

Code No: R21242

R10**SET - 1****II B. Tech I Semester Regular Examinations, March – 2014****AUTOMOTIVE ENGINES**

(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Give classification of S.I. Engines by valve location.  
b) Explain the thermodynamic cycle of a supercharged I.C. engine. (7M+8M)
2. a) Describe the scavenging diagram for a two-stroke cycle S.I. Engine.  
b) Discuss any two theoretical scavenging processes. (7M+8M)
3. a) Discuss the basic functions of a cylinder head.  
b) Explain the typical cylinder head layouts for Diesel engine. (6M+9M)
4. A simple jet carburetor has to supply 5 kg of air per minute. The air at a pressure of 1.013 bar and at a temperature of 27°C. Calculate the throat diameter of the choke for air flow velocity of 90 m/s. Take velocity coefficient to be 0.8. Assume isentropic flow. Assume the flow to be compressible. (15M)
5. a) What is the necessity for gasoline injection? Explain with suitable sketch.  
b) Mention the various types of gasoline injection systems. (8M+7M)
6. a) Explain the working of various nozzles with sketches.  
b) Explain the working of felt type oil filter with a neat sketch. (8M+7M)
7. a) Explain the working principle of pneumatic governor with a neat sketch.  
b) Explain the various phases of spray formation with sketches. (8M+7M)
8. a) Explain the dry sump lubricating system with a sketch.  
b) Compare wet sump and dry sump lubricating systems. (8M+7M)

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**R10****SET - 2**

**II B. Tech I Semester Regular Examinations, March – 2014**  
**AUTOMOTIVE ENGINES**  
(Automobile Engineering)

Time: 3 hours

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks  
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1. a) What are the limits of turbo-charging? Explain how it effect the performance of an I.C Engine.
b) What is supercharging? Explain the advantages and disadvantages of it. (7M+8M)
2. What is the function of the following in a Stirling Engine?
a) Power piston and the displacer piston assembly.
b) Buffer space c) Swash plate drive. (5M+5M+5M)
3. a) Discuss the important functions of a connecting rod and also represent the various forces acting on it.
b) Discuss the materials used for the construction of camshaft, crankshaft, flywheel and connecting rod. (7M+8M)
4. A single jet carburetor is to supply 6 kg/minute of air and 0.4 kg/ minute of petrol of specific gravity 0.75. The air is initially at 1.013 bar and 27⁰C. Assuming an isentropic coefficient of 1.35 for air, find: i) the diameter of the venturi if the air speed is 90 m/s and the velocity coefficient for venturi is 0.85. ii) the diameter of the jet if the pressure drop at the jet is 0.8 times the pressure drop at the venturi and the discharge coefficient for the jet is 0.66. (15M)
5. a) Explain the advantages of petrol injection systems.
b) What are the various sensors used in electronic fuel injection system? (7M+8M)
6. a) How are the injection systems classified? Why the air injection system is not used nowadays?
b) Explain the working of a filter with Felt and Paper elements with a neat sketch. (8M+7M)
7. a) Explain the working principle of mechanical governor with a neat sketch.
b) Explain the working of multihole nozzle with a sketch. (8M+7M)
8. a) Explain the air and water cooling systems with neat sketches.
b) What is meant by crankcase ventilation? Explain with a sketch. (8M+7M)

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R10**SET - 3****II B. Tech I Semester Regular Examinations, March – 2014****AUTOMOTIVE ENGINES**

(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) What is turbo- charging? How is it achieved?  
b) Derive an expression for the power required for an I.C. engine supercharger. (8M+7M)
2. a) Discuss the advantages & disadvantages of Stirling Engine.  
b) Describe with sketches the working of Wankel combustion Engine. (8M+7M)
3. a) Explain the arrangement of the basic valve system for an overhead valve engine.  
b) Describe various types of commonly used valve arrangements. (8M+7M)
4. A petrol engine has a carburetor of 32 mm venturi size. The jet diameter is 2 mm. The pressure difference at throat is 50 mm of Hg. The atmospheric pressure is 1 bar and temperature 27<sup>0</sup>C. The coefficient of discharge for venturi is 0.85 and for fuel jet 0.66. The density of petrol is 740 kg/m<sup>3</sup>. Nozzle lip is zero. Relative density of Hg is 13.6. Find the fuel velocity, fuel flow, air velocity, air flow and F/A, neglecting compressibility. (15M)
5. a) Explain the merits and demerits of an Electronic fuel Injection system.  
b) Describe the Multi Point Fuel Injection system with a neat sketch. (8M+7M)
6. a) What are the functional requirements of an injection system?  
b) With a neat sketch explain the jerk pump type injection system. (7M+8M)
7. a) Explain the working of Pintle nozzle with a sketch.  
b) What is the purpose of using a governor in C.I. Engines? What are the two major types of governors? (7M+8M)
8. a) Explain the forced water cooling system with a sketch.  
b) Give the classification of oil filters and explain the working of any one of them with a sketch. (8M+7M)

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**R10****SET - 4****II B. Tech I Semester Regular Examinations, March – 2014****AUTOMOTIVE ENGINES**

(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) What modifications are necessary for a supercharged engine?
b) Discuss the various applications of I.C. Engines. (8M+7M)
2. a) Discuss the important designs of variable compression ratio engines & comment on their salient points.
b) What is the difference between the valve timing of a crankcase-scavenged & supercharge two stroke Engine? (8M+7M)
3. a) Discuss the main principles of intake and exhaust manifold design of an Engine.
b) What is a cylinder liner? Discuss the advantages & disadvantages of a wet liner over a dry liner. (8M+7M)
4. A simple jet carburetor is required to supply 6 kg of air per minute and 0.45 kg of fuel of density of 740 kg/m^3 . The air is initially at 1.013 bar and 27°C . Calculate the throat diameter of the choke for a flow velocity of 92 m/s. Take velocity coefficient as 0.8. (15M)
5. a) Explain port injection and throttle body injection systems with neat sketches.
b) Describe D-MPFI and L-MPFI injection systems. (7M+8M)
6. a) With a neat sketch explain the working principle of distributor type fuel injection pump.
b) Discuss the important functions of nozzle. (8M+7M)
7. a) Explain the working of Pintaux nozzle with a sketch.
b) Explain the working principle of pneumatic governor with a neat sketch. (8M+7M)
8. a) Explain the thermosyphon cooling system with a sketch.
b) Give the classification of the lubricating oils and their functions. (8M+7M)