

Code No: RT41031

R13

Set No. 1

IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017
AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Why does the lower end of the connecting rod have to be spilt? [3]
- b) What are the advantages of synchromesh transmission? [4]
- c) Define camber angle and its function in modern cars. [3]
- d) How does torsion type spring shackle differ from compression type? [4]
- e) Uses of engine specifications. [4]
- f) How catalytic convertors help in controlling pollution? [4]

PART-B (3x16 = 48 Marks)

2. a) Explain with a simple schematic diagram, working of a four wheel drive automobile. [8]
- b) Why lubrication system is essential in a automobile, explain working of pressurized lubrication system. [8]
3. a) Explain with a simple sketch, working of centrifugal type of clutch and why free play should be provided for clutch. [8]
- b) Draw and explain with a simple sketch, working of a constant mesh gear box. [8]
4. a) Explain with a simple sketch, working of worm and ball bearing nut steering mechanism. [8]
- b) What are the functions of steering system, explain with relevant sketch Ackerman steering mechanism. [8]
5. a) Explain with a schematic diagram, working of rigid axle front wheel suspension system. [8]
- b) Briefly discuss the functional requirements of braking fluids. [8]
6. a) How effective are seat belts and explain why is it safer to wear seat belts. [8]
- b) What is cruise control, explain briefly its working. [8]
7. a) Briefly explain the mechanism of formation of pollutants in automobile exhaust. [8]
- b) Explain briefly the procedure for service of valve mechanism in a automobile. [8]



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Set No. 2

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AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) List all functions performed by lubricating oil in automobile engine. [4]
- b) Why are overdrives designed to be used above a set car speed? [3]
- c) Why do the front wheels have to toe-out during turns? [3]
- d) Differentiate between dead axle and live axle. [4]
- e) Why seat belts are essential in modern cars? [4]
- f) Why stringent norms are emphasized by pollution control boards? [4]

PART-B (3x16 = 48 Marks)

2. a) Give the comparison between front wheel drive and rear wheel drive. Also mention advantages of four wheel drive. [8]
- b) What is a super charger and explain how it can improve performance of an engine. [8]
3. a) Explain with relevant schematic diagram, working of a multi plate clutch assembly in a automobile. [8]
- b) Why synchromesh gear box are more advantageous than constant mesh gear box, Comment. [8]
4. a) What are camber and castor angles, what are its significance in steering geometry. [8]
- b) Explain with a simple sketch, conventional type of linkage used in commercial cars. [8]
5. a) What are the advantages of independent suspension system, explain independent front wheel suspension using torsion bars. [8]
- b) Draw and explain with simple layout hydraulic braking system in a commercial automobile. [8]
6. a) Explain how air bags work and why it is essential in a automobile. [8]
- b) What are suspension sensors and explain how these improve comfort levels in a automobile. [8]
7. a) Explain briefly the methods available to control emissions from a automobile. [8]
- b) Discuss various methods by which amount of wear can be estimated in big end bearing of connecting rod. [8]



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Set No. 3

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AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Why mineral oils used almost exclusively for engine lubrication? [4]
- b) What is the function of torsion spring in clutch assembly? [4]
- c) What are the functions of steering gears in steering mechanism? [4]
- d) Explain how hydraulic brakes are naturally self equalizing. [3]
- e) What are functional requirements of wind screen? [3]
- f) List all indications for cylinder wall wear. [4]

PART-B (3x16 = 48 Marks)

2. a) Explain the working of a turbocharger in a automobile and comment on how it improves engine performance. [8]
- b) What are the different methods of repairing an engine which has worn out cylinder walls? [8]
3. a) Explain with a simple sketch, construction and working of differential in a automobile. [8]
- b) Draw a schematic diagram and explain the working of a torque convertor. [8]
4. a) Why steering system is essential in a automobile, explain with relevant sketch Davis steering mechanism? [8]
- b) Define directional stability and explain the factors which factors influence directional stability in a automobile. [8]
5. a) Draw and explain in detail with a simple sketch, working of master cylinder in braking system. [8]
- b) Explain with a simple sketch, working of Bendix mechanism in a automobile. [8]
6. a) Explain the working of ABS in a automobile with simple sketch with its uses. [8]
- b) Briefly explain how engine specifications logically guide a customer while purchasing a new vehicle. [8]
7. a) What are catalytic convertors and explain how they help in containing emissions from a automobile. [8]
- b) Discuss briefly inspection and repair procedures for engine crank shafts in automobiles. [8]



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Set No. 4

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AUTOMOBILE ENGINEERING

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) List all functions of a piston rings in an engine. [3]
- b) Why is clutch pedal free play important? [3]
- c) How does castor angle help in directional stability in automobiles? [4]
- d) Explain why a high pedal produces better braking action than a low one? [4]
- e) Is speed control essential in modern cars if so why? [4]
- f) Why should aluminum heads be tightened only when cold? [4]

PART-B (3x16 = 48 Marks)

2. a) Draw a simple sketch of a supercharger and explain how its presence can improve performance of an engine. [8]
- b) Why crankcase ventilation essential in a engine, explain with a simple sketch working of it. [8]
3. a) Explain with a simple sketch, construction and working of epicyclic gear box in a automobile. [8]
- b) What are the different types of wheels used in passenger cars and what are the advantages of tubeless tires. [8]
4. a) What are the different types of steering gears used in commercial automobiles, explain working of it. [8]
- b) What is steering geometry and explain it briefly. [8]
5. a) Explain with a simple sketch, working of power brakes in a commercial automobile. [8]
- b) Draw and explain with relevant circuit diagram, working of a windscreen wiper in a automobile. [8]
6. a) What are the advantages and disadvantages of central locking system in a automobile. [8]
- b) Explain with relevant sketches, working of electric windows in a automobile. [8]
7. a) What are the advantages and disadvantages of use of alternate fuels in automobiles? [8]
- b) Discuss briefly the procedure for repair of cylinder wear in a automobile engine. [8]

