

CBCS SCHEME

USN

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BAU306B

Third Semester B.E/B.Tech. Degree Examination, Dec.2025/Jan.2026
Automotive Transmission

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Describe the following terms i) Gradability ii) Tractive effort.	4	L1	CO1
	b.	Explain the various resistances offered by a vehicle, with neat sketch.	6	L2	CO1
	c.	A sliding Mesh type of gear box with forward speed only is to be designed. The gear box should have the following gear ratios available approximately : 1.0, 1.5, 2.5 and 3.9. The centre distance between the layshaft and the main shaft is 78 mm and the smallest gear is to have at least 16 teeth with a diametrical pitch of 3.25 mm. Calculate the number of teeth of the various gears and the exact gear ratios thus available.	10	L3	CO1
OR					
2	a.	What are the functions of gear box in automobiles?	4	L1	CO1
	b.	Describe the working of a constant Mesh gear box with the help of neat sketch.	6	L2	CO1
	c.	Illustrate the working of a synchromesh gear box with the help of a sketch.	10	L3	CO1
Module – 2					
3	a.	Describe the need of clutch in automobiles.	4	L1	CO1
	b.	With neat sketch, explain the construction and working of centrifugal clutch.	6	L2	CO1
	c.	Interpret the working of mulitplate clutch with neat sketch.	10	L3	CO1
OR					
4	a.	Write difference between torque converter and fluid couplings.	4	L1	CO1
	b.	Explain with neat sketch, the working of sprag and roller type overrunning clutch.	6	L2	CO1
	c.	With suitable sketch, illustrate and working of fluid coupling and mention the advantages.	10	L3	CO1

1 of 2

Module – 3

5	a.	Describe the principle of operation of a planetary transmission system with figure.	4	L1	CO3
	b.	Draw a neat sketch of epicyclic gear train and discuss the working principle with advantages.	6	L2	CO3
	c.	Illustrate the working of over drive with neat sketch.	10	L3	CO3

OR

6	a.	Briefly describe hydraulic control in the planetary gear system.	4	L1	CO3								
	b.	Draw and explain the working of Wilson planetary gear box.	6	L2	CO3								
	c.	In the Wilson gear box, the number of teeth on various gears are :<table><tr><td>$T_{S1} = 15$</td><td>$T_{R1} = 60$</td></tr><tr><td>$T_{S2} = 20$</td><td>$T_{R2} = 70$</td></tr><tr><td>$T_{S3} = 20$</td><td>$T_{R3} = 70$</td></tr><tr><td>$T_{S4} = 26$</td><td>$T_{R4} = 50$</td></tr></table> Calculate all the gear ratios.	$T_{S1} = 15$	$T_{R1} = 60$	$T_{S2} = 20$	$T_{R2} = 70$	$T_{S3} = 20$	$T_{R3} = 70$	$T_{S4} = 26$	$T_{R4} = 50$	10	L3	CO3
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$T_{S4} = 26$	$T_{R4} = 50$												

Module – 4

7	a.	Describe about the applications and limitations of hydrostatic drives.	4	L1	CO4
	b.	Explain constant displacement pump and variable displacement pump.	6	L2	CO4
	c.	With neat sketch, interpret the working principle of hydrostatic drive system.	10	L4	CO4

OR

8	a.	With the help of diagram, describe the working of hydramatic transmission.	4	L1	CO4
	b.	Briefly explain the basic four speed hydraulic control system with sketch.	6	L2	CO4
	c.	Illustrate the working of Borg-Warner automatic transmission with the help of figure.	10	L4	CO4

Module – 5

9	a.	Describe EV Motor sizing briefly.	4	L1	CO4
	b.	Explain torque – speed characteristics in electric vehicle.	6	L2	CO4
	c.	Outline the electric vehicle transmission configuration with neat diagram.	10	L4	CO4

OR

10	a.	Describe permanent Magnet DC motor with sketch.	4	L1	CO4
	b.	Briefly explain the modeling of the electromechanical system.	6	L2	CO4
	c.	Outline the DC-DC power converter with neat sketch.	10	L4	CO4
