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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

December 2016 Semester End Main Examinations

Course: **Elements of Mechanical Engineering**
Course Code: **14ME11CEME**

Duration: **3 hrs**
Max Marks: **100**

Date: 19.12.2016

Instructions: 1. Answer any five full questions choosing one from each unit.
2. Assume missing data (if any) suitably

UNIT 1

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|---|----|---|-----------|
| 1 | a) | List the differences between renewable and non-renewable sources of energy. | 05 |
| | b) | Explain the working of a Hydro electric power plant with a neat sketch. | 10 |
| | c) | State the functions and locations of the Boiler mountings. | 05 |

UNIT 2

- | | | | |
|---|----|--|-----------|
| 2 | a) | Identify the differences between Impulse turbine and Reaction turbine. | 06 |
| | b) | Define the following terms. | 06 |
| | | i) Ton of refrigeration | |
| | | ii) COP | |
| | | iii) Ice making capacity. | |
| | c) | With a neat sketch, explain the working principle of a Vapour absorption refrigerator. | 08 |

UNIT 3

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|---|----|--|-----------|
| 3 | a) | With a neat sketch, explain the working of a Four-stroke petrol engine with PV diagram. | 10 |
| | b) | Calculate the Brake power output of a single cylinder 4-stroke petrol engine for the following given data. | 10 |
| | | Diameter of brake wheel=600mm, Brake rope diameter=30mm | |
| | | Dead Weight=24Kg, Spring balance reading=4Kg and Rated speed=450rpm. | |

OR

- | | | | |
|---|----|--|-----------|
| 4 | a) | Compare & Contrast any four differences between 2-Stroke engine with 4-Stroke engine. | 08 |
| | c) | A single cylinder, four stroke diesel engine develop indicated power of 30KW at 300rpm. The indicated mean effective pressure is 6.5. The piston speed is 180 m/min. Determine the Stroke and the diameter of the cylinder. Also, find brake specific fuel consumption, if mechanical efficiency is 80% and indicated thermal efficiency is 30%. Take the Calorific value of diesel as 40000KJ/Kg. | 12 |

UNIT 4

- 5 a) Explain with the help of sketches four machining operations that can be carried out in a Lathe machine. **10**
- b) With a neat sketch, explain Radial drilling machine. **10**

OR

- 6 a) Summarize the following drilling machine operations. **10**
- i) Reaming
 - ii) Boring
 - iii) Tapping
 - iv) Counter sinking.
- b) Explain Surface grinding operation with a neat sketch. **06**
- c) How is milling machine specified?. **04**

UNIT 5

- 7 a) Define the following terms used in belt drive. **08**
- i) Tight side ii) Slack side iii) Slip iv) Creep.
- b) Mention the differences between Open and Cross belt drive. With neat diagrams **08**
- c) Write the simple block diagram for closed control system. **04**
