

- b. Explain about conventional sealed bulb head lamps are LED lighting system in detail using suitable sketches. 10 3 2 1
28. a. Discuss the distributorless ignition system in detail with neat sketches. 10 3 3 1
- (OR)**
- b. Draw the block diagram of electronic engine control system and discuss the various engine control modes in detail. 10 3 3 1,3
29. a. Explain the electric power assisted steering mechanism with a neat sketch. 10 3 4 1
- (OR)**
- b. Discuss in detail with neat sketches and circuit diagram the working of adaptive cruise control system in an automobile. 10 3 4 1,3
30. a. With the help of neat sketches, discuss the GPS navigation system and its structure in detail. 10 3 5 1
- (OR)**
- b. Explain the OBD II system in detail along with its advantages and disadvantages. Also mention the various components tested by comprehensive component monitor. 10 3 5 1

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Reg. No.

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022

Sixth and Seventh Semester

18AUC303J – AUTOMOTIVE ELECTRICAL AND ELECTRONIC SYSTEMS

(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
- (ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours

Max. Marks: 75

PART – A (25 × 1 = 25 Marks)

Answer **ALL** Questions

- | | Marks | BL | CO | PO |
|---|-------|----|----|-----|
| 1. _____ batteries have the electrodes and separators rolled into spiral shapes to reduce internal resistance.
(A) Lead acid (B) Nickel cadmium
(C) Nickel metal hydrides (D) Lithium ion | 1 | 1 | 1 | 1 |
| 2. _____ are used in lead acid batteries, which allow room for the reaction of acid with both plate materials, yet insulate the plates to prevent short circuiting.
(A) Separators (B) Grids
(C) Plates (D) Cells | 1 | 1 | 1 | 1 |
| 3. _____ is a measure of energy stored in a battery.
(A) Battery testing (B) Battery charging
(C) Battery rating (D) Battery sulphation | 1 | 1 | 1 | 1 |
| 4. _____ is used to find the state of charge of a battery.
(A) Open circuit voltage test (B) Cadmium test
(C) Cranking motor test (D) High discharge test | 1 | 1 | 1 | 1 |
| 5. The orange colour spots produced on the defective battery is the indication of _____.
(A) Sulphation failure (B) Internal short circuit
(C) Over charging failure (D) Cyclic failure | 1 | 2 | 1 | 1,4 |
| 6. To protect many wires from damage and to keep them from becoming a confusing tangle, the automotive electrical system is organized into bundles of wire known as _____.
(A) Wiring circuit (B) Duty cycle
(C) Wiring harness (D) Electronic regulators | 1 | 2 | 2 | 1,3 |
| 7. Duty cycle in a fuel injector actuator refers to ratio of fuel
(A) On time / off time (B) Off time / on time
(C) Off time / (on time + off time) (D) On time / (on time + off time) | 1 | 1 | 2 | 1 |

8. The direction of induced current generated in the alternator is given by
(A) Flemings left hand rule (B) Flemings right hand rule
(C) Thumb rule (D) Faradays laws 1 1 2 1
9. In DC generator, the generated AC current is rectified into DC by means of
(A) Rectifier (B) Commutator
(C) Regulator (D) Cut out relay 1 1 2 1
10. A _____ reflector in headlamps is made up of a number of sections each with a common focal point.
(A) Head lamp (B) Parabolic
(C) Bifocal (D) Homifocal 1 1 2 1
11. In _____ technique, the fuel quantity can be regulated by varying the fuel pressure.
(A) Continuous injection (B) Intermittent injection
(C) Phased injection (D) Throttle body injection 1 2 3 1,3
12. In multipoint fuel injection system the number of injectors in equal to
(A) No. of cylinders (B) 3×no. of cylinders
(C) 2×no. of cylinders (D) 4×no. of cylinders 1 1 3 1
13. _____ sensors measures the temperature of the engine coolant and from this data the computer adjust the mixture of strength to rich side for cold starting.
(A) Exhaust gas oxygen (B) Engine temperature
(C) Air flow (D) Manifold pressure 1 1 3 1,3
14. The components of a pulse generator are
(A) Electronic control unit, reluctor (B) Timer coil, reluctor and permanent magnet
(C) Electronic control unit, (D) Timer coil, reluctor and ignition reluctor, ignition coil coil 1 2 3 1
15. In conventional ignition system the vacuum advance mechanism advance retard the spark in based on _____
(A) Speed (B) Load
(C) Knock (D) Power 1 1 3 1
16. _____ sensor converts steering torque input and its direction into voltage signal.
(A) Speed (B) Torque
(C) Load (D) Pressure 1 1 4 1,4
17. Statement A : ABS reduces the stopping distance
Statement B : ABS removes the wheel slip completely
(A) Statement A is correct, B is wrong (B) Statement B is correct, A is wrong
(C) Both statements are correct (D) Both statements are wrong 1 2 4 1,2

18. Antilock braking system can apply or release braking pressure
(A) 5 times per second (B) 15 times per second
(C) 25 times per second (D) 50 times per second 1 1 4 1
19. Electric power steering (EPS) uses an _____ rather than hydraulic system to assist the driver of a vehicle.
(A) Transformer (B) Generator
(C) Brushless motor (D) Alternator 1 1 4 1
20. In adaptive cruise control system, which of the following is/are controlled?
(A) Throttle (B) Brake
(C) Throttle and steering (D) Throttle and brake 1 2 4 1,4
21. An inertial navigation system incorporates which of the following sensors?
(A) Radio receiver (B) Doppler radar
(C) Gyros and accelerometer (D) IR sensor 1 2 5 1
22. The number of parts in OBD II data link connector are
(A) 8 (B) 12
(C) 16 (D) 18 1 2 5 1,5
23. Which of the following diagnostic trouble code indicates ignition system fault?
(A) P0100 (B) P0200
(C) P0300 (D) P0400 1 2 5 1,5
24. Which of the following trouble codes are grouped for engine related faults in OBD II?
(A) Pxxx codes (B) Bxxx codes
(C) Cxxx codes (D) Uxxx codes 1 2 5 1,5
25. Diagnostic trouble code P0400 indicate
(A) Idle speed control fault (B) Emission control system fault
(C) Trans axle fault (D) Computer output circuit fault 1 2 5 1,5

PART – B (5 × 10 = 50 Marks)

Answer ALL Questions

Marks BL CO PO

26. a. Discuss in detail the various charging and testing methods of a lead acid battery. 10 3 1 1
- (OR)**
- b. Describe the construction and working of solenoid operated overrunning clutch drive mechanism with a neat sketch. 10 3 1 1
27. a. With the help of neat circuit diagram, explain the working of an alternator and mention its significance in automobiles. 10 3 2 1,3

(OR)