DIPLOMA – COMMON ENTRANCE TEST-2013

AE	COURSE	DAY : SUNDAY DATE : 30-JUNE-2013
	AERONAUTICAL	TIME : 9.00 a.m. to 12.00 Noon

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-4	**100080**

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 08.50 a.m.**
3. The serial number of this question booklet should be entered on the OMR answer sheet.
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 9.00 a.m., till then;**
   * Do not remove the seal / staple 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.

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 9.00 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 ballpoint 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 :

① ● ③ ④

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 12.00 Noon,** 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.**

[P.T.O.

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PART – A

It consists of **1 – 40** questions.

1. If x cot 45° cos 60° = sin 60° tan 30° then the value of x is

    (1) $\sqrt{3}$

    (2) $\sqrt{3}/2$

    (3) 1/2

    (4) 1

2. If tan x = 15/8 and x is in the III quadrant then the value of
   (2 sin x – 3 cos x) / (2 cos x + 3 sin x) is

    (1) 61/6

    (2) – 61/6

    (3) – 6/61

    (4) 6/61

3. The value of {[sin (2π – θ) + cos (– θ)] / [tan (– θ) + cot (2π + θ)]} – {[sin (π/2 + θ)
   + cos (3π/2 – θ)] / [cot (π + θ) + tan (2π – θ)]} is

    (1) 0

    (2) – 1

    (3) + 1

    (4) – 2

4. If sin A = 5/13 and sin B = 4/5 then the value of cos (A – B) is

    (1) 65/56

    (2) 56/65

    (3) 16/65

    (4) – 16/65

5. On simplification the value of (cos³ A – cos 3 A) / cos A + (sin³ A + sin 3 A) / sin A is

    (1) 3

    (2) 1

    (3) 2

    (4) 0

6. d/dx $\left(\sqrt{\sin^2 x} \right.$ is

    (1) cos x

    (2) sin 2x

    (3) cos² x

    (4) $\sqrt{\cos x / \sin x}$

SPACE FOR ROUGH WORK

7. $\dfrac{d}{dx} \tan^{-1} \sqrt{(1-\cos 2x)/(1+\cos 2x)}$ is

   (1) 1

                      (2) 0

   (3) tan x

                      (4) cos x

8. If $y = \sin x^x$ then dy/dx is

   (1) x log sin x

   (2) $\cos x^x$

   (3) $\sin x^x$ (x cot x + log sin x)

   (4) $\cos x^x$ (x tan x + log sec x)

9. $\dfrac{d}{dx}\left(\sinh^{-1} x\right)$ is

   (1) $1/\sqrt{1+x^2}$

                      (2) $1/\sqrt{1-x^2}$

   (3) $1/\sqrt{x^2-1}$

                      (4) $1/\sqrt{x^2+1}$

10. The equation to the normal to the curve $y = 5x^2 + 4x - 11$ at the point $(-1, 2)$ is

   (1) x − 6y + 11 = 0

   (2) x + 6y − 11 = 0

   (3) 6x − y + 11 = 0

   (4) 6x + y − 11 = 0

11. In solving the equations by Cramer's rule for $5x - 3y = 1$ and $2x - 5y = -11$, the value of x and y is

   (1) (3, 2)

                      (2) (− 3, − 2)

   (3) (2, 3)

                      (4) (− 2, − 3)

SPACE FOR ROUGH WORK

12. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 1 & 2 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ then A adj A is

    (1) Diagonal   (2) Scalar

    (3) Identity   (4) Zero matrix

13. The minor of the element 6 in a matrix $A = \begin{bmatrix} 2 & -3 & 0 \\ 4 & 1 & 6 \\ 3 & 2 & 0 \end{bmatrix}$ is

    (1) 10   (2) 11

    (3) 12   (4) 13

14. The characteristic equation of the matrix $A = \begin{bmatrix} 5 & -3 \\ 2 & 1 \end{bmatrix}$ is

    (1) $\lambda^2 - 6\lambda + 11 = 0$ (2) $\lambda^2 - 6\lambda - 11 = 0$

    (3) $\lambda^2 + 6\lambda + 11 = 0$ (4) $-\lambda^2 + 6\lambda = 0$

15. The fourth term in the expansion of $\left(\sqrt{3} + 2\right)^7$ is

    (1) 2520   (2) -2520

    (3) 1/2520   (4) $-1/2520$

16. The value of (sin 100° + sin 20°) / (cos 100° + cos 20°) is

    (1) $\sqrt{3}/2$ (2) 1/2

    (3) $\sqrt{3}$ (4) 1

17. The value of $(\tan^{-1} 5/6 + \tan^{-1} 1/11)$ is

    (1) 30°   (2) 60°

    (3) 90°   (4) 45°

SPACE FOR ROUGH WORK

18. If the points $(-3, K)$, $(5, 7)$ and $(-11, 1)$ are collinear, then the value of K is

    (1) 4   (2) 3

    (3) 2   (4) 1

19. The ratio of the line join of the points $(2, 3)$ and $(-5, 6)$ divided by y – axis is

    (1) 5 : 2   (2) 2 : 5

    (3) 3 : 2   (4) 2 : 3

20. Three vertices of a triangle are $(-2, 3, 1)$, $(-1, 4, 2)$ and $(-6, 5, 2)$, then the centroid of the triangle is

    (1) $(-3, 4, 1)$ (2) $(0, 5/3, 1/3)$

    (3) $(4, 3, 1)$ (4) $(-3, -4, -2)$

21. The volume of a sphere is increasing at the rate of 4π c.c/sec, then the rate of increase of the radius is when the volume is 288π cc

    (1) 6 cm/sec   (2) 1/6 cm/sec

    (3) 1/36 cm/sec   (4) 36 cm/sec

22. $\int \sin^2 x \, dx$ is

    (1) $\cos x + c$ (2) $x/2 - (\sin 2x)/4 + c$

    (3) $x/2 + (\cos 2x)/4 + c$ (4) $x/2 + (\sin 2x)/4 + c$

23. $\int (3x^2 + x - 1)^6 (6x + 1) \, dx$ is

    (1) $6 (3x^2 + x - 1)^5 + c$ (2) $(3x^2 + x - 1)^6 + c$

    (3) $(3x^2 + x - 1)^7 / 7 + c$ (4) $(3x^2 + x - 1)^7 / 21 + c$

SPACE FOR ROUGH WORK

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24. $\int \tan^{-1} x \, dx$ is

(1) $x \tan^{-1} x - 1/2 \log (1 + x^2) + c$

(2) $x \tan^{-1} x + 1/2 \log (1 + x^2) + c$

(3) $\tan^{-1} x - 1/2 \log (1 + x^2) + c$

(4) $\tan^{-1} x + 1/2 \log (1 + x^2) + c$

25. $\int\limits_{0}^{\pi/2} \sin 3x \cos 2x \, dx$ is

(1) 3/5

(2) $-$3/5

(3) 5/3

(4) $-$5/3

26. The constant term in the expansion $(x^2 + 1/x)^{12}$ is

(1) $-$495

(2) 495

(3) 1/495

(4) 945

27. The projection of vector $(3, 1, 3)$ on vector $(1, -2, 1)$ is

(1) $2\sqrt{6}/5$

(2) $-2\sqrt{6}/3$

(3) $2\sqrt{6}/3$

(4) $-2\sqrt{6}/5$

28. If vector $a = (1, 1, 1)$ and vector $b = (2, 2, 1)$ then magnitude of vector $a \times b$ is

(1) $\sqrt{26}$

(2) $\sqrt{28}$

(3) $\sqrt{24}$

(4) 1

29. The cosine of the angle between the vectors $(3, -1, 1)$ and vector $(1, 1, -1)$ is

(1) $1/\sqrt{11}$

(2) $-1/\sqrt{33}$

(3) $1/\sqrt{33}$

(4) $-1/\sqrt{11}$

SPACE FOR ROUGH WORK

A-4

[P.T.O.

30. The value of $(\sec^6 x - \tan^6 x)$ is

    (1) $1 - 3\sec^2 x \tan^2 x$

    (2) $1 + \tan^2 x \sec^2 x$

    (3) $1 + 3\sec^2 x \tan^2 x$

    (4) $1 - \tan^2 x \sec^2 x$

31. The equation to the straight line passing through (3, 2) and perpendicular to the line $5x + 2y - 3 = 0$ is

    (1) $2x - 5y - 4 = 0$

    (2) $2x - 5y + 4 = 0$

    (3) $2x + 5y + 4 = 0$

    (4) $5x - 2y + 4 = 0$

32. The slope of a line passing through the points $(-4, -5)$ and $(2, 3)$ is

    (1) 3/4

    (2) $-3/4$

    (3) 4/3

    (4) $-4/3$

33. The acute angle between the lines $2x - y + 3 = 0$ and $x - 3y + 2 = 0$ is

    (1) 30°

    (2) 60°

    (3) 90°

    (4) 45°

34. The value of $\lim_{n \to \infty} [(3 - n)(4 - n)(2n - 5)] / (4n^3 - 3)$

    (1) $-1/2$

    (2) 1/2

    (3) 3/2

    (4) $-3/2$

35. The value of $\lim_{x \to -3} (x^4 - 81) / (x^3 + 27)$ is

    (1) 3

    (2) -3

    (3) 4

    (4) -4

SPACE FOR ROUGH WORK

36. $\int_{0}^{2} (x-1)(x-2) \, dx$ is

    (1) 2/3   (2) − 2/3

    (3) 3/2   (4) − 3/2

37. The area bounded by the curve $y = 2x^2$, the x − axis and the ordinates at x = − 1 and x = 2 is

    (1) − 6 sq units

    (2) 3 sq units

    (3) − 3 sq units

    (4) 6 sq units

38. The differential equation formed by eliminating a and b from $x + y = ae^x + be^{-x}$ is

    (1) $d^2y/dx^2 + y = 0$

    (2) $d^2y/dx^2 - y = 0$

    (3) $d^2y/dx^2 - x - y = 0$

    (4) $d^2y/dx^2 + x - y = 0$

39. The solution of the differential equation $dy/dx = (1 + y^2) / (1 + x^2)$ is

    (1) $\tan^{-1} y + \tan^{-1} x + c = 0$

    (2) $\log(1 + y^2) + \log(1 + x^2) + c = 0$

    (3) $\tan^{-1} y - \tan^{-1} x + c = 0$

    (4) $\log(1 + y^2) - \log(1 + x^2) + c = 0$

40. If $\begin{vmatrix} x+2 & 5 \\ 0 & x-2 \end{vmatrix} = 0$, then x =

    (1) 1   (2) 2

    (3) 3   (4) 0

SPACE FOR ROUGH WORK

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PART – B

It consists of **41 – 80** questions.

41. A bullet of mass 0.01 kg is fired from a rifle of mass 20 kg with a speed of 10 m/s , then the recoil velocity of rifle is _____ m/s.
    (1) –1
    (2) –0.05
    (3) –200.01
    (4) –0.005

42. Final velocity of a body thrown downwards is _____
    (1) Maximum
    (2) Minimum
    (3) No change
    (4) Zero

43. A person throws a sand bag from a boat at rest in a pond then boat moves
    (1) In the same direction
    (2) In the opposite direction
    (3) In a perpendicular direction
    (4) In circular direction

44. Two equal forces at a point, the square of their resultant is equal to three times the product of the forces. Then the angle between the forces is equal to
    (1) 30°
    (2) 45°
    (3) 60°
    (4) 90°

45. Equilibrant is a force
    (1) Which brings a body in equilibrium
    (2) Which moves the body along the resultant force
    (3) in zig-zag movement of the body
    (4) Which moves the body in opposite direction to equilibrant force

46. The best value of reverberation time for speech listener _____
    (1) 0.5 to 1.5 s
    (2) 0.15 to 0.5 s
    (3) 0.05 to 0.15 s
    (4) 0.5 to 5 s

SPACE FOR ROUGH WORK

A-4

47. 3 strings of equal lengths but stretched with different tensions are made to vibrate, if their masses per unit length are in the ratio 3:2:1 and frequencies are same then the ratio of the tensions _____

(1) 1:2:3

(2) 2:3:1

(3) 1:3:2

(4) 3:2:1

48. Newton's formula for velocity of sound was corrected by

(1) Boyle

(2) Charles

(3) Laplace

(4) Hertz

49. Light waves are composed of both electric and magnetic field is proposed by

(1) Newton's corpuscular theory

(2) Huygen's wave theory

(3) Maxwell's theory of light

(4) Plank's theory

50. If 'a' and 'b' are the amplitudes of two interfering waves then for destructive interference the amplitude ' R' is

(1) R = ab

(2) R = a/b

(3) R = a – b

(4) R = a + b

51. Which of the following is dimensional physical quantity ?

(1) pressure

(2) strain

(3) mechanical advantage

(4) sp.gravity

52. The principle of vernier is

(1) n VSD = (n + 1) MSD

(2) (n – 1) VSD = n MSD

(3) n MSD = (n – 1) V SD

(4) (n – 1) MSD = n VSD

SPACE FOR ROUGH WORK

A-4

[P.T.O.

53. A screw gauge has a pitch of $\frac{1}{2}$ mm and 50 division on sleeve. The reading when the jaws touch is +5 division. While gripping a wire the reading is PSR = 3 PSD and HSR = 17, then the diameter of wire is

    (1) 1.62 cm
    (2) 0.162 cm
    (3) 0.162 mm
    (4) 16.2 mm

54. The extension of the material by itself without increase of load takes place

    (1) within elastic limit
    (2) beyond elastic limit
    (3) beyond yield point
    (4) at breaking point

55. If the strain in a wire is 0.1%, then the change in the length of the wire of length 5 m is

    (1) 5×10^{-2} m
    (2) 5×10^{-3} m
    (3) 5×10^{-4} m
    (4) 5×10^{-3} cm

56. A force of 10 N acting on a body fixed at a point the distance from the fixed point to the line of force is 2 m. Then the moment of the force is _____ N-m.

    (1) 0.002
    (2) 0.02
    (3) 2
    (4) 20

57. By Lami's theorem, P Q R are three forces acting in equilibrium and angle between PR, PQ, QR, are α, β, γ respectively then which of the following is correct ?

    (1) $\dfrac{P}{\sin\beta} = \dfrac{Q}{\sin\gamma} = \dfrac{R}{\sin\alpha}$
    (2) $\dfrac{P}{\sin\gamma} = \dfrac{Q}{\sin\alpha} = \dfrac{R}{\sin\beta}$
    (3) $\dfrac{P}{\sin\alpha} = \dfrac{Q}{\sin\beta} = \dfrac{R}{\sin\gamma}$
    (4) $\dfrac{P}{\sin\alpha} = \dfrac{Q}{\sin\gamma} = \dfrac{R}{\sin\beta}$

58. If the line of action of the force passes through the point of rotation, then the moment of force is

    (1) Maximum
    (2) Less than one
    (3) Greater than one
    (4) Zero

SPACE FOR ROUGH WORK

A-4

59. 1 Kilo calorie of heat is equal to _____ joule.

    (1) 4.186

    (2) 41.86

    (3) 418.6

    (4) 4186

60. The correct relation between °F and K scale is

    (1) $5K = 9 (F - 32)$

    (2) $9K = -5(F - 32)$

    (3) $K = \dfrac{9}{5} (F - 32) - 273$

    (4) $K = \dfrac{5}{9} (F - 32) + 273$

61. Two coherent sources 2×10^{-4} m apart are illuminated by the light of wave length 5000×10^{-10}m. The distance between the source and screen is 0.2m, then fringe width is

    (1) 0.05×10^{-3} m

    (2) 5×10^{-3}m

    (3) 0.5×10^{-3}m

    (4) 50×10^{-3}m

62. Resolving power of microscope is

    (1) Equal to the resolution of the microscope

    (2) Reciprocal to the resolution of the microscope

    (3) Reciprocal to the focal length of the microscope

    (4) Product of wave length and semi vertical angle

63. Which of the following phenomenon confirm that light is transverse wave ?

    (1) Diffraction

    (2) Interference

    (3) Refraction

    (4) Polarization

SPACE FOR ROUGH WORK

A-4

[P.T.O.

64. In Field emission

(1) High positive voltage is used

(2) Secondary electrons are used

(3) High energy is used

(4) High radiations are used

65. Which of the following is not true ?

(1) Photoelectric emission is an instantaneous process

(2) Photoelectric emission do not takes place below threshold frequency

(3) The K.E. of the photoelectron depends on the wavelength of incident radiation

(4) Number of photoelectrons emitted is directly proportional to the intensity

66. Poisson's ratio is the ratio of

(1) $\dfrac{Lateral\ strain}{Linear\ strain}$

(2) $\dfrac{Linear\ strain}{Lateral\ strain}$

(3) $\dfrac{Lateral\ strain}{Volume\ strain}$

(4) $\dfrac{Volume\ strain}{Lateral\ strain}$

67. The pressure at a depth of 100 m below the surface of water density 1000 kgm^{-3} is

(1) $98 \times 10^5\ Nm^{-2}$

(2) $9.8 \times 10^4\ Nm^{-2}$

(3) $980 \times 10^4\ Nm^{-2}$

(4) $98 \times 10^4\ Nm^{-2}$

68. When two capillary tube of different diameters are dropped vertically in a liquid, the height of the liquid is

(1) More in the tube of larger diameter

(2) More in the tube of smaller diameter

(3) Lesser in the tube of smaller diameter

(4) Same in both the tubes

SPACE FOR ROUGH WORK

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69. The property by virtue of which a liquid opposes relative motion between its different layers is

(1) Viscosity

(2) Elasticity

(3) Surface tension

(4) Inertia

70. The maximum amount of force acting for a short duration is known as

(1) Momentum

(2) Inertia

(3) Power

(4) Impulse

71. Absolute zero is the temperature of a gas at which, the _____ of gas is theoretically zero.

(1) Mass

(2) Weight

(3) Volume

(4) Density

72. When the particle is in SHM having amplitude ' r ' ,then its velocity is

(1) $v = \omega \, (r^2 - y^2)$

(2) $v = \omega \sqrt{r^2 - y^2}$

(3) $v = r \omega^2$

(4) $v = r \omega^3$

73. Ripples in water are the example for

(1) Transverse wave

(2) Longitudinal wave

(3) Sound wave

(4) Ultrasonic wave

74. The length of one ventral segment in stationary wave is equal to

(1) Full wavelength of the wave

(2) Twice the wavelength of the wave

(3) Half a wavelength of the wave

(4) Quarter a wavelength of the wave

SPACE FOR ROUGH WORK

A-4

[P.T.O.

75. A stretched string under a tension T vibrates with a frequency f. When the tension is increased by 4 times, then the frequency becomes _____
    (1) same
    (2) doubled
    (3) tripled
    (4) zero

76. The appearance of additional frequencies in scattered beam of light is known as
    (1) Raman effect
    (2) Coherent scattering
    (3) Incoherent scattering
    (4) Bipolar scattering

77. Two properties of LASER are
    (1) Highly monochromatic and extremely intense
    (2) Highly chromatic and extremely fast
    (3) Very high frequency and extremely high wave length
    (4) Very high power and extremely low amplitude

78. To form a galvanic cell
    (1) difference in concentration of electrolyte is required
    (2) difference in concentration of frequency is required
    (3) difference in concentration of amplitude is required
    (4) both (2) and (3)

79. pH value is not having its application in
    (1) determination of quality of soil
    (2) determination of quality of textile dyes
    (3) determination of quality of chemicals
    (4) determination of quality of electron

80. The prefix "mega" stands for
    (1) 10^3
    (2) 10^{-3}
    (3) 10^{-6}
    (4) 10^6

SPACE FOR ROUGH WORK

A-4

PART – C

81. Pilot would like to fly the aircraft
    (1) At subsonic speed region
    (2) At supersonic speed region
    (3) At transonic speed region
    (4) At both (1) & (2)

82. Ability of a material to absorb energy when deformed elastically and to return it when unloaded is called
    (1) Toughness
    (2) Stiffness
    (3) Resilience
    (4) Hardness

83. Steel containing carbon percentage ranging from 0.30 to 0.50 % is classified as
    (1) Low Carbon steel
    (2) High carbon steel
    (3) Medium carbon steel
    (4) Wrought iron

84. Tungsten-chromium steel is a high speed steel which contains Tungsten
    (1) 14 to 18%
    (2) 1 to 5%
    (3) 50 to 80%
    (4) 80 to 100%

85. Steel is heated above upper critical point and cooled in still air, this is called
    (1) Annealing
    (2) Normalizing
    (3) Hardening
    (4) All are incorrect

86. Negative decomposition in an aircraft happens when
    (1) The aircraft goes for sudden climb
    (2) The aircraft goes into a sudden dive
    (3) Cabin pressure control valve fails
    (4) Both 2 & 3

87. The speed of the propeller is controlled by
    (1) Reduction gear box
    (2) Governor
    (3) Brake housing
    (4) Hub

SPACE FOR ROUGH WORK

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[P.T.O.

88. The general shape of honey comb is
    (1) Pentagonal
    (2) Hexagonal
    (3) Rectangle
    (4) Triangular

89. Aircraft paints should have
    (1) High melting point
    (2) High corrosion resistance
    (3) Low freezing point
    (4) All of above

90. The anti-torque effect in helicopter is given by
    (1) Main rotor
    (2) Fuselage
    (3) Tail rotor
    (4) Empennage

91. Return line is not required in
    (1) Hydraulic brakes
    (2) Pneumatic system
    (3) Hydraulic landing gears
    (4) Hydraulic steering system

92. Aircraft having tail undercarriages is called
    (1) Conventional U/C
    (2) Tricycle U/C
    (3) Bi-cycle U/C
    (4) 1 & 2 are correct

93. When aircraft is at high altitude it consumes
    (1) More fuel for a given airspeed
    (2) Average fuel for a given airspeed
    (3) Maximum fuel for a given airspeed
    (4) Less fuel for a given airspeed

94. The max temp of an IC engine occurs during
    (1) Suction
    (2) End of compression
    (3) Expansion
    (4) Exhaust

95. During suction process pressure inside the cylinder is
    (1) Less than atmospheric pressure
    (2) More than atmospheric pressure
    (3) Equal to atmospheric pressure
    (4) Slightly more than atmospheric pressure

SPACE FOR ROUGH WORK

A-4

96. Thrust produced by fan in turbofan engine is
    (1) 0-20%
    (2) 15-30%
    (3) 70-80%
    (4) 85-100%

97. In annular combustion chamber flame tube is
    (1) Common
    (2) Individual
    (3) Outside
    (4) None

98. Thrust reversal is for
    (1) Increasing thrust
    (2) Decreasing thrust
    (3) Increasing velocity
    (4) None

99. Voltage regulation is required in aircraft because
    (1) Generator voltage should be constant in all load conditions, varying speeds within the fluctuation limits
    (2) All electrical equipment require constant voltage to operate
    (3) All electrical equipment will not be able to take the load otherwise
    (4) All of the above.

100. In aircraft electrical system, carbon pile regulator system is used
    (1) In generators capable of high output current, requiring field excitation current
    (2) To avoid uses of vibrating contact type that gets worn out faster
    (3) To reduce the field excitation current
    (4) Both (1) and (2)

101. Fuel/oil filters should be inspected according to
    (1) Operating speed
    (2) Flying hours
    (3) Operator's requirements
    (4) None of the above

102. If an aircraft is affected by lightening strike, inspect
    (1) Fuselage
    (2) Propeller
    (3) Static dischargers
    (4) Wing tips

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103. A glass cockpit in aircraft

    (1) Provide all information on MFD (Multi Function Display) to the pilot

    (2) Provide all information on TV screens to pilot

    (3) Is totally made up of glass windows which can be seen by the pilot from all angles

    (4) None of the above

104. An automatic radio direction finder (ADF) is

    (1) Device for finding direction of radio source

    (2) Device for transmitting the radio waves

    (3) Device for all radio frequencies in use

    (4) None of the above

105. In navigation, dead reckoning is

    (1) Calculating ones current position by using a previously determined position

    (2) A process by which current position can be found out dead accurately

    (3) A process by which current position and coming position also can be found out

    (4) None of the above

106. The maintenance cost can be estimated by knowing

    (1) No. of break downs   (2) Down time of the aircraft

    (3) Consumption of spare parts   (4) All of the above

107. In Terotechnology system, the word 'TEREIN" means

    (1) To look after   (2) To guard

    (3) To take care of   (4) All of the above

108. The ability to maintain in the least amount of time at the lowest cost is called

    (1) Availability   (2) Maintainability

    (3) Serviceability   (4) None of the above

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109. It is a measure of the degree to which an item is in an operable state and can be committed at the start of the mission when called for at an unknown point of time. The term referred to is

    (1) Maintainability
    (2) Serviceability
    (3) Availability
    (4) None of the above

110. MTBM is a function of

    (1) Reliability
    (2) Maintainability
    (3) Availability
    (4) None of the above

111. It is of utmost for aviation field to know the variation of

    (1) Temperature, pressure & relative humidity with altitudes
    (2) Temperature, density of air, relative humidity of air
    (3) Temperature, pressure, weight, volume of air
    (4) None of the above

112. The wake referred in aircraft flying is

    (1) The turbulent flow of air just behind the trailing edge of the wing
    (2) The vortex flow which forms behind the aircraft at cruising altitudes
    (3) The vortex flow which forms behind the aircraft during take-off and landing
    (4) The turbulent flow behind an aircraft flying at supersonic speed

113. The boundary layer referred to an aerofoil is

    (1) The region of airflow, adjacent to surface of wing, in which speed is less than 99% of free stream flow
    (2) The region of airflow where the free stream flow of air adjacent to the aerofoil is highest
    (3) The region of airflow where the free stream flow of air adjacent to the aerofoil is lowest
    (4) The region of air flow where the free stream flow of air adjacent to the aerofoil reaches exactly 50 %

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[P.T.O.

114. The purpose of Flap, Slat, Slot and vortex generator in an aircraft is
    (1) To provide flexibility for the pilot to vary the lift during all stages of flight of aircraft
    (2) To provide the pilot reduce the stall speed during landing, to increase camber during take off
    (3) To provide max lift characteristics under all conditions of flight
    (4) Both (1) & (2)

115. Compressive lift are produced in an aircraft when
    (1) Aircraft flies beyond M = 3.0
    (2) Aircraft flies below M = 3.0
    (3) Aircraft flies beyond M = 5.0
    (4) Aircraft flies steadily at M = 1.0

116. The process where a part is placed in furnace and heated to temperature around 1000°F. Then it is soaked at this temperature and ammonia gas is circulated in the furnace chamber is called
    (1) Cladding   (2) Nitriding
    (3) Cold working   (4) Extruding

117. In an aircraft instrument system fail safe feature is a must requirement because
    (1) Pilot should not be bothered about instrument being safe or not
    (2) When an instrument fails safety is not compromised
    (3) When instrument fails, it should always fail towards safety side of operation
    (4) The pilot should know that instrument should never fail

118. In an aircraft instrument system fail sure feature is a must requirement because
    (1) Pilot should be informed & be prepared for the crash landing
    (2) It allows the pilot to make fine adjustments before it fails
    (3) It should inform the pilot that the instrument has failed for sure & no doubt exists
    (4) Pilot should know that now he should switch off the instrument

119. The vertical speed indicator is also known as
    (1) Rate of climb/descent indicator   (2) Mach meter
    (3) Altimeter   (4) 1&3

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120. The basic six instruments in an aircraft cockpit are
  (1) ASI, ALTI, GH, MACH, VSI, TBI
  (2) ASI, ALTI, GH, DI, MAGRI, ROCI
  (3) ASI, ALTI, GH, DH, DI, VSI, TBI
  (4) ASI, ALTI, DI, ROCI, GH, GPS

121. Bulkhead of fuselage structure resist
  (1) Bending load
  (2) Compression load
  (3) Tension load
  (4) Concentrated load

122. In rectangular wing stalling first occurs at
  (1) Root
  (2) Mid span
  (3) Wing tip
  (4) Leading edge

123. In military aircraft
  (1) Mono-spar is preferred
  (2) Multi-spar is preferred
  (3) I beam s preferred
  (4) None of them

124. Flaps, spoilers, slats are
  (1) Primary control surface
  (2) Secondary control surface
  (3) Tertiary control surface
  (4) Auxiliary control surface

125. Moving the control stick forward moves
  (1) Elevators up
  (2) Elevators down
  (3) Aircraft nose down
  (4) 2 & 3 are correct

126. Supercharging of IC engine
  (1) Improves inlet pressure
  (2) Improves thrust
  (3) Increase the weight of engine
  (4) All of them

127. In an Otto cycle combustion occurs at
  (1) Constant volume
  (2) Constant pressure
  (3) Constant temperature
  (4) Constant Entropy

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[P.T.O.

128. The gas turbine engine works on
   (1) Constant volume
   (2) Constant pressure
   (3) Constant temperature
   (4) Constant density

129. Diffuser is placed in front of
   (1) Combustion chamber
   (2) Compressor
   (3) Turbine
   (4) Nozzle

130. The amount of compressed air allowed for secondary zone of combustion chamber
   (1) 20-30%
   (2) 10-20%
   (3) 30-40%
   (4) 80-90%

131. Thermal switches are used in aircraft where
   (1) Visual warning and automatic operation of protection devices are required
   (2) Thermal indication are required
   (3) Temperatures are critical
   (4) None of the above

132. In aircraft Circuit Breaker is used
   (1) For protecting electrical circuit from current overload
   (2) For breaking the circuit as per requirement
   (3) For keeping the critical loads safe
   (4) For protecting cockpit instruments from surges

133. Aircraft lighting system consists of
   (1) External lighting and internal lighting
   (2) External lighting, internal lighting and navigation lighting
   (3) External, internal and radar light
   (4) External, internal and engine inspection lights

134. Transformer rectifier unit (TRU) is
   (1) Combination of transformer and rectifier packs
   (2) Combination of step-down transformer and 3-phase rectifier
   (3) Combination of step-up transformer and 3-phase rectifier
   (4) Combination of single phase transformer and rectifier only

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135. The routine and recurring process of keeping aircraft/engine/equipment in its normal operating condition is called
    (1) Inspection
    (2) Maintenance
    (3) Preservation
    (4) Servicing

136. An inter-com system in aircraft is used
    (1) To have effective communication between pilots, all flight crew during flight
    (2) To have communication among all people who are travelling in aircraft
    (3) For conversation between cabin crew and passengers
    (4) None of the above

137. Electromagnetic spectrum is
    (1) The full range of magnetic frequencies available
    (2) The full range of electrical frequencies available
    (3) The range of all possible frequencies in electromagnetic radiation
    (4) None of the above

138. A public address system is
    (1) Used to allow a person to address a large crowd through electronic system
    (2) System for keeping all addresses of the public in that area
    (3) A system which can be used by all the public in that particular area
    (4) All of the above

139. Secondary radars are
    (1) Making use of a transponder for reply and not echo signal from the target
    (2) Secondary in their application of scanning of frequencies
    (3) Better as compared to primary radars if reply signal strength is considered
    (4) Both (1) and (3)

140. VOR operates in the frequency band
    (1) 108 to 121.52 MHz
    (2) 108 to 117.95 MHz
    (3) 88 to 108 MHz
    (4) 78 to 108 MHz

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[P.T.O.

141. ——————— is computed as the no. of failures per time units in the respective intervals, divided by the average no. of surviving cases at the mid point of the interval

(1) Failure rate
(2) Hazard rate
(3) Reliability
(4) None of the above

142. The type of failure occurs in the early part of life of a system's operation is known as

(1) Chance failure
(2) Independent failure
(3) Early failure
(4) Creeping failure

143. ——————— system can monitor on line and off line

(1) Stand by system
(2) Parallel system
(3) Automatic system
(4) BITE

144. The consequences of ozone layer depletion

(1) Disturbance in eco system
(2) Greenhouse effect
(3) Shorten life of paints and plastic
(4) All the above

145. Air safety is a term encompassing of

(1) Theory
(2) Investigation
(3) Flight Failures
(4) All of the above

146. Winglets are provided in aircraft wings to

(1) Allow extra maneuverability control for pilot on aircraft
(2) Improve the air flow over the aircraft and wings
(3) To overcome the effects of wing tip vortices
(4) Improve the low speed characteristics of aircraft

147. In an aircraft, the supersonic flow of air over aircraft

(1) Happens together at all surfaces of aircraft
(2) Happens only at leading edges of wing of aircraft
(3) Happens only on certain portion of the aircraft
(4) Happens at the leading edges of the wing and nose portion of the aircraft

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148. A normal shock wave is

    (1) One which is parallel to the direction of flow

    (2) One which is perpendicular to the direction of flow

    (3) One which is at a min angle to the direction of flow

    (4) One which is oblique to the direction of flow

149. Local Mach no. (M_L) in an aircraft wing surface

    (1) Remains constant beyond Mach-1

    (2) Are not the same at all speeds of aircraft

    (3) Are the same at all speeds of aircraft below Mach-1

    (4) None of the above

150. In a supersonic flight of aircraft

    (1) Pressure waves and aircraft remain together

    (2) Pressure waves remain ahead of aircraft

    (3) Pressure waves lag or cannot keep up with aircraft

    (4) Pressure waves have no effect from speed of aircraft

151. Basic T instrument of an aircraft instrument are

    (1) TSI, TBI, DI, GH, VSI & MACH

    (2) ASI, AH, ALTI, DI, GH

    (3) MACH, ASI, GH, DI, VSI, DI, VSI & GPS

    (4) None of above

152. The four important elements of an aircraft instrument are

    (1) Detecting, sensing, measuring, coupling and display

    (2) Detecting, sensing, coupling, display

    (3) Detecting, amplifying, coupling, display

    (4) Detecting, transmitting, translating, displaying

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[P.T.O.

153. If there is a kink (bend) in dynamic pressure line of Pitot system of aircraft

    (1) ASI will under read, altimeter will read correctly, ROCI will read correctly, mach meter will under read

    (2) ASI will under read, altimeter will under read, ROCI will under read, mach meter will read only

    (3) ASI will not read, altimeters will under read, ROCI will over read, mach meter will over read

    (4) None of above

154. If there is a kink (bend) in static pressure line of Pitot static system of an aircraft

    (1) ASI will over read, altimeter, Roci will under read, mach meter will over read

    (2) ASI will under read, altimeter, Roci will over read, mach meter will over read

    (3) ASI will read normal, altimeter, Roci will under read, mach meter will over read

    (4) None of above, no effect on any meter

155. Explosive decomposition happens in an aircraft

    (1) Whenever a bomb explodes inside an aircraft

    (2) Whenever there is a sudden leak inside the pressurized aircraft cabins

    (3) Whenever the differential pressure between inside & outside the cabin goes beyond the set limits

    (4) All of above

156. Ailerons provides _____ movement

    (1) Yaw   (2) Roll
    (3) Pitch   (4) All are incorrect

157. Spoilers are used in modern heavy aircraft for

    (1) Yawing   (2) Braking
    (3) Pitching   (4) 1 & 2 are correct

158. Fuel dispenser must have a filter of

    (1) 5 microns   (2) 10 microns
    (3) 15 microns   (4) 16 microns

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159. _____ converts rotary movement into linear motion
    (1) Actuator
    (2) Motor
    (3) Screw jack
    (4) Gears

160. Shuttle valve is used in hydraulic system
    (1) Landing gear
    (2) Flight controls
    (3) Brakes
    (4) 1 & 3 are correct

161. Bleed air is taken from
    (1) Last stage of compressor
    (2) First stage of compressor
    (3) Mid stage of compressor
    (4) None of above

162. The thermal efficiency of gas turbine depends on
    (1) Maximum temp of turbine
    (2) Fuel octane number
    (3) Compression ratio
    (4) All of them

163. After burner is generally used during
    (1) Landing
    (2) Take off
    (3) Accelerating flight
    (4) Both 2 & 3

164. Multi spool arrangement is possible in
    (1) Turbojet
    (2) Turbofan
    (3) Ramjet
    (4) Turbo shaft

165. Supersonic nozzles are
    (1) Convergent
    (2) Divergent
    (3) Convergent & Divergent
    (4) None of them

166. It provides for inspection of all civil aircraft at specific intervals, depending upon the type of operation they engaged, the documents/authority refereed is
    (1) FAR
    (2) Maintenance Manual
    (3) 14CFR
    (4) All the above

167. Under ATA 100 Specification system, Maintenance Manual Ch-26 refers to
    (1) Air conditioning
    (2) Structures
    (3) Fire Protection
    (4) None of the above

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[P.T.O.

168. The primary purpose of aircraft weight and balance control is
    (1) Safety
    (2) To achieve utmost efficiency
    (3) Both 1 & 2
    (4) To minimize drag

169. The control cable is inspected for
    (1) Kinks
    (2) Bird caging
    (3) Broken wires
    (4) All of the above

170. Functional check of a system is carried out after
    (1) Repair/Rectification
    (2) Repair of leakage of fuel, oil system/component etc.
    (3) Change of any component
    (4) All of the above

171. Doppler radar makes use of
    (1) Doppler effect to produce velocity data of object at a distance
    (2) Shift in acceleration between two objects
    (3) Shift in velocity from an object
    (4) All of the above

172. Date of effectively of a CAR is mentioned on
    (1) First page
    (2) All pages
    (3) Even pages
    (4) Odd pages

173. Primary Maintenance Process is
    (1) Hard time maintenance process
    (2) On condition maintenance process
    (3) Condition monitoring maintenance process
    (4) All of the above

174. The engine and propeller log books shall be preserved for a period of _____ year after the engine/ propeller is permanently withdrawn from use.
    (1) 2 years
    (2) 1 year
    (3) 4 years
    (4) 3 years

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175. The process of ensuring a system continuously performs its intended functions at its designed-in level of reliability and safety, is known as

    (1) Management
    (2) Maintainability
    (3) Maintenance
    (4) Reliability

176. Tetra-Ethyl Lead (TEL) is ———— type of additive.

    (1) Anti-Oxidant
    (2) Anti-knocking
    (3) Corrosion inhibitor
    (4) Biocide additive

177. In aircraft tyre the circumferential recesses between the tread ribs are called

    (1) Chafer
    (2) Flippers
    (3) Grooves
    (4) Lines

178. Roughly ———— percentage of bird strikes involves aircraft flying below 800 feet.

    (1) 85 %
    (2) 55 %
    (3) 95%
    (4) 25 %

179. In DGCA organization chart, flight inspection unit comes under

    (1) Airworthiness division

    (2) Air safety division

    (3) Operation division

    (4) None of the above

180. The commercial flying, transport aircraft flying and research flying by NASA

    (1) Carry out their flying in lower layer of atmosphere only

    (2) Carry out their flying in troposphere

    (3) Carry out their flying in troposphere and partly in Stratosphere

    (4) All of the above

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