CLASS: B.TECH   SEMESTER : VI
BRANCH: MECHANICAL   SESSION : SP2023

SUBJECT: ME305 AUTOMOBILE ENGINEERING

TIME: 02 Hours   FULL MARKS: 25

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. **Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Briefly explain the working of a knock sensor.	[2]	CO1	BL2
Q.1(b)	With a neat sketch explain the working of a starting system.	[3]	CO1	BL3
Q.2(a)	How does a solenoid work? Explain.	[2]	CO1	BL2
Q.2(b)	Sketch the construction of capacitive discharge ignition system and explain its working.	[3]	CO1	BL3
Q.3(a)	Describe various resistances that try to retard the motion of a vehicle.	[2]	CO2	BL4
Q.3(b)	Discuss the function of various types of temperature sensors.	[3]	CO1	BL2
Q.4	Obtain the expression for maximum acceleration and reaction forces for front wheel drive vehicle.	[5]	CO2	BL6
Q.5	The coefficient of rolling resistance for a truck weighing 65000N in 0.015 and the coefficient of air resistance is 0.02 in the formula R= KW + K_aAV^2 Newton. Where A is truck's frontal area (in m^2), W is its weight, V is the speed (in km/hr), K is coefficient of rolling resistance and K_a is coefficient of air resistance. The transmission efficiency in the top gear is 6:1 is 90% and that in second gear is 15:1 is 80%. The frontal area is 6 m^2. If the truck has to have a maximum speed of 90 km/hr in top gear. Calculate:	[5]	CO2	BL5

   i)   The engine brake power.
   ii)   The engine speed if the driving wheels have an effective diameter of 0.8 m.
   iii)   The maximum grade that the truck can negotiate at the above engine speed in second gear.

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