KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

Marks Scored:

Level: B.E.
Year : IV

Course : MEPP 412
Semester : I

Exam Roll No. :

Time: 30 mins.

F.M. : 20

Registration No.:

Date 31 MAY 2019

SECTION "A"
[20Q. × 1 = 20 marks]

Choose the most appropriate answer among the given options and ***mark*** [×] *in the box of your choice.*

1. In an engine, the temperature of the piston will be more at the
   [ ] Piston rings
   [ ] Skirt of the piston
   [ ] Piston walls
   [ ] Crown of the piston

2. If the diameter of a piston is 'D' then the length of skirt is usually of the range of
   [ ] 0.75D to 0.8D
   [ ] 0.5D to 1D
   [ ] 1.5D to 2D
   [ ] 0.2D to 0.6D

3. The coefficient of rolling resistance for a truck weighing 63,500 N is 0.018. The rolling resistance to the truck is
   [ ] 1.143 N
   [ ] 11.43 N
   [ ] 114.3 N
   [ ] 1143 N

4. If clearance volume of I.C. engines is increased, the compression ratio will
   [ ] Increase
   [ ] Decrease
   [ ] Remain constant
   [ ] Be doubled

5. The condition that results in large quantities of CO emission is
   [ ] Insufficient air during combustion
   [ ] Insufficient fuel during combustion
   [ ] Low temperature combustion
   [ ] High temperature combustion

6. The camshaft of a four stroke Diesel engine running at 1000 rpm will run at
   [ ] 500 rpm
   [ ] 1000 rpm
   [ ] 2000 rpm
   [ ] 4000 rpm

7. The component that is responsible for converting the rotation of the steering wheel into lateral motion is the
   [ ] Steering wheel
   [ ] Steering shaft
   [ ] Steering gearbox
   [ ] Tie rod

8. An imbalance wheel during vehicle operation
   [ ] Makes large noise when its heavy point hits the road surface
   [ ] Deflects in the vehicle's longitudinal direction
   [ ] Bounces vertically or deflects from side to side (as seen from front or rear)
   [ ] Creates a standing wave

9. The effect of vapor locking on the brake performance is that the
[ ] Brakes function more effectively
[ ] Brakes fail completely
[ ] Brake operation is delayed after depression of the brake pedal
[ ] Vapor locking has no effect on brake performance

10. When the top of the wheel is tilted outward, then it is called
[ ] Positive camber [ ] Negative camber
[ ] Positive caster [ ] Negative caster

11. Petrol that detonates easily is called
[ ] High octane petrol [ ] Low octane petrol
[ ] Unleaded petrol [ ] Blended fuel

12. In a single dry plate clutch, torsional vibrations are absorbed by
[ ] Coil springs known as torsional springs [ ] Cushion springs
[ ] Central hub [ ] Clutch pedal

13. When indicated power (I.P.) and frictional power (F.P.) are known, we can calculate
[ ] Compression ratio [ ] Brake power
[ ] Specific air consumption [ ] Mean effective pressure

14. The function of a governor in automobiles is to
[ ] Limit the power [ ] Limit the vehicle speed
[ ] Maintain constant engine speed [ ] Maximise the fuel economy

15. The specific gravity of acid in a fully charged battery is generally
[ ] 1.00 [ ] 1.28 [ ] 1.82 [ ] 2.81

16. A gas undergoes step 4 in Carnot cycle. Which of these processes describes the 2nd step
[ ] Isentropic expansion [ ] Isentropic compression
[ ] Isothermal expansion [ ] Isothermal compression

17. Inter-metallic corrosion between steel studs and aluminium alloy lead to _____
[ ] engine war-up [ ] higher fuel consumption
[ ] cylinder head stick to cylinder block [ ] gaskets get damaged

18. A separate _____ crankcase would result in saving weight also enabling cheaper and quick replacement.
[ ] nickel [ ] chromium [ ] iron [ ] aluminium

19. In internal combustion engine the approximate percentage of the combustion heat that passes to the cylinder walls is
[ ] 5% [ ] 10% [ ] 30% [ ] 60%

20. Camshaft gear is made from which material
[ ] Cast iron [ ] Mild steel [ ] Bakelite [ ] Brass

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SECTION "B"

*Attempt **ALL** questions.*

1. List the merits and demerits of vertical and horizontal engine. Illustrate your answer with neat sketch. [5]

2. State the function of a vibration damper and spurt hole in the connecting rod. Show all the components in sketch. [5]

3. What is highest useful compression ratio (HUCR)? Define diesel knock and explain how delay period influence the diesel knocks. [5]

4. Differentiate between a pneumatic governor and a hydraulic governor with suitable sketch. [5]

5. Explain the working principle of antifreeze use in an automobile. [5]

6. How is it possible to remove harmful liquids from the lubricating oil through a crankcase ventilator? Explain with neat sketch. [5]

7. Explain the action of the single plate and multi plate clutch during engagement and disengagement with neat diagrams. [5]

8. From where power steering hydraulic pressure obtained, explain? What does the steering link do? [5]

9. Explain in detail the four main circuits of automobile electrical system. [7]

10. Describe the working of fuel deliver system of the electronic fuel injection system. Illustrate your answer with flow chat diagram of fuel flow. Differentiate between continuous fuel and sequential multiport injection. [8]