Printed Pages : **NAU-603/EAU-603**

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

PAPER ID : **Roll No.** | | | | | | | | | | |

B.TECH.

Theory Examination (Semester-VI) 2015-16

DESIGN OF AUTOMOTIVE COMPONENTS

Time : 3 Hours ***Max. Marks : 100***

Note:- Attempt **all** questions.

1. Attempt **all** parts of this question: **(10 x 2=20)**

a) What are the functions of clutch?

b) List various types of clutch.

c) What are the different types of friction material used on a clutch plate?

d) What do you understand by overdrive?

e) What is fluid drive? How does it differ from gear drive?

f) What are the functions of suspension in motor vehicle?

g) What do you understand by chassis?

h) What is the difference between integral and semi-integral frames?

i) What is a plain bearing?

j) What are the types of sections used to make the frame?

SECTION B

2. Attempt any **five** questions of the following: **(10 x 5=50)**

a) What is the need of a clutch in an automobile? Explain the working of centrifugal clutch.

b) Explain the construction and working of a multiplate clutch with a suitable diagram. How does the number of plates affect the working of this clutch?

c) Write short notes on following:

i. Torque reaction **ii.** Differential lock

iii. Double reduction axle **iv.** Pnahard rod

d) What is necessity of synchromesh gear box in an automobile? Explain the working of synchronizer used in a gear box with neat sketch.

e) What are the merits and demerits of frame less construction over frame type construction in the case of cars?

f) Classify the rear axles on the basis of their mounting styles. Sketch and explain the mounting details of wheel on (i) semi-floating, (ii) three-fourth floating, and (iii) full-floating axles. Which style is the best and why?

g) Sketch a chassis of any four wheelers and mark various parts on it. Describe the function of a suspension system, ignition system, and clutch system.

h) Differentiate between multi-axle and multi-wheel rigid vehicle. Explain various configurations for layout of axles and wheels in them.

SECTION C

Attempt any **two** questions of the following: **(15 x 2=30)**

3. Enumerate various types of propeller shaft. What are different loads, moments and stresses experienced by a propeller shaft, and what preventions are incorporated in its design to combat them?

4. Discuss different kinds of loads being experienced by the frame. Under what situations are such loads produced? Consequently, what stresses are induced in the frame? Suggest the measures taken-up in construction of the frame to combat these loads and stresses.

5. A sliding mesh gearbox is to be designed for approximate gear ratios in forward speeds as 1.0, 1.6 and 2.6, and in reverse speed as 3.15. The smallest gear to be used is to have at least 12 teeth of 4 mm diametral pitch. If centre to centre distance between main shaft and the layshaft is 84 mm, estimate the number of teeth on all gears. Accordingly, calculate the exact gear ratios thus available.