



Education and Sports Development

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GRADE 12
GRAAD 12

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JUNIE EKSAMEN
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MEMORANDUM

MARKS/PUNTE: 150

This memorandum consists of 9 pages.
Hierdie memorandum bestaan uit 9 bladsye.



NW/JUNE/TEC-SCNE/ EMIS/6*****

QUESTION/VRAAG 1 (MULIPLE CHOICE/MEERVOUDIGE KEUSE)

1.1	A ✓✓	(2)
1.2	B ✓✓	(2)
1.3	B ✓✓	(2)
1.4	D ✓✓	(2)
1.5	C ✓✓	(2)
1.6	C ✓✓	(2)
1.7	B ✓✓	(2)
1.8	D ✓✓	(2)

[16]

QUESTION/VRAAG 2

2.1 An atom / group of atoms that determine(s) the physical and chemical properties of a group of organic compounds / *atoom of groep atome wat die chemiese eienskappe van 'n molekule bepaal.* ✓✓

(2)

2.2.1 D / ethanoic acid *etanoësuur* ✓ has the lowest vapour pressure/ *het die laagste dampdruk.* ✓

(2)

2.2.2 A / butane/ *butaan.* ✓

(1)

2.3

- **Between the molecules of B/** ketones are dipole-dipole forces in addition to London forces ✓
Tussen die molekules van B/ ketone is dipool-dipool kragte sowel as London kragte
- **Between the molecules of A/** butane/ alkane are London/ induced dipole/ dispersion forces. ✓
Tussen die molekules van A/ butane/ alkane is London/ dispersie kragte
- Intermolecular forces in **B are stronger** than those in A ✓
(Take any reasonable answer)
Intermolekulêre kragte in B is sterker as in die van A
(Aanvaar enige redelike antwoord)

(3)

2.4 **C and D have hydrogen Bonding /** A and B do not have any hydrogen bonding

C en D bevat waterstofbindings / A en B bevat geen waterstofbindings

- In A and B there is London forces/ dispersion forces/ induced dipole forces/ dipole-dipole forces
In A en B daar is London kragte/ dispersie kragte/ geïnduseerde dipool kragte/ dipool-dipool kragte

(1)



2.5 Option 1

- D has more sites for hydrogen bonding than C. ✓✓ OR
- D has stronger/ more intermolecular forces/ dipole-dipole forces ✓✓
OR
- D needs more energy to overcome/ break the intermolecular forces. ✓✓

Opsie 1

- D het meer bindingsplekke vir waterstofbindings as C. OF
- D het sterker/ meer intermolekulêre kragte/ dipool-dipool kragte OF
- D benodig meer energie om die intermolekulêre kragte te breek

Option 2

- C has less sites for hydrogen bonding than D. ✓✓ OR
- C has weak/ less intermolecular forces/ dipole-dipole forces ✓✓
(Take only one correct answer for two marks)

Opsie 2

- C het minder bindingplekke vir waterstofbindings as D OF
- C het swak intermolekulêre kragte/ dipool-dipool kragte
(Neem slegs een korrekte antwoord vir twee punte) (2)

2.6 Liquid / Vloeistof ✓ (1)

[12]

QUESTION/VRAAG 3

- 3.1.1 Methane/ Metaan ✓✓ (2)
- 3.1.2 Propane / Propaan ✓✓ (2)
- 3.1.3 Butane / Butaan ✓✓ (2)
- 3.1.4 Pentane / Pentaan ✓✓ (2)
- 3.1.5 Hexane / Heksaan ✓✓ (2)

3.2.1 Homologous series: A series of compounds that are described by the same general formula. Each member in the series differs from the following one by -CH₂. ✓✓

Homoloë reeks: 'n Reeks van verbindings wat dieselfde algemene formule het en waar elke lid verskil van die volgende een met -CH₂ (2)

3.2.2 Organic molecules: Compounds that contain carbon atoms. ✓✓ (2)
Organiese molekule: Molekules wat koolstofatome bevat.

3.2.3 Structural Isomer: Compounds with the same molecular formulae, but different structural formulae. ✓✓

Struktuur isomeer: Verbindings met dieselfde molekulêre formules, maar verskillende struktuurformules ✓✓ (2)

3.3.1 B. (2)

3.3.2 It contains only single covalent bonds between the carbon atoms.
Dit bevat slegs enkel kovalente bindings tussen koolstofatome. (2)



- 3.4.1 A. a) Ethene/ *Eteen*
b) Alkenes/ *Alkene*
B. a) Ethyne *Etyn*
b) Alkynes /*Alkyne*
C. a) Ethane /*Etaan*
b) Alkanes/ *Alkane* (6)
- 3.5 $2C_2H_2 + 5O_2 \checkmark \rightarrow 4CO_2 \checkmark + 2H_2O \checkmark$ (One \checkmark for balancing *Ballansering*) (4)
- [30]

QUESTION/VRAAG 4

4.1 Halo-alkane: An alkane that has bonded with a halogen.
Haloalkaan: 'n Alkaan wat met 'n halogen gebind het. (2)

4.2 Halogenation reaction: When one or more of the H atoms of an alkane is replaced by halogen atoms.
Halogeneringsreaksie: Wanneer een of meer H atome vervang word met halogeen atome. (2)



4.3 chloromethane / *chlorometaan* $\checkmark\checkmark$ (2)

[9]

QUESTION/VRAAG 5

Match column A with column B
Pas kolom A by kolom B

- 5.1 E $\checkmark\checkmark$ (2)
5.2 B $\checkmark\checkmark$ (2)
5.3 I $\checkmark\checkmark$ (2)
5.4 H $\checkmark\checkmark$ (2)
5.5 C $\checkmark\checkmark$ (2)
5.6 J $\checkmark\checkmark$ (2)
5.7 A $\checkmark\checkmark$ (2)

[14]

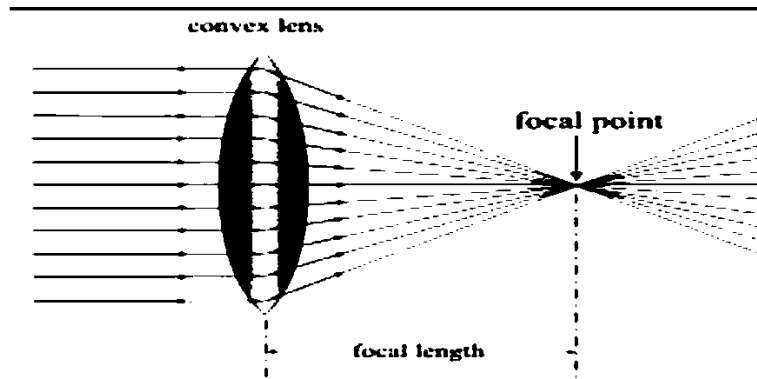
QUESTION/VRAAG 6

6.1 Convex lenses /*Konvekse lens* \checkmark (1)

6.2.1 To correct the vision of the people who are short sighted/
near sighted people/ people who cannot see far. $\checkmark\checkmark$
Om die visie van mense wat bysiende is te verbeter (2)



6.2.2



Notes

- 1 mark for the correct drawing
- 1 mark for mentioning the focal point
- 1 mark for the focal length

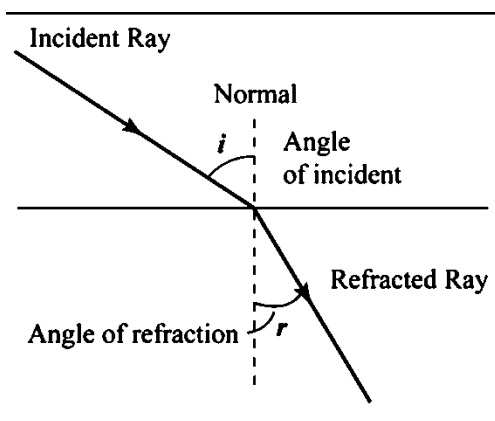
(3)

- 6.2.3 (a) Are used in manufacturing of glasses for far sighted persons. ✓✓
 (b) Are used in camera lenses ✓✓
 (c) Are used in binoculars. ✓✓
 (d) Are used in telescopes ✓✓
 (Any three)

- (a) Word gebruik om brille te vervaardig vir mense wat versiene is.
 (b) Kameralense
 (c) Verkykers
 (d) Teleskope
 (Enige drie)

(6)
 [12]

QUESTION/VRAAG 7



7.1

(5)

Notes/Notas

- 1 mark for each label indicated correctly ✓✓✓✓✓
- 1 punt vir elke byskrif korrek aangedui

- 7.2 **Refraction** is the bending of light rays ✓ when it passes from one medium to another. ✓
Breking die buiging van lig wanneer dit van een medium na 'n ander beweeg. (2)
- 7.3 **The law of reflection state that:**
- The incident ray, reflected ray and the normal are in the same plane. ✓✓
 - The angle of incidence is equal to the angle of reflection ✓✓
- Die wet van weerkaatsing stel dat:**
- Die invalstraal, die weerkaatste straal en die normal is in dieselfde plat vlak
 - Die invalshoek is gelyk aan die weerkaatsingshoek (4)
- 7.4 (a) Reflected *Weerkaats* ✓
(b) Absorbed *Geabsorbeer* ✓
(c) Pass through *Deurgelaat* ✓ (3)
- 7.5 **Angle of refraction** is the angle between the normal and the refracted ray. ✓
Brekingshoek is die hoek tussen die gebroke straal en die normal. (1)
- 7.6 **Dispersion** is the phenomenon whereby white light breaks up into its component colours ✓✓
Dispersie is die opbreek van wit lig in die verskillende kleure van die spektrum (2)
- 7.7 B ✓ (1)
- 7.8 (a) For the total internal reflection to take place, the incident ray must move from optically denser medium toward an optically less dense medium. ✓✓
(b) The angle of incidence must be greater than the critical angle of the medium. ✓✓
- (a) *Vir totale interne weerkaatsing om plaas te vind, moet die invalstral vanaf 'n opties meer digte medium na opties minder digte medium beweeg.*
(b) *Die invalshoek moet groter wees as die grenshoek van die betrokke medium.* (4)

[22]



QUESTION/VRAAG 8

- 8.1 Wavelength increase from the smallest to the biggest.
Golflengte vermeerder van die kleinste na die grootste

- | |
|--|
| <ol style="list-style-type: none">1. Gamma ✓2. X- ray X-straal ✓3. UV light UV lig ✓4. Visible light Sigbare lig ✓5. Infrared Infrarooi ✓6. Microwave Mikrogolf ✓7. Radio wave Radiogolf ✓ |
|--|

(7)

Notes/ Notas

- 1 Mark for each correct position only ✓
- 1 Punt vir elke korrekte posisie

- 8.2 Frequency is inversely proportional to wavelength, so **as the wavelength increases the frequency decreases.** ✓✓
*Frekwensie is omgekeerd eweredig aan die golflengte, dus sal die **golflengte toeneem wanneer die frekwensie afneem.*** (2)

- 8.3 Accelerating charges induce alternating ✓ magnetic and electric fields perpendicular to each other ✓ and perpendicular to the direction of propagation. ✓
Versnellende ladings induseer ossilerende magneetvelde en elektriese velde reghoekig tot mekaar en reghoekig tot die bewegingsrigting. (3)

- 8.4 (a) EM waves are transverse waves. ✓✓
(b) Has the particles properties, can have interaction with electrons. ✓✓
(c) Do not need the medium to propagate. ✓✓
(d) It moves at the constant speed of $3 \times 10^8 \text{ m.s}^{-1}$ in the vacuum. ✓✓
(e) It consists of electric and magnetic fields vibrating at right angles to each other. ✓✓
(Take any two)

- (a) *EM golwe is transversale golwe*
(b) *Besit deeltjigeaardheid, kan interaksie hê met elektrone*
(c) *Benodig nie 'n medium om in voor te plant nie*
(d) *Beweeg teen 'n konstante spoed van $3 \times 10^8 \text{ m.s}^{-1}$ in 'n vacuum*
(e) *Bestaan uit elektriese en magnetiese velde wat reghoekig tot mekaar beweeg.*
(Enige twee) (4)

- 8.5 (a) Security scanners/ *Sekuriteitsskandeerders* ✓
(b) Medical images / *Mediese beelde* ✓
(c) CT scans / *CT-skandering* ✓
(Take any two reasonable answers. 1 mark each)
(*Neem enige twee redelike antwoorde. 1 punt elk*) (2)



8.6 When the skin is exposed too much it can **cause skin damage / cancer.** ✓✓
*Te hoë blootstelling kan **vel beskadig / kanker*** (2)

8.7 **Advantages of UV light.**

- (a) Sterilisation of food. ✓
- (b) Prolongs shelf life of food. ✓
- (c) Checking authenticity of bank notes. ✓
- (d) Exposure to UV light is important to make vitamin D in the body.
(Any two)

Voordele van UV lig

- (a) *Sterilisasie van voedsel*
- (b) *Verleng raklewe van voedsel*
- (c) *Kontroleer egtheid van banknote*
- (d) *Blootstelling aan UV lig is belangrik vir die vervaardiging van vitamin D in die liggaam.*
(Enige twee) (2)

Disadvantages of UV light

- (a) Can cause cancer. ✓
- (b) Can damage eyes. ✓
- (c) Can damage skin. ✓
(Any two)

Nadele van UV lig

- (a) *Kan kanker veroorsaak*
- (b) *Kan oë beskadig*
- (c) *Kan vel beskadig*
(Enige twee) (2)

8.8.1 $c=f\lambda$ ✓
 $3 \times 10^8 = (3.2 \times 10^{15}) \lambda$ ✓ (λ) ✓
 $\lambda = 9.375 \times 10^{-8} \text{ m}$ ✓ (✓ Unit) (5)

8.8.2 $E = hf$ ✓
 $= (6.63 \times 10^{-34}) (3.2 \times 10^{15})$ ✓
 $E = 2.12 \times 10^{-18} \text{ J}$ ✓ (✓ unit) (5)

[34]
TOTAL/TOTAAL: 150

