PART – A

Choose the correct word which is opposite of the word in bold.

1. **Sustain**
   A) stop  B) attain  C) bear  D) aid

2. **Migratory**
   A) wandering  B) settled  C) nomad  D) inventory

Choose the word that is most nearly similar in meaning to the word in bold.

3. **Plagiarism**
   A) theft of funds  B) theft of ideas  C) belief in Gods  D) arson

4. **Consanguinity**
   A) bloodletting  B) relief  C) understanding  D) kinship

Choose the word that is most nearly similar in meaning to the idiom/phrase given in bold.

5. **To meet one’s Waterloo**
   A) To die fighting  B) To meet one’s final defeat  C) To meet with humiliation  D) To meet a strong adversary

6. Who among the following received the Nobel Prize twice for the same subject?
   A) Frederic Jolit  B) Frederic Sanger  C) Stanley Cohen  D) Marie Curie

7. Who is known as the ‘Lady with the lamp’?
   A) Joan of Arc  B) Sarojini Naidu  C) Indira Gandhi  D) Florence Nightingale

8. Which one of the following is the oldest English daily in India?
   A) The Hindustan Times  B) The Tribune  C) The Times of India  D) The Indian Express

A*
PART – B

26. Stoke’s theorem converts
   A) line integral to surface integral    B) surface integral to volume integral
   C) line integral to volume integral    D) scalar quantity to vector quantity

27. The value of a gradient (A.R) is
   (where A is a constant vector and R is position vector.)
   A) 0          B) |A|          C) R          D) A

28. For a non-zero constant acceleration, the velocity-time graph is a
   A) straight line parallel to the time axis    B) straight line perpendicular to the time axis
   C) straight line inclined to the time axis   D) not a straight line

29. Coriolis acceleration of a body in rotating frame of reference is given by
   (ω is angular velocity of rotating frame and V’ is velocity of body in rotating frame.)
   A) −[ω × V’]                B) −[ω × V’]/2
   C) −2[ω × V’]               D) −2[ω × V’] × V’

30. Maximum and minimum orbital velocities of a satellite under the action of a central force are $V_{max}$ and $V_{min}$ respectively. The eccentricity ‘e’ of satellite’s orbit is
   A) $[V_{max} + V_{min}]/V_{max}$    B) $[V_{max} - V_{min}]/[V_{max} + V_{min}]$
   C) $[V_{max} - V_{min}]/V_{max}$    D) $[V_{max} + V_{min}]/[V_{max} - V_{min}]$

31. A 2 kg body moving on a frictionless surface with velocity $V_i = 8 \hat{i}$ m/s collides with another body of mass 4 Kg. After the collision first body goes with velocity $V_{i}' = [2\hat{i} + 2\sqrt{3} \hat{j}]$ m/s. The velocity of the second body after the collision (in m/s) will be
   A) $3\hat{i} + \sqrt{3} \hat{j}$    B) $3\hat{i} - \sqrt{3} \hat{j}$
   C) $12\hat{i} - 4\sqrt{3} \hat{j}$  D) $6\hat{i} - 2\sqrt{3} \hat{j}$

32. A particle moves in x-y plane under the action of a force $F$ such that its linear momentum $P$ has components $P_x = 2\cos t$ and $P_y = 2\sin t$ at time $t$. The angle between force and linear momentum at time $t$ is
   A) 0°          B) 30°        C) 90°        D) 180°

33. Consider a circular plate A of uniform thickness $t$ whose radius is $2R$ and centre is at a point $P$. A circular plate B of radius $R$ is cut from the above plate A such that one end of its diameter lies at $P$ and another at edge of A. How far is the new centre of mass from the point $P$?
   A) $R/3$     B) $R/4$     C) $R/5$     D) $R/6$