

**SIR ARTHUR LEWIS COMMUNITY COLLEGE**  
**DIVISION OF TECHNICAL EDUCATION AND MANAGEMENT STUDIES**

**EXAMINATION SESSION** : May 2015 Final Examination

**TUTOR (S)** : Mr. Rohan John Baptiste

**PROGRAMME TITLE** : Automotive Engineering

**PROGRAMME CODE** : 3ME-AUT-AD

**COURSE TITLE** : Automotive Theory and Practice

**COURSE CODE** : EGP 217

**CLASS (ES)** : Year 2's

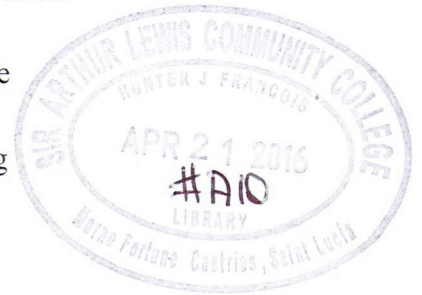
**DATE** : Wednesday 13<sup>th</sup> May, 2015

**COMMENCEMENT TIME** : 1:00 pm

**DURATION** : 2 ½ hours

**INVIGILATOR (S)** : A. Carrazana, T. Warner

**ROOM** : TRA-R3



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**INSTRUCTIONS:**

**SECTION I:** Multiple Choice

One mark for each correct answer. Use the answer sheet provided.

**SECTION II:** Fill in the blanks one mark each.

**SECTION III -** Essay questions, marks are awarded accordingly.

- Students are reminded to read **all** questions and instructions in each section very carefully
- Please number your responses accordingly
- **Note: Bags, Books as well as writing paper not given by the invigilator should be deposited at the front of the examination room or as otherwise indicated.**
- **All cell phones must be turned off during the exam**

Students must **not** write their names on their answer sheets, only their **ID number**

## SECTION I - MULTIPLE CHOICE

1. Which of the following is not a possible function of the ignition distributor?
  - (A) House the ignition coil
  - (B) Power the engine oil pump
  - (C) Transfer high voltage to the coil
  - (D) Distribute coil pulses to each plug wire
2. An ignition control module can be located at each of these spots except
  - (A) In the vehicle's trunk
  - (B) Inside the distributor
  - (C) Under the vehicle dash
  - (D) In the engine compartment
3. Which of the following spark plug components causes electricity to jump the gap and return to the battery through frame ground?
  - (A) Shell
  - (B) Insulator
  - (C) Side electrode
  - (D) Center terminal
4. Which of the following is not part of a simple circuit?
  - (A) Wheatstone bridge
  - (B) Load
  - (C) Power source
  - (D) Conductors
5. The three elements of electricity are
  - (A) Watts, volts, and ohms
  - (B) Current, voltage, and resistance
  - (C) Both A and B
  - (D) Neither A nor B
6. As battery temperature drops, battery power is \_\_\_\_\_.
  - (A) Increased
  - (B) Reduced
  - (C) Unaffected
  - (D) Fluctuates up and down
7. An automotive battery produces:
  - (A) Hydrogen gas
  - (B) Voltage
  - (C) Direct current
  - (D) All of the above
8. Technician A says some late – model starting systems are programmed to open the circuit between the ignition key and starter solenoid when the engine is running. Technician B says this prevents the driver from accidentally engaging the starting motor while the engine is running. Who is right?
  - (A) A only
  - (B) B only
  - (C) Both A and B
  - (D) Neither A nor B
9. The starter solenoid is located \_\_\_\_\_.
  - (A) On the starter motor
  - (B) On a body panel away from the starter motor
  - (C) In the starter motor itself
  - (D) Both A and B
10. All of the following are parts of the field frame, except:
  - (A) Field coils
  - (B) Center housing
  - (C) Commutator

- (D) Shoes
11. Technician A says a movable pole shoe starter uses a yoke lever to move the pinion gear. Technician B says a movable pole starter has a plunger that moves a shift lever to engage the pinion gear. Who is right?
- (A) A only
  - (B) B only
  - (C) Both A and B
  - (D) Neither A and B
12. All of the following are used to increase starter motor power and smoothness, except:
- (A) Several loops of wire
  - (B) A commutator with no segments
  - (C) A commutator with segments
  - (D) Connecting each winding to its own segment on the commutator
13. A (n) \_\_\_\_\_ is a stationary insulated wire wrapped in a circular shape.
- (A) Field winding
  - (B) Armature
  - (C) Commutator
  - (D) Pinion
14. Where is the neutral safety switch mounted on cars with automatic transmissions?
- (A) On the shift lever
  - (B) On the transmission
  - (C) On a body panel
  - (D) Both A and B
15. The neutral safety switch is wired into the circuit going into the \_\_\_\_\_.
- (A) Starter motor
  - (B) Starter solenoid
  - (C) Starter relay
  - (D) None of the above
16. A \_\_\_\_\_ uses small current from the ignition switch to control a slightly higher current to the starter solenoid.
- (A) Transistor
  - (B) Diode
  - (C) Starter relay
  - (D) Neutral safety switch
17. All of following are advantages of the alternator, except:
- (A) Smaller than a dc generator
  - (B) Heavier than a dc generator
  - (C) More dependable than a dc generator
  - (D) Has higher output than a dc generator
18. The alternator current must be \_\_\_\_\_ into direct current before entering the vehicle's electrical system.
- (A) Forward biased
  - (B) Rectified
  - (C) Reverse biased
  - (D) None of the above
19. All of the following are main components in a typical alternator, except:
- (A) Rotor assembly
  - (B) Brush assembly
  - (C) Charge indicator

(D) Housing

20. Technician A says alternator bearings are usually roller bearings. Technician B says alternator front bearings are usually press – fit. Who is right?

- (A) A only
- (B) B only
- (C) Both A and B
- (D) Neither A nor B

21. An alternator uses all of the following for power, except:

- (A) V – belt
- (B) Chain
- (C) Cogged V – Belt
- (D) Ribbed belt

22. Technician A says alternator speed determines whether the regulator increases or decreases charging output. Technician B says alternator temperature determines whether the regulator increases or decreases charging output. Who is right?

- (A) A only
- (B) B only
- (C) Both A and B
- (D) Neither A nor

23. Which of the following is not part of a torque converter?

- (A) Band
- (B) Stator
- (C) Impellor
- (D) Turbine

24. Technician A says an automatic transmission’s input shaft transfer power from the valve body to the gearsets. Technician B says an automatic transmission’s input shaft transfers power from the gearset to the drive shaft. Who is right?

- (A) A only
- (B) B only
- (C) Both A and B
- (D) Neither A nor B

25. Technician A says the term “torque multiplication” refers to the ability of a torque converter to increase the amount of engine torque applied to the transmission output shaft. Technician B says the term “torque multiplication” refers to the ability of a torque converter to increase the amount of engine torque applied to the transmission input shaft. Who is right?

- (A) A only
- (B) B only
- (C) Both A and B
- (D) Neither A nor B

26. The drive members of the clutch assembly include the following parts:

- i. Flywheel, clutch disc, and pressure plate
- ii. Clutch disc, pressure plate, and throw-out bearing

- (A) i only
- (B) ii only
- (C) Either i and ii
- (D) Neither i and ii

27. The clutch pressure plate holds the clutch disc against the flywheel by:

- i. Spring pressure
  - ii. Friction
- (A) i only  
(B) ii only  
(C) Either i and ii  
(D) Neither i and ii

28. The clutch is usually:

- i. Of one- piece construction
  - ii. A multiple disc
- (A) i only  
(B) ii only  
(C) Either i and ii  
(D) Neither i and ii

29. The clutch disc springs are design to

- i. Absorb the shock of clutch application
  - ii. Keep the clutch disc in position
- (A) i only  
(B) ii only  
(C) Either i and ii  
(D) Neither i and ii

30. Clutch pedal free play travel is necessary to help:

- i. Prevent clutch disc slippage
  - ii. Protect the throw out bearing
- (A) i only  
(B) ii only  
(C) Either i and ii  
(D) Neither i and ii

## SECTION II - FILL IN THE BLANKS

1. Dwell time is not \_\_\_\_\_ in an electric ignition system.
2. It normally takes about \_\_\_\_\_ to \_\_\_\_\_ volts to operate a spark plug.
3. A direct ignition system has an ignition coil mounted \_\_\_\_\_ each spark plug.
4. A \_\_\_\_\_ sensor is commonly installed in place of the ignition distributor.
5. \_\_\_\_\_ is a mixture of sulfuric acid and distilled water.
6. A 12 volt battery has six cells that produce an open circuit voltage of \_\_\_\_\_ volts.
7. As battery temperature drops, battery power is \_\_\_\_\_.
8. A key operated switch in the driver's compartment is the \_\_\_\_\_ switch.
9. An ignition coil is a (n) \_\_\_\_\_ transformer capable of producing short bursts of high voltage to start combustion.
10. Somewhere between \_\_\_\_\_ and \_\_\_\_\_ volts are needed to make current jump the gap at the spark plug electrodes.
11. An inoperative gasoline injector and a fouled spark plug could cause a(n) \_\_\_\_\_.
12. A worn clutch disc will cause clutch \_\_\_\_\_ and sometimes damage to the \_\_\_\_\_.
13. The clutch \_\_\_\_\_ allows the driver to disengage the clutch with a foot pedal.
14. Clutch slippage is noticed when the engine \_\_\_\_\_ without an increase in the vehicle's \_\_\_\_\_.
15. The two types of gears found in a manual transmission are \_\_\_\_\_ gears and \_\_\_\_\_ gears.

## SECTION III- ESSAY QUESTIONS

1. What is electrical leakage? (2 marks)
2. Why do spark plug leads need internal resistance? (2 marks)
3. List five possible advantages of a distributorless ignition. (10 marks)
4. List the eight (8) major parts of an automatic transmission (8 marks).
5. What are four functions of a charging system? (8 marks)
6. What does battery cold cranking rating indicate? (2 marks)
7. How should you begin diagnosis of a transmission problem? (2 marks)
8. Describe the construction of a typical drive shaft, not including the universal joints or other parts.(2 marks)
9. What is the symptom of a worn, dry center support bearing? ( 2 marks)
10. Define ampere, volt, and ohm. (6 marks)
11. List the parts of a complete electrical circuit. (4 marks)
12. In your own words, how do you gap spark plugs? ( 2 marks)

**END OF EXAMINATION!**