

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: MECHANICAL**

**SEMESTER : VI
SESSION : SP/2025**

SUBJECT: ME305 AUTOMOBILE ENGINEERING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Explain the construction and working of distributorless ignition system with neat sketch.	[5]	CO1	BL3
Q.1(b)	Explain the different types of position sensors used in automobiles with its utility.	[5]	CO1	BL2
Q.2(a)	Discuss the factors that affect the resistances to vehicle motion.	[5]	CO2	BL2
Q.2(b)	A passenger car, with gross mass of 1100 kg, travelling at 80 km/hr is accelerated up a gradient of 1 in 20, the vehicle has a frontal area of 1.9m ² and air resistance coefficient of 0.02688. The rolling resistance is given by $0.0112 mg + 0.00006 mgV$. Where V is in km/hr and m is in kg. At 80 km/hr the engine develops 60 kW corresponding to an engine speed of 4400 rpm. Rear axle ratio is 5:1. The transmission efficiency is 95%. Assume the wheel radius is 0.334 m. Calculate: I. The total resistance. II. The tractive effort available.	[5]	CO2	BL5
Q.3(a)	With neat and suitable sketch explain the construction and working of torque converter.	[5]	CO3	BL4
Q.3(b)	Explain the working of constant mesh gear box with its merits and demerits.	[5]	CO3	BL3
Q.4(a)	Explain the construction and working of hydraulic braking system with its merits over mechanical braking system.	[5]	CO4	BL4
Q.4(b)	With neat sketch explain Hotchkiss drive.	[5]	CO4	BL4
Q.5(a)	Explain in brief the keyless entry system used in modern vehicles.	[5]	CO5	BL2
Q.5(b)	Explain the construction and layout of Hybrid Vehicles.	[5]	CO5	BL3

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