(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4022 Roll No. | | | | | | | | | | |

B.Tech.

SEVENTH SEMESTER EXAMINATION, 2004-2005

AUTOMOBILE ENGINEERING

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt ALL questions.*

(ii) All questions carry equal marks.

1. Attempt *any four* parts of the following : (5x4=20)

(a) Name various types of resistances encountered by a moving vehicle. How can these resistances be minimised ?

(b) Why should we use a gear box on auto -vehicles ?

(c) What do you mean by 'gear ratio' ? What is the significance of low and high gear ratios ?

(d) Draw layout of a valve operating mechanism for an overhead valve engine.

(e) Why maximum power and maximum torque is not produced at the same r.p.m. in an engine ?

(f) Write short notes on the following :

(i) Tractive effort

(ii) Gradeability of a car

(iii) Taxable horsepower of a vehicle

2. Attempt ***any four*** parts of the following : (5x4=20)

(a) Explain the difference between Hotchkiss drive and Torque tube drive with the help of neat sketches.

(b) What is the need of a clutch in the transmission system ? Write down the requirements of a good clutch.

(c) Enlist the components used in an overdrive and explain the working of free wheel unit.

(d) What is the need of using a differential assembly ? Why is it essential to employ a final drive ?

(e) What is wheel alignment and which are its inter-related factors ?

(f) What is self-righting torque ? How slip angle affect the self righting torque ?

3. Attempt ***any two*** parts of the following : (10x2=20)

(a) What is the function of master cylinder ? Explain the working of master cylinder and wheel cylinder with the help of neat sketches.

(b) How is the vacuum form the engine inlet manifold utilized to actuate the vehicle brakes ? Explain fully with diagrams.

(c) Explain the construction and working of a telescopic type of shock absorber with the help of a neat diagram.

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4. Attempt *any two* parts of the following : (10x2=20)

(a) Draw the wiring system of a typical passenger car lighting system.

(b) What are the fuel-air requirements of a carburettor at different operating conditions ? Describe the provisions made to overcome idling and low speed difficulties.

(c) Sketch and explain the construction and working of a diesel fuel injector. What do you understand by injector needle lift pressure ? How it affects the combustion ?

5. Attempt *any two* parts of the following : (10x2=20)

(a) What role lubricating oil plays in the working of an engine ? What characteristics lubricating oil should possess ? Explain the lubricating system employed in 2-stroke engines.

(b) Which are the different types of radiators ? Describe them. What are the main properties of anti-freeze solutions used in cooling ? Name some of the anti-freeze solutions in practice.

(c) What is preventive maintenance ? Explain the various steps in this regard. Give some suggestions for maintaining a vehicle.

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