Clutch Diagnosis and Repair

1) Which of the following are the three critical clutch pedal measurements?
   a. Pedal height, apply pressure, and free play
   b. Pedal free play, reserve, and operating range
   c. Pedal height, free play, and reserve
   d. Pedal reserve, height, and kickback pressure

2) Clutch slippage may be caused by which of the following?
   a. Worn or rough clutch release bearing
   b. Excessive input shaft end play
   c. Leaking rear main seal
   d. Weak or broken torsional springs

3) Which of the following must be replaced during the service of a hydraulically controlled clutch?
   a. Input shaft
   b. Pilot bearing
   c. Clutch linkage
   d. Clutch fluid

4) A vehicle comes in with hard shifting concerns, particularly into first gear. Technician A says the first speed blocking ring is the MOST likely cause. Technician B says the clutch could be out of adjustment. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

5) If a transmission can be shifted into two gears at the same time, which of the following is the MOST likely cause?
   a. Defective input bearing
   b. Faulty interlock
   c. Worn speed gears
   d. Worn countershaft bearings

6) What would be the MOST likely customer complaint for a damaged transmission case, center adapter plate or rear extension housing mate surface?
   a. Jumps out of gear
   b. Hard to shift
   c. Will not shift
   d. Oil leak
7) What disassembly operation is being performed in the photo below?

a. Removing the snap ring retaining the input shaft bearing
b. Removing the snap ring retaining the output shaft bearing
c. Removing the snap ring retaining the cluster gear bearing
d. Removing the snap ring retaining the reverse gear bearing

8) The manual transmission fluid is being checked during a routine maintenance. Technician A says gold-colored particles in the fluid can be from worn blocking rings. Technician B says aluminum colored shavings can be from the gear wear. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

Transaxle Diagnosis and Repair
9) What is being checked in the illustration below?

a. Differential side bearing preload
b. Input and output shaft bearing preload
c. Nominal play from input shaft
d. Differential side bearing play

10) This question has the word EXCEPT. For this question, look for the choice that could NOT cause the described condition. Read the entire question carefully before choosing your answer. All of these components can be removed from a transmission/transaxle before removing if from the vehicle, EXCEPT:

a. Vehicle speed sensor
b. Reverse (backup) light connector
c. Front bearing retainer (quill)
d. Axle drive shafts

11) Two technicians are discussing snap rings used in manual transaxles. Technician A says snap rings are used as a selective fit on some main shafts. Technician B says snap rings have a “right side” that should always face up so that the snap ring pliers can be applied. Who is right?

a. A only
b. B only
c. Both A and B
d. Neither A nor B

12) A transaxle jumps out of gear under load. Which of the following is the MOST likely cause?

a. Worn or broken synchronizers
b. Clutch not adjusted correctly
c. Shift linkage is maladjusted, worn or loose
d. Transmission cover springs are weak
13) Technician A says U-joints must be in phase to prevent vibration. Technician B says when re-assembling a drive shaft the U-joints do not have to be in alignment for proper operation provided they are greased with the proper lubricant. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

14) Technician A say a vibration at high speed can be caused by an incorrect rear U-joint operating angle. Technician B says a squeaking noise in reverse is caused by a worn cross shaft bearing surface. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

15) Technician A says the drive shafts on a FWD (front wheel drive) vehicle are usually removed with a pry bar or special puller. Technician B says the axle nuts on a FWD vehicle are NOT reusable. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

16) Two technicians are discussing axle drive shaft removal on a vehicle with a transaxle. Technician A says that, when removing the axle, drive shafts match marks should be made to prevent a vibration after reassembly. Technician B says the front wheel bearings could be damaged if the vehicle is moved while the drive shafts are removed. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

Rear Wheel Drive Axle Diagnosis and Repair

17) A growling sound is heard from the rear of a RWD vehicle during cornering only. Technician A says incorrect drive pinion bearing preload could be the cause. Technician B says defective rear axle bearings may be the cause. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B
18) What rear axle measurement is being performed in the photo?

- a. Side bearing preload
- b. Backlash
- c. Ring gear runout
- d. Gear tooth pattern

19) What rear axle measurement is being performed in the photo?

- a. Side bearing preload
- b. Backlash
- c. Ring gear runout
- d. Gear tooth pattern

20) The ring gear to pinion backlash is less than specifications (too low). This will cause the ring gear tooth pattern to show contact in which of the following areas of the ring gear?
a. Toe contact on concave and convex sides
b. Heel contact on concave and convex sides
c. Flank contact on concave and convex sides
d. Face contact on concave and convex sides

**Four-Wheel and All-Wheel Component Diagnosis and Repair**

21) The owner of an older 4WD (four wheel drive) truck that uses Cardan U-joints to drive the front wheels complains that whenever turning sharply and accelerating rapidly a severe vibration is created. Technician A says the rear drive shaft may be out of balance. Technician B says this is normal condition for Cardan U-joints used on early 4WD vehicles. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

22) Two technicians are discussing the front axle neutral position on a 4WD pickup truck. Technician A says the front axles are disconnected if the vehicle is being towed. Technician B says the neutral position is also used on an AWD vehicle. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

23) A transfer case is extremely noisy in all selections except neutral (N) whenever the vehicle is moving. Technician A says the drive chain may be worn and loose causing the noise as it hits the inside of the case. Technician B says a transfer case bearing could be defective. Who is right?
   a. A only
   b. B only
   c. Both A and B
   d. Neither A nor B

24) A transfer case will not shift from the low gear ratio up to direct drive or 1:1 ratio. Which of the following is the MOST likely cause?
   a. Broken shift shaft spring
   b. Faulty shift indicator
   c. Damaged planetary gearset
   d. Broken shift shaft