circuit or eac cou om o c arge

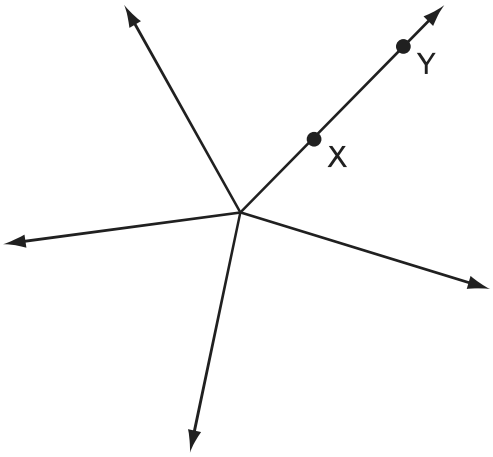
C e otentia i erence across an com onent connecte to t e atter i e 9

D ere i a a s e 9 across t e atter termina s

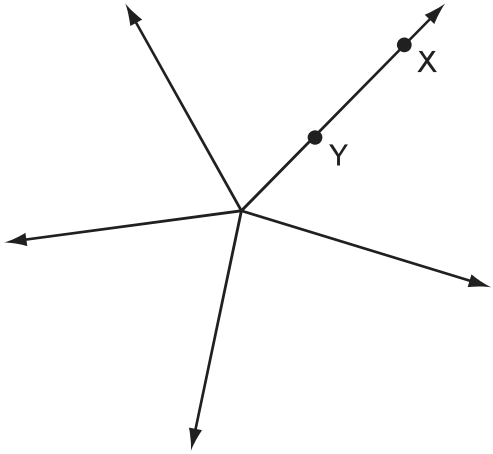
72 n eac e ectric ie iagram a ositi e c arge artic e is mo e rom to 97 2 12 11/Q31

n ic iagram ou t e artic e e erience an increasing re u si e orce

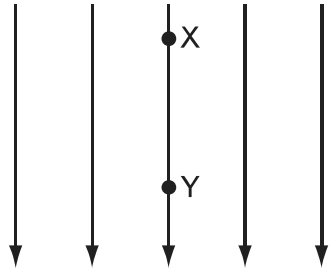
A



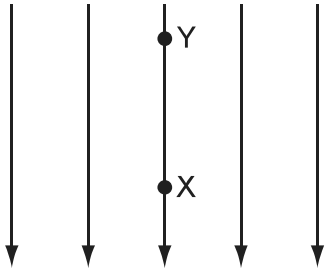
B



C



D



73 e iagram s o s a air o ara e meta ates 4 mm a art connecte to a 9 atter

97 2 12 11/Q29

at is t e e ectric ie strengt et een t e ates

A 4 4 1 ^{4} C ^{1}

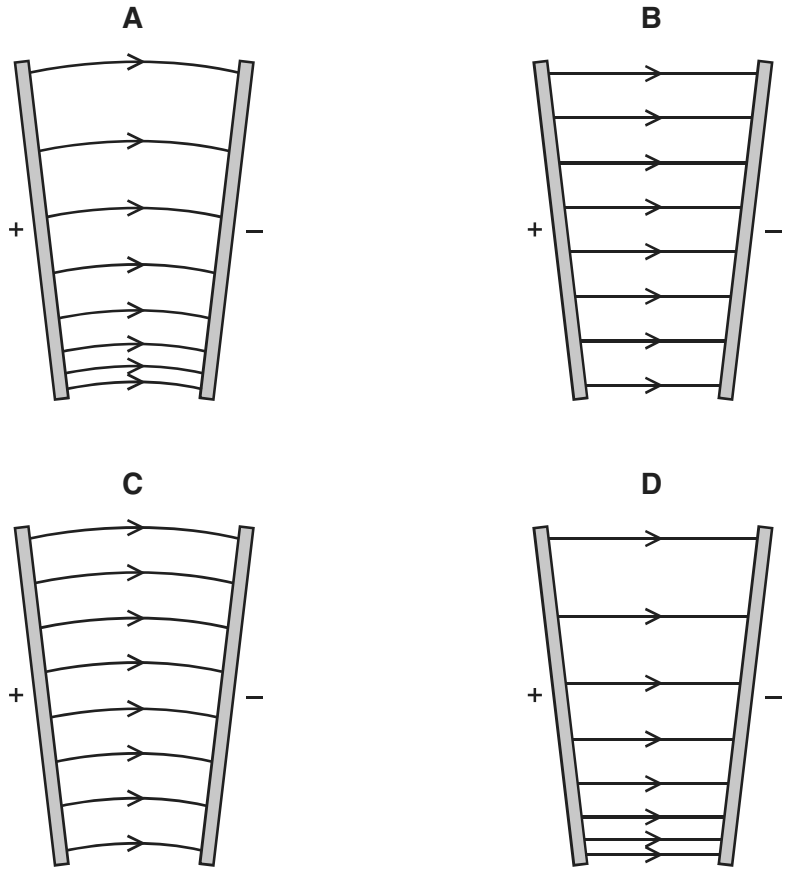
B 3 6 1 ^{2} C ^{1}

C 36 C ^{1}

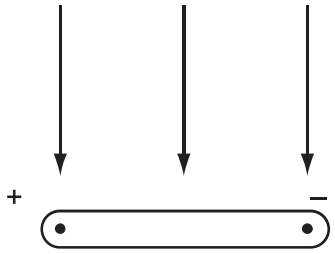
D 2 3 1 ^{3} C ^{1}

74 **A otentia i erence is a ie et een t o meta ates t at are not ara e** **97 2 13** **11**/Q29

ic iagram s o s t e e ectric ie et een t e ates



75 **e iagram s o s an insu ating ro it e ua an o osite oint c arges at eac en An e ectric ie o strengt acts on t e ro in a o n ar s irection** **97 2 11** **11**/Q32



ic ro is correct

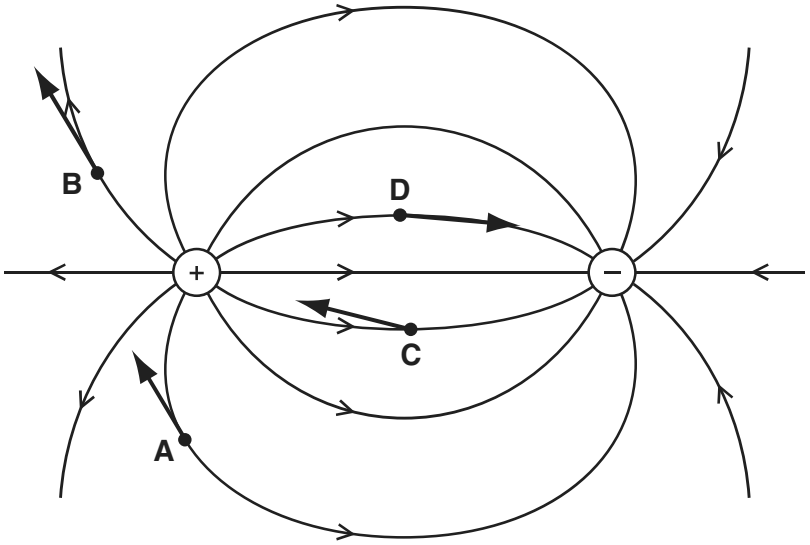
	resu tant orce	resu tant tor ue
A	ero	c oc ise
B	o n ar s	c oc ise
C	ero	anti c oc ise
D	o n ar s	anti c oc ise

76 e iagram s o s a non uni orm e ectric ie near a ositi e c arge an a negati e c arge s ere

97 2 12 11/Q31

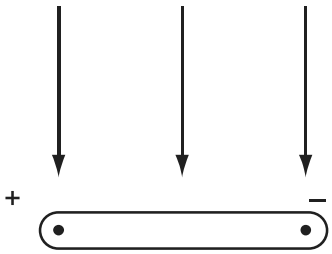
our e ectrons A B C an D are s o n at i erent ositions in t e ie

n ic e ectron is t e irection o t e orce on t e e ectron s o n correct



77 e iagram s o s an insu ating ro it e ua an o osite oint c arges at eac en An e ectric ie o strengt acts on t e ro in a o n ar s irection

97 2 13 11/Q31

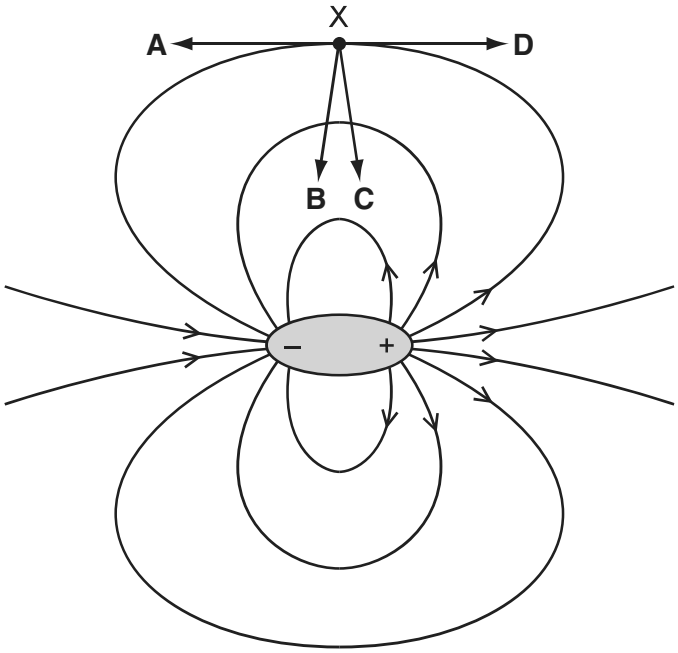


ic ro is correct

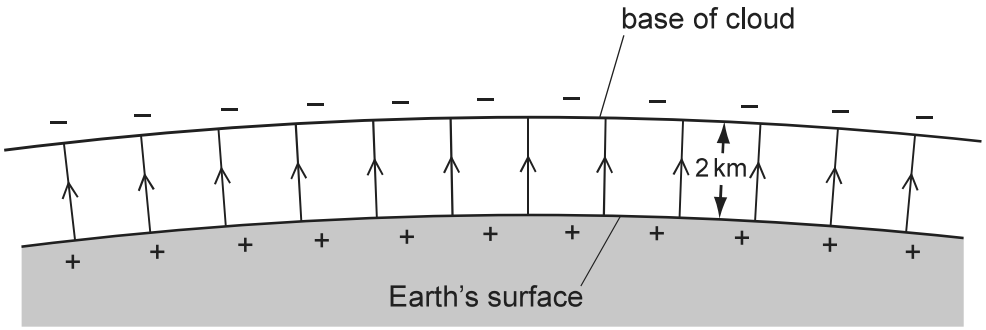
	resu tant orce	resu tant tor ue
A	ero	c oc ise
B	o n ar s	c oc ise
C	ero	anti c oc ise
D	o n ar s	anti c oc ise

78 **A i oe is a air o one negati e c arge an one ositi e c arge o e ua magnitu e e e ectric ie o a i oe iss s o n e o** **97 2 11 12**/Q31

n ic irection oes t e orce act on an e ectron en at oint



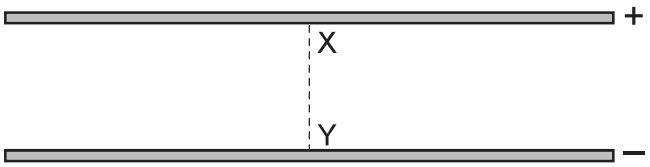
79 **ig tning can occur et een a c arge c ou an t e art s sur ace en t e e ectric ie strengt in t e inter ening atmos ere reac es 25 C** [1] **e iagram s o s t e e ectric ie et een t e ase o a c ou an t e art s sur ace** **97 2 11 12**/Q32



at is t e minimum otentia i erence et een t e art an t e ase o a c ou 2 m ig or ig tning to occur

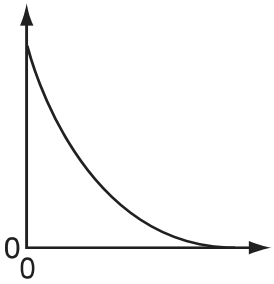
A 12 5 B 25 C 5 D 1

80 An e ectric ie e ists in t e s ace et een t o c arge meta ates 97 2 12 12/Q31

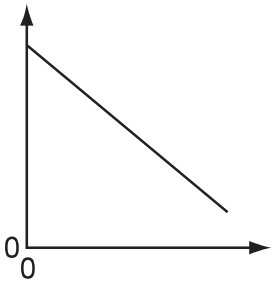


ic gra s o s t e ariation o e ectric ie strengt it istance rom a ong t e ine

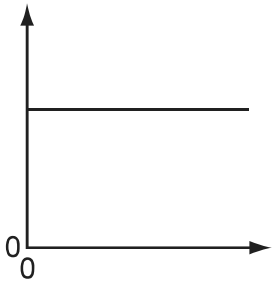
A



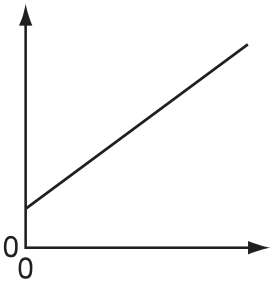
B



C



D



81 o ori onta ara e ate con uctors are se arate a istance o 5 mm in air e o er ate is eart e an t e otentia o t e u er ate is 5 97 2 13 11/Q32

at is t e e ectric ie strengt at a oint mi a et een t e ates

A 1 1 4 m 1 o n ar s

B 1 1 4 m 1 u ar s

C 2 1 4 m 1 o n ar s

D 2 1 4 m 1 u ar s

82 o ori onta ara e ate con uctors are se arate a istance o 5 mm in air e o er ate is eart e an t e otentia o t e u er ate is 5 97 2 11 11/Q31

at is t e e ectric ie strengt at a oint mi a et een t e ates

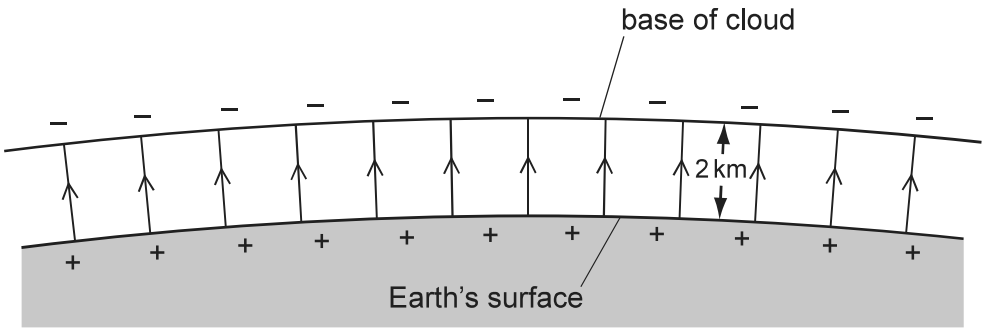
A 1 1 4 m 1 o n ar s

B 1 1 4 m 1 u ar s

C 2 1 4 m 1 o n ar s

D 2 1 4 m 1 u ar s

83 ig tning can occur et een a c arge c ou an t e art s sur ace en t e e ectric ie strengt in t e inter ening atmos ere reac es 25 C [1] e iagram s o s t e e ectric ie et een t e ase o a c ou an t e art s sur ace 97 2 13 12/Q33

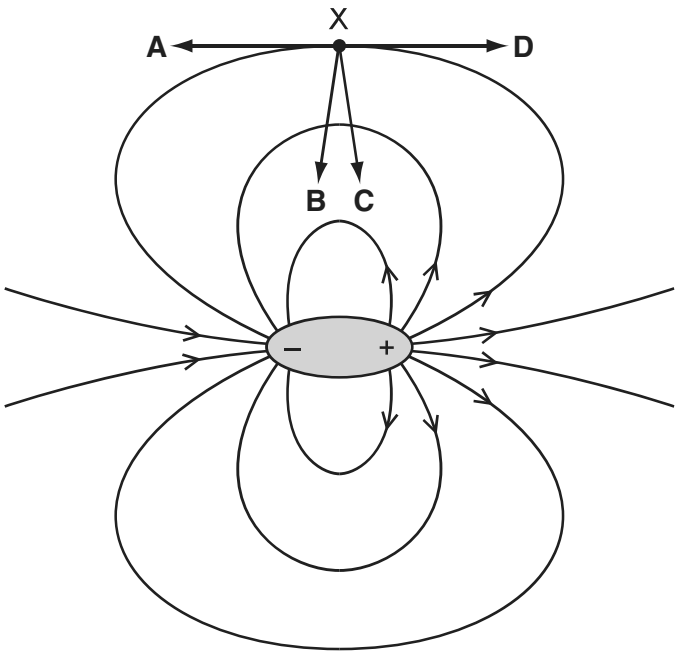


at is t e minimum otentia i erence et een t e art an t e ase o a c ou 2 m ig or ig tning to occur

A 12 5 B 25 C 5 D 1

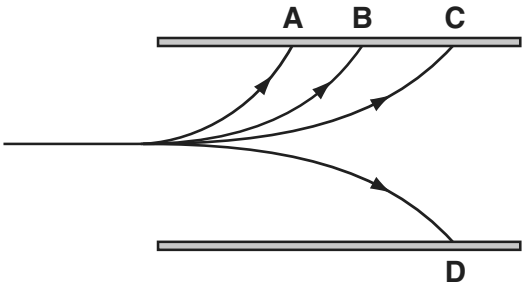
84 A i oe is a air o one negati e c arge an one ositi e c arge o e ua magnitu e e e ectric ie o a i oe is s o n e o 97 2 13 12/Q31

n ic irection oes t e orce act on an e ectron en at oint



85 A sing e roton tra e ing it a constant ori onta e ocit enters a uni orm e ectric ie et een t o ara e c arge ates n t e iagram B s o s t e at ta en t e roton

ic at is ta en a e ium nuc eus t at enters t e e ectric ie at t e same oint an it t e same e ocit as t e roton 97 2 12 12/Q33



86 A c arge artic e mo es in a uni orm e ectric ie et een t o ara e meta ates

o ca cu ate t e orce acting on t e artic e ue to t e e ectric ie ic uantit is not re uire 97 2 12 12/Q32

A artic e c arge

B artic e s ee

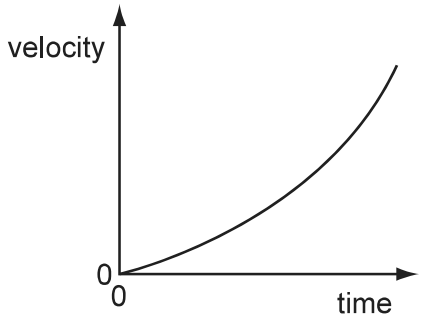
C ate se aration

D otentia i erence et een t e ates

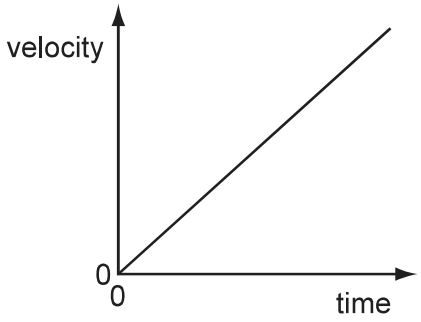
87 An e ectron is initia at rest in a uni orm e ectric ie 97 2 11 12/Q30

ic gra s o s t e ariation it time o t e e ocit o t e e ectron

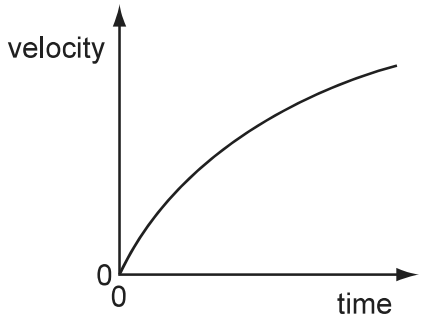
A



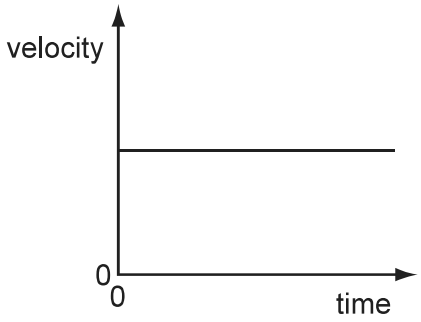
B



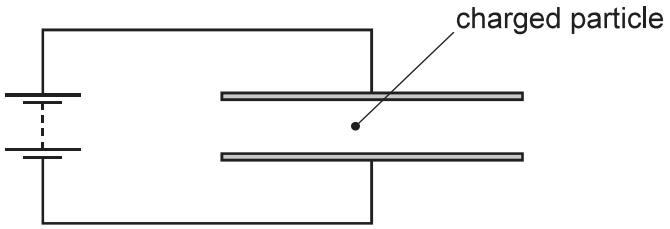
C



D



88 A c arge artic e is in t e e ectric ie et een t o ori onta meta ates connecte to a source o constant otentia i erence as s o n 97 2 11 12/Q31



ere is a orce on t e artic e ue to t e e ectric ie

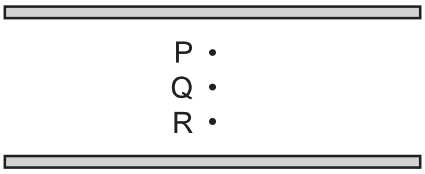
e se aration o t e ates is ou e

at i e t e ne orce on t e artic e

A $\frac{}{4}$ B $\frac{}{2}$ C D 2

89 e iagram s o s t o ara e ates 97 2 13 12/Q30

e ates are c arge so t at t ere is an e ectric ie et een t em an are oints ic are $\frac{1}{4}$ $\frac{1}{2}$ an $\frac{3}{4}$ o t e istance rom t e to ate to t e ottom ate



at is t e e ectric ie strengt at oint

A t e same as t at at oint

B t ice t at at oint

C a t at at oint

D one t ir t at at oint

90 A ositi e c arge o 2 6 1 ^{8}C is in an e ectric ie o constant ie strengt 3 m ^{1}

o muc or must e one on t e c arge in or er to mo e it a istance o 4 mm in t e o osite irection to t e irection o t e ie 97 2 13 12/Q31

A 3 1 1 ^{5}

B 2 1 ^{3}

C 3 1 1 ^{2}

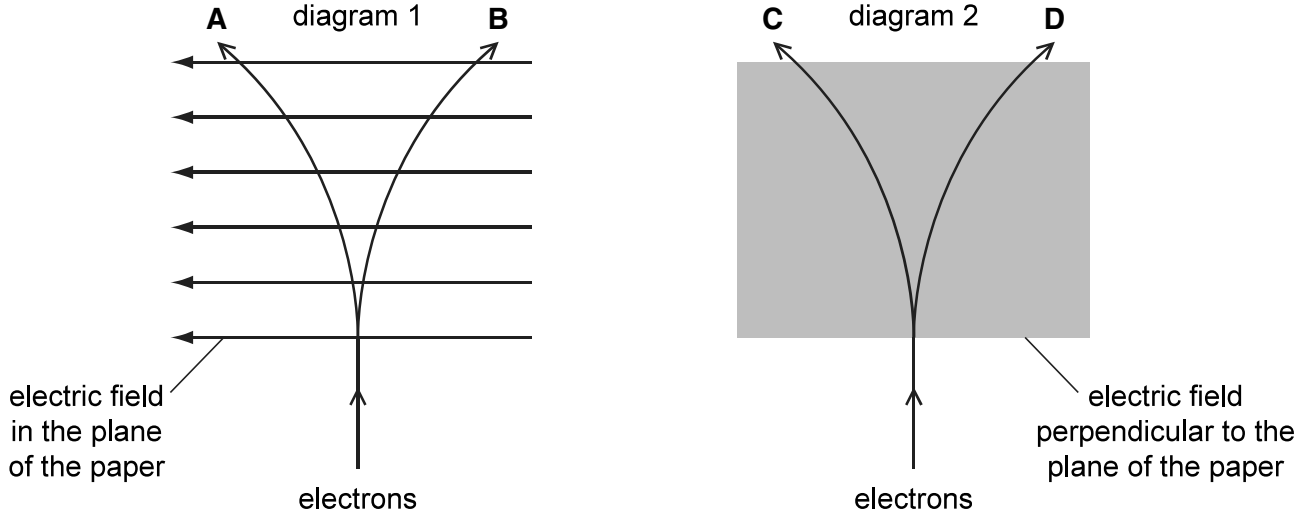
D 2

91 **A eam o e ectrons is irecte into an e ectric ie an is e ecte it** **97 2 11** **13**/Q30

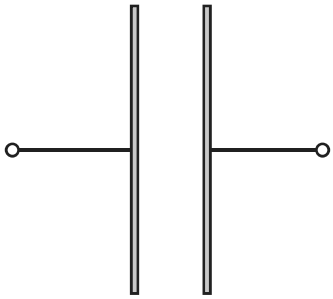
Diagram 1 re resents an e ectric ie in t e ane o t e a er
Diagram 2 re resents an e ectric ie irecte er en icu ar to t e ane o t e a er

e ines A B C an D re resent ossi e at s o t e e ectron eam A at s are in t e ane o t e a er

ic ine est re resents t e at o t e e ectrons insi e t e ie



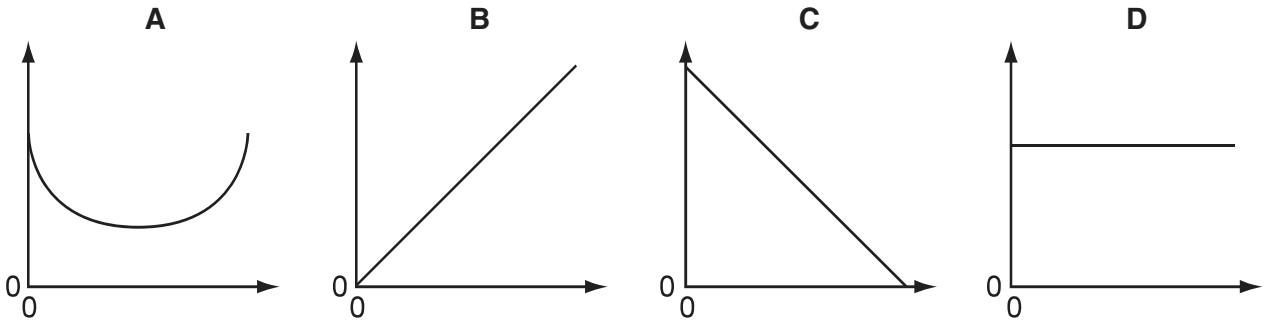
92 **o o osite c arge ara e ates are arrange as s o n** **97 2 11** **13**/Q31



An e ectron is re ease rom rest rom t e sur ace o t e negati e c arge ate

e e ectron tra e s rom t e negati e c arge ate to ar s t eositi e c arge ate

ic gra s o s o t e orce on t e e ectron aries it its istance rom t e negati e ate



93 **o con ucting a ers o a i ui cr sta is a o a ca cu ator are 8 m a art A 1 5 ce is connecte acrossthe con ucting a ers en t e ca cu ator is s itc e on** **97 2 12** **13**/Q30

at is t e e ectric ie strengt et een t e a ers

A **1 2 1** ^{5} **m** ^{1}

B **19 m** ^{1}

C **12 m** ^{1}

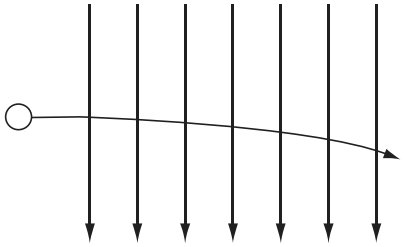
D **1 9 1** ^{5} **m** ^{1}

94 **A ositi e c arge artic e is ro ecte into a uni orm e ectric ie** **97 2 12** **13**/Q31

ic iagram re resents t e at o t e artic e in t e e ectric ie

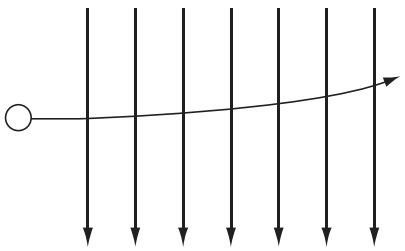
A

electric field in plane of the paper



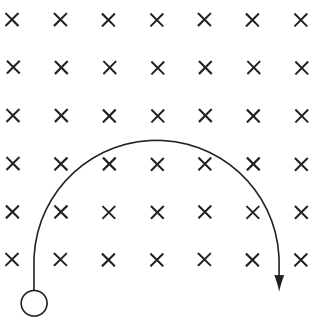
B

electric field in plane of the paper



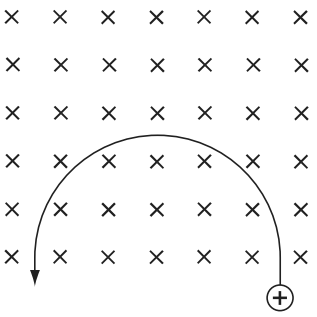
C

electric field into paper



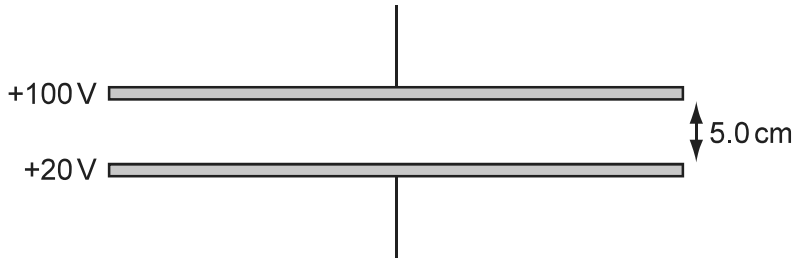
D

electric field into paper



95 o meta ates are e ori onta an ara e 5 cm a art e ates are at otentia s o 1 an 2

97 2 13 13/Q29



at is t e orce e erience an e ectron in t e e ectric ie et een t e ates

A 2 6 1 ^{18}

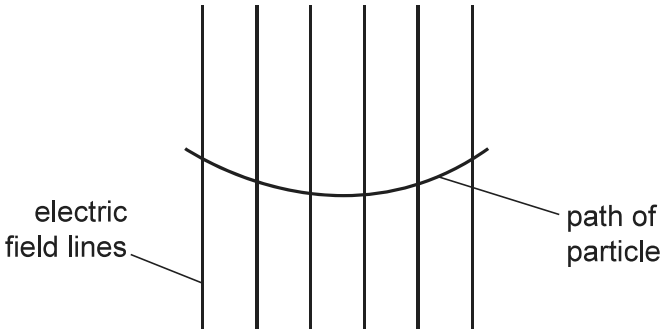
B 3 8 1 ^{18}

C 2 6 1 ^{16}

D 3 8 1 ^{16}

96 e iagram s o s t e at o a c arge artic e t roug a uni orm e ectric ie a ing ertica ie ines

97 2 13 13/Q30



at cou gi e a at o t is s a e

A a ositi e c arge tra e ing e t to rig t in a ie irecte o n ar s

B a ositi e c arge tra e ing rig t to e t in a ie irecte o n ar s

C a negati e c arge tra e ing rig t to e t in a ie irecte u ar s

D a negati e c arge tra e ing e t to rig t in a ie irecte o n ar s

97 A sma c arge is ace in t e e ectric ie o a arge c arge

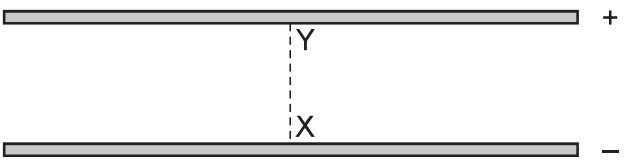
97 2 13 13/Q31

Bot c arges e erience a orce

at is t e e ectric ie strengt o t e c arge at t e osition o t e c arge

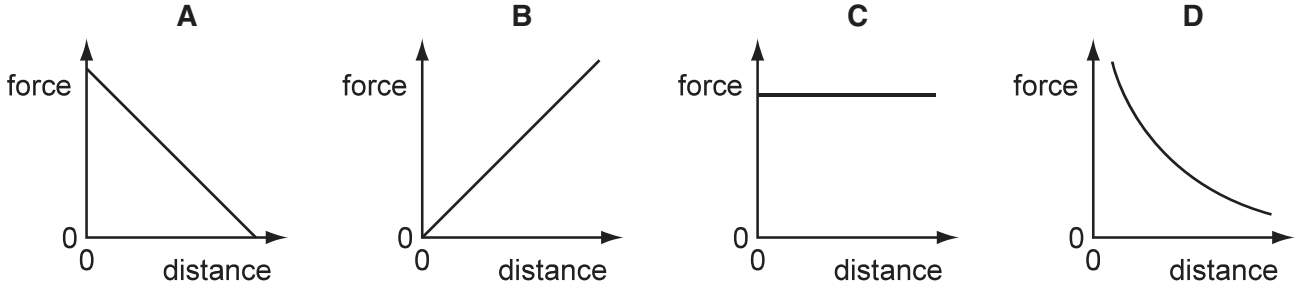
A —— B — C D —

98 **o c arge ara e meta ates ro uce an e ectric ie** **97 2 13** **13**/Q30

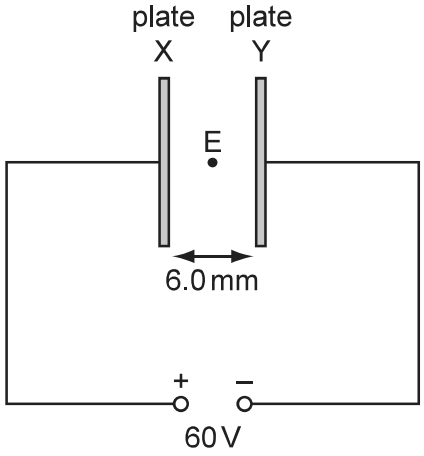


A c arge artic e mo es rom to

ic gra s o s t e ariation o t e orce on t e artic e it istance rom a ong t e ine



99 **o ertica con ucting ates an are ositione so t at t e are se arate a istance o 6 mm in air A 6 c su is connecte as s o n** **97 2 11** **13**/Q31



at is t e e ectric ie strengt at a oint mi a et een t e ates

A 1 1 ^{4} m ^{1} to ar s

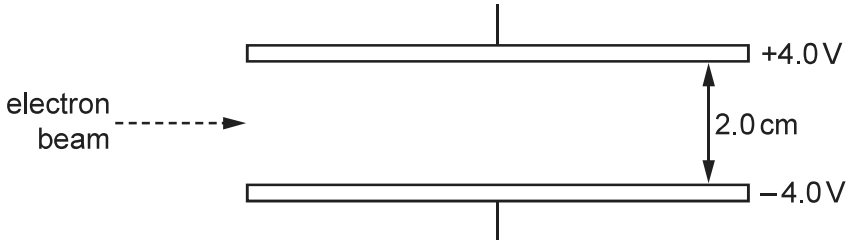
B 1 1 ^{4} m ^{1} to ar s

C 2 1 ^{4} m ^{1} to ar s

D 2 1 ^{4} m ^{1} to ar s

100 **A ori onta eam o e ectrons is asse et een t o ori onta ara e ates 2 cm a art as s o n**

97 2 11 14/Q28



e u er ate as an e ectrica otentia o 4 an t e o er ate as an e ectrica otentia o 4

at is t e orce on eac e ectron en et een t e ates

A 3 2 1 17 o n ar s

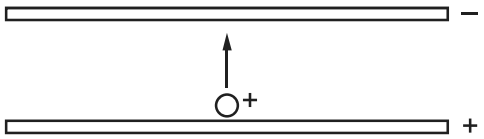
B 3 2 1 19 u ar s

C 6 4 1 19 o n ar s

D 6 4 1 17 u ar s

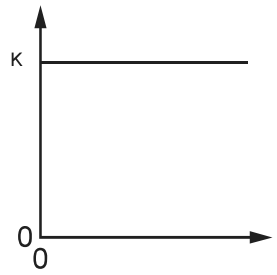
101 **o o osite c arge ori onta meta ates are ace in a acuum A ositi e c arge artic e starts rom rest an mo es rom one ate to t e ot er ate as s o n**

97 2 12 14/Q29

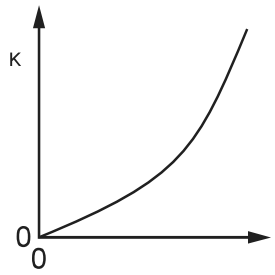


ic gra s o s o t e inetic energ o t e artic e aries it t e istance mo e rom t e ositi e ate

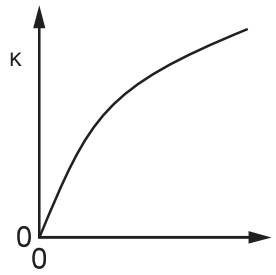
A



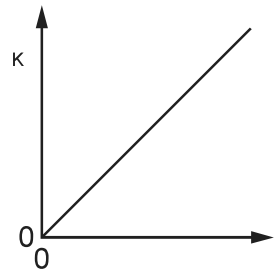
B



C

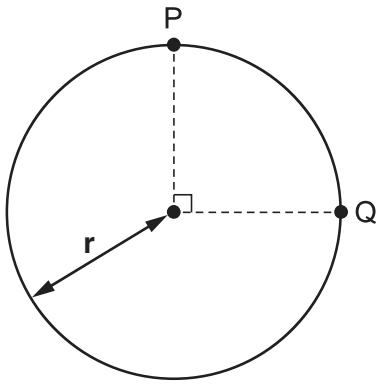


D



102 e iagram s o s t o oints an ic ie 9 a art on a circ e o ra ius r 97 2 11 14/Q29

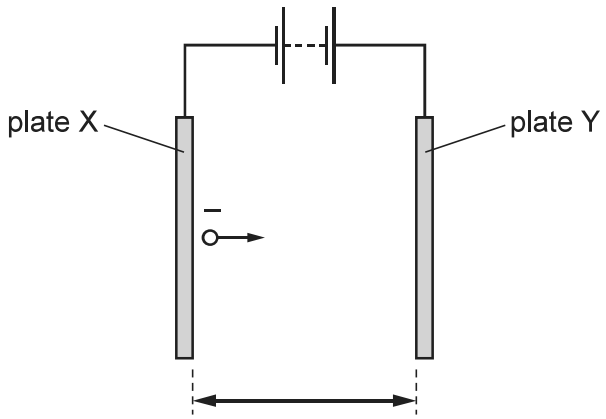
A ositi e oint c arge at t e centre o t e circ e creates an e ectric ie o magnitu e at ot an



ic e ression gi es t e or one in mo ing a unit ositi e c arge rom to

A B r C $\left(\frac{\pi r}{2}\right)$ D πr

103 o ara e ates an are se arate a istance in a acuum ere is a otentia i erence et een t e ates so t at a uni orm e ectric ie is ro uce 97 2 13 14/Q32



A c arge mo es rom rest rom t e sur ace o ate an tra e s to ar s ate

en t e c arge reac es ate it as inetic energ

ic e ression gi es t e e ectric ie strengt et een t e ates

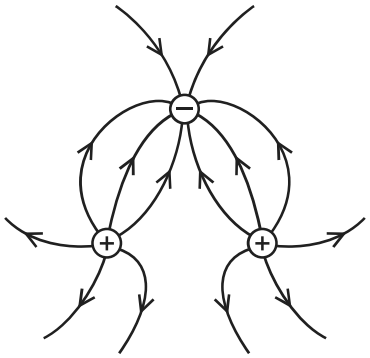
A $\frac{q}{Kd}$ B $\frac{qd}{K}$ C $\frac{K}{qd}$ D $\frac{Kd}{q}$

104 o ositi e c arges an one negati e c arge a o e ua magnitu e are set at t e corners o an e ui atera triang e

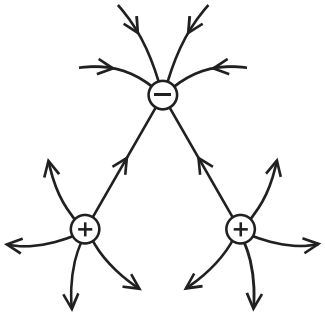
97 2 12 14/Q28

ic iagram est re resents t e e ectric ie surroun ing t e c arges

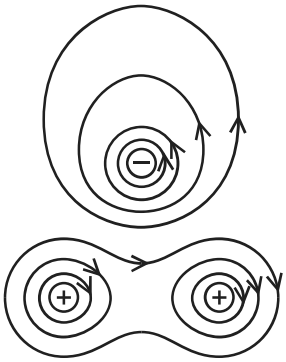
A



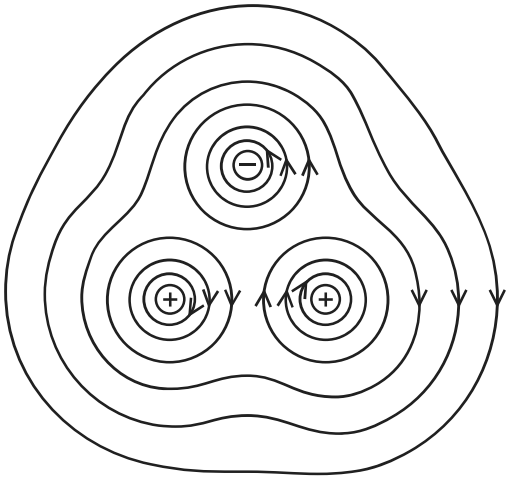
B



C



D



105 A artic e is in a uni orm ie e artic e e eriences a orce in t e o osite irection to t e ie

97 2 11 13/Q13

ic ie is t e artic e in an on ic ro ert o t e artic e is t e ie acting

	ie	ro ert o artic e on ic t e ie acts
A	e ectric	c arge
B	e ectric	current
C	gra itationa	mass
D	gra itationa	eig t

106 o ara e meta ates a e a otentia i erence et een t em o 12 e istance et een t e ates is 1 mm

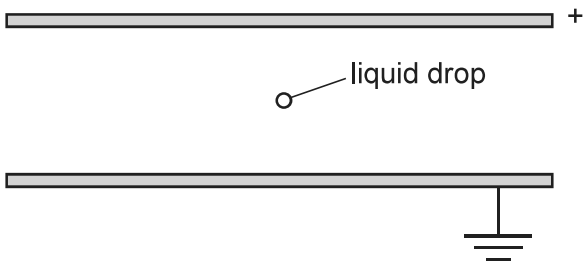
97 2 11 13/Q32

at are t e e ectric ie strengt et een t e ates an t e or one on a c arge o 3 9 C to mo e t e c arge rom t e negati e ate to t eositi e ate

	e ectric ie strengt C [1]	or one
A	12	4 7 1 [5]
B	12	47
C	12	4 7 1 [5]
D	12	47

107 e iagram s o s t o ara e ori onta meta ates ere is a otentia i erence et een t e ates

97 2 11 14/Q28



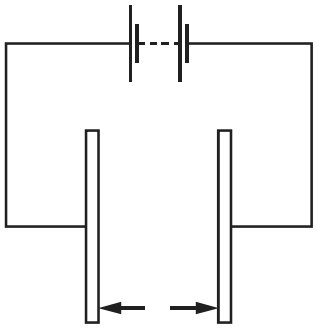
A sma c arge i ui ro mi a et een t e ates is e in e ui i rium t e com ination o its eig t an t e e ectric orce acting on it

e acce eration o ree a is g an t e e ectric ie strengt is

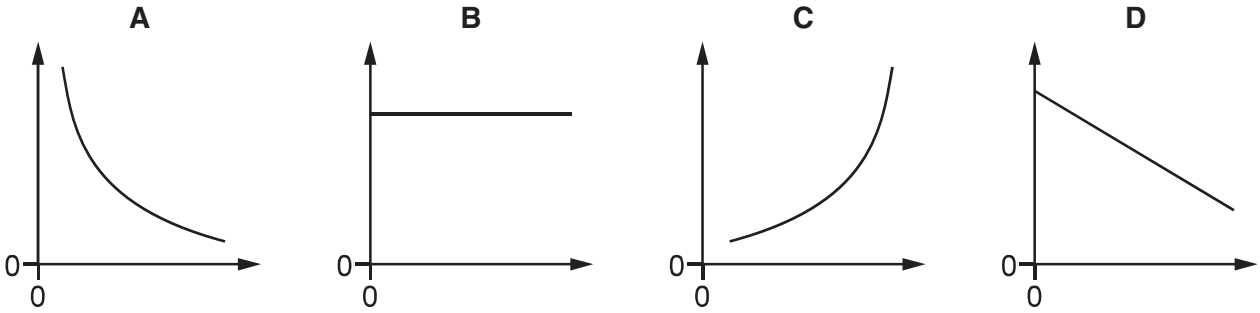
at is t e o arit o t e c arge on t e ro an t e ratio o c arge to mass o t e ro

	o arit	$\frac{\text{c arge}}{\text{mass}}$
A	negati e	$\frac{}{g}$
B	negati e	$\frac{g}{}$
C	ositi e	$\frac{}{g}$
D	ositi e	$\frac{g}{}$

108 e iagram s o s t o meta ates connecte to a constant ig o tage 97 2 11 14/Q29



ic gra s o s t e ariation o t e e ectric ie strengt mi a et een t e t o ates as t e istance et een t e t o ates is increase

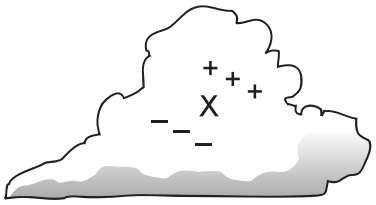


109 An e ectron enters a region o s ace ere t ere is a uni orm e ectric ie as s o n 97 2 13 14/Q31

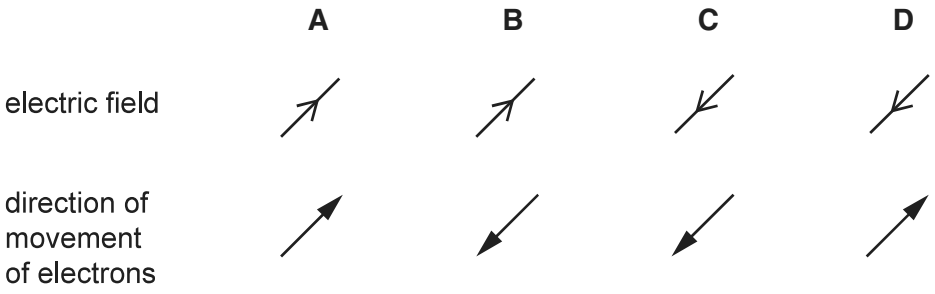
nitia t e e ectron is mo ing ara e to an in t e irection o t e e ectric ie at is t e su se uent at an c ange o s ee o t e e ectron

	at o e ectron	s ee o e ectron
A	inear	ecreases
B	inear	increases
C	ara o ic	ecreases
D	ara o ic	increases

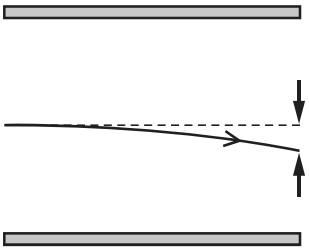
110 egions o un a ance c arge are ro uce insi e a c ou as s o n 97 2 13 14/Q31



or t e region ic iagram correct re resents t e irection o t e e ectric ie an t e initia irection in ic e ectrons ou mo e



111 e at o an e ectron it initia s ee in t e uni orm e ectric ie et een t o ara e ates is s o n 97 2 13 14/Q32



e ertica e ection is measure at t e rig t an e ge o t e ates

e istance et een t e ates is a e e otentia i erence et een t e ates remains t e same

at i e t e ne e ection o t e e ectron it t e same initia s ee

A B $\sqrt{2}$ C 2 D 4

112 ic unit is not use in eit er t e e inition o t e cou om or t e e inition o t e o t 97 2 12 15/Q31

A am ere

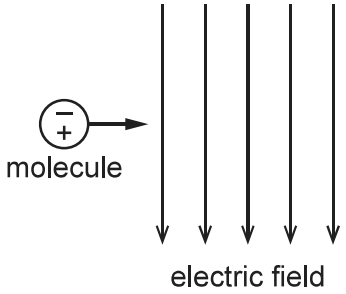
B ou e

C o m

D secon

113 A mo ecu e e a es as an e ectric i o e consisting o t o e ua oint c arges o o osite sign se arate a i e istance e mo ecu e mo es it constant ori onta e ocit as it enters a ertica uni orm e ectric ie as s o n

97 2 13 15/Q30



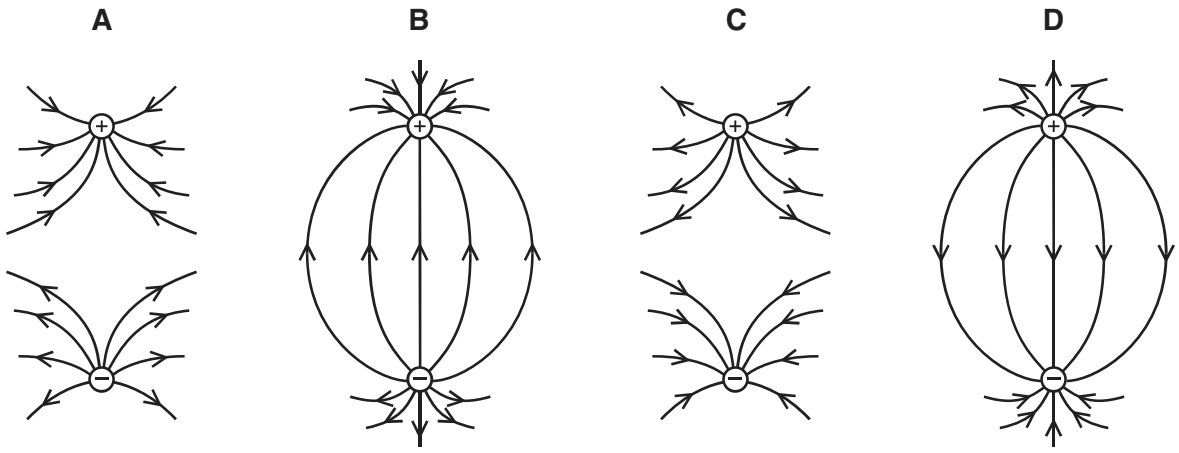
e ositi e an negati e c arges o t e mo ecu e enter t e ie at t e same time

ic ro escri es t e e ocit o t e mo ecu e in t e ie

	ori onta com onent o e ocit	ertica com onent o e ocit
A	constant	increases
B	constant	ero
C	increases	increases
D	increases	ero

114 ic iagram est re resents t e e ectric ie et een t o oint c arges o e ua magnitu e an o osite sign

97 2 13 15/Q31



115 o ara e meta ates a istance o 2 mm a art a e a otentia i erence o 1 across t em

97 2 11 15/Q31

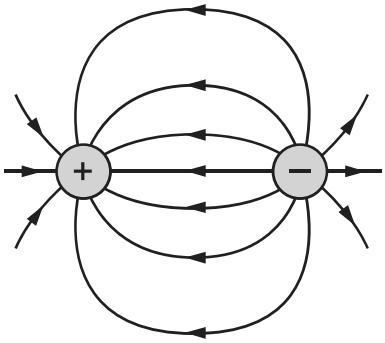
at is t e e ectric ie strengt et een t e ates

A 5 m 1 B 5 m 1 C 5 C 1 D 5 C 1

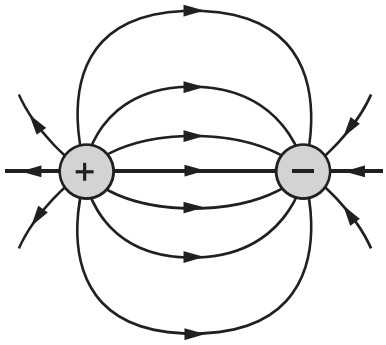
116 **A ositi e c arge an a negati e c arge o e ua magnitu e are ace a s ort istance a art**

ic iagram est re resents t e associate e ectric ie **97 2 12 15/Q29**

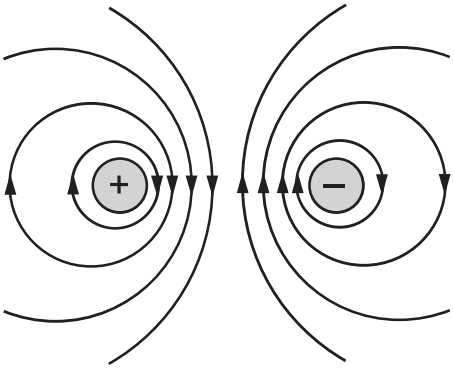
A



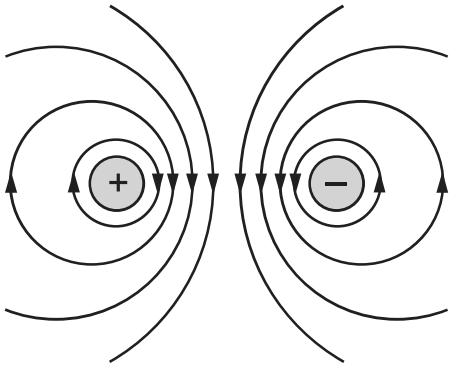
B



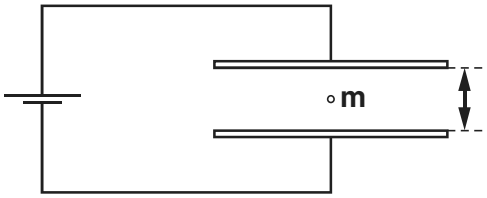
C



D



117 **A c arge oi ro o mass m it n e cess e ectrons is e stationar in t e uni orm e ectric ie et een t o ori onta ates se arate a istance** **97 2 12 15/Q30**



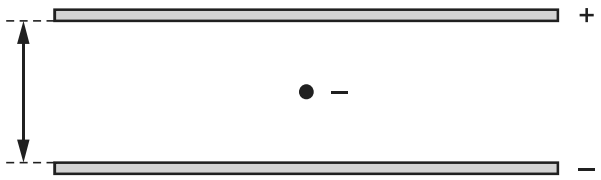
e o tage et een t e ates is t e e ementar c arge is e an t e acce eration o ree a is g

at is t e a ue o n

A $\frac{e}{mg}$ **B** $\frac{mg}{e}$ **C** $\frac{me}{g}$ **D** $\frac{g}{me}$

118 An oi ro et as c arge an is situate et een t o ori onta meta ates as s o n in t e iagram

97 2 11 15/Q32



e se aration o t e ates is e ro et is o ser e to e stationar en t e u er ate is at otentia an t e o er ate is at otentia

or t is to occur at is t e eig t o t e ro et

A — B $\frac{2}{}$ — C — D $\frac{2}{}$ —