Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
THIRD SEMESTER B.Sc. Applied Sciences in Engg.
END-SEMESTER THEORY EXAMINATIONS NOVEMBER - 2018
AUTOMOBILE ENGG. [IME 235 - S2]

Marks: 100   **Duration: 180 mins.**

Answer 5 out of 8 questions.
Any missing data may be suitably assumed.

1)

A) Sketch two types of cylinder liners. List any five differences between them. (10)

B) With a neat sketch explain wishbone type independent front suspension system. List its two advantages and disadvantages. (10)

2)

A) Sketch and explain the working of battery ignition system for a four cylinder engine. (10)

B) With a neat sketch explain the working of a single plate clutch. (10)

3)

A) List any five differences between tubed and tubeless tyre. (5)

B) Draw a neat labeled sketch of three quarter floating rear axle. (5)

C) With a neat sketch explain the working of tandem master cylinder. (10)

4)

A) List and explain four factors affecting the ignition advance mechanism. (4)

B) With neat sketches explain wire wound piston and piston with compensatory slots. (6)

C) List any five differences between hotchkiss and torque tube drive system. (10)

5)

List four advantages of side engine valve mechanism. (4)

A)		
B)	A motor car engine develops 5.9KW at 2100 rpm. Find the suitable size of clutch plate having friction linings riveted on both sides, to transmit the power, under the following conditions: i. Intensity of the pressure on the surface not to exceed $6.87 × 10^4$ Pa ii. Slip torque and losses due to wear etc. is 35% of engine torque. iii. Coefficient of friction on contact surface is 0.3. iv. Inside diameter of the friction plate is 0.55 times the outside diameter.	(6)
C)	With a neat sketch explain the working of mechanical fuel pump.	(10)

6)   List four advantages of epicyclic gear train.   (4)

A)		
B)	With a neat sketch explain the working of wax type thermostat.	(6)
C)	Sketch and explain the working of rack and pinion steering gear system.	(10)

7)   List five functions of steering system.   (5)

A)		
B)	A vehicle has pivot pins 1.5 m apart. Length of each track arm is 0.25 m and track rod is behind front axle and is 1.2 m long. Determine the wheel base which will give true rolling for all wheels when the vehicle is turning so that inner wheel stub axle is 55° to the centerline of the vehicle.	(5)
C)	Sketch and explain the working of simple carburetor.	(10)

8)   Explain the following terms   (4)

A)	i. Soft suspension ii. Sprung weight iii. Bottoming iv. Pitching	
B)	With a neat sketch explain the working of torsion bar.	(6)
C)	A car has kerb weight of 9700N and wheel base of	(10)

2520mm. Its C.G. is 1350mm in front of the rear axle and 700mm above the level road. The coefficient of road wheel's adhesion is 0.65. If the car is moving upward on a road inclined at an angle 30º with the horizontal, calculate the load distribution on the front and the rear axles, the retardation and the stopping distance while moving at 65km/hr i)front brakes are applied, and ii) all the four wheel brakes are applied. The seating capacity of the vehicle is for 5 persons including the driver. Take weight of each person as 550N.

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