DIPLOMA - COMMON ENTRANCE TEST-2019

AE	COURSE	DAY : SUNDAY DATE : 21-07-2019
	AERONAUTICAL	TIME : 10.00 a.m. to 1.00 p.m.

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
180	200 MINUTES	180 MINUTES

MENTION YOUR DIPLOMA CET NUMBER	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	A	260401

Dos :

1. Candidate must verify that the DCET number and Name printed on the OMR Answer Sheet is tallying with the DCET number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 9.50 am**.
3. The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DONTs :

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The **3rd Bell rings at 10.00 am, till then;**
   - Do not remove the seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains **180** (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the **3rd Bell is rung at 10.00 am**, remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent **180** minutes:
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   - Completely **darken / shade** the relevant circle with a blue or **black ink ballpoint pen against the question number on the OMR answer sheet**.

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
(A) ● (C) (D)	(A) (B) (C) (D) (A) (B) (C) (D) (A) ● ● (D) (A) (B) (C) (D) (A) ● (C) (D)

4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last bell is rung at 1.00 pm**, stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Hand over the **OMR answer sheet** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year**.

AE-A

PART – A

APPLIED SCIENCE

1. One of the basic unit in SI is

(A) Newton (B) Joule

(C) Kilometer (D) Ampere

2. The pitch of screw is $\frac{1}{2}$ mm. The number of divisions on head scale of screw gauge is 50. The least count of screw gauge is

(A) 0.1 mm (B) 0.5 mm

(C) 0.01 mm (D) 0.05 mm

3. Which one of the following is a vector quantity ?

(A) Speed (B) Density

(C) Velocity (D) Mass

4. The magnitude of resultant of two forces $\vec{P}$ & $\vec{Q}$ acting perpendicular to each other is

(A) $\sqrt{P^2 + Q^2}$ (B) $\sqrt{P^2 - Q^2}$

(C) $P^2 - Q^2$ (D) $P^2 + Q^2$

5. A force of 50 N acts at a point making an angle of 30° with the horizontal. The vertical component is

(A) 50 N (B) 25 N

(C) 150 N (D) 1.6 N

Space For Rough Work

6. A couple produces

(A) pure linear motion (B) pure rotational motion

(C) both linear and rotational motion (D) neither linear nor rotational motion

7. The resultant of two like parallel forces acts in the direction of

(A) same as that of two forces (B) opposite to two forces

(C) perpendicular to two forces (D) direction cannot be specified

8. The reciprocal of bulk modulus of elasticity is called

(A) Compressibility (B) Rigidity

(C) Modulus of elasticity (D) Viscosity

9. A steel wire has a cross sectional area of 0.05 m^2. If the maximum stress of steel wire is 1000 N/m^2. The force is

(A) 20×10^3 N (B) 50 N

(C) 200 N (D) 20 N

10. The pressure at a point on surface of a liquid is

(A) minimum (B) maximum

(C) zero (D) infinity

11. The pressure exerted by sea water of density 1025 kg/m^3 on a fish at a depth of 10 m ($g = 10\ m/s^2$) is

(A) 1025 kPa (B) 10.25 kPa

(C) 1.025 kPa (D) 102.5 kPa

Space For Rough Work

12. A drop of rain assumes spherical shape due to

(A) Density (B) Viscosity

(C) Surface tension (D) Humidity

13. The phenomenon of rise or fall of liquid in a capillary tube is

(A) Viscosity (B) Capillarity

(C) Density (D) Elasticity

14. The S.I. unit of coefficient of viscosity is

(A) Ns/m^2 (B) Nm^2/s

(C) m^2s/N (D) Ns/m

15. The expression that represents Boyle's law is

(A) PV = constant (B) PT = constant

(C) VT = constant (D) PVT = constant

16. The volume of gas at 30 °C is 2 litres. To what temperature the gas must be heated for its volume to become 4 litres at constant pressure.

(A) 300 °C (B) 273 °C

(C) 333 °C (D) 606 °C

17. Working of pressure cooker is based on the principle of

(A) Boyle's law (B) Charle's law

(C) Laplace's law (D) Gay-Lussac's law

Space For Rough Work

18. Land and sea breeze is an example of

(A) Conduction (B) Convection

(C) Condensation (D) Radiation

19. The measure of average kinetic energy of all the particles in a gas is

(A) Heat (B) Mechanical energy

(C) Chemical energy (D) Temperature

20. When a wave travels through the medium, the particles of the medium are

(A) displaced in the direction of wave

(B) displaced opposite to the direction of wave

(C) mean position remains same

(D) starts rotating

21. Two waves with very little difference in their frequencies overlap on one another to produce

(A) Stationary waves (B) Progressive waves

(C) Beats (D) Transverse waves

22. The acceleration of the particle executing simple harmonic motion is directly proportional to its

(A) displacement from its mean position

(B) period of motion

(C) frequency of vibration

(D) amplitude of wave

Space For Rough Work

23. In the expression for velocity of sound in air, $V = \sqrt{\frac{\gamma P}{\rho}}$, notation γ is equal to

(A) $C_P + C_V$ (B) $C_P - C_V$

(C) $C_P \times C_V$ (D) $\frac{C_P}{C_V}$

24. Velocity of sound in outer space is

(A) 3×10^8 m/s (B) 330 m/s

(C) zero (D) 360 m/s

25. A string of length 1 m and mass 0.04 kilogram vibrates with fundamental frequency of 100 Hz then the tension in the string is

(A) 4000 N (B) 1600 N

(C) 400 N (D) 1000 N

26. Nodes and antinodes are characteristics of

(A) Stationary waves (B) Longitudinal waves

(C) Transverse waves (D) Beats

27. Natural frequency of a string does not vary with

(A) thickness (B) applied force

(C) tension (D) length

28. The electromagnetic radiation used in Forensic Department to study the finger print is

(A) Ultraviolet Ray (UV Ray) (B) Radio wave

(C) Micro wave (D) X-ray

Space For Rough Work

29. The type of light used to study Holography is

(A) Visible light (B) Laser light

(C) Sodium light (D) Mercury light

30. Which technology is used to develop Sun Screen lotion and cosmetics ?

(A) Geo-technology (B) Nano-technology

(C) Electro-technology (D) Micro-technology

31. The process of separating the information signal from the carrier wave at the receiver is known as

(A) Amplification (B) Modulation

(C) Attenuation (D) Demodulation

32. Optical fibre is used in

(A) Pressure sensors (B) Drilling

(C) Holography (D) Welding

33. The mass of copper deposited on the cathode of a copper voltmeter by a current of 2 amperes in 30 minutes is

(Given ece of copper (Z) = 0.0003 gm / coulomb)

(A) 3.2 gm (B) 4.3 gm

(C) 1.08 gm (D) 2.5 gm

34. The process of coating zinc over iron or steel is known as

(A) Galvanizing (B) Tinning

(C) Alloying (D) Non-Metallic coating

Space For Rough Work

35. SOFC is a type of

(A) Primary cell (B) Secondary cell

(C) Fuel cell (D) Solar cell

36. Magnalium is an alloy made by the combination of aluminium and

(A) Phosphorous (B) Zinc

(C) Tin (D) Magnesium

37. Zinc-carbon battery is an example for

(A) Secondary Battery (B) Fuel cell

(C) Primary Battery (D) Solar cell

38. Which of the following is not a polymer ?

(A) Teflon (B) Nylon

(C) Bakelite (D) Glass

39. Ceramic is which type of material ?

(A) Composite material (B) Alloy

(C) Polymer (D) Bio-material

40. The pH value of distilled water is

(A) 13 (B) 7

(C) 2 (D) 11

Space For Rough Work

PART – B

ENGINEERING MATHEMATICS

41. If $A = \begin{bmatrix} -3 & 4 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ -2 & 1 \end{bmatrix}$, then $B^T \cdot A^T$ is

(A) $\begin{bmatrix} 3 & 8 \\ -4 & 0 \end{bmatrix}$

(B) $\begin{bmatrix} -5 & -2 \\ -2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 5 & 2 \\ -2 & -4 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & 2 \\ 2 & 4 \end{bmatrix}$

42. The value of the $\begin{vmatrix} \tan\theta & 0 & -1 \\ 1 & 0 & \tan\theta \\ 2 & -1 & 3 \end{vmatrix}$ is

(A) $-\sec^2\theta$

(B) $\operatorname{cosec}^2\theta$

(C) 1

(D) $\sec^2\theta$

43. The values of x and y in the simultaneous equations $2x - 3y = 13$ and $3x + 4y = -6$ are

(A) $x = -3, y = 2$

(B) $x = -2, y = -3$

(C) $x = 2, y = -3$

(D) $x = 2, y = 3$

44. If $\begin{vmatrix} 3 & -2 & 4 \\ 4 & 0 & x \\ 2 & -5 & 4 \end{vmatrix} = -4$, then the value of x is

(A) 4

(B) –4

(C) $\frac{44}{19}$

(D) $-\frac{44}{19}$

Space For Rough Work

45. The characteristics roots of the matrix $\begin{bmatrix} 2 & 0 \\ 0 & -3 \end{bmatrix}$ are

(A) $\lambda = 2$ and $\lambda = 3$

(B) $\lambda = -2$ and $\lambda = -3$

(C) $\lambda = 2$ and $\lambda = -3$

(D) $\lambda = -2$ and $\lambda = 3$

46. The adjoint of the matrix $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$ is

(A) $\begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 3 \\ -2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$

(D) $\begin{bmatrix} 4 & -3 \\ 2 & 1 \end{bmatrix}$

47. If A = (1, 2, –3) and B = (2, 0, –1) then $\overrightarrow{AB}$ is

(A) $i - 2j + 2k$

(B) $-i + 2j - 2k$

(C) $3i + 2j - 4k$

(D) $i + 2j - 2k$

48. The work done by the force $\vec{F} = 2i + 6j - 8k$, whose displacement is $\vec{S} = -2i + 3j - k$ is

(A) 26 units

(B) –22 units

(C) 22 units

(D) 30 units

49. The vector product of $\vec{a} = 4i - j + k$ and $\vec{b} = 3i - 2k$ is

(A) $2i - 11j + 3k$

(B) $2i + 11j + 3k$

(C) $2i + 5j + 3k$

(D) $2i + 11j - 3k$

50. When a fair coin is tossed two times, the event A "getting exactly one tail" is given by

(A) {HT, TH}

(B) {TT}

(C) {TH}

(D) {TT, HT}

Space For Rough Work

51. If $\tan\theta = \frac{5}{12}$ and $\pi < \theta < \frac{3\pi}{2}$, then the value of $\sin\theta - \cos\theta$ is

(A) $\frac{17}{13}$ (B) $\frac{7}{13}$

(C) $-\frac{17}{13}$ (D) $-\frac{7}{13}$

52. The value of $\tan 225° \times \cot 405°$ is

(A) 1 (B) –1

(C) 2 (D) $\frac{1}{2}$

53. The value of $\sin 50° \cos 20° - \cos 50° \cdot \sin 20°$ is

(A) $\sin 70°$ (B) $\frac{\sqrt{3}}{2}$

(C) $\frac{1}{2}$ (D) $-\frac{1}{2}$

54. If $\cos A = \frac{15}{17}$ and $\sin B = \frac{3}{5}$, then the value of $\cos(A + B)$ is

(A) $\frac{84}{85}$ (B) $-\frac{36}{85}$

(C) $-\frac{84}{85}$ (D) $\frac{36}{85}$

55. The value of $\sqrt{\frac{1+\sin 2A}{1-\sin 2A}}$ is

(A) $\cot\left(\frac{\pi}{4}+A\right)$ (B) $\cot\left(\frac{\pi}{4}-A\right)$

(C) $\tan\left(\frac{\pi}{4}-A\right)$ (D) $\cot\left(\frac{\pi}{2}-A\right)$

Space For Rough Work

56. The value of $\cos 40° + \sin 10°$ is

(A) $\sin 20°$ (B) $-\cos 20°$

(C) $\cos 20°$ (D) $-\sin 20°$

57. The value of $i + i^2 + i^3 + i^4$ is

(A) i (B) –i

(C) 1 (D) 0

58. $\lim_{x \to 0} \frac{x}{\sqrt{1+x}-1}$ is equal to

(A) 0 (B) 1

(C) 2 (D) ∞

59. $\lim_{x \to \infty} \frac{3x^3 + 4x + 7}{(6+x^2)(x-1)} =$

(A) 3 (B) –3

(C) $\frac{1}{2}$ (D) $\frac{1}{6}$

60. $\lim_{x \to 0} \frac{3x + \sin 4x}{2 \sin 3x - 5x} =$

(A) $\frac{4}{3}$ (B) 7

(C) $\frac{3}{5}$ (D) $\frac{7}{11}$

Space For Rough Work

61. The slope and y-intercept of the line $6x - 4y + 3 = 0$ are respectively

(A) $\frac{3}{2}$ and $\frac{3}{4}$ (B) $\frac{2}{3}$ and $\frac{4}{3}$

(C) $\frac{-3}{2}$ and $\frac{4}{3}$ (D) $\frac{3}{2}$ and $\frac{2}{3}$

62. The equation of the line joining the points (1, 3) and (2, –4) is

(A) $7x - y - 10 = 0$ (B) $7x + y - 10 = 0$

(C) $x + 7y + 10 = 0$ (D) $x - 7y - 10 = 0$

63. If $y = e^{-2x} + 4a^x$, then $\frac{dy}{dx} =$

(A) $\frac{e^{-2x}}{2} + \frac{4a^x}{\log a}$ (B) $e^{-2x} + 4x\, a^{x-1}$

(C) $-2e^{-2x} + 4a^x \log a$ (D) $2e^{-2x} - 4a^x \log a$

64. If $y = \log(\log 3x)$ then $\frac{dy}{dx} =$

(A) $\frac{1}{x \log 3x}$ (B) $\frac{3}{x \log 3x}$

(C) $2 \log 3x$ (D) $\frac{1}{\log x}$

65. If $xy = x + y^2$, then $\frac{dy}{dx} =$

(A) $\frac{x - 2y}{1 - y}$ (B) $\frac{1 - y}{x - 2y}$

(C) $\frac{2y - x}{y - 1}$ (D) $\frac{1 + y}{x + 2y}$

Space For Rough Work

66. If $x = \tan^{-1} t$ and $y = 3t + t^3$ then $\frac{dy}{dx} =$

(A) 3

(B) $3(1 + t^2)^2$

(C) $\frac{3}{(1 + t^2)^2}$

(D) $\frac{1}{3(1 + t^2)^2}$

67. If $y = (x)^{\frac{1}{x}}$, then $\frac{dy}{dx} =$

(A) $y\left[\frac{1 + \log x}{x^2}\right]$

(B) $\frac{1 + \log x}{x^2 y}$

(C) $\frac{1 - \log x}{x^2 y}$

(D) $\frac{y[1 - \log x]}{x^2}$

68. Which of the following equations satisfy for the function $y = e^{\tan^{-1} x}$ with usual notations ?

(A) $(1 + x^2)y_2 + (2x - 1)y_1 = 0$

(B) $(1 + x^2)y_2 + 2xy_1 = 0$

(C) $(1 - x^2)y_2 - xy_1 - y = 0$

(D) $xy_2 - 2y_1 - xy = 0$

69. The equation of a normal to the curve $y = 4x^3 + 3x^2 + 4$ at the point $(-1, 3)$ is

(A) $6x + y - 19 = 0$

(B) $x + 6y - 17 = 0$

(C) $x - 6y + 17 = 0$

(D) $6x - y + 19 = 0$

70. The rate of change of surface area of a sphere is 12 cm^2/s. The rate at which the radius is changing when the radius of the sphere is 2 cm is equal to

(A) $\frac{\pi}{4}$ cm/s

(B) $\frac{3\pi}{4}$ cm/s

(C) 3π cm/s

(D) $\frac{3}{4\pi}$ cm/s

Space For Rough Work

71. $\int \left(1 + x - \frac{1}{x} + e^x\right) dx$

(A) $1 - \frac{1}{x^2} + e^x + c$

(B) $1 + \frac{x^2}{2} - \frac{1}{x^2} + e^x + c$

(C) $x + \frac{x^2}{2} - \log x + e^x + c$

(D) $x + 1 - \frac{1}{x^3} - e^x + c$

72. $\int e^{\tan x} \cdot \sec^2 x \, dx =$

(A) $e^{\tan x} + c$

(B) $e^{\sec^2 x} + c$

(C) $e^{\tan^2 x} + c$

(D) $e^{\sec x} + c$

73. $\int \cot^2 x \, dx =$

(A) $-\text{cosec}\, x + c$

(B) $-\cot x - x + c$

(C) $-\cot x + x + c$

(D) $\cot x + x + c$

74. $\int x \sin x \, dx =$

(A) $x \sin x - \cos x + c$

(B) $x \cos x - \sin x + c$

(C) $x \sin x + \cos x + c$

(D) $-x \cos x + \sin x + c$

75. $\int \sqrt[3]{x^2} \, dx =$

(A) $\frac{5}{2} x^{\frac{5}{2}} + c$

(B) $\frac{3}{5} x^{\frac{5}{3}} + c$

(C) $\frac{5x^{\frac{2}{5}}}{2} + c$

(D) $\frac{x^2}{2} + c$

Space For Rough Work

76. $\int_0^{\pi/2} \cos^2 x \, dx =$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{6}$

(C) $\frac{\pi}{3}$ (D) $\frac{\pi}{4}$

77. The volume of a solid generated when the curve $y = \sqrt{x^2 + 4}$ is rotated about x-axis between the ordinates $x = -1$ and $x = 1$ is

(A) $\frac{23\pi}{3}$ cubic units (B) $\frac{26\pi}{3}$ cubic units

(C) $\frac{16\pi}{3}$ cubic units (D) 0

78. The order and degree of the differential equation $\frac{dy}{dx} = \sqrt{1 + \frac{d^2y}{dx^2}}$ respectively are

(A) 1 and 1 (B) 1 and 2

(C) 2 and 1 (D) 2 and 2

79. The differential equation formed from the equation $y = ae^x + be^{-x}$ by eliminating arbitrary constants is

(A) $\frac{d^2y}{dx^2} - y = 0$ (B) $\frac{d^2y}{dx^2} + y = 0$

(C) $\frac{dy}{dx} + y = 0$ (D) $\frac{dy}{dx} - y = 0$

80. Solution of the differential equation $\frac{dy}{dx} = \frac{1 + y^2}{1 + x^2}$ is

(A) $\tan^{-1} y + \tan^{-1} x = k$ (B) $\tan^{-1} y - \tan^{-1} x = k$

(C) $\sin^{-1} y + \sin^{-1} x = k$ (D) $\sin^{-1} y - \sin^{-1} x = k$

Space For Rough Work

PART-C

AERONAUTICAL ENGINEERING

81. At constant pressure, volume of gas expands proportionally with increase in temperature. This is known as

(A) Boyle's law
(B) Perfect gas law
(C) Charles's law
(D) Universal gas law

82. Temperature lapse rate of a standard atmosphere is

(A) 1.98 °C per 1000 ft
(B) 1.98 °C per 1000 ft upto 36,090 ft beyond which it remains constant of –56.5 °C
(C) 6.5 °C per 1000 ft
(D) 6.5 °C per 1000 ft upto 36,090 ft beyond which it remains constant of –56.5 °C.

83. The actual flight speed of an airplane relative to an air mass is termed as

(A) true air speed
(B) indicated air speed
(C) caliberated air speed
(D) equivalent air speed

84. Kutta condition generally means that

(A) at lower values of circulation, the rear stagnation point will be on the upper surface of the airfoil.
(B) with increased circulation, the front stagnation point shifts downwards on the lower surface of the airfoil.
(C) at a fixed value of circulation, the flow leaves the trailing edge smoothly.
(D) circulation around the given airfoil is equal to velocity of air deflected dowards in downstream of the airfoil.

85. The thin separation of flow region behind the trailing edge in which the flow is always turbulent is known as

(A) wake
(B) circulation
(C) vortex
(D) None of these

Space For Rough Work

86. If chord length (c) = 100 mm, then the given airfoil NACA 4412 has

(A) 4 mm of camber, located at 44 mm from the leading edge and the thickness of airfoil is 12 mm.

(B) 4 mm of camber, located at 40 mm from the leading edge and the thickness of airfoil is 12 mm.

(C) 4 mm of camber is located at 41 mm from the leading edge whose thickness of the airfoil is 12 mm.

(D) None of these

87. The phenomenon that is applicable to supersonic flights in which the aircraft makes use of the shock waves to generate lift is called as

(A) vortex lift (B) lift coefficient

(C) compression lift (D) ground effect

88. Hardness of the material can be increased by

(A) rolling (B) heat treatment

(C) hammering (D) All of these

89. Negligible quantity of carbon is present in

(A) stainless steel (B) cast iron

(C) maraging steel (D) high speed tool steel

90. The strength of composites can be increased with the addition of

(A) reinforcement (B) matrix

(C) Both (A) and (B) (D) Neither (A) and (B)

91. A metal surface treatment using acid and base to prevent corrosion is called

(A) sand blasting (B) oxidizing

(C) pickling (D) metalizing

92. Which of the following is a plain carbon steel ?

(A) Wrought iron (B) High speed tool steel

(C) Stainless steel (D) Maraging steel

Space For Rough Work

93. The capacity of high pressure oxygen cylinder is

(A) 1800 to 1850 psi
(B) 600 to 650 psi
(C) 2300 to 2500 psi
(D) 1900 to 1950 psi

94. In the case of non-availability of Altimeter setting, the pilot should adjust the altimeter to

(A) The elevation of the nearest airport corrected to mean sea level.
(B) The elevation of the departure area.
(C) Pressure altitude corrected for non-standard temperature.
(D) ISA values at sea level.

95. Deviation in a magnetic compass is caused by

(A) presence of flaws in the permenant magnet of the compass.
(B) difference in the location between true north and magnetic north.
(C) magnetic field within the aircraft distorting the lines of magnetic force.
(D) None of these

96. If a flight is made from low pressure region to high pressure region without changing altimeter setting, then the altimeter will indicate

(A) the altitude above sea level
(B) lower than the actual altitude above sea level
(C) higher than the actual altitude above sea level
(D) No change in altitude.

97. The angular difference between true north and magnetic north is called

(A) Magnetic variation
(B) Magnetic deviation
(C) Compass acceleration error
(D) Magnetic field error

98. Stability about lateral axis is called

(A) Lateral stability
(B) Longitudinal stability
(C) Directional stability
(D) Dynamic stability

99. In a pump feed fuel system, selector valve has three positions namely, '_____', 'Right' and 'Off'.

(A) Crossfeed
(B) Pump on
(C) Both (A) and (B)
(D) Left

Space For Rough Work

100. The vapour lock problem may be caused in

(A) pipes (B) feed pump

(C) float chamber (D) All of these

101. After refueling the aircraft,

(A) first bonding cable to be disconnected and then fueling connection to be removed.

(B) first fueling connection to be removed and then bonding cable to be disconnected.

(C) anyone (bonding cable or refueling connection) can be disconnected first since fueling has been completed.

(D) if bowser is grounded, bonding cable can be disconnected before disconnecting the fueling connection.

102. Which of the following statement is correct ?

(A) Secondary effect of elevator is speed control.

(B) Secondary effect of aileron is adverse yaw.

(C) Secondary effect of rudder is roll.

(D) All of the above statements are correct.

103. Identify the wrong statement.

(A) In push-pull rod control system, bell crank is used for changing direction of force.

(B) In cable control system, pulley is used for changing direction of force.

(C) Turn buckle is used in cable pulley system to adjust cable tension.

(D) In a chain control system, pulley is used to change the direction of force.

104. Various deicing and anti-icing methods used for windscreen is

(A) chemical (B) electric heating

(C) windshield wiper (D) All of these

105. To isolate the engine compartment from the rest of the aircraft, the Nacelle's are provided with

(A) Fairings (B) Inspection door

(C) Thermal blankets (D) Firewall

Space For Rough Work

106. Which among the following is not the fairing ?

(A) Ventral fairing (B) Wall fairing

(C) Wing root (D) Speed fairing

107. In airframe construction longeron is a

(A) vertical member (B) slant member

(C) longitudinal member (D) circular member

108. Which of the following wing belongs to asymmetrical aircraft ?

(A) Oblique wing (B) Canard

(C) Tandem (D) Swing wing

109. In dihedral wing,

(A) the wing tips are higher than the wing root.

(B) the wing tips are lower than the wing root.

(C) the wing tips and wing root are in straight line.

(D) None of these

110. Monocoque construction consists of

(A) Formers, longerons and bulkheads (B) Formers, frame and bulkheads

(C) Longerons, frame and stringers (D) Longerons, bulkheads and frame

111. Aspect ratio of wing is ratio of

(A) span by mean chord (B) mean span by mean chord

(C) average span by chord (D) average span by mean chord

112. The ratio of lateral strain to linear strain due to applied load is known as

(A) Bulk modulus (B) Modulus of elasticity

(C) Young's modulus (D) Poisson's ratio

113. Relationship between Young's modulus, Shear modulus and Bulk modulus is

(A) $E = 3K(1 - 2\mu)$ (B) $E = 2G(1 + \mu)$

(C) $E = \frac{9KG}{3K + G}$ (D) $E = K(1 + \mu)$

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114. Shear force in a beam acts

(A) perpendicular to longitudinal axis (B) perpendicular to lateral axis

(C) parallel to longitudinal axis (D) parallel to lateral axis

115. Longitudinal stress in thin cylindrical shell is

(A) $\sigma_L = \frac{Pd}{6t}$ (B) $\sigma_L = \frac{Pd}{4t}$

(C) $\sigma_L = \frac{Pd}{3t}$ (D) $\sigma_L = \frac{Pd}{t}$

116. The slope at the supports of fixed beam is

(A) minimum (B) zero

(C) maximum (D) equal through out

117. Which of the following processes are thermodynamically reversible ?

(A) Throttling (B) Free expansion

(C) Isothermal and adiabatic (D) Constant volume and constant pressure

118. The value of n = 1 in the polytropic process indicates it to be

(A) Adiabatic process (B) Isothermal process

(C) Reversible process (D) Irreversible process

119. According to first law of thermodynamics,

(A) work done by a system is equal to heat transfer.

(B) total internal energy of a system during a process remain constant.

(C) internal energy, enthalpy, entropy during a process remain constant.

(D) total energy of the system remain constant.

120. A system in which there may be exchange of energy but not mass is a/an

(A) open system (B) closed system

(C) isolated system (D) insulated system

121. Work done on a system is taken to be

(A) negative (B) positive

(C) zero (D) varying according to situation

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122. The process of breaking up of a liquid into fine droplets by spraying is called
(A) vaporisation (B) carburation
(C) injection (D) atomisation

123. Heat added in the otto cycle is
(A) reversibly at constant pressure (B) irreversibly at constant pressure
(C) reversibly at constant volume (D) irreversibly at constant volume

124. The ratio of brake power to the indicated power is
(A) brake thermal efficiency (B) mechanical efficiency
(C) indicated thermal efficiency (D) overall efficiency

125. The size of the inlet valve of an engine in comparison to the exhaust valve is
(A) bigger size (B) same size
(C) lesser size (D) depends on the engine

126. The air fuel ratio in a petrol engine is controlled by
(A) fuel pump (B) fuel injector
(C) fuel governor (D) carburettor

127. Adiabatic compression is
(A) isothermal process.
(B) process, where there is an increase in kinetic energy.
(C) a process, where there is no loss or gain of heat.
(D) isochoric process.

128. The purpose of a diffuser is to
(A) increase the kinetic energy of air
(B) increase the static pressure of the air
(C) stall the turbine
(D) induce a swirl to the air prior to combustion

129. A Bellmouth inlet is used on
(A) supersonic aircrafts (B) aircraft with low ground clearance
(C) subsonic aircraft, fixed wing (D) helicopters

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130. The overall air fuel ratio of a combustion chamber can vary between

(A) 45 : 1 and 130 : 1 (B) 10 : 1 and 45 : 1

(C) 15 : 1 and 20 : 1 (D) 100 : 1 and 120 : 1

131. Turbine impulse blading forms a

(A) convergent duct (B) constant area duct

(C) divergent duct (D) convergent divergent duct

132. On a front fan engine, to obtain thrust reversal, the

(A) hot and cold streams are reversed (B) hot stream is reversed.

(C) cold stream is reversed (D) None of these

133. Turbine blade vibration is reduced by

(A) impulse type blading (B) reaction type blading

(C) fir tree blade attachment (D) shrouded type blades

134. In EM wave propagation,

(A) Both electric and magnetic field propagates.

(B) Electric and magnetic field co-exist during propagation.

(C) Electric and magnetic fields are at 90° to each other during propagation.

(D) All of these are correct.

135. 12 GHz to 18 GHz frequency band is called

(A) C band (B) Ka band

(C) Ku band (D) X band

136. For air to ground communication in aircraft

(A) VHF and UHF frequency is used.

(B) Only VHF frequency is used.

(C) Only UHF frequency is used.

(D) VHF and UHF frequency is used. In addition to this, some aircraft uses HF communication.

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137. The atmospheric layer closest to the earth in

(A) Troposphere (B) Ionosphere

(C) Mesosphere (D) Exosphere

138. Which of the following is a wrong statement ?

(A) Resonant antenna radiates almost the entire radio signal fed to the antenna.

(B) Non-resonant antenna radiate a broad range of radio signal.

(C) Non-resonant antenna has a narrow bandwidth.

(D) Resonant antenna has high efficiency.

139. Energy can be fed to the aerials by means of a transmission line. Usually aerials are

(A) center fed or End fed (B) center fed only

(C) Intermediary fed (D) Center fed, end fed or intermediary fed

140. If the peak transmitted power in a radar system is increased by a factor of 16, the maximum range will be increased by a factor

(A) 2 (B) 4

(C) 8 (D) 16

141. IFF is a secondary radar. It has

(A) Airborne interrogator and ground interrogator

(B) Ground transponder and airborne transponder

(C) Airborne interrogator and ground transponder

(D) Ground interrogator and airborne transponder

142. Flight Data Recorder (FDR) records

(A) Important flight parameters (B) Important engine parameters

(C) Cockpit voice information (D) Both (A) and (B)

143. NDB transmit vertically polarized AM signals in the frequency range

(A) 190 kHz and 1750 kHz (B) 120 kHz and 1850 kHz

(C) 150 kHz and 1560 kHz (D) 110 kHz and 1789 kHz

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144. Electrical wire has a

(A) single strand

(B) two strands insulated separately

(C) multiple strands insulated separately

(D) None of these

145. Types of cable used in aircraft electrical system

(A) Insulated and twisted (B) Shielded

(C) Coaxial (D) All of these

146. Thermocouple used for measuring temperature of cylinder head an exhaust gas are

(A) Copper – constantan type (B) Chromel – Alumal type

(C) Iron – constantan type (D) Both (A) and (B)

147. Benefits of correct cable routing in aircraft

(A) General safety, fire safety and avoid interference.

(B) Avoid interference with the reception and transmission of signals by radio.

(C) Ease of circuit testing and fault rectification.

(D) All of these

148. Which of the following is a wrong statement ?

(A) Single pole single throw switch can connect one input to one output.

(B) Single pole double throw switch can connect one input to two output.

(C) Double pole single throw switch can connect two input to single output.

(D) Double pole double throw switch can connect two input to four output.

149. A green light at or near starboard wing tip, a red light at or near port wing tip a white light visible from the rear of the aircraft in the horizontal plan are called

(A) Parking light (B) Position light

(C) Formation light (D) Navigation light

150. The light used for the general illumination of instruments, control panels, pedestals, side consoles and areas of cockpit floors are called

(A) Illumination light (B) Torch light

(C) Instrument light (D) Flood light

Space For Rough Work

151. Factors affecting the degree of maintainability in a machine is considered during design phase. Higher the maintainability

(A) Lower the cost of production

(B) Increases the cost of production

(C) Doesn't affect the cost of production

(D) None of these

152. Some of the factors affecting maintainability are

(A) Environment operated, support system and level of training.

(B) System design and manufacturing quality.

(C) Environment operated, support system, level of training, system design, manufacturing quality, availability of materials, tools and spare parts.

(D) Availability of tools, material and spare parts.

153. The length of time a device or product is expected to last in operation is called

(A) MTBF (B) MTTR

(C) MTTF (D) MTF

154. Average time a system is non-operational is called

(A) MTBF (B) MDT

(C) MTTR (D) MTTF

155. Successive stages of a bathtub curve are

(A) Infancy period, useful life period and ageing period.

(B) Burn-in period, normal operating life period and wear out period.

(C) Debugging period, normal operating period and wear out period.

(D) All of these are correct.

156. Sudden and total failure of some system from which recovery is impossible, is called

(A) sudden failure (B) independent failure

(C) degradation failure (D) catastrophic failure

Space For Rough Work

157. Actions such as repair, replacement or restore will be carried out after occurrence of the failure to eliminate the source of this failure or reduce the frequency of its occurrence is called

(A) Breakdown maintenance
(B) Preventive maintenance
(C) Corrective maintenance
(D) Special maintenance

158. TQM stands for

(A) Total Quality Management
(B) Tested Quality Management
(C) Trusted Quality Manager
(D) Typical Quality Management

159. In India, laying down of standards for emission or discharge of environmental pollutants from various sources whatsoever, is the responsibility of :

(A) Central Government
(B) State Government
(C) District Magistrate
(D) America lays down the standards and India follows it.

160. Which of the following is not a function of Pollution Control Board ?

(A) Advice Central Government on matters concerning prevention and control of water, air and soil pollution.
(B) Collection of municipality garbage and transporting to land fills.
(C) Plan and execute program for prevention and control of water, air and soil pollution
(D) Provide technical assistance and guidance to state boards on pollution prevention and control.

161. Which type of force is predominant in sheet metal forming process ?

(A) Shear force
(B) Compressive force
(C) Tensile force
(D) Torsional force

162. The process used for finishing the internal cylindrical surface is

(A) Lapping
(B) Reaming
(C) Boring
(D) Honing

Space For Rough Work

163. Removing the dull grains in order to make the grinding wheel sharp is known as

(A) Loading (B) Glazing

(C) Dressing (D) Trueing

164. Non-conventional (traditional) machining is also called

(A) contact machining (B) non-contact machining

(C) partial contact machining (D) half contact machining

165. In oblique cutting of metals, the cutting edge of the tool is

(A) perpendicular to the work piece

(B) perpendicular to the direction of tool travel

(C) parallel to the direction of tool travel

(D) inclined at an angle less than 90° to the direction of tool travel

166. A self centring chuck has

(A) 4 Jaws (B) 3 Jaws

(C) 2 Jaws (D) 6 Jaws

167. Which of the following milling operation can be used for machining a flat surface, parallel to the axis of the cutter ?

(A) Slab milling (B) Face milling

(C) Angular milling (D) Form milling

168. LASER stands for

(A) Light amplification by simulated emission of radiation.

(B) Light amplification by simulated erosion of reaction.

(C) Light amplification by simulated erosion of radiation.

(D) Light amplification by simulated emission of reaction.

169. Die electric medium in EDM is used for

(A) making the medium conducting (B) flushing away the debris

(C) to decrease material removal rate (D) to protect the job

Space For Rough Work

170. Most widely used welding in aerospace application is

(A) GAS (B) MIG

(C) GTAW (D) MAG

171. The 'tip path plane' in a helicopter rotor system is

(A) the path formed by the ground effect caused when helicopter is doing hovering near ground.

(B) path described by the blade tips during rotation.

(C) plane of rotation for hovering and vertical flight of the helicopter.

(D) None of these

172. The retreating blade of a rotor of helicopter is

(A) that blade which is the last one to rotate during start up.

(B) that blade which is moving away from the free stream airflow during flight.

(C) the one which always stays at the retreated position.

(D) All the rotor blades.

173. The method of controlling heading / antitorque in a helicopter flight is

(A) by changing the tail rotor speed

(B) by changing the pitch angle of the tail rotor blades

(C) by changing the tail rotor pitch angle the direction of the helicopter can be changed.

(D) Both (B) and (C)

174. Description of hingeless rotor in a modern helicopter

(A) No mechanical means are provided for chordwise or flapwise displacement of the blade, blades are cantilevered from the rotor hub.

(B) Hinges are not provided for flapping action of the rotor blade.

(C) Hinges are not provided only for pitching action of blades.

(D) Both (B) and (C)

175. The reason for folding the main rotor blades in a helicopter

(A) is that blades do not get loading when helicopter is parked

(B) to reduce the parking area needed per helicopter in carrier based operations of helicopters

(C) to reduce the maintenance

(D) None of these

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176. The function of Rudder pedals in helicopter is

(A) to control the amount heading / direction change in helicopter flight

(B) to control the amount of antitorque needed to control the rotating torque produced by the helicopter fuselage due to rotation of main rotor blades

(C) to control the roll motion of the helicopter

(D) Both (A) and (B)

177. The purpose of swash plate assembly in a helicopter is

(A) to engage the main rotor smoothly after engine picks up speed

(B) to transmit all the control inputs from collecting and cyclic controls to the rotor blade

(C) to transfer the linear movements of pilot controls to blades, rotors

(D) Both (B) and (C)

178. The helicopter fuel system consists of

(A) fuel supply system and fuel cutoff / shutoff system

(B) fuel supply system and engine fuel control system

(C) fuel supply system and fuel monitoring system

(D) fuel cutoff system

179. The limitation for maximum speed in a helicopter during its flight is

(A) Advancing blade stall (B) Engine power output

(C) Retreating blade stall (D) Altitude

180. Ground effect happens during the flight of helicopter when

(A) distance from ground is less than one rotor diameter above the surface.

(B) hovers vertically at any altitude.

(C) in vertical hovering effect is less

(D) (B) and (C) both

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