PART – A

Choose the correct word which is <u>opposite</u> 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

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) $-[\omega \times V']$
    B) $-[\omega \times V']/2$
    C) $-2[\omega \times V']$
    D) $-2[\omega \times V'] \times V'$

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

A*