

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
- $\frac{4}{3}\pi cU\alpha, \frac{2}{3}\pi cU\alpha$
 - $\frac{2}{3}\pi cU\alpha, \frac{2}{3}\pi cU\alpha$
 - $\frac{2}{3}\pi cU\alpha, \frac{4}{3}\pi cU\alpha$
 - $\frac{4}{3}\pi cU\alpha, \frac{4}{3}\pi cU\alpha$

1 STATEMENT FOR LINKED ANSWER QUESTIONS 54 AND 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 $C_{m0} = C_{m_{ac}} = -0.06$ and the location of airplane aerodynamic center from the wing leading edge is $X_{ac} = 0.25c$. Here c is the chord length.

- 2) The airplane trim lift coefficient $C_{L_{trim}}$ is
- 0.502
 - 0.402
 - 0.302
 - 0.202
- 3) Distance of center of gravity of the aircraft X_{CG} from the wing leading edge is
- $0.447c$
 - $-0.547c$
 - $0.547c$
 - $-0.25c$

General Aptitude (GA) Questions

Q.56 – Q.60 carry one mark each.

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

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 the above sentence?

- a) is wanting
- b) wants
- c) want
- d) was wantng

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