



DATE : 26TH MARCH 2006
TIME : 0930 HRS - 1230 HRS
DURATION : THREE HOURS

INSTRUCTIONS FOR PART "B"

1. Part B consists of seven (07) questions. Answer **any four** questions.
2. All questions carry equal marks.
3. Time allotted for **Part B** is **Two hours and Fifteen minutes**.

PART – B

QUESTION 01

A four cylinder, four stroke, spark ignition engine with a cylinder bore of 80 mm and a stroke of 100 mm was tested on an engine dynamometer and the following results were obtained.

Engine speed	-	3000 rev/min
Brake torque	-	150 Nm
Volume flow rate of fuel	-	0.26 litres/min
Volume flow rate of air	-	2.35 m ³ /min
Specific gravity of fuel	-	0.8
Calorific value of fuel	-	44 MJ/kg

Determine the following parameters of the engine.

- (i) Brake power
- (ii) Brake mean effective pressure
- (iii) Brake thermal efficiency
- (iv) Volumetric efficiency

QUESTION 02

- (a) "Four methods are employed for attaching the piston and the connecting rod". List these methods and explain one such method with the aid of a sketch.
- (b) What are the desirable properties a lubricating oil must possess in order to meet the requirements of the function of the lubricating system of an automobile? Explain.

QUESTION 03

- (a) Explain with the aid of a sketch how a thermosyphon system of engine cooling operates. What are the advantages of forced circulation systems over thermosyphon systems?
- (b) What is meant by “dwell angle”? Explain what happens if the dwell angle is too small.

QUESTION 04

- (a) Fig. Q4(a) shows a sectional view of a carburettor showing the slow port, idle port etc. Explain briefly how the fuel is supplied to the engine when the engine is idling and when the throttle is slightly open.

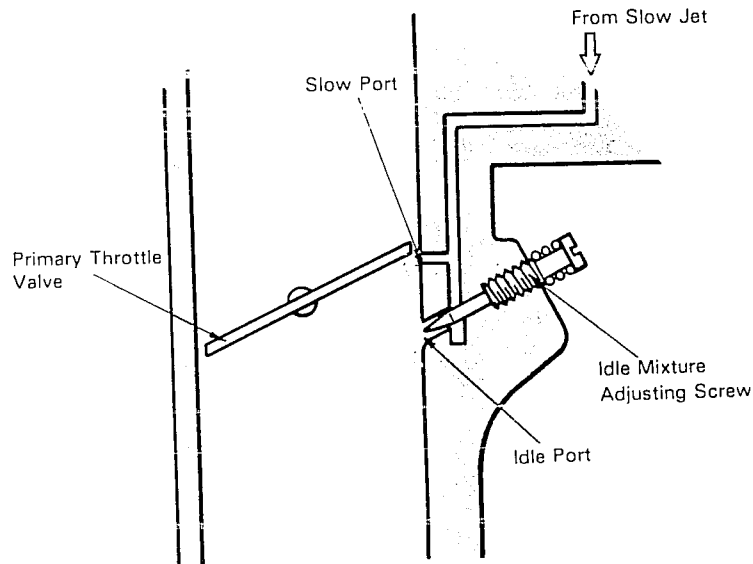


Fig. Q4(a)

- (b) Briefly explain the limitations on the use of distributor type fuel injection pumps in diesel engines.

QUESTION 05

- (a) Why is it necessary to fit an exhaust muffler to an internal combustion engine? Explain.
- (b) Explain the factors, which have a great influence over the concentration of NO_x , formed during combustion and the methods by which NO_x in exhaust gas can be reduced.

QUESTION 06

- (a) "Basically the differential unit of a vehicle consists of two main sub units". What are these sub units? Explain the function and operation of these sub units briefly.
- (b) What are the desirable properties of a brake fluid? Explain.

QUESTION 07

- (a) Explain the construction and operation of the Rack and pinion type steering mechanism, with the aid of sketches.
- (b) Explain the basic function of a suspension system of a vehicle.

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