DIPLOMA - COMMON ENTRANCE TEST-2016

AE	COURSE	DAY : SUNDAY
	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 - 1	135192

DOs :

1. Check whether the Diploma CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the invigilator after the **2nd Bell i.e., after 09.50 a.m.**
3. The Serial Number of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :

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 a.m., till then;**
   - Do not remove the paper seal / polythene bag 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 a.m.,** remove the paper seal / polythene bag 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 BALL POINT PEN against the question number on the OMR answer sheet.**

Correct Method of shading the circle on the OMR answer sheet is as shown below :

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 p.m.,** 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.**

PART – A

APPLIED SCIENCE

1. An example of basic S.I. unit is

(A) Newton (B) Joule

(C) Ampere (D) Watt

2. The prefix used for 10^{+2} is

(A) hecta (B) centi

(C) pico (D) peta

3. An example of dimensionless physical quantity is

(A) surface tension (B) strain

(C) impulse (D) period

4. The velocity of a freely falling body gradually _____ as it falls.

(A) decreases (B) increases

(C) remains same (D) increases and then decreases

5. A main scale is divided into half mm and having a vernier containing 20 divisions has a least count of _____ cm.

(A) 2.5×10^{-2} (B) 0.5×10^{-2}

(C) 0.025×10^{-2} (D) 0.25×10^{-2}

6. For a particular mass of the moving body, its friction is minimum when it is

(A) sliding (B) static

(C) rolling (D) dragged

Space For Rough Work

7. All equations of motion hold good under the condition of

(A) constant velocity (B) constant acceleration

(C) variable velocity (D) variable acceleration

8. A force of 1.5×10^{-2} N acts for 3 seconds on a body of mass 0.05 kg moving with velocity 4 m/s. The final velocity of the body is

(A) 4.9 m/s (B) 18 m/s

(C) 9 m/s (D) 7.5 m/s

9. To check the equilibrium of five coplanar concurrent forces, we use law of

(A) Parallelogram of forces (B) Triangle of forces

(C) Lami's theorem (D) Polygon of forces

10. The S.I. unit of momentum is

(A) kg m (B) $kg\ m^{-1}s^{-1}$

(C) $kg\ m\ s^{-2}$ (D) $kg\ m\ s^{-1}$

11. When three forces acting at a point are in equilibrium, the angle opposite to biggest force is always _____ angle.

(A) biggest (B) smallest

(C) equal to other (D) obtuse

12. Towing of a boat by two forces is an illustration of

(A) Law of parallelogram of forces. (B) Lami's theorem.

(C) Law of triangle of forces. (D) Law of polygon of forces.

Space For Rough Work

13. Two forces 3N and 5N acts on a body simultaneously making an angle 60° between them. The resultant force on the body is

(A) 8 N (B) 4 N

(C) 7 N (D) 49 N

14. Dimensional formula for stress is

(A) $[LM^{-1}T^{-2}]$ (B) $[L^{-1}MT^{-2}]$

(C) $[L^{-1}M^{-1}T]$ (D) $[L^{2}M^{-1}T^{-2}]$

15. The pull in the bicycle chain is an example of

(A) tensile stress (B) volume stress

(C) shear stress (D) shear strain

16. Viscosity of water at 20 °C in centipoise is

(A) 1.792 (B) 0.650

(C) 1.005 (D) 0.470

17. Dimensional formula of surface tension is

(A) $[LMT^{-2}]$ (B) $[L^{2}MT^{-2}]$

(C) $[LM^{-1}T^{-2}]$ (D) $[L^{0}MT^{-2}]$

18. A steel needle can be floated on the surface of water because of the

(A) density of steel is greater than water

(B) density of steel is less than water

(C) surface tension

(D) viscosity

Space For Rough Work

19. Thrust on the bottom of the container having a base area of 10 m^2 filled with water to a height of 6 m is

(A) 60×10^2 N (B) 58.8×10^4 N

(C) 60.8 N (D) 600 N

20. Keeping the temperature constant, if the pressure of the gas is doubled its volume

(A) remains constant (B) doubles

(C) reduces to one fourth (D) reduces to half

21. Heat transfer in the absence of the medium is

(A) conduction (B) convection

(C) radiation (D) absorption

22. Zero of absolute scale of temperature is at

(A) 0 °C (B) 100 °C

(C) 273 °C (D) – 273 °C

23. Ripples on water surface is an example of

(A) electromagnetic waves (B) transverse waves

(C) waves travelling in space (D) longitudinal waves

24. The time interval between two consecutive waxing and waning of sound waves is

(A) beat period (B) wave period

(C) beat frequency (D) wave frequency

Space For Rough Work

25. S.I. unit of intensity of sound is

(A) watt per square meter (B) watt per meter

(C) watt square meter (D) watt meter

26. The study of characteristics of buildings with reference to sound is

(A) resonance (B) interference

(C) echo (D) acoustics

27. The distance travelled by the disturbance in the medium for one complete oscillation is

(A) wave velocity (B) wavelength

(C) wave frequency (D) wave amplitude

28. Momentum of a photon is given by

(A) $P = \frac{\lambda}{h}$ (B) $P = \frac{h}{\lambda}$

(C) $P = \lambda h$ (D) $P = \lambda^2 h$

29. The velocity of sound in case of liquids is given by

(A) $\sqrt{\frac{d}{k}}$ (B) $\sqrt{kd}$

(C) $\sqrt{\frac{k}{d}}$ (D) $\sqrt{\frac{d^2}{k}}$

30. A tuning fork vibrating in air is an example of

(A) damped free vibrations (B) resonant vibrations

(C) undamped free vibrations (D) forced vibrations

Space For Rough Work

31. Raman lines are

(A) unpolarised (B) polarised

(C) diffracted (D) reflected

32. A crystal which has two optic axes is

(A) calcite (B) quartz

(C) mica (D) glass

33. Electron microscope is used to

(A) study virus and bacteria

(B) view three dimensional images

(C) automatic switching on and off of street-lights

(D) electronic industry for soldering

34. Which of the following statements is correct in case of γ-rays ?

(A) Penetrating power is less than β-rays.

(B) Penetrating power is less than α-rays.

(C) Penetrating power is very high.

(D) γ particles are nothing but electrons.

35. For destructive interference of light the path difference should always be

(A) $(2n + 1)\frac{\lambda}{2}$ (B) $\frac{n\lambda}{2}$

(C) $(2n + 1)\frac{\lambda}{3}$ (D) $n\lambda$

Space For Rough Work

36. The resultant intensity of interference of two monochromatic waves having same amplitude and constant phase difference equal to ϕ is

(A) $2a\cos\left(\frac{\phi}{2}\right)$ (B) $4a^2\cos^2\left(\frac{\phi}{2}\right)$

(C) $4a^2\cos\left(\frac{\phi}{2}\right)$ (D) $4a\cos^2\left(\frac{\phi}{2}\right)$

37. For two objects to be just resolved, the principle maximum should be on

(A) first maximum (B) second maximum

(C) first minimum (D) second minimum

38. Resolving power of microscope is given by

(A) $\frac{\lambda}{2n\sin\theta}$ (B) $\frac{n}{2\lambda\sin\theta}$

(C) $\frac{2\lambda\sin\theta}{n}$ (D) $\frac{2n\sin\theta}{\lambda}$

39. In case of acids, the concentration of H^+ ions is

(A) more than 10^{-7} g ions/litre.

(B) less than 10^{-7} g ions/litre.

(C) equal to 10^{-7} g ions/litre.

(D) between 10^{-7} g ions/litre and 10^{-14} g ions/litre.

40. Corrosion of metal can be prevented by keeping it in

(A) acidic medium (B) basic medium

(C) neutral medium (D) moisture

Space For Rough Work

PART – B

APPLIED MATHEMATICS

41. The value of the determinant $A = \begin{vmatrix} 1 & 1 & 1 \\ 3 & 3 & 3 \\ 4 & 5 & 6 \end{vmatrix}$ is

(A) 1 (B) 3

(C) -2 (D) 0

42. The value 'x' by Cramer's rule in $3x + 2y = 4$ and $x - 2y = 8$ is

(A) 12 (B) 3

(C) -13 (D) 15

43. If $A = \begin{bmatrix} 2 & -3 \\ 1 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix}$, then $A + 2B$ is

(A) $\begin{bmatrix} 4 & 1 \\ 9 & -1 \end{bmatrix}$ (B) $\begin{bmatrix} 4 & 1 \\ 9 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 3 & -1 \\ 5 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$

44. If $A = \begin{bmatrix} 2 & 3 & 4 \\ -2 & x & -4 \\ -5 & 6 & 7 \end{bmatrix}$ is singular, then the value of x is

(A) -3 (B) 3

(C) $\frac{1}{3}$ (D) $\frac{-1}{3}$

Space For Rough Work

45. The characteristic roots of the matrix $A = \begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$ is

(A) 5, 2 (B) –5, –2

(C) 5, –2 (D) –5, 2

46. If ${}^{n}C_{16} = {}^{n}C_{3}$, then the value of n is

(A) –19 (B) 19

(C) 13 (D) –13

47. The last term in the expansion of $\left(3x^2 + \frac{1}{2x^2}\right)^4$ is

(A) $\frac{1}{8x^8}$ (B) $\frac{1}{16x^8}$

(C) $81\,x^8$ (D) $12\,x^8$

48. The unit vector of $\vec{a} = 2i - 3j + 4k$ is

(A) $\frac{2i-3j+4k}{\sqrt{29}}$ (B) $\frac{2i-3j+4k}{\sqrt{11}}$

(C) $\frac{2i-3j+4k}{\sqrt{3}}$ (D) $\frac{\sqrt{29}}{2i-3j+4k}$

49. If $\vec{a} = i - 4j + 3k$ and $\vec{b} = -2i + j + 6k$, then the projection of $\vec{a}$ on $\vec{b}$ is

(A) $\frac{24}{\sqrt{41}}$ (B) $\frac{12}{\sqrt{26}}$

(C) $\frac{-12}{\sqrt{41}}$ (D) $\frac{12}{\sqrt{41}}$

Space For Rough Work

50. The area of triangle whose two sides are $\vec{a} = 3i + 4j + k$ and $\vec{b} = 5i + 6j + 2k$ is

(A) 3 sq. units (B) $\frac{1}{2}$ sq. units

(C) $\frac{3}{2}$ sq. units (D) $\frac{9}{2}$ sq. units

51. The simplification of $\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta}$ is

(A) $2\cos^2\theta$ (B) $2\sec^2\theta$

(C) $\tan^2\theta$ (D) $2\operatorname{cosec}^2\theta$

52. The value of $\tan^2 30° + \sin^2 45° + \cos^2 90° + \cos^2 60°$ is

(A) $\frac{4}{3}$ (B) $\frac{13}{12}$

(C) $\frac{13}{24}$ (D) $\frac{25}{12}$

53. The simplification of $\frac{\sin(180°-A)\cos(360°-A)}{\tan(90°+A)\sin(-A)}$ is

(A) sin A (B) cosec A

(C) – sin A (D) – cosec A

54. If $\cos A = \frac{-3}{5}$ where $90° < A < 180°$, then the value of cot A is

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

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

Space For Rough Work

55. The value of $\cos 105°$ is

(A) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (B) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

(C) $\frac{2\sqrt{2}}{1-\sqrt{3}}$ (D) $\frac{1-\sqrt{3}}{2\sqrt{2}}$

56. If $\tan\frac{A}{2}=\frac{1-\cos A}{\sin A}$, then the value of $\tan 22\frac{1}{2}°$ is

(A) $\sqrt{2}+1$ (B) $1-\sqrt{2}$

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

57. The value of $\cos 5x \cdot \cos 3x$ is

(A) $\cos 8x + \cos 2x$ (B) $\frac{1}{2}(\cos 8x + \cos 2x)$

(C) $\frac{1}{2}(\sin 8x + \sin 2x)$ (D) $\frac{1}{2}(\cos 8x - \cos 2x)$

58. The simplified value of $\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{3}\right)$ is

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

(C) 1 (D) $\tan^{-1}\left(\frac{1}{7}\right)$

59. Distance of a point P(– 2, 5) from the origin is

(A) $\sqrt{29}$ (B) $\sqrt{21}$

(C) $\sqrt{3}$ (D) 29

60. The co-ordinates of the point which divides the line joining the points A (8, 3) and B(–5, 6) in the ratio of 2 : 3 externally is

(A) (– 34, –3) (B) (34, 3)

(C) $\left(\frac{14}{5},\frac{21}{5}\right)$ (D) (34, –3)

Space For Rough Work

61. The area of triangle with the vertices (5, 3), (4, 6) and (5, 8) is

(A) $\frac{15}{2}$ sq. units (B) 15 sq. units

(C) $\frac{5}{2}$ sq. units (D) $\frac{45}{2}$ sq. units

62. The slope of the line making an angle 150° with the x-axis is

(A) $\frac{-1}{\sqrt{3}}$ (B) $\frac{1}{\sqrt{3}}$

(C) $\sqrt{3}$ (D) $-\sqrt{3}$

63. The two point form of a straight line is

(A) $y - y_1 = m(x - x_1)$ (B) $\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$

(C) $\frac{y}{x} = \frac{y_2 - y_1}{x_2 - x_1}$ (D) $\frac{y - y_2}{x - x_2} = \frac{y_2 - y_1}{x_2 - x_1}$

64. The equation of straight line perpendicular to $2x + 5y - 8 = 0$ and passing through $(-1, 2)$ is

(A) $2x + 5y + 9 = 0$ (B) $5x - 2y + 1 = 0$

(C) $5x - 2y + 9 = 0$ (D) $5x + 2y - 9 = 0$

65. The value of $\lim_{x \to 3} \frac{2x^2 - 7x + 3}{2x - 6}$ is

(A) 3 (B) $\frac{2}{5}$

(C) $\frac{5}{2}$ (D) 5

Space For Rough Work

66. The value of $\lim_{x \to 0} \frac{\sqrt{1-\cos x}}{x}$ is

(A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$

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

67. If $y = e^x (\cos x - \sin x)$, then $\frac{dy}{dx}$ is

(A) $2e^x \cos x$ (B) $-2e^x \cos x$

(C) $2e^x \sin x$ (D) $-2e^x \sin x$

68. If $x + y = \log x + \log y$, then $\frac{dy}{dx}$ at $x = -1$ and $y = 2$ is

(A) $-\frac{1}{4}$ (B) -4

(C) 4 (D) $\frac{1}{2}$

69. If $x = a \cos^2 \theta$ and $y = b \sin^2 \theta$, then $\frac{dy}{dx}$ is

(A) $\frac{-b}{a}$ (B) $\frac{b}{a}$

(C) $\frac{a}{b}$ (D) $\frac{-a}{b}$

70. The second derivative of $y = \log\left(\frac{1}{x}\right)$ is

(A) x (B) 1

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

Space For Rough Work

71. The equation of normal to the curve $y = (2x + 1)^2$ at $(-2, 0)$ is

(A) $x - 16y + 2 = 0$ (B) $x - 12y + 2 = 0$

(C) $x + 16y + 2 = 0$ (D) $x + 12y + 2 = 0$

72. The maximum value of the function $y = 2x^3 + 3x^2 - 36x$ is

(A) -44 (B) -30

(C) 81 (D) -81

73. The value of $\int \sin 3x \cos 2x \, dx$ is

(A) $\frac{-1}{2}\left[\frac{\cos 5x}{5} + \cos x\right] + C$ (B) $\frac{1}{2}\left[\frac{-\cos 5x}{5} + \cos x\right] + C$

(C) $\frac{1}{2}\left[\frac{\cos 5x}{5} + \cos x\right] + C$ (D) $\frac{-1}{2}[\cos 5x + \cos x] + C$

74. The value of $\int x^2 \sin(2x^3) \, dx$ is

(A) $\frac{-\cos(2x^3)}{6} + C$ (B) $\frac{-\cos(2x^3)}{3} + C$

(C) $12x^3 \cos(2x^3) + C$ (D) $\frac{\cos(2x^3)}{6} + C$

75. $\int \log x \, dx$ is

(A) $\frac{1}{x} + C$ (B) $\frac{1}{x} - x + C$

(C) $x \log x + x + C$ (D) $x \log x - x + C$

Space For Rough Work

76. The value of $\int_0^{\pi/2} \sqrt{1+\sin 2x}\, dx$ is

(A) 0 (B) 1

(C) 2 (D) -2

77. $\int_0^1 \frac{x}{1+x^4}$ is

(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{8}$

(C) $\frac{-\pi}{8}$ (D) $\frac{-\pi}{4}$

78. The area formed by the curve $y = (2x + 1)^3$ between the ordinates $x = -1$ and $x = 1$ is

(A) $\frac{41}{4}$ sq. units (B) 2 sq. units

(C) 20 sq. units (D) 10 sq. units

79. The order and degree of differential equation $\left[1+\left(\frac{dy}{dx}\right)^4\right]^{2/3} = \frac{d^2y}{dx^2}$ is

(A) order 2 and degree 3 (B) order 2 and degree 1

(C) order 1 and degree 2 (D) order 1 and degree 4

80. The solution of differential equation $\sec^2 x \tan y\, dx + \sec^2 y \tan x\, dy = 0$ is

(A) $\tan^2 x + \tan^2 y = C$ (B) $\tan x + \tan y = C$

(C) $\tan x \tan y = C$ (D) $x + y + \log(\sec x \sec y) = C$

Space For Rough Work

PART-C

AERONAUTICAL ENGINEERING

81. In a flow past a circular cylinder

(A) The stagnation points are at opposite ends of horizontal diameter.

(B) The stagnation points are at diametrically opposite ends.

(C) The stagnation points shift their position as per flow.

(D) The stagnation points do not exist at all.

82. In a streamline pattern flow of fluid past an aerofoil without circulation

(A) There is no drag but lift will be there.

(B) There is no drag no life.

(C) There will be drag and life both equal.

(D) There is no lift but drag will be there.

83. In a Kutta condition

(A) The vortex is just above the leading edge of aerofoil.

(B) The vortex is just below the trailing edge of aerofoil.

(C) The vortex is away from tip of trailing edge of aerofoil.

(D) Vortex forms and disappears with speed.

84. The wake behind an aircraft in flight is

(A) A clear laminar flow.

(B) A pure turbulent flow.

(C) A mixture of laminar and turbulent flow.

(D) A supersonic turbulent flow.

85. Earth's atmosphere consists of

(A) Troposphere, Stratosphere, Mesosphere, Thermosphere

(B) Troposphere, Strategic sphere, Mesosphere, Thermosphere

(C) Troposphere, Ionosphere, Stratosphere, Mesosphere

(D) Troposphere, Stratosphere, Ionosphere, Thermosphere

Space For Rough Work

86. Composition of atmosphere by volume is

(A) Nitrogen 78%
Oxygen 21%
Argon 0.93%
CO_2 0.03%
Traces of Inert gases

(B) Nitrogen 79%
Oxygen 20%
Argon 0.93%
CO 0.1%
Other inert gases

(C) Nitrogen 77%
Oxygen 21%
Argon 1%
CO_2, traces of inert gas 1%

(D) Nitrogen 79%
Oxygen 21%
Traces of Inert gases

87. Standard atmosphere as per ICAO at MSL is

(A) T = 15 °C
Pr = 1013.5 mb
Relative Humidity 100%

(B) T = 10 °C
Pr = 1015.5 mb
Relative humidity 98%

(C) T = 16 °C
Pr = 1013.5 mb
Relative humidity 100%

(D) T = 15 °C
Pr = 1028.5 mb
Relative humidity 100%

Space For Rough Work

88. Lapse rate for temperature is

(A) 2 °C per 1000 ft altitude rise
(B) 3 °C per 1000 ft altitude rise
(C) 1.98 °C per 1000 ft altitude rise
(D) 1.98 °C per 100 ft altitude rise

89. Reynold's number is the ratio of

(A) $\frac{\text{Turbulent flow}}{\text{Laminar flow}}$
(B) $\frac{\text{Laminar flow}}{\text{Turbulent flow}}$
(C) $\frac{\text{Inertial forces}}{\text{Viscous forces}}$
(D) $\frac{\text{Viscous forces}}{\text{Inertial forces}}$

90. Chord length of an aerofoil is

(A) A good measurement scale.
(B) The characteristic dimension.
(C) A percentage of the thickness.
(D) Always kept minimum for safety purpose.

91. Pressure distribution around an aerofoil varies

(A) As the aerodynamic pressure varies
(B) In an exponential way
(C) As the angle of attack changed
(D) Almost nil for good quality aerofoil

92. The main reason for employing sweepback wing plan form is

(A) To improve the aerodynamic look of aircraft.
(B) To improve the drag handling capability.
(C) To fly very very fast during combat.
(D) To improve the high speed characteristics of the wing.

93. Noise is basically

(A) An unwanted modulation produced in communication.
(B) An unwanted form of energy which interferes with wanted signal.
(C) Always present when high power is transmitted.
(D) Proportional to the heat produced in communication system circuits.

Space For Rough Work

94. Co-axial cable system can handle frequencies up to

(A) UHF and SHF
(B) Microwave and HF
(C) HF and VHF
(D) Microwave and VHF region

95. Propagation paths for radio waves are

(A) Los, Troposcatters, microwave, VLF
(B) LOS, MOS, UHF, SHF
(C) Ground wave, space wave and sky wave
(D) Sky wave, Ground wave, under water waves

96. VOR equipment in an aircraft basically provides

(A) vertical spacing between aircrafts flying in air
(B) proportional range information to pilot
(C) Horizontal/Azimuth bearing information from an airport to pilot
(D) Speed information in all weather condition

97. Following type of communication gives longest range :

(A) VHF
(B) VLF
(C) HF
(D) UHF

98. HF communication is normally not used in aircraft to ATC/Ground mode because

(A) It is having attenuation problem more.
(B) It's range is very limited.
(C) It's range is too much hence can reach out to not wanted places.
(D) It's continuous use is injurious to health.

99. VOR transmits two signals

(A) one is vertically polarized, other one is horizontally polarized.
(B) one is powerful, other one is medium power signal.
(C) one is always on, other one comes on sequentially.
(D) one is reference signal, other one is varying in phase.

Space For Rough Work

100. Advantages of VOR mainly are

(A) It uses very less power hence equipment is very light and economical.

(B) Does not need any ground based equipment.

(C) Any number of aircraft can use the facility at the same time, gives visual bearing indications.

(D) It does not depend on weather, so it is a great aid in bad weather for pilot.

101. Cat III C type of ILS is not normally used

(A) It has already become obsolete.

(B) It is very heavy.

(C) It is very costly, lot of training needed for pilots to use it.

(D) It is not easily available.

102. The function of commutator is

(A) To facilitate current collection from armature conductors.

(B) To transfer the current from rotor to stator.

(C) To reduce the loading on the armature.

(D) To supply field current at a constant rate thereby reducing heating.

103. The types of generators used in aircraft are

(A) Shunt wound, low excitation, low power factor type

(B) Separately excited, self excited, zero excitation type

(C) Self excited, separately excited type

(D) Self excited, excited by induction from other equipment type

104. In self excited generators normally following types are available :

(A) Shunt wound, serious wound, compound wound

(B) Series wound, shunt wound, compound wound

(C) Series wound, shunt wound, simultaneously wound

(D) Shunt wound, Never wound, always open

105. In a carbon pile resistance, the resistance of the carbon pile

(A) Increases with pressure (B) Decreases with pressure

(C) Changes gradually (D) Changes exponentially

Space For Rough Work

106. In aircraft external lighting, wing scan lights are given so that
(A) Pilots see the correct position of flaps, ailerons
(B) Ice formation on wind leading edge can be seen in night
(C) Co-pilot can always monitor wing loading during high speed flight
(D) Pilots can keep the wings always under control

107. Colour of cockpit/cabin lighting is now universally adopted as
(A) white with intensity control
(B) red with intensity control
(C) white and red both with intensity control
(D) any soft coloured light

108. The horsepower developed in the cylinder of a reciprocating engine is known as
(A) Brake horse power
(B) Shaft horse power
(C) Indicated horse power
(D) Mean horse power

109. One cause of after firing in an aircraft engine is
(A) Lean mixture
(B) Stoichiometric mixture
(C) Excessively rich mixture
(D) None of the above

110. Position when piston is farthest from crank shaft is known as
(A) Bottom dead centre
(B) Top dead centre
(C) Stroke
(D) Cylinder volume

111. Mechanical efficiency is defined as
(A) $\frac{IHP}{BHP}$
(B) $\frac{FHP}{IHP}$
(C) $\frac{FHP}{BHP}$
(D) $\frac{BHP}{IHP}$

112. A turbojet engine gives
(A) Large acceleration to a small mass of air.
(B) Large acceleration to a large weight of air.
(C) Small acceleration to a large mass of air.
(D) Small acceleration to a small mass of air.

Space For Rough Work

113. Combustor, turbine and exhaust form

(A) Front section (B) Hot section

(C) Cold section (D) Fuel system

114. The working fluid of a gas turbine engine

(A) Gasoline (B) Air

(C) Kerosene (D) Petrol

115. A bypass ratio of 5 : 1 indicates that the bypass flow is

(A) equal to $\frac{1}{5}$ of hot stream (B) five times the hot stream

(C) five times the cold stream (D) equal to hot stream

116. The air passing through the combustion chamber is

(A) Entirely combined with fuel and burned.

(B) Used to support combustion and cool the engine.

(C) Speeded up and heated by the action of turbine.

(D) Used for cleaning

117. Combustion chamber flame temperature is in the order of

(A) 500 °C (B) 1000 °C

(C) 5000 °C (D) 2000 °C

118. Turbine impulse blading forms a

(A) Constant area duct (B) Divergent duct

(C) Convergent duct (D) Conv.-Div. duct

119. Surrounded blandes allow

(A) Smaller inlets to be used

(B) Higher turbine inlet temperatures

(C) Thinner, more efficient blade section to be used

(D) less number of blandes

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120. Creep
(A) has no effect on turbine diameter
(B) increases turbine diameter
(C) decreases turbine diameter
(D) None of the above

121. RAM effect due to aircraft forward speed causes the efficiency of the engine to
(A) Remain constant
(B) Decrease
(C) Increase
(D) Steadily decrease

122. Which of the following is the ultimate limiting factor of turbine engine operation ?
(A) Compressor air inlet temperature
(B) Burner can pressure
(C) Ambient temperature
(D) Turbine inlet temperature

123. In a pressurized aircraft cabin altitude is maintained to a maximum of
(A) 6000 ft
(B) 5000 ft
(C) 8000 ft
(D) 1000 ft

124. The presence of microbiological contaminations in an aircraft fuel tank is indicated by
(A) Brown slimy deposit
(B) Corrosion
(C) Excessive sediments
(D) Water

125. The strength of control cable is affected by
(A) Kinks
(B) Bird caging
(C) Broken wings
(D) All of the above

126. Dry nitrogen is charged in the fire extinguisher bottle before CO_2 is filled in the container. The purpose is to
(A) Reduce weight
(B) prevent premature discharge
(C) prevent premature discharge of CO_2 in hot climate
(D) easy release of CO_2

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127. _____ is a form of heat exchanger designed to extract heat from the vapourized refrigerant in the air conditioning system.

(A) Evaporator (B) Cold air unit

(C) Condenser (D) None of the above

128. Addition of gasoline to jet fuel

(A) Allowed

(B) Not allowed

(C) Allowed and it forms jet 'B' fuel

(D) Allowed and it forms jet 'A_1' fuel

129. Over inflation of aircraft tyres may cause

(A) Uneven trend wear (B) Bulging out

(C) Less braking efficiency (D) All of the above

130. _____ is added to fuel to improve its performance.

(A) Tetra ethyl lead (B) Ethylene glycol

(C) Iso octane (D) Normal heptane

131. Time period up to which any aircraft part can withstand fatigue is called

(A) Maintenance time (B) Endurance time

(C) Scheduled time (D) Mean time

132. Maintenance means

(A) Checking

(B) Keeping system in normal operating condition

(C) Breakdown

(D) Repair

133. The time to focus on increasing the market share is called

(A) Introduction phase (B) Decline phase

(C) Maturity phase (D) Growth phase

Space For Rough Work

134. MTBM means
(A) Minimum Time Between Maintenance
(B) Maximum Time Between Maintenance
(C) Mean Time Between Maintenance
(D) Model Time Between Maintenance

135. Failure rate is
(A) Failure during flight
(B) Failure per unit time
(C) Failure in design
(D) Cost of failure

136. The maintenance performed after the occurrence of failure is called
(A) Breakdown maintenance
(B) Periodical maintenance
(C) Preventive maintenance
(D) Automatic maintenance

137. Graphical representation of the process in respect of measured quality characteristic is
(A) Pie-chart
(B) Control chart
(C) Graph
(D) Table

138. MTTF means
(A) Mean Time To Failure
(B) Maximum Time To Failure
(C) Minimum Time To Failure
(D) Maintenance Time To Failure

139. Actions performed on a time schedule that detects, mitigates degradation of a component and sustaining its useful life is called
(A) Automatic maintenance
(B) Preventive maintenance
(C) Breakdown maintenance
(D) Corrective maintenance

140. SOAP stands for
(A) Spectroscopic Oil Analysis Program
(B) Spectrometric Oil Analysis Program
(C) Strategic Oil Analysis Program
(D) None of the above

Space For Rough Work

141. Spoilers one used for

(A) Spoiling the lift
(B) Spoiling the drag
(C) Spoiling the thrust
(D) Decreasing gravitational force

142. Camber means

(A) Length of wing
(B) Length of fuselage
(C) Curvature of aerofoil
(D) Span of aircraft

143. Movement of aircraft about lateral axis

(A) Rolling
(B) Pitching
(C) Yawing
(D) Diving

144. Pulleys are used for

(A) Supporting cables
(B) Changing directions
(C) Transferring force
(D) All of the above

145. To enable unpressurized flight _____ is used.

(A) Discharge valve
(B) Dump valve
(C) Relief valve inward
(D) None of the above

146. Hand pump is used for

(A) Building pressure
(B) Emergency requirement
(C) Ground servicing
(D) All of the above

147. Freon gas has a property to boil at

(A) Low temperature
(B) Medium temperature
(C) High temperature
(D) None of the above

148. Which of the valve is used to slow down the undercarriage extension ?

(A) Two way restrictor
(B) One way restrictor
(C) Shuttle valve
(D) Non-return valve

Space For Rough Work

149. Hydraulic system fluid choosen should have
(A) Low freezing point
(B) Medium freezing point
(C) High freezing point
(D) No freezing point

150. Pressure lapse rate is _____ per increase of height of 30 ft in Troposphere.
(A) 1.0 Mb
(B) 0.1 Mb
(C) 0.5 Mb
(D) 2.0 Mb

151. Dynamic pressure is not used by
(A) ASI
(B) TBI
(C) VSI
(D) Machmeter

152. QNH indicates
(A) Airport elevation
(B) Height above sea level
(C) Transition altitude
(D) None of the above

153. Machmeter has
(A) Altitude capsule
(B) Airspeed capsule
(C) (A) and (B) are correct.
(D) None of the above

154. Gyroscope rigidity is directly proportional to
(A) Mass of rotor
(B) Speed of rotation
(C) Radius of gyration
(D) All are correct.

155. Aircraft logbook is to be preserved for a period of _____ after a damage beyond economical repair.
(A) 0.5 years
(B) 1.0 years
(C) 1.5 years
(D) 2.0 years

156. Flight test is required on a three engine aircraft if _____ as per DGCA.
(A) one engine changed
(B) two engine changed
(C) one engine rectified
(D) two engine rectified

Space For Rough Work

157. Flight manual Section-2 contains

(A) General informations (B) Limitation imposed

(C) Emergency procedures (D) None of the above

158. Statically indeterminate structure is given by equation, if 'M' is number of member and 'J' is the joints

(A) $M > 2J - 3$ (B) $M \neq 2J - 3$

(C) $M < 2J - 3$ (D) $M = 2J - 3$

159. Which is not a part of TRUSS type of fuselage construction ?

(A) Bulk head (B) Longeron

(C) Diagonal member (D) Frame

160. In a rectangular wing the stall, first occurs at

(A) Tip (B) Root

(C) Middle (D) Winglet

161. Generally, wing with _____ configuration provides longitudinal and lateral stability during all condition of flying.

(A) MID wing (B) Dihedral wing

(C) Low wing (D) Anhedral wing

162. In a wing structure the bending load is carried by

(A) Web (B) Rib

(C) Spar (D) Stringer

163. In an 'I' beam the maximum shear stress is carried by

(A) Web (B) Flange

(C) between web & flange (D) Neutral axis

164. Which control surface is located near tip and adjacent to the trailing edge of wing ?

(A) Spoilers (B) Ailerons

(C) Elevator (D) Rudder

Space For Rough Work

165. V-N diagram is drawn using which parameter
(A) Load factor and altitude
(B) Load factor and Airspeed
(C) Altitude and Airspeed
(D) Altitude

166. Spare management involves holding of large inventories of
(A) Technology
(B) Skill
(C) Spares
(D) Professional

167. _____ has an obligation to promote safe, orderly and effective operation of civil aviation activities in India.
(A) FAA
(B) DGCA
(C) NACA
(D) ISRO

168. _____ is add to ATF as anti-knocking additives.
(A) Kerosene
(B) Tetra-ethyl lead
(C) Napthenes
(D) Paraffin

169. The _____ required inflation must be maintained for cooler climate.
(A) Minimum
(B) Maximum
(C) 100%
(D) 104%

170. Shoulder wear of TREAD in aircraft tyre is due to
(A) under inflation
(B) no inflation
(C) over inflation
(D) correct inflation

171. Basic-six instruments consist of which of the following ?
(A) AS, MM, VSI, AL, DI, TBI
(B) AS, VSI, AL, RPM, TBI
(C) AS, GH, VSI, AL, DI, TBI
(D) AS, VSI, AL, RPM, DI

172. In which type of display, presents data without requiring users to look away from view points ?
(A) HDD
(B) HUD
(C) Vertical
(D) Radial

Space For Rough Work

173. _____ measures the pressure of fuel-air mixture.

(A) Pressure switch
(B) Tachometer
(C) Boost pressure gauge
(D) Ratiometer

174. _____ type of thermometer is used to measure cylinder head temperature.

(A) Bi-metallic
(B) Thermocouple
(C) Vapour pressure
(D) Mercury thermometer

175. Measurement of fuel quantity by _____ is to eliminate error.

(A) Volume
(B) Area
(C) Weight
(D) Height

176. _____ is the property of metal which allows metal to form into various shapes.

(A) Ductility
(B) Malleability
(C) Fuscibility
(D) Stiffness

177. Medium carbon steel consist of _____ percentage of carbon.

(A) 0 to 0.1
(B) 0.3 to 0.5
(C) 0.7 to 1.0
(D) 1.0 to 1.5

178. Which is not the advantage of composites material ?

(A) High strength
(B) Low cost
(C) Does not corrode
(D) Less weight

179. Failure of metal due to cyclic stress is called

(A) Creep
(B) Fatigue
(C) Fracture
(D) Strain

180. Which among the following is surface inspection technique ?

(A) Dye-penetration test
(B) Eddy current
(C) Ultrasonic
(D) Thermal inspection

Space For Rough Work

A-1