

**DIPLOMA IN MECHANICAL ENGINEERING
(DME)**

Term-End Examination

December, 2013

BME-061 : AUTOMOBILE ENGINEERING

Time : 2 Hours

Maximum Marks : 70

Note : *Answer five questions. Q. No. 1 is compulsory. Use of scientific calculator is permitted.*

1. Choose the correct alternative in case of following multiple choice questions : 7x2=14
- (a) Suction and exhaust valves are used in :
- (i) two stroke engines
 - (ii) four stroke engines
 - (iii) both two and four stroke engines
 - (iv) none of the above
- (b) The function of piston rings is to :
- (i) seal the high pressure and low pressure side of cylinder
 - (ii) to prevent leakage
 - (iii) scrap the lubricating oil
 - (iv) to provide all the above functions

- (c) Which is not the part of magneto ignition system ?
- (i) battery (ii) distributor
(iii) spark plugs (iv) condenser
- (d) A simple gear train consists of two gears which are mounted on two different shafts. Gear 1 which is driver runs at 1000 rpm. Gear 1 and 2 are having 20 and 40 teeth respectively. What will be its train value ?
- (i) 2 (ii) $\frac{1}{2}$
(iii) 500 (iv) 1000
- (e) Slip joint is a component of :
- (i) universal joint (ii) differential
(iii) propeller shaft (iv) final drive
- (f) Bleeding of brakes is the process of :
- (i) cleaning of braking system
(ii) adding brake fluid in the linings
(iii) removal of air from the brake tubes
(iv) removal of dirt from the brake fluid
- (g) Toe-in is provided to :
- (i) prevent excessive tyre wear
(ii) stabilize steering and prevent slipping
(iii) ensure that wheels roll parallel
(iv) ensure all the above

2. Draw schematic diagram of a 4-stroke petrol engine and give brief description of its various components and related terms. 14
3. Describe the charging system of an automobile electrical system. List its components and describe their working. 14
4. Describe the function of following components : 4x3.5=14
- (a) Clutch
 - (b) Differential
 - (c) Hydraulic brakes
 - (d) Leaf springs
5. Describe the working of constant mesh gear box with the help of a suitable sketch. List various advantages of this type of gear box. 14
6. What are the functions of a rear axle ? List various types and describe any two. 14
7. A compound gear train transmits power from motor shaft to output shaft as shown in the given figure. The motor shaft is connected to gear 1 and output shaft to gear 4. Gears 2 and 3 are mounted on same shaft. The speed of motor shaft is 2500 rpm and it rotates in clockwise direction. 14

If number of teeth on gear 1, 2, 3 and 4 are 60, 150, 40, and 100 respectively, determine the speed and rotation of output shaft.

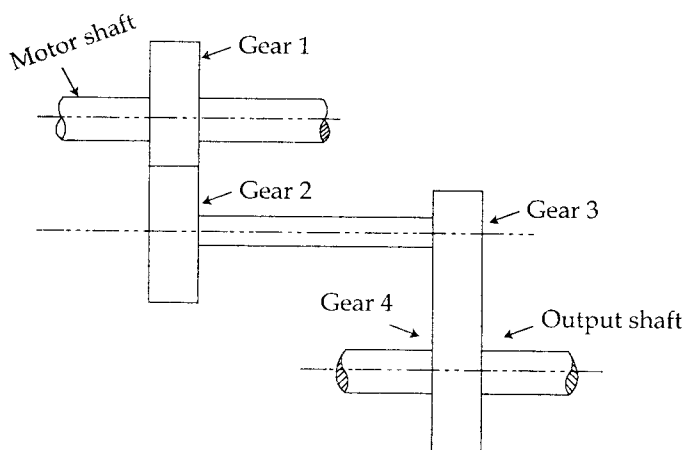


Figure : Compound gear train.