

SECTION I. FOURTEEN (14) COMPULSORY QUESTIONS.

01. Classify the gear boxes used in automobile into the types listed below:

- a) Selective gear box. **3marks**
- b) Automatic gear box. **2marks**

02. Make a simplified sectional diagram of a torque converter and describe it. **5marks**

03. An engine develops a torque of 108Nm. The clutch disc has a mean radius of 75mm and the coefficient of friction between the rubbing pair is 0.4. If there are six (6) thrust springs, what clamping force must each spring provide to transmit this torque? **3marks**

*Shock
Chock*

04. What are the conditions to be met by the brake fluid? **3marks**

05. List four (4) functions that a suspension damper has to perform for security of passengers & vehicles. **4marks**

06. Quote and comment on the requirements to be met by a special oil for automatic transmission. **5marks**

07. Why are helical gears preferred in transmission? **3marks**

08. Describe how can the alignment of the front wheels be checked? **2marks**

09. What are the different angles that form the steering geometric? **4marks**

10. Which faults may be present when a gear of manual gearbox jumps out? **4marks**

11. Define: a) toe-in
b) toe-out **3marks**

12. After cleaning and examining a bearing, what are the important causes that lead to his reshuffles? **5marks**

13. a. If a manual transmission is only noisy in all gears, what does that tell you about the problem? **3marks**

b. What can be caused by milk transmission oil? **2marks**

14. a) A gearbox is experiencing poor synchronisation. Give possible causes for this. **2marks**

b) What are the two functions of a transmission synchronis? **2marks**

Shock

Toe, Camber, Caster, Kingpin inclination

SECTION II. ATTEMPT ANY THREE (3) QUESTIONS.

15. A vehicle has its steering set to provide a turning-circle radius of 4.5m with a wheel-track width of 1.4m. If the effective road-wheel rolling diameter is 0.8m, determine the number of complete revolutions made by the inner and outer wheels for one turning circle. **10marks**
16. Perform a control of a disassembled clutch mechanism. **10marks**
17. Name the possible causes of (trouble shooting in an automatic transmission):
- a) fluid discolored or smells burnt.
 - b) Vehicle doesn't move in any forward range or reverse. **10marks**
18. Discuss ten (10) main causes of tyre wear. **10marks**
19. What are the requirements of tyres (in general)? **10marks**

SECTION III. ATTEMPT ANY ONE (1) QUESTION.

20. Among the defects of steering, what are those may cause the squeal of:
- (a) hard steering
 - (b) Poor return
 - (c) Abnormal noise? **15marks**
21. Name (a) eight conditions that would cause the car to pull to one side when braking (drum brakes) and (b) six conditions in a disk-brake system that would require excessive pedal travel to produce braking. **15marks**
22. Describe the symptom (how would the driver notice) and the cause (what caused the problem to occur) of the following:
- a. Clutch drag **10marks**
 - b. Clutch slip. **5marks**

*chork
Shock*

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