

Code No: 07A72402

R07

Set No. 2

IV B.Tech I Semester Examinations, November 2010
AUTOMOTIVE CHASSIS AND SUSPENSION
Automobile Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Sketch and explain construction and working of Master cylinder.
(b) List and explain the factors affecting the performance of brakes. [8+8]
2. Discuss the laboratory of test of an engine. What major parameters are tested in Laboratory? [16]
3. Give the classification of two wheeler. List some two wheelers. Give the difference between two wheelers & three wheelers. [16]
4. (a) Discuss classification of Automobiles.
(b) Sketch and explain front wheel drive system. [8+8]
5. What is combined angle discuss the effect of combined angle. Discuss in detail. How is it different from other angles? [16]
6. (a) What are the requirements of good steering system?
(b) Draw a neat layout of complete steering system and discuss each component. [4+12]
7. What is an independent suspension system? Explain with neat sketch single arm perpendicular type and double arm perpendicular type suspension system. [16]
8. What are the implications of providing proper inflation in the tyres? Do you believe that steer characteristics of a vehicle are improved by using lower pressure at the front and higher pressure at the rear. [16]

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R07**Set No. 4**

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Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Derive an equation for condition for perfect rolling of all wheels.
 (b) With neat sketch explain Ackermann steering mechanism. [8+8]
2. Draw the neat sketch of simple carburetor explain working principles of the same. [16]
3. Draw the neat sketch of differential unit in rear wheel & explain its working? [16]
4. (a) With neat sketches describe the construction of
 - i. Disc Wheel
 - ii. Wire Wheel
 Compare the advantages and disadvantages.
 (b) List the requirement of a good tyre
 (c) A car has a wheel base of 2520 mm and pivot centre of 1100 mm. The front and rear tracks are 1400 mm each. If inside lock angle is 43° , Determine
 - i. The correct outside lock angle.
 - ii. Maximum and minimum turning circle radii. [4+4+8]
5. What is function of shock absorber? Give the classification of shock absorber. Give the details of same? [16]
6. How you are going to prepare the test report of engine testing? What are the points to be considered while preparing a test report? [16]
7. Sketch and explain the following performance characteristics for a petrol engine driven vehicle.
 - (a) Variation in tractive effort against vehicle speed in first, second, third and top gear.
 - (b) Total resistance against vehicle speed on level road. [16]
8. An automobile brake of the internal expanding type has a leading and a trailing shoe which work inside a brake drum of 0.38 m diameter. The brake shoes are pinned together at the bottom 0.15m away from the brake drum center. The free ends of the two shoes are forced apart each with a force of 311.5N which may be considered as acting at a distance of 0.3m from the fixed pin. Assuming the normal pressure on the brake shoe to act at right angles to the line joining the pin centre with the brake drum centre and the point of application of the resultant frictional

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force to act at a distance of 0.22 m from the brake drum centre, determine the braking torque provided by the leading and trailing shoe. Take the coefficient of friction between the shoe and the drum as 0.4. [16]

FIRSTRANKER

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R07**Set No. 1**

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Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain in detail the construction of tubed and tubeless tyres for automobiles.
(b) Differentiate between cross ply and radial ply tyres.
(c) Discuss the properties expected in an automobile tyre. [6+4+6]
2. Draw the neat sketch of front axle. Give the method of manufacturing & material of the same? [16]
3. (a) Explain with neat layout the working of rear wheel drive. List the advantages and disadvantages of it.
(b) List advantages & disadvantages of 4 wheel drive. [10+6]
4. (a) What is the difference between braking distance and stopping distance?
(b) Explain the concept of brake efficiency due to brake force distribution and comment on the methods to improve it.
(c) How will we specify the required brake retardation for
 - i. dry asphalted road
 - ii. roads having a thin 2mm layer of water
 - iii. pavements covered with melting snow. [4+6+6]
5. Draw the layout of air suspension system & Explain briefly the action of air spring in automobiles? [16]
6. (a) Explain classification of brakes.
(b) Derive an expression to show that the torque at leading shoe is greater than torque at trailing shoes. [4+12]
7. What is function of carburetors in two - three wheeled vehicles? Draw & explain starting, idling & running circuits in a typical carburetor? [16]
8. How you are going to conduct wheel balancing test in laboratories & explain major precautions taken in this test? [16]

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R07**Set No. 3**

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Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. With neat sketches, explain working principle of Four - stroke petrol engine in detail? [16]
2. (a) Write an explanatory note on types rear axle casing?
(b) Discuss the power transmission in a vehicle while taking a turn. [8+8]
3. (a) Give the types of leaf springs in detail & Discuss helper springs in detail?
(b) List out the different type of helper spring in detail? [10+6]
4. (a) Explain working of four wheel drive.
(b) Sketch & explain front wheel drive system. [8+8]
5. (a) Explain different types of frames used in automobiles. Indicate materials used.
(b) The bending moment diagram for the channel section frame shows a maximum value of 200Nm. Ascertain the suitability of the following section : width = 80mm, height = 220mm, thickness = 6.5mm, Permissible stress = 80Mpa. [8+8]
6. (a) A motor car has a wheel base of 2.64m, the height of its center of gravity above the ground is 0.61 m and it is 1.12m in front of the rear axle. If the car is traveling at 40km/hr on a level track, determine the minimum distance in which the car may be stopped, when
 - i. The rear wheels are braked
 - ii. The front wheels are braked
 - iii. All wheels are braked.The coefficient of friction between tyre and road may be taken as 0.6.
(b) Explain pneumatic brakes used in automobiles. [10+6]
7. What are the different types of road tests conducted for vehicle? Explain mileage Test in brief. [16]
8. What is meant by power steering? Sketch any one power steering system and explain its working. [16]
