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B.E. (Mechanical) (Part - IV) (Semester - VII) (Revised) (New)

Examination, November - 2016

AUTOMOBILE ENGINEERING (Elective - I)

Sub. Code : 67506

Day and Date : Wednesday, 23 - 11 - 2016

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Draw neat sketches wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Make suitable assumption if necessary.
 - 5) Use of non-programmable calculator is allowed.

Q1) a) Explain with neat diagram, front engine rear wheel drive layout and write its advantages and disadvantages. **[8]**

b) Which are the different types of chassis? What are the materials used for chassis frames? **[8]**

Q2) a) With the help of suitable diagram, describe the constructional features of a diaphragm spring type clutch. Discuss its advantages and disadvantages relative to the clutch employing helical springs (coil spring). **[9]**

b) What is an overdrive? Explain its construction and discuss its working with sketch. **[8]**

OR

Discuss with neat sketch of principle and working of differential.

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- Q3)** a) Which are two types of steering mechanism? Explain any one of them with neat sketch. [8]
- b) What is mean by active suspension? With neat sketch explain air suspension. [9]

OR

Which are the different types of independent suspensions? Explain any one of them with neat sketch.

Q4) Solve any three questions:

- a) What are various types of brakes? Compare drum brakes with disc brakes. [6]
- b) Explain with neat sketch working of air brakes. List advantages. [6]
- c) Explain with layout sketch working of ABS list advantages [6]
- d) Define tyre size and catogeries of tyres. What are various tyre specifizations. List causes of tyre wear. [6]

Q5) Solve any two questions:

- a) Explain with sketch battery construction. How battery produces electricity and how charging can be done? Explain. [8]
- b) Explain with neat sketch working of magneto ignition system. Compare with battery ignition system. [8]
- c) Explain with neat sketch electronic controlled engine & vehicle management system. [8]

Q6) Solve any two questions:

- a) Explain various resistances to vehicle motion? How to estimate total resistance to vehicle motion and power required to propel vehicle. [8]
- b) Explain various factors affecting air resistance to vehicle motion? How to reduce each of them. [8]
- c) A vehicle specifications are as follows [8]

Vehicle weight - 7975.5 N

Power - 14.7 KW @ 2500 rpm

Speed of 2500 rpm - 64.37 kmph in top gear

Gear box bottom ratio - 3.5 : 1

Transmission effi. - 88% in top gear

Transmission effi. - 80% in bottom gear

Wheel diameter - 0.762 mts.

Frontal area of vehicle - 1.116 m²

Coest. of air resi. k_a - 0.0314

Coent of polling resi. k_r = 0.023

Estimate

- i) Speed of vehicle in bottom gear
- ii) Tractive effort available at wheels in top and bottom gear
- iii) Gradient can climb in bottom gear

