Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (OLD) EXAMINATION – WINTER 2018

Subject Code:160201 **Date: 07/12/2018**

Subject Name: Automobile Component Design

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain lubrication and mounting of bearing.	**07**
	(b)	Explain the theory of Beam strength of gear tooth for spur gear.	**07**
Q.2	**(a)**	Explain design criteria of intake manifold and exhaust manifold.	**07**
	(b)	Describe design of spline shafts for gear box used in automobiles.	**07**
		OR	
	(b)	Write a note on design criteria of connecting rod.	**07**
Q.3	**(a)**	Explain design of valves in I.C.Engine with sketch.	**07**
	(b)	Describe taper rolling bearing and thrust ball bearing with sketch.	**07**
		OR	
Q.3	**(a)**	Explain the design of components for casting and welding.	**07**
	(b)	Write a note on combustion chamber design in automobile component design.	**07**
Q.4	**(a)**	The following data is given for the piston of a four stroke diesel engine : Cylinder bore = 250 mm Maximum gas pressure = 4 MPa Allowable bearing pressure for skirt = 0.4 MPa Ratio of side thrust on liner to maximum gas load on piston = 0.1 Width of top land = 45 mm Width of ring grooves = 6 mm Total number of piston rings = 4 Axial thickness of piston rings = 7 mm Calculate: (1) length of skirt and (2) length of piston.	**07**
	(b)	Explain design consideration of gearbox.	**07**
		OR	
Q.4	**(a)**	A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. Then normal pressure angle is 20 degree, while the helix angle is 25 degree. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 (S_{ut} = 600N/mm^2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Take Lewis factor Y = 0.344 .Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears.	**07**
	(b)	Explain thermal consideration in automobile component design.	**07**
Q.5	**(a)**	Describe the criteria of design for solid and rim type flywheel.	**07**
	(b)	Explain gear terminology for bevel gear with neat sketch.	**07**
		OR	
Q.5	**(a)**	Explain beam strength and wear strength of bevel gears.	**07**
	(b)	Explain dry liners and wet liners with neat sketch.	**07**

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