Auto Electrical and Electronic System VTU CBCS Question Paper Set 2018

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10AU64

Sixth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Auto Electrical and Electronic System

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART - A

1 a. With a neat sketch, explain the construction and working of a lead acid battery. **(08 Marks)**

b. Explain how specific gravity of electrolyte is a direct indication of the state of charge of the battery. **(04 Marks)**

c. Write down a trouble shooting chart of Automotive lead acid batteries with Defects, Causes and Remedies. **(08 Marks)**

2 a. Explain with circuit diagram, series, shunt and compound wound generators. **(09 Marks)**

b. With a circuit diagram, explain the need for third crush regulation in generators. **(06 Marks)**

c. What are the advantages of Alternators over DC generators? **(05 Marks)**

3 a. What are the requirements of a cranking system for starting an engine? **(04 Marks)**

b. Explain the terms :
i) Engine breakaway Torque ii) Engine resisting Torque iii) Motor loaded Torque iv) Motor driving Torque. **(06 Marks)**

c. Show with a neat sketch, the difference in the operational principle of Inertia type and pre engaged type cranking motor. **(10 Marks)**

4 a. Explain with a neat sketch conventional battery Ignition system. **(08 Marks)**

b. With a block diagram, explain Distribution Ignition System. **(06 Marks)**

c. What are the advantages of programmed Ignition system over conventional Ignition system? **(06 Marks)**

PART - B

5 a. Explain Balancing coil type fuel gauge, with the help of a wiring diagram. **(07 Marks)**

b. Write a short note on Fuses and Circuit breakers. **(04 Marks)**

c. What are the advantages of Electric fuel pump? Draw a neat sketch of an Electric fuel pump naming all its components. **(09 Marks)**

6 a. What are the functional requirements of a typical heating and ventilation system? **(05 Marks)**

b. Explain with a neat sketch, how heating and ventilation is accomplished in a car. **(08 Marks)**

c. What are the requirements of seat heaters? Discuss an view of the passenger comfort. **(07 Marks)**

7 a. Explain various Engine design parameters for exhaust emission control. **(10 Marks)**

b. What is Artificial Intelligence? Explain with relevance to Automotive Engineering taking Adaptive Ignition system as an example. **(10 Marks)**

8 a. What are the benefits of ABS? Explain the function of each component with a neat sketch of ABS. **(08 Marks)**

b. Draw a block diagram of an Active Suspension System. **(05 Marks)**

c. With a block diagram, explain the working of Traction Control System. **(07 Marks)**

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PART – A

1 a. Explain the construction and working of a Lead – acid battery. **(08 Marks)**
b. Describe various tests that can be conducted on a Battery. **(08 Marks)**
c. Write a note on Nickle – Cadmium cell. **(04 Marks)**

2 a. Describe with a neat sketch, the principle of a DC generator. **(08 Marks)**
b. What is Armature reaction? Explain in brief. **(06 Marks)**
c. Explain voltage regulator, with a neat diagram. **(06 Marks)**

3 a. Describe various torque terms related to cranking motor. **(06 Marks)**
b. Explain with a neat sketch, a standard Bendix drive. **(08 Marks)**
c. List the causes and remedies for the following :
i) Armature fails to rotate.
ii) The engine cranks slowly but does not start.
iii) Solenoid plunger chatters. **(06 Marks)**

4 a. With a neat sketch, explain Battery – coil Ignition system of a 4 – cylinder SI engine. **(08 Marks)**
b. What are the requirements of a good spark plug? Sketch and explain the construction details of a spark plug. **(08 Marks)**
c. Write a note on : Electronic spark timing and control. **(04 Marks)**

PART – B

5 a. Differentiate between earth return and insulated return systems. **(04 Marks)**
b. What is Head light dazzle? List the reasons and remedies. **(06 Marks)**
c. Explain the working of : i) Wind screen wiper ii) Temperature gauge. **(10 Marks)**

6 a. With a neat diagram, explain and typical air conditioning circuit in detail. **(08 Marks)**
b. What are the functional requirements of a heating and ventilating system? Explain plenum chamber effect of ventilation. **(08 Marks)**
c. Write a note on seat heaters. **(04 Marks)**

7 a. Explain Combined Ignition and fuel management system, with a block diagram. **(10 Marks)**
b. With a block diagram, describe the complete vehicle management system. **(10 Marks)**

8 a. What is ABS? Mention its requirements. **(06 Marks)**
b. With a neat diagram, explain the sensors used in an Active Suspension System. **(08 Marks)**
c. Write short notes on : i) Central locking ii) Seat belt tensioner. **(06 Marks)**

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Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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PART – A

1 a. With neat suitable sketches, explain the construction and working of a lead acid battery. **(10 Marks)**

b. Write a note on : (i) Battery rating (ii) battery efficiency (iii) Storage of batteries (iv) Sulphation. **(10 Marks)**

2 a. Explain the construction and working principle of a generator, with a neat sketch. **(10 Marks)**

b. Write short notes on armature reaction and third brush regulation in a DC generator. **(10 Marks)**

3 a. Explain the principle of working of starting motor with a neat sketch. **(10 Marks)**

b. What are the types of D.C. motor drives used in starting system of an automobile? Explain with a neat sketch the working of Bendix drive. **(10 Marks)**

4 a. What are the main components of an ignition system? Discuss in detail with the help of a neat sketch, the ignition system of 4-cylinder SI engine. **(10 Marks)**

b. Write note on:
(i) Ignition coil (ii) Spark plug (iii) Distributor. **(10 Marks)**

PART – B

5 a. What are the various lights used in a modern automobile? Explain the construction and working of (i) Sealed beam lamp (ii) Wind screen wiper. **(10 Marks)**

b. Explain the working principle of :
(i) Electric horn (ii) Electrical fuel pump **(10 Marks)**

6 a. Explain basic air conditioning cycle with neat sketch. Explain functions of all the components of the system. **(10 Marks)**

b. Write short notes on :
(i) Heating and ventilation
(ii) Seat heaters **(10 Marks)**

7 a. Explain with a block diagram combined ignition and fuel control system. **(10 Marks)**

b. Explain with a block diagram a complete vehicle control system. **(10 Marks)**

8 a. Why ABS is required in vehicles? Explain working principle of ABS. **(07 Marks)**

b. What is the necessity of central locking, air tags and seat belt tensioners? **(09 Marks)**

c. Explain traction control system. **(04 Marks)**

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10AU64

Sixth Semester B.E. Degree Examination, June/July 2015
Auto Electrical and Electronic Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Explain with neat sketch construction and working of lead acid battery. **(08 Marks)**

b. What do you mean by battery rating? Explain different battery ratings. **(08 Marks)**

c. Write causes and remedies of following battery faults:
i) Sulphation ii) Loss of electrolyte. **(04 Marks)**

2 a. With a neat sketch, explain working of D.C. generator. **(10 Marks)**

b. Write advantages of alternator over D.C. generator. **(05 Marks)**

c. What is the need of cutout relay in charging system? Explain its construction and working. **(05 Marks)**

3 a. Explain suitability of series motor for engine cranking. **(05 Marks)**

b. What are the requirements of starting system? **(05 Marks)**

c. List out different types of starting motor drives. Explain any one of them with neat sketch. **(10 Marks)**

4 a. Sketch and explain battery ignition system for a multicylinder engine. **(10 Marks)**

b. What are the advantages of electronic ignition system over conventional ignition system? **(04 Marks)**

c. With block diagram, explain "Distributor less" ignition system. **(06 Marks)**

PART – B

5 a. Explain earth return and insulated return wiring system. **(04 Marks)**

b. Explain construction and working of
i) Electrical fuel pump ii) Temperature gauge. **(10 Marks)**

c. Explain working of wind screen wiper with neat sketch. **(06 Marks)**

6 a. Explain functional requirements of heating and ventilation system used in automobile. **(05 Marks)**

b. With neat sketch, explain basic air-conditioning or refrigeration cycle. **(10 Marks)**

c. Write a short note on seat heaters. **(05 Marks)**

7 a. Explain effect of various engine design parameters on engine emissions. **(10 Marks)**

b. Explain complete vehicle control with block diagram. **(10 Marks)**

8 Write short notes on:

a. Antilock brakes

b. Central locking

c. Active suspension

d. Air bags.

Wherever required draw neat sketches. **(20 Marks)**

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10AU64

Sixth Semester B.E. Degree Examination, June/July 2016
Auto Electrical and Electronics System

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Briefly discuss about the selection and positioning of battery used in automotive vehicle. **(06 Marks)**

b. Explain the factors affecting the charging battery. **(04 Marks)**

c. With sketch, explain the working principle of lead acid battery with equation of chemical reaction. **(10 Marks)**

2 a. List out the requirements of charging system. **(05 Marks)**

b. Why road trucks get more life out of their generator brushes as compared to a car. **(05 Marks)**

c. Explain with full circuit, working principle of alternator. **(10 Marks)**

3 a. List out the factors influencing the ability to reach the minimum speed of starter motor in automotive vehicle. **(05 Marks)**

b. With neat sketch, explain the Bendix drive (inertia drive) construction and working principle. **(10 Marks)**

c. Mention the advantages of electronic control starter. **(05 Marks)**

4 a. Explain with neat sketch, electronic ignition system used in a car and list out the advantages of same. **(10 Marks)**

b. What is MBT timing? Why ignition advance angle cannot be more than 30 – 40° degrees. **(10 Marks)**

PART – B

5 a. With necessary sketches, explain the head light aiming and leveling. **(07 Marks)**

b. Explain the following with circuit :
i) Engine cooling fan (low and high speeds)
ii) Wind screen wiper with rain module. **(10 Marks)**

c. Briefly discuss about dynamic bending of head light. **(03 Marks)**

6 a. List out any five functional requirements of heating and ventilation system. **(05 Marks)**

b. With the suitable sketch, explain the construction and working principle of air conditioning system used in vehicle. **(10 Marks)**

c. Describe briefly about the screen heater with time relay, with neat circuit diagram. **(05 Marks)**

7 a. List out the emission control techniques used for the reduction of oxides of nitrogen. **(04 Marks)**

b. Explain the complete vehicle control system with block diagram. **(10 Marks)**

c. With suitable sketch, explain the hydrogen fuel cell used in automotive vehicle. **(06 Marks)**

8 a. With suitable diagram, explain the working principle 3–channel ABS, used in passenger car. **(10 Marks)**

b. List out the various methods of traction control and compare them with suitable graph of wheel slip with time. **(05 Marks)**

c. Explain the infrared central locking system used in car with circuit. **(05 Marks)**

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Sixth Semester B.E. Degree Examination, June/July 2017
Automotive Electrical and Electronics Systems

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Describe the construction and working of battery hydrometer. **(08 Marks)**

b. Compare lead Acid Batteries with alkaline Batteries. **(06 Marks)**

c. Discuss the following by giving neat sketches : i) the plate group ii) the separator. **(06 Marks)**

2 a. What is an alternator? Compare it with generator. **(06 Marks)**

b. With a neat sketch, explain the working principle of a third brush generator. **(08 Marks)**

c. Explain the construction and working of cutout relay. **(06 Marks)**

3 a. List out different types of starting motor drives. Explain anyone them with a neat sketch. **(12 Marks)**

b. Explain the operation of cranking motor with a neat sketch. **(08 Marks)**

4 a. With a neat sketch, explain the battery ignition system for a 4 cylinder spark ignition engine. **(10 Marks)**

b. Sketch and explain the centrifugal spark advance mechanism in full and no advance positions. **(10 Marks)**

PART – B

5 a. Describe with the help of a neat diagram, the working of thermostatic type of temperature gauge. **(08 Marks)**

b. What are the advantages of electric fuel pump over mechanical pump? With a neat sketch explain its working and constructional details. **(12 Marks)**

6 a. With neat sketch explain the basic principle of an air – conditioning system. **(10 Marks)**

b. Summarize the requirements of ventilation and air conditioning system in automobiles. **(05 Marks)**

c. Write a short note on seat heaters. **(05 Marks)**

7 a. Explain the process to be carried out to calculate injection duration. **(10 Marks)**

b. Explain the effect of various engine design parameters on engine emissions. **(10 Marks)**

8 Write a note on :

a. ABS

b. Seat belt tensioners

c. Central locking system

d. Active suspension. **(20 Marks)**

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