

GAUTENG DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

MOTOR MECHANICS SG

POSSIBLE ANSWERS OCT / NOV 2006

Note: Any correct answer not mentioned in the memorandum may be accepted as correct.

QUESTION 1
MULTIPLE-CHOICE QUESTIONS

1.1 B
1.2 B
1.3 B
1.4 B
1.5 C

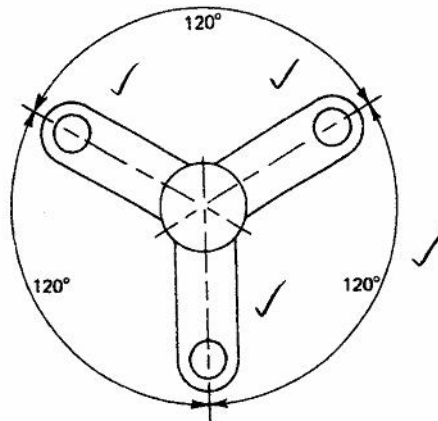
1.6 B
1.7 C
1.8 C
1.9 C
1.10 C

1.11 A
1.12 C
1.13 C
1.14 B
1.15 A

15x2=[30]

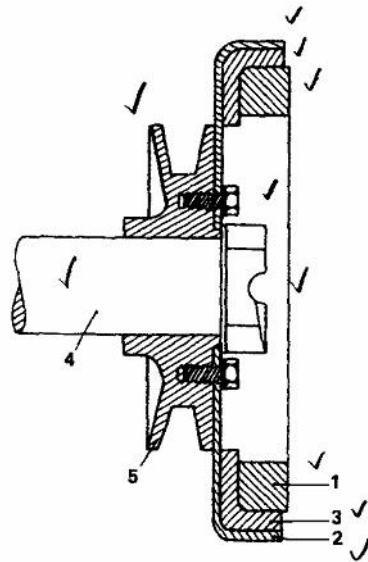
QUESTION 2
ENGINE BALANCE / CI ENGINES

2.1



(4)

2.2



- (1) metal flywheel
- (2) mounting disc
- (3) rubber layer
- (4) front of crankshaft
- (5) fan pulley

Sketch = 8
Any two labels = 2

Reason: eliminates engine vibrations.

(12)

2.3

Uneven pressure on piston during power stroke

(2)

2.4

It is the even distribution of mass around the axis of rotation in all planes.

(3)

2.5

By making use of a primary and secondary fuel filter

(2)

2.6

Delivery valve

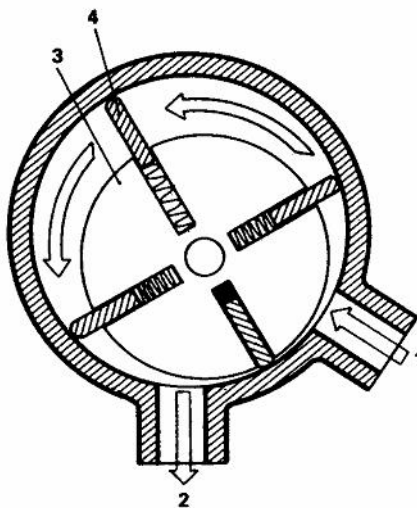
(2)

2.7

Position of the helix

(2)

2.8



- (1) Air inlet
- (2) Air outlet
- (3) Rotor
- (4) Vanes

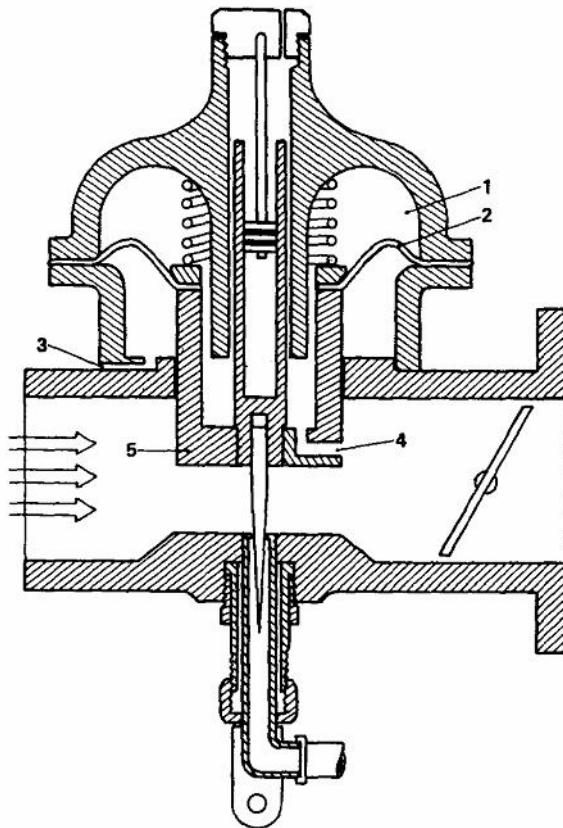
Vane-type blower or supercharger.

(7)
[34]

QUESTION 3
FUELS / CARBURETTORS

- 3.1 Fischer-Tropsch synthesis process (4)
- 3.2 "Ping" (2)
- 3.3
- 3.3.1 The ease with which a fuel is transformed from a liquid to vapour. (2)
- 3.3.2 Is the temperature at which sufficient inflammable vapour is given off to produce a momentary flash when an open flame is brought to its surface. (4)
- 3.4
- * Antioxidants
 - * Rust inhibitors
 - * Purifiers
 - * Antifreeze
 - * Metal deactivators
 - * Phosphor compounds
 - * Detonation stabilisers
 - * Ethylbromide
 - * Colouring
- (Any 4) 4x2=(8)

3.5



- (1) suction chamber
(2) diaphragm
(3) atmospheric port
(4) vacuum port
(5) piston

Diaphragm-type constant-vacuum carburettor.

(14)
[34]

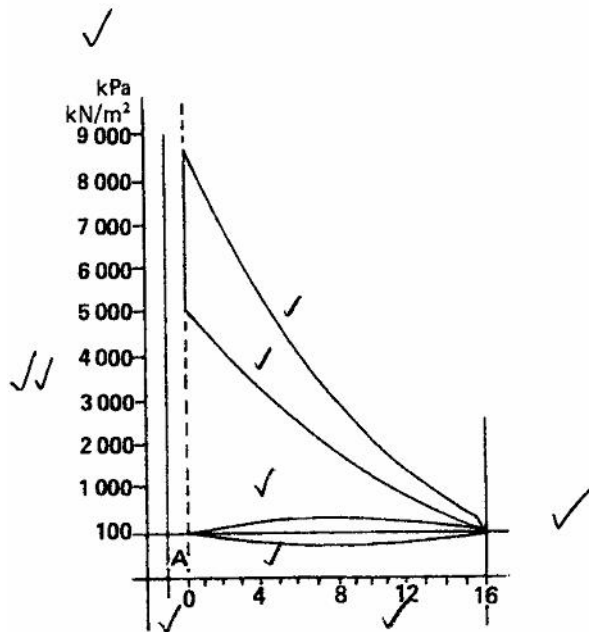
QUESTION 4
TERMINOLOGY AND CALCULATIONS

4.1
4.1.1 Is the unit that causes or inhibits movement or the tendency to move an object. (3)

4.1.2 It is the rate or speed at which work is done within a unit of time. (3)

4.2 $T = F \times R$
 $F = \frac{T}{R} \text{ PP}$
 $= \frac{40}{200} \times 1\,000 \text{ PP}$
 $F = 200 \text{ N PP}$ (6)

4.3



(10)

4.4 Indicated power (2)

4.5

4.5.1 Is the ratio of the actual volume of air / fuel mixture taken into the cylinder to the total or possible volume that can be taken into the cylinder. (4)

4.5.2 Is the ratio of the actual amount of heat energy transformed into mechanical energy to the total amount of heat energy released during the total combustion of a fixed quantity of fuel. (4)

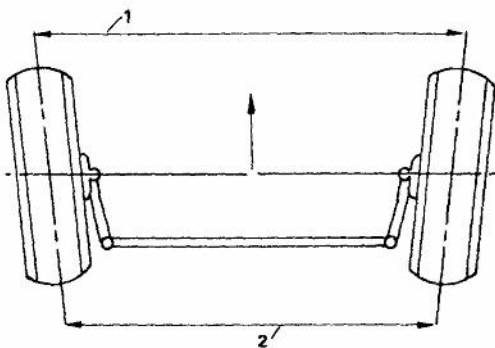
4.5.3 Is the ratio of brake power to indicated power. (2)

[34]

**QUESTION 5
DRIVES / WHEEL ALIGNMENT**

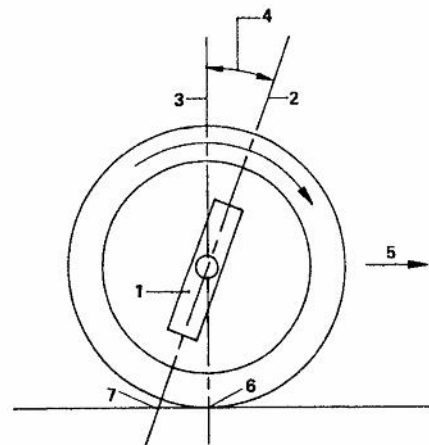
- 5.1
- 5.1.1 Second gear (2)
- 5.1.2 Reverse gear (2)
- 5.2 * Increases torque at pull away.
 * Shifting to higher gear ratio is done automatically.
 * Shifting to lower gear ratio is done automatically.
 * Smoother, easier driving (Any 2) (2)
- 5.3 Double-reduction final drive (2)
- 5.4 * Increases torque
 * Absorbs road shocks
 * Converts rotary motion of steering wheel into a reciprocating motion of front wheels (6)
- 5.5 * Engine power is absorbed by the hydraulic pump.
 * Road feeling on the steering wheel is lost.
 * More moving parts are subjected to wear.
 * Manufacturing costs are high. (Any 2) 2x1=(2)
- 5.6 Positive camber (2)
- 5.7 Degrees (2)
- 5.8

5.8.1



(5)

5.8.2



(7)

5.9 Toe-out on turns (2)
[34]

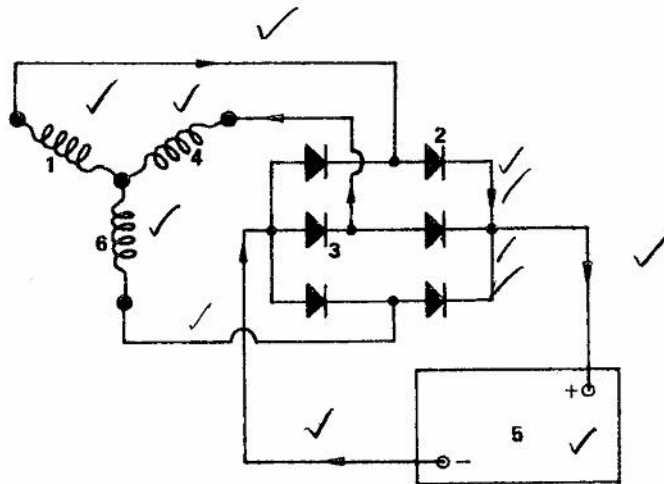
**QUESTION 6
ELECTRICITY**

6.1 Capacitor (2)

6.2 * Accumulator
* Ignition switch
* Transistor
* Primary coil
* Contact points (Any 4) 4x1=(4)

6.3 Convert alternating current to direct current. (2)

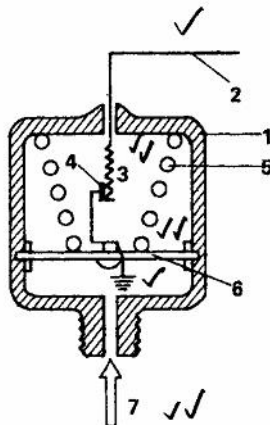
6.4



(12)

6.5 * Is made for either positive or negative earthing.
* Certain components are easily damaged by short circuits.
* Diodes are easily damaged by vibrations and overheating. 3x2=(6)

6.6



(8)
[34]

TOTAL: 200