|  | | | **Reg. No.:** | |  | | |
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| **Name :** | |  | | |
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| **Mid-Term Examinations – August 2021** | | | | | | | |
| Programme | : | **B.Tech. [ BCE]** | | Semester | | : | **Interim 2021-22** |
| Course | : | **Energy & Environmental Physics** | | Code | | : | **PHY2002** |
| Faculty | : | **Dr. Suchetana Sadhukhan** | | Slot/ Class No. | | : | **A11/ 0198** |
| Time | : | **1 ½ hours** | | Max. Marks | | : | **50** |
| **Answer all the Questions** | | | | | | | |
| **Q.No.** | **Sub. Sec.** | **Question Description** | **Marks** |
| 1 | (a) | An advertisement claims that a certain 1200-kg car can accelerate from rest to a speed of 25 m/s in a time of 8.0 s.  Find out the work done by the motor of the car. | **6** |
|  | (b) | Illustrate the law of conservation of energy by discussing the energy changes which occur when we draw a pendulum bob to one side and allow it to oscillate. Why does the bob eventually come to rest? What happens to its energy eventually? Is it a violation of the law of conservation of energy? | **6** |
| 2 |  | A spherical body of 2.0 cm diameter is maintained at 600 °C. Assuming that it radiates as if it were a blackbody, at what rate (in watts) is energy radiated from the sphere? | **8** |
| 3 |  | “All of the heat added to a system can’t be used in doing work”- Explain how this statement applies; alternatively, argue against the statement. | **10** |
| 4 |  | An inventor proposes an engine that operates between the 27°C warm surface layer of the ocean and a 10°C layer a few meters down. Calculate its efficiency. | **10** |
| 5 |  | What are the disadvantages of fossil fuels? Why are we looking at alternate sources of energy? | **10** |
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