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Name:	
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Invigilator's Signature :	

CS/B.TECH (AUE)/SEM-6/AUE-603/2010 2010

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

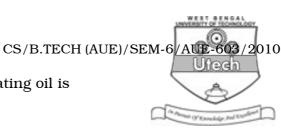
c) 100

- d) 72.
- ii) A fuel of octane no. 60 means
 - a) 60% normal haptane + 40% iso-octane
 - b) 40% normal haptane + 60% iso-octane
 - c) 40% normal haptane + 60% HMN
 - d) 40% normal alcohol + 60% iso-octane.

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iii)	The	e correct mixture	strengt	h for	LPG engine is	
	a)	18:1		b)	15·4:1	
	c)	22.4 : 1		d)	8.2 : 1.	
iv)	If power output of an engine is 14 kW, $N=900~{\rm rp}$ then torque is					
	a)	142 Nm		b)	182 Nm	
	c)	252 Nm		d)	none of these.	
v)	Mcl	Pherson strut cor	mbines			
	a)	Shock absorber	r and cl	ıassi	s	
	b) Shock absorber and coil spring					
	c) Shock absorber and frame					
	d)	None of these.				
vi)	In	'complete shor	t circu	uiting	' scavenging process,	
	scavenging efficiency is					
	a)	100%		b)	50%	
	c)	25%		d)	0%.	
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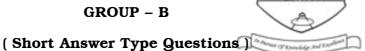


vii) Purpose of lubricating oil is

- a) Cooling
- b) Lubricating
- c) Cleaning
- d) All of these.
- viii) Front brake of a motor cycle is operated by
 - a) right leg
- b) right hand.

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- ix) For same power engine is heavy for
 - a) four-stroke
 - b) two-stroke
 - c) same for both
 - d) none of these.
- x) Morse test is performed for finding
 - a) BP
 - b) IP
 - c) FP
 - d) none of these.

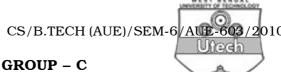


Answer any *three* from the following. $3 \times 5 = 15$

- 2. a) What is the difference between blow down and scavenging in connection with 2-stroke engines?
 - b) Write the advantages of petrol injection sysem than a carburetor fueling system. 2 + 3
- 3. What does an LPG auto conversion system involve ?

 Describe in detail.
- 4. Describe all theoretical Scavenging Processes.
- 5. a) Can any vehicle be converted to run on LPG?
 - b) A diesel engine is working with a compression ratio of 15 and expansion ratio of 10. Calculate the air standard efficiency of the cycle. 2+3
- 6. How spark plug is specified ? What is the difference between heater plug and spark plug ?

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(Long Answer Type Questions)

Answer any three of the following.

 $3 \times 15 = 45$

- 7. a) What are the remedies can be taken to control emission in two-stroke SI engines?
 - b) Why are two-stroke autos banned nowadays?
 - c) A two-stroke SI engine having a cylinder volume of 1100 cc and compression ratio 8 runs at 2800 rpm, scavenging efficiency is 0.5. Calculate the trapping efficiency, delivery ratio for a charge flow of 4 kg/min. If brake thermal efficiency is 0.25, fuel-air ratio is 0.065, calculate brake power and bsfc. Also calculate short circuiting loss per hour. Take calorific value of fuel as 45 MJ/kg and density of charge as 1.2 kg/m^3 .

3 + 2 + 10

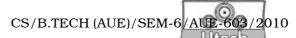
8. Describe the following terms :

 5×3

- a) Trapping efficiency
- b) Relative Cylinder Charge
- c) Pure Air Ratio
- d) Excess air factor
- e) Cross scavenging.

- 9. a) Determine the air standard efficiency of a diesel engine having a cylinder with bore 240 mm, stroke 365 mm and a clearance volume of 1200 c.c. with fuel cut-off occurring at 6% of the stroke. Take $\gamma = 1.4$.
 - b) A uniform disc having a mass of 8 kg and radius of gyration of 150 mm is mounted on one end of a horizontal arm length 200 mm. The other end of the arm can rotate freely in a universal bearing. The disc is given a clock-wise spin of 250 rpm as seen from the disc end of the arm. Determine the motion of the disc if the arm remains horizontal.
- 10. a) Derive the equation of stability of a two wheeler while taking a turn.
 - b) Find the angle of inclination with respect to vertical of a two wheeler negotiating a turn. Given total mass of the vehicle 250 kg, mass moment of inertia of engine is 0.3 kg-m^2 , MMI of front wheel is 1 kg-m^2 and MMI of rear wheel is 1.08 kg-m^2 , speed of engine is 5 times of wheel in same direction. Height of c.g. is 0.6 m, two wheeler speed is 90 km/hr, wheel radius 300 mm and radius of turn 50 m.

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- 11. a) Describe the purpose of using lubricating oil in automobile applications.
 - b) Describe in detail the purpose of using additives in lubricating oil.
 - c) Describe the braking system of a two wheeler with the help of a flow diagram for both front and rear brakes.

4 + 5 + 6

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