

## WORK, ENERGY AND POWER

**General Instructions:** Answer all the questions. If you are unable to answer any question, go through the page number that is given against that particular question in the text book. You can find the answer.

### Test Paper-I

**MAX MARKS: 30**

**TIME: 90Mts**

- |    |                                                                                                                                                                                                                                                              |      |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---|
| 1  | Define Energy                                                                                                                                                                                                                                                | P114 | 1 |
| 2  | What is meant Scalar product or dot Product of two vectors?                                                                                                                                                                                                  | P115 | 2 |
| 3  | What are the laws obeyed by Scalar product of vectors                                                                                                                                                                                                        | P115 | 2 |
| 4  | Find the angle between force $F = 3\hat{i} + 4\hat{j} - 5\hat{k}$ unit and displacement $d = (5\hat{i} + 4\hat{j} - 3\hat{k})$ unit. Also find the projection of F on d.                                                                                     | P115 | 3 |
| 5  | State and Prove Work-Energy theorem                                                                                                                                                                                                                          | P116 | 3 |
| 6  | Consider a drop of mass 1.00g falling from a height of 1.00 km. It hits the ground with a speed of $50.0 \text{ m s}^{-1}$ . (a) What is the work done by the gravitational force? What is the work done by the unknown resistive force?                     | P116 | 3 |
| 7  | Define work done by the force. Give the dimensional formula of force. What is the SI unit of Work?                                                                                                                                                           | P117 | 3 |
| 8  | Give examples where the work done by a force is zero, positive and negative.                                                                                                                                                                                 | P117 | 3 |
| 9  | A cyclist comes to a skidding stop in 10m. During this process, the force on the cycle due to the road is 200 N and is directly opposed to the motion. (a) How much work does the road do on the cycle? (b) How much work does the cycle do on the road?     | P117 | 3 |
| 10 | What is meant by Kinetic Energy? Is it a scalar or vector quantity? Give the formula to find the Kinetic energy of an object of mass m has velocity v.                                                                                                       | P117 | 2 |
| 11 | In a ballistics demonstration a police officer fires a bullet of mass 50.0 g with speed $200 \text{ ms}^{-1}$ on soft plywood of thickness 2.00cm. The bullet emerges with only 10% of its initial kinetic energy. What is the emergent speed of the bullet? | P118 | 2 |
| 12 | How will you find the work done by a variable force? Explain briefly.                                                                                                                                                                                        | P118 | 3 |