(b) Define spring rate and spring index of the coil spring. **2**

(c) Describe elaborately the constructional details and characteristics of Multi-leaf and coil springs. Also tell the advantages of using coil spring over leaf spring ? **10**

Unit IV

7. Explain in detail the design of full floating and semi-floating rear shaft and axle housing with neat sketches. **15**

8. Find out the weight of the mild steel propeller shaft having 4 mm outside diameter used to transmit a maximum engine power of 28 kW at 1500 rpm and its first gear ratio of vehicle being 3.06. The safe shear stress of 55×10^3 kPa and the length of the shaft is 1 m. Take density of mild steel as 7860 kg/m^3. **15**

No. of Printed Pages : 04 **Roll No. .....**

F-194

B. Tech. EXAMINATION, May 2018

(Sixth Semester)

(B. Scheme) (Main & Re-appear)

(AE)

AE308B

AUTOMOTIVE CHASSIS DESIGN

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. A single plate clutch having a single driving plate with contact surfaces on each side is required to transmit 110 kW at 1250 rpm. The outer diameter of the surfaces is to be 300 mm. The coefficient of friction is 0.4.

(a) Assuming a uniform pressure of 0.17 N/mm^2,, determine the inner diameter of the friction surfaces.

(b) Assuming the same dimensions and the same total axial thrust, determine the maximum torque that can be transmitted and the maximum intensity of pressure when uniform wear conditions have been reached. **15**

2. Explain in detail the design of roller and sprang type clutches. **15**

Unit II

3. Write short notes on the following : **5+10=15**

(a) Traction and tractive effort

(b) Design of four speed gear box.

4. An automotive gear box 3 forward speeds and one reverse with a top gear of unity and bottom and reverse gear ratio of approximately 3.3 : 1. The center distance between the shaft is to be 110 mm approximately. Gear teeth of module 3.25 mm are to be employed. Sketch the layout of constant mesh gear box for these conditions giving the number of teeth for the various gear wheels and showing closely how the different ratios are obtained. **15**

Unit III

5. (a) What are the forces and moments the automobile frame has to withstand ? **5**

(b) Explain, how thse torsional stiffness and bending regidity of ladder types vehicle frame may be tested in the laboratory. Supplement your answer with sketches of the test set-up. **10**

6. (a) What are Shock. Absorbers ? How do they differ from coil spring suspension ? **3**