Total No. of Questions – [10] Total No. of Printed Pages: 1

G.R. No.	

P118-121 (T2)

OCTOBER 2018 / IN - SEM (T2)
F. Y. M. TECH. (CIVIL-WREE) (SEMESTER -I)
COURSE NAME: ADVANCED FLUID MECHANICS
COURSE CODE: CVPA11181
(PATTERN 2018)

Time: [1/2 Hour] [Max. Marks: 10]

(*) Instructions to candidates:
1) All questions are compulsory
2) Each question is of 1 mark. Mark the correct choice by encircling it.
3) Use of scientific calculator is allowed
4) Use suitable data where ever required

1. If x is the distance measured from the leading edge of a plate the laminar boundary layer thickness varies as
   a) X b) $x^{1/2}$ c) $x^{-1/2}$ d) $x^{-4/5}$
2. The expression for momentum thickness of an incompressible boundary layer is given by
   a) $\int_0^{\delta} \frac{u}{U} dy$ b) $\int_0^{\delta} (1-\frac{u}{U}) dy$ c) $\int_0^{\delta} \frac{u}{U}(1-\frac{u}{U}) dy$ d) $\int_0^{\delta} (\frac{u}{U})^2 (1-\frac{u}{U}) dy$
3. The growth of a turbulent boundary layer thickness as compared to the laminar boundary layer takes place
   a) At a slower rate b) at a faster rate c) at the same rate d) unpredictable
4. Flow separation in a flow past a solid object is caused by
   a) A favorable (negative) pressure gradient b) an adverse (positive) pressure gradient
   c) The boundary layer thickness reducing to zero d) a reduction of pressure to vapor pressure
5. The expression for displacement thickness of an incompressible boundary layer thickness is
   a) $\int_0^{\delta} \frac{u}{U} dy$ b) $\int_0^{\delta} (1-\frac{u}{U}) dy$ c) $\int_0^{\delta} \frac{u}{U}(1-\frac{u}{U}) dy$ d) $\int_0^{\delta} (\frac{u}{U})^2 (1-\frac{u}{U}) dy$
6. If x is the distance measured from the leading edge of a plate the skin friction coefficient for laminar boundary layer varies as
   a) x b) $x^{1/2}$ c) $x^{-1/2}$ d) $x^{-4/5}$
7. The velocity profile for laminar boundary layer flow over a flat plate is given as $\frac{u}{U} = \frac{3}{2}\frac{y}{\delta} - \frac{1}{2}\left(\frac{y}{\delta}\right)^3$. The displacement thickness of the boundary layer is given as
   a) $3\frac{\delta}{8}$ b) $\frac{39}{280}\delta$ c) $\frac{1}{2}\delta$ d) $\frac{7}{72}\delta$
8. The velocity profile for laminar boundary layer flow over a flat plate is given as $\frac{u}{U} = \frac{3}{2}\frac{y}{\delta} - \frac{1}{2}\left(\frac{y}{\delta}\right)^3$. The momentum thickness of the boundary layer is given as
   a) $3\frac{\delta}{8}$ b) $\frac{39}{280}\delta$ c) $\frac{1}{2}\delta$ d) $\frac{7}{72}\delta$
9. The predominant forces acting on an element of fluid in the boundary layer over a flat plate placed in a uniform stream include
   a) inertia and pressure force b) viscous and pressure force c) viscous and body force
   d) viscous and inertia force
10. Consider a laminar boundary layer over a flat plate. The local skin friction coefficient along the length
    a) decreases b) increases c) remains constant d) first decreases and then decreases