



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2014/2015**

COURSE NAME : INTRODUCTION TO AUTOMOTIVE TECHNOLOGY

COURSE CODE : BNG 20103

PROGRAMME : 2 BNG

EXAMINATION DATE : JUNE 2015 / JULY 2015

DURATION : 3 HOURS

INSTRUCTION : 1. SECTION A: ANSWER **ALL** QUESTIONS
2. SECTION B: ANSWER **TWO (2)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF **TEN (10)** PAGES

SECTION A

Q1 All of the following are functions of the charging system *except*:

- (a) Recharge the battery
- (b) Power electrical accessories
- (c) Supply power for the starter motor
- (d) Maintain the battery's state of charge

(0.5 mark)

Q2 Which vehicle system is responsible for turning on the "check engine" light?

- (a) The fuel system
- (b) The ignition system
- (c) The transmission control system
- (d) The OBD II system

(0.5 mark)

Q3 All of the following statements about superchargers are correct *except*:

- (a) Superchargers are driven by the engine crankshaft
- (b) Supercharges may require special lubrication
- (c) Intercoolers are not used with superchargers
- (d) Some vehicles use superchargers and turbochargers together

(0.5 mark)

Q4 The EGR system is designed to reduce which exhaust emission?

- (a) HC
- (b) CO
- (c) NO_x
- (d) CO₂

(0.5 mark)

Q5 Scan tools can perform all of the following *except*:

- (a) Retrieve DTCs
- (b) Perform battery tests
- (c) Reprogram control modules
- (d) Display freeze frame information

(0.5 mark)

Q6 Technician A says engines can be classified by their number of operating cycles. Technician B says engines are classified by the type of valvetrain used. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q7 How many degrees of crankshaft rotation are required to complete one complete combustion cycle?

- (a) 180
- (b) 360
- (c) 540
- (d) 720

(0.5 mark)

Q8 All of the following are advantages of diesel engines *except*:

- (a) Diesel engines use less fuel than gasoline engines
- (b) Improved cold weather starting capability
- (c) Increased durability compared to gasoline engines
- (d) Increased combustion efficiency

(0.5 mark)

Q9 Glow plugs in a diesel engine are used to

- (a) Ignite the air/fuel mixture
- (b) Heat the fuel before injection
- (c) Heat the intake air
- (d) Warm the engine coolant

(0.5 mark)

Q10 The purpose of the air conditioning condenser is:

- (a) Remove heat from the passenger compartment
- (b) Transfer heat to the air
- (c) Store refrigerant until it is needed
- (d) Lower the refrigerant pressure

(0.5 mark)

Q11 Technician A says when removing an engine, the A/C system must be discharged. Technician B says on some vehicles, the A/C compressor can be unbolted and moved aside so the system can remain charged. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q12 All of the following will cause higher AC generator output *except*:

- (a) Increasing current to the rotor
- (b) Increasing generator drive pulley diameter
- (c) Increasing the number of windings in the stator
- (d) Increasing the number of windings in the rotor

(0.5 mark)

Q13 Which of the following refrigerants is the most commonly used in modern vehicles?

- (a) R12
- (b) R152a
- (c) R132a
- (d) R744

(0.5 mark)

Q14 The most likely component to wear in a starter motor is

- (a) Field coils
- (b) Armature
- (c) Brushes
- (d) End frame

(0.5 mark)

Q15 Technician A says condensation occurs when a liquid turns into a vapor. Technician B says condensation occurs when a vapor turns into a liquid. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q16 All of the following are functions of a dual-mass flywheel *except*:

- (a) Reduce gear noise
- (b) Allow smoothing shifting
- (c) Reduce crankshaft oscillation
- (d) Increase torque applied to the input shaft

(0.5 mark)

Q17 Which of the following is the correct purpose of the clutch disc wave springs?

- (a) Increase disc application force
- (b) Reduce clutch chatter
- (c) Improve clutch disc cooling
- (d) Absorb torsional loads

(0.5 mark)

Q18 Technician A says the clutch is disengaged when the clutch pedal is depressed. Technician B says the clutch is engaged when the clutch pedal is depressed. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q19 All of the following are functions of the differential *except*:

- (a) Allow the drive wheels to turn at different speeds while cornering
- (b) Increases the speed of the drive wheels compared to the driveshaft
- (c) Directs torque to the drive wheels
- (d) Balances the forces on the drive wheels

(0.5 mark)

Q20 Which of the following is *not* a function of a synchronizer?

- (a) Allow shafts to match speed
- (b) Prevent more than one gear from applying during shifting
- (c) Lock the gears to the shaft
- (d) Act as a reverse idler gear

(0.5 mark)

Q21 Which of the following is *not* a function of the torque converter clutch?

- (a) Reduce transmission oil heat
- (b) Increase fuel economy
- (c) Increase torque output
- (d) Reduce engine speed

(0.5 mark)

Q22 All of the following are used to transfer power to the front and rear axles *except*:

- (a) Viscous clutch
- (b) Transfer case
- (c) Final drive assembly
- (d) Interaxle differential

(0.5 mark)

Q23 Technician A says CVT type transmissions use variable belts and pulleys to vary forward speeds. Technician B says CVT design eliminates the need for a torque converter. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q24 Which of the following statements about alignment adjustment are incorrect?

- (a) Control arm shims are used to adjust caster and camber
- (b) Eccentric cams are used only on MacPherson strut suspensions
- (c) Special shims may be needed to adjust rear caster or camber
- (d) Slotted holes may be used on upper controls to adjust camber

(0.5 mark)

Q25 What is the primary purpose of power-steering hoses?

- (a) To lubricate pump
- (b) To relieve pressure
- (c) To transmit power through fluid under pressure
- (d) None of the above

(0.5 mark)

Q26 Which of the following is *not* a common method of mounting a ball joint to a control arm?

- (a) Rivets
- (b) Welding
- (c) Press fit
- (d) Bolts

(0.5 mark)

Q27 Premature wheel bearing failure could be caused by all of the following *except*:

- (a) Incorrect lubricant
- (b) Incorrect endplay adjustment
- (c) Excessive lateral wheel runout
- (d) Incorrect wheel offset

(0.5 mark)

Q28 Which of the following can be found in air-adjustable suspensions?

- (a) Air compressor
- (b) Height sensor
- (c) Control module
- (d) All of the above

(0.5 mark)

Q29 All of the following statements about shock absorbers are true *except*:

- (a) Shocks support the weight of the vehicle
- (b) Shocks dampen spring oscillations
- (c) Shocks can be either oil or gas charged
- (d) Jounce and rebound resistance is generally 50%

(0.5 mark)

Q30 Which of the following is *not* a factor of brake fade?

- (a) Frictional surface area
- (b) Heat dissipation ability
- (c) Airflow around the brake assemblies
- (d) Static coefficient of friction

(0.5 mark)

Q31 A drum brake inspection is being attempted but the technician is having difficulty removing the brake drums. All of the following are possible causes *except*:

- (a) Incorrect parking brake adjustment
- (b) Excessive shoe-to-drum clearance
- (c) Wear ridge on the drum
- (d) Parking brake not fully released

(0.5 mark)

Q32 Which of the following components is used to link the engine and the automatic transmission?

- (a) Planetary gearset
- (b) Valve body
- (c) Torque converter
- (d) Overrunning clutch

(0.5 mark)

Q33 When replacing pads on a floating caliper disc brake system, Technician A says it is OK to let the caliper hang by the brake hose. Technician B says pads can often be removed from floating calipers without removing the caliper. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q34 All of the following are advantages of disc brakes *except*:

- (a) Increased resistance to fade
- (b) Increased effort for application
- (c) Improved straight-line stopping
- (d) Self-adjusting ability

(0.5 mark)

Q35 All of the following are components of a disc brake assembly *except*:

- (a) Caliper
- (b) Pads
- (c) Return spring
- (d) Hub and rotor

(0.5 mark)

Q36 All of the statements about drum brakes are correct *except*:

- (a) All drum brakes are self-adjusting
- (b) Drum brakes can multiply application force
- (c) Brake shoes can be either riveted or bonded
- (d) The anchor prevents shoe rotation

(0.5 mark)

Q37 Technician A says the backing plate supports the brake shoes. Technician B says the brake shoes supports the lining material. Who is correct?

- (a) Technician A
- (b) Technician B
- (c) Both A and B
- (d) Neither A or B

(0.5 mark)

Q38 Which of the following is *not* a factor in brake lining material?

- (a) Noise generation
- (b) Dust generation
- (c) Coefficient of friction
- (d) Heat dissipation

(0.5 mark)

Q39 All of the following statements about tires are true *except*:

- (a) Rolling resistance should be low
- (b) Tube tires are the most commonly used
- (c) Sipes are used to increase wet traction
- (d) Nylon cording can cause a rough ride when cold

(0.5 mark)

Q40 A tire with excessive lateral runout will try to _____ when it rotates.

- (a) Hop
- (b) Shimmy
- (c) Pull
- (d) All of the above

(0.5 mark)

SECTION B

- Q1** (a) List down at least **six (6)** main components of drum brake.
(3 marks)
- (b) Discuss the different between fixed caliper and floating caliper.
(3 marks)
- (c) Explain the function of brake wear indicator and illustrate the condition of new pad and worn pad.
(4 marks)
- Q2** (a) Explain the function of flywheel in clutch system.
(4 marks)
- (b) In clutch disc construction, grooves are cut across the face of the friction facings. Analyze what will happen if there are no grooves at the friction facings.
(6 marks)
- Q3** (a) Illustrate the basic refrigerant cycle.
(2 marks)
- (b) Differentiate between the functions of condenser and evaporator in air conditioning system.
(4 marks)
- (c) Compare the different between dryer and accumulator in air conditioning system and state the equivalent of these two parts.
(4 marks)
- Q4** (a) Explain the different between gasoline and diesel 4 stroke engines.
(3 marks)
- (b) Discuss the operation of supercharger in internal combustion engines.
(2 marks)
- (c) Define the EGR and discuss the function of EGR in internal combustion engines.
(5 marks)

- END OF QUESTION -