2013-AE

EE24BTECH11056 - S.Kavya Anvitha

1) A second identical airfoil is placed behind the first one at a distance of $c/2$ from the trailing edge of the first. The second airfoil has an unknown circulation Γ_2, placed at its quarter chord. The normal velocity becomes zero at the same chord-wise locations of the respective airfoils as in the previous question. The values of Γ_1 and Γ_2 are respectively
   a) $\frac{4}{3}\pi cU\alpha,\ \frac{2}{3}\pi cU\alpha$
   b) $\frac{2}{3}\pi cU\alpha,\ \frac{2}{3}\pi cU\alpha$
   c) $\frac{2}{3}\pi cU\alpha,\ \frac{1}{3}\pi cU\alpha$
   d) $\frac{4}{3}\pi cU\alpha,\ \frac{4}{3}\pi cU\alpha$

1 Statement for Linked Answer Questions Q.54 and Q.55:

A wing-body alone configuration airplane with a wing loading of $\frac{W}{S} = 1000N/m^2$ is flying in cruise condition at a speed $V = 90m/s$ at sea-level (air density at sea-level $\rho_e = 1.122kg/m^3$). The zero lift pitching moment coefficient of the airplane is $C_{\mathrm{m0}} = C_{m_{\mathrm{ac}}} = -0.06$ and the location of airplane aerodynamic center from the wing leading edge is $X_{\mathrm{ac}} = 0.25c$. Here c is the chord length.

2) The airplane trim lift coefficient $C_{L_{\mathrm{trim}}}$ is
   a) 0.502
   b) 0.402
   c) 0.302
   d) 0.202

3) Distance of center of gravity of the aircraft X_{CG} from the wing leading edge is
   a) $0.447c$
   b) $-0.547c$
   c) $0.547c$
   d) $-0.25c$

General Aptitude (GA) Questions
Q.56 – Q.60 carry one mark each.

4) If $3 \le X \le 5 and 8 \le Y \le 11$ then which of the following options is TRUE?
   a) $\frac{3}{5} \le \frac{X}{Y} \le \frac{8}{5}$
   b) $\frac{3}{11} \le \frac{X}{Y} \le \frac{5}{8}$
   c) $\frac{3}{5} \le \frac{X}{Y} \le \frac{8}{5}$

d) $\frac{3}{5} \leq \frac{X}{Y} \leq \frac{8}{11}$

5) The Headmaster to speak to you.
Which of the following options is incorrect to complete theabove sentence?
a) is wanting
b) wants
c) want
d) was wanting

6) Mahatma Gandhi was known for his humility as
a) he played an important role in humiliating exit of British from India.
b) he worked for humanitarian causes.
c) he displayed modesty in his interactions.
d) he was a fine human being.

7) All engineering students
should learn mechanics, mathematics and how to do computation.
Which of the above underlined parts of the sentence is not appropriate?
a) I
b) II
c) III
d) IV

8) Select the pair that best expresses a relationship similar to that expressed in the pair:
water: pipe
a) cart: road
b) electricity: wire
c) sea: beach
d) music: instrument

Q.61 to Q.65 carry two marks each.

9) Velocity of an object fired directly in upward direction is given by $V = 80-32t$, where t (time) is in seconds. When will the velocity be between $32m/sec$ and $64m/sec$?
a) (1, 3/2)
b) (1/2, 1)
c) (1/2, 3/2)
d) (1, 3)

10) In a factory, two machines $M1$ and $M2$ manufacture 60% and 40% of the autocomponents respectively. Out of the total production, 2% of $M1$ and 3% of $M2$ are found to be defective. If a randomly drawn autocomponent from the combined lot is found defective, what is the probability that it was manufactured by $M2$?

a) 0.35
b) 0.45
c) 0.5
d) 0.4

11) Following table gives data on tourists from different countries visiting India in the year 2011.

Country	Number of Tourists
USA	2000
England	3500
Germany	1200
Italy	1100
Japan	2400
Australia	2300
France	1000

Which two countries contributed to the one third of the total number of tourists who visited India in 2011?

a) USA and Japan
b) USA and Australia
c) England and France
d) Japan and Australia

12) If $|-2x+9|=3$ then the possible value of $|-x|-x^2$ would be:

a) 30
b) -30
c) -42
d) 42

13) All professors are researchers
Some scientists are professors

Which of the given conclusions is logically valid and is inferred from the above arguments?

a) All scientists are researchers
b) All professors are scientists
c) Some researchers are scientists
d) No conclusion follows