Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B. TECH (AUE)/SEM-6/AUE-603/2012

2012
TWO AND THREE WHEELER

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Alpha methyl naphthalene has a cetane no. of

a) 0 b) 10

c) 100 d) 72.

ii) Most anti skid devices are employed on

a) rear brakes b) front brakes

c) secondary brakes d) parking brakes.

iii) In loop scavenging inlet and exhaust ports are in

a) opposite side of cylinder

b) same side of cylinder

c) opposite ends of cylinder

d) diagonal-wise in the cylinder.

iv) Box section chassis is used in
   a) Hero Honda b) Rajdoot
   c) Bajaj d) TVS.

v) In luna-ST moped engine is
   a) double cylinder 2 stroke engine
   b) single cylinder 4 stroke engine
   c) single cylinder 2 stroke engine
   d) none of these.

vi) ECU is used in
   a) ignition system b) kick starter system
   c) both cases d) none of these.

vii) Odometer indicates
   a) driving speed of motor cycle
   b) accumulated mileage
   c) fuel quantity in tank
   d) acceleration of the motor cycle.

viii) Condenser is used in
   a) battery ignition system
   b) magnetic ignition system
   c) in both cases
   d) none of these.

ix) Throttle grip in motor cycle is in
   a) left handle bar b) right handle bar
   c) both hands d) left paddle.

x) The dwell angle on a six cylinder engine compared to a four cylinder engine is
   a) more
   b) less
   c) equal
   d) some times less and some time more.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Draw the circuit diagram of a battery ignition system and explain it.
3. Describe magneto-ignition system with a neat sketch.
4. Describe the breaking system of a two wheeler with the help of flow diagram for both front and near breaks.
5. Explain the three theoretical scavenging processes.
6. Write about the different methods by which power from engine is transmitted to rear wheel in two and three wheelers.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Write short notes on the following :
   a) Different types of wheel used in two and three wheelers.
   b) Maintenance of a scooter.
   c) Different kinds of chassis used in case of two and three wheelers.
8. A four cylinder, two stroke cycle engines with a 2·75 lit displacement and crankcase compression is running at 2500 rpm and an air fuel ratio of 16·2 : 1. At this condition the Trapping efficiency is 77%. Relative charge is 82% and the exhaust residual from the previous cycle in each cylinder is 8%. Oil is added to the intake air flow such that the input fuel to-oil ratio is 48 : 1 and take density of air is 1.181 kg/m^3 at (25°.C).
   Calculate : i) rate of oil use.
   ii) Rate of unburned oil added to the exhaust flow.

9. a) Obtain the equation of stability for a two wheeler vehicle while taking a turn. 7

   b) The mass of the motor cycle along with the rider is 180 kg. The height of the centre of gravity of total mass is 60 cm above the ground when it moves straight. Each wheel has diameter equal to 70 cm and polar mass moment of inertia of each wheel is 2 kg-m^2. The engine rotates at a speed 5 times the road wheel and engine rotating parts have polar moment of inertia equal to 0.2 kg-m^2. Determine the angle of heel required if motorcycle negotiates a curve of radius 100 m at a speed of 108 kmph. 8

10. a) A uniform disc of diameter 300 mm and mass of 5 kg is mounted on one end of arm of length 60 mm. If the disc rotates at a speed of 300 rpm; find the velocity of precession. Radius of gyration of the disc is 106 mm. 8

    b) Determine the air standard efficiency of a diesel engine having a cylinder with bore 250 mm, stroke 375 mm and a clearance volume of 1500 cc, with fuel cut-off occurring at 5% of the stroke. Take $\gamma = 1{\cdot}4$. 7

11. a) Describe the purpose of using lubricating oil in automobile applications. 5

    b) Describe in detail the purpose of using additives in lubricating oil 5

    c) Write the advantages and disadvantages of mist lubrication system. 5