DIPLOMA - COMMON ENTRANCE TEST-2016

ME	COURSE	DAY : SUNDAY
	MECHANICAL	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
					B - 1	111754

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. 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

2. Dimensional formula for stress is

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

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

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

   (A) tensile stress (B) volume stress

   (C) shear stress (D) shear strain

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

   (A) 1.792 (B) 0.650

   (C) 1.005 (D) 0.470

5. Dimensional formula of surface tension is

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

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

6. 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

7. 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

8. 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

9. Heat transfer in the absence of the medium is

(A) conduction (B) convection

(C) radiation (D) absorption

10. Zero of absolute scale of temperature is at

(A) 0 °C (B) 100 °C

(C) 273 °C (D) – 273 °C

11. Ripples on water surface is an example of

(A) electromagnetic waves (B) transverse waves

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

12. 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

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

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

(C) watt square meter (D) watt meter

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

(A) resonance (B) interference

(C) echo (D) acoustics

15. 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

16. Momentum of a photon is given by

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

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

17. 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) $\sqrt{\frac{d^2}{k}}$

18. 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

19. Raman lines are

(A) unpolarised (B) polarised

(C) diffracted (D) reflected

20. A crystal which has two optic axes is

(A) calcite (B) quartz

(C) mica (D) glass

21. 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

22. 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.

23. 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

24. 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) $4a\cos^2\left(\frac{\phi}{2}\right)$

25. 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

26. 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) $\frac{2n\sin\theta}{\lambda}$

27. 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.

28. 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

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

(A) Newton (B) Joule

(C) Ampere (D) Watt

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

(A) hecta (B) centi

(C) pico (D) peta

31. An example of dimensionless physical quantity is

(A) surface tension (B) strain

(C) impulse (D) period

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

(A) decreases (B) increases

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

33. 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}

34. 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

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

(A) constant velocity
(B) constant acceleration
(C) variable velocity
(D) variable acceleration

36. 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

37. 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

38. 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}

39. 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

40. 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

PART – B
APPLIED MATHEMATICS

41. 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

42. 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) $2\operatorname{cosec}^2\theta$

43. 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) $\frac{25}{12}$

44. 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

45. 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

46. 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) $\frac{1-\sqrt{3}}{2\sqrt{2}}$

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

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

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

48. 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) $\frac{1}{2}(\cos 8x - \cos 2x)$

49. 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) $\tan^{-1}\left(\frac{1}{7}\right)$

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

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

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

51. 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

52. 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

53. 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) $-\sqrt{3}$

54. 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) $\frac{y - y_2}{x - x_2} = \frac{y_2 - y_1}{x_2 - x_1}$

55. 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) $5x + 2y - 9 = 0$

56. 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

57. 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

58. 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) $-2e^x \sin x$

59. 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) $\frac{1}{2}$

60. 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) $\frac{-a}{b}$

61. 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

62. 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) $x + 12y + 2 = 0$

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

(A) -44 (B) -30

(C) 81 (D) -81

64. 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) $\frac{-1}{2}[\cos 5x + \cos x] + C$

65. 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) $\frac{\cos(2x^3)}{6} + C$

66. $\int \log x \, dx$ 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

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

(A) 0 (B) 1

(C) 2 (D) -2

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

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

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

69. 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

70. 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

71. 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

72. 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

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

(A) 12 (B) 3

(C) -13 (D) 15

74. 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) $\begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$

75. 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

76. 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

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

(A) –19 (B) 19

(C) 13 (D) –13

78. 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) $12\,x^8$

79. 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) $\frac{\sqrt{29}}{2i-3j+4k}$

80. 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

PART – C

MECHANICAL ENGINEERING

81. Oxygen to acetylene ratio in case of neutral flame is

(A) 0.8 : 1 (B) 1 : 1

(C) 1.2 : 1 (D) 2 : 1

82. The process of producing holes of desired shape is called

(A) Blanking (B) Trimming

(C) Drawing (D) Piercing

83. The purpose of a riser is to

(A) deliver molten metal into the mould cavity.

(B) act as a reservoir for the molten metal.

(C) feed the molten metal to the casting in order to compensate for the shrinkage.'

(D) deliver molten metal from pouring basin to gate.

84. Sand for making cores is

(A) Green sand (B) Dry sand

(C) Loam sand (D) Oil sand

85. When a pattern is made in three parts, the top part is

(A) Drag (B) Cheek

(C) Cope (D) Any one of the above

86. In gas welding the temperature of the neutral flame is of the order of about

(A) 5900 °F (B) 6300 °F

(C) 5500 °F (D) 1475 °F

87. Seam welding is best for metal thickness ranging from

(A) 0.025 to 3 mm (B) 3 to 5 mm

(C) 5 to 8 mm (D) 8 to 10 mm

Space For Rough Work

88. Which of the following is an intensive property of a Thermodynamic system ?
(A) Volume
(B) Temperature
(C) Mass
(D) Energy

89. Which law states that the Internal Energy of a gas is a function of temperature ?
(A) Charle's Law
(B) Joule's Law
(C) Regnault's Law
(D) Boyle's Law

90. Kelvin-Plank's law deals with
(A) conversion of Liquids into solids
(B) conversion of Solids into Liquids
(C) conversion of Liquids into Gases
(D) Conversion of Heat into work

91. Which law defines the Thermal Equilibrium State of more than two thermal systems ?
(A) Joule's Law
(B) Zeroth Law of Thermodynamics
(C) First Law of Thermodynamics
(D) Second Law of Thermodynamics

92. The following thermal process does not involve neither supply nor rejection of heat :
(A) Constant pressure process
(B) Iso-thermal process
(C) Adiabatic process
(D) Constant volume process

93. Which cycle finds use in Spark Ignition (SI) engine ?
(A) Diesel cycle
(B) Otto cycle
(C) Dual cycle
(D) Brayton cycle

94. The intake Air filters are provided in compressors to
(A) reduce temperature of suction air
(B) reduce pressure of suction air
(C) remove dust and dust from suction air
(D) None of the above

Space For Rough Work

95. Compression Ratio of Diesel Engine will have a range

(A) 8 to 10 (B) 10 to 15

(C) 16 to 20 (D) None of the above

96. In a four-stroke cycle Diesel Engine, during suction –stroke

(A) only air is sucked in (B) only fuel is sucked in

(C) mixture of fuel and air is sucked in (D) None of the above

97. Principal constituents of a fuel are

(A) Carbon and Hydrogen (B) Oxygen and Hydrogen

(C) Sulphur and Oxygen (D) Sulphur and Hydrogen

98. The piston of an I.C. Engine completes two strokes in

(A) 180° of crank rotation (B) 360° of crank rotation

(C) 540° of crank rotation (D) 720° of crank rotation

99. The fly-wheel is located on

(A) Rocker-arm shaft (B) Crank shaft

(C) Cam shaft (D) None of the above

100. Spark-Ignition Engine works on

(A) Carnot cycle (B) Rankin cycle

(C) Constant pressure cycle (D) Constant volume cycle

101. When the piston is at Top Dead Centre, the volume above the piston in the combustion chamber is

(A) Cylinder volume (B) Stroke volume

(C) Clearance volume (D) None of the above

Space For Rough Work

102. The Calorific value of Diesel is about

(A) 36.5 MJ/kg (B) 38.5 MJ/kg

(C) 45.5 MJ/kg (D) 42.5 MJ/kg

103. When relative motion between two elements is completely or successfully constrained, then these two elements form a

(A) Mechanism (B) Machine

(C) Kinematic pair (D) Kinematic chain

104. Ball bearing forms a

(A) Turning pair (B) Rolling pair

(C) Sliding pair (D) Spherical pair

105. Creep in Belt drive is due to

(A) weak material of belt

(B) weak material of pulley

(C) uneven extension and contractions of the belt when it passes from tight side to slack side

(D) None of the above

106. The size of a Gear is usually specified by

(A) pressure angle (B) circular pitch

(C) module (D) pitch circle diameter

107. The product of diametral pitch and module of a gear is equal to

(A) 2π (B) π

(C) 1 (D) $\pi/2$

108. The gear train used to connect minute hand and hour hand in a clock is

(A) Simple Gear Train (B) Compound Gear Train

(C) Epicyclic Gear Train (D) Reverted Gear Train

Space For Rough Work

109. The power transmitted by a belt is maximum when the maximum tension in the belt is equal to _____ times the centrifugal tension.

(A) 2 (B) 3

(C) 4 (D) 5

110. For static balancing of a shaft

(A) the net dynamic force acting on the shaft should be zero

(B) the net couple due to dynamic forces acting on the shaft should be zero

(C) Both (A) and (B)

(D) None of the above

111. The angle between the direction of follower motion and a normal drawn to the pitch curve is called

(A) pitch angle (B) prime angle

(C) base angle (D) pressure angle

112. In a Radial cam, the follower moves

(A) in a direction perpendicular to cam axis.

(B) in a direction parallel to cam axis.

(C) in any direction irrespective to cam axis.

(D) along the cam axis.

113. A disturbing mass m_1 attached to a rotating shaft may be balanced by a single mass m_2 attached in the same plane of rotation as that of m_1 such that (r_1 and r_2 are radii of rotations)

(A) $m_1r_2 = m_2r_1$ (B) $m_1m_2 = r_1r_2$

(C) $m_1r_1 = m_2r_2$ (D) None of the above

114. The type of brake commonly used in Railway trains is

(A) Shoe brake (B) Band brake

(C) Band and Block brake (D) Internal Expanding brake

Space For Rough Work

115. The frictional torque transmitted by a disc or plate clutch is same as that of

(A) Flat Pivot Bearing (B) Flat Collar Bearing

(C) Conical Pivot Bearing (D) Trapezoidal Pivot Bearing

116. The power absorbed by a dynamometer is converted into

(A) Pressure (B) Torque

(C) Force (D) Heat

117. The clutch is located between

(A) Gear box and wheel axle (B) Gear box and Brake drum

(C) Engine and Gear box (D) None of the above

118. Poisson's Ratio is least for

(A) Cast iron (B) Concrete

(C) Rubber (D) Mild steel

119. The relation between Young's Modulus (E) and Modulus of Rigidity (C) is given by

(A) $E = 2C\left(1+\frac{1}{m}\right)$ (B) $E = 3C\left(1+\frac{1}{m}\right)$

(C) $E = 2C\left(1-\frac{1}{m}\right)$ (D) $E = 3C\left(1-\frac{1}{m}\right)$

120. The deformation of a bar per unit length in the direction perpendicular to that of line of action of force is called

(A) Primary strain (B) Linear strain

(C) Lateral strain (D) Shear strain

121. The point that appears before elastic limit in the stress-strain curve is

(A) Proportionality limit (B) Upper yield point

(C) Lower yield point (D) Breaking point

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122. When a bar is heated and if it is not allowed to expand, the type of stress induced is

(A) Tensile stress (B) Shear stress

(C) Compressive stress (D) No stress

123. The value of Modulus of Elasticity for mild steel is around

(A) 200 GN/m^2 (B) 200 GN/mm^2

(C) 100 GN/m^2 (D) 100 GN/mm^2

124. For mild steel, the ultimate tensile stress is _____ the ultimate compressive stress.

(A) less than (B) more than

(C) equal to (D) less than or equal to

125. The unit of strain is

(A) N/m^2 (B) N/m

(C) $N \cdot m$ (D) None of the above

126. For a simply supported beam loaded with UDL, the shear force diagram consists of

(A) two triangles (B) two rectangles

(C) two curves (D) two squares

127. A beam having many supports is known as

(A) Cantilever (B) simply supported beam

(C) Built-in beam (D) Continuous beam

128. The maximum Bending moment for a cantilever of length L and point load W at its free end is

(A) $\frac{WL^2}{2}$ (B) $\frac{WL^2}{4}$

(C) WL (D) $\frac{WL^2}{8}$

Space For Rough Work

129. The bending moment diagram of a simply supported beam with point load at its centre is

(A) a square (B) a triangle

(C) a parallelogram (D) a rectangle

130. The load which is same per unit length on the beam is called

(A) Point load (B) Uniformly varying load

(C) Uniformly distributed load (D) Concentrated load

131. In a simply supported beam, at the point where shear force changes its sign, the bending moment is

(A) Maximum (B) Minimum

(C) Zero (D) All the above

132. When a bar of length one metre is elongated by one millimetre due to the action of tensile force, the strain is

(A) 0.01 (B) 0.0001

(C) 0.1 (D) 0.001

133. Smelting is the process of

(A) removing the impurities like clay, sand etc. from the iron ore by washing with water.

(B) expelling moisture, carbon dioxide, sulphur and arsenic from the iron ore by heating in shallow kilns.

(C) reducing the ore with carbon in the presence of a flux.

(D) None of the above

134. The property of a material which it breaks with little permanent distortion is

(A) Brittleness (B) Ductility

(C) Malleability (D) Plasticity

Space For Rough Work

135. The cutting tools are made from

(A) Nickel steel
(B) Chrome steel
(C) Silicon steel
(D) High speed steel

136. In spheroidising the steel is

(A) heated below the lower critical temperature and cooled slowly.
(B) heated upto the lower critical temperature and then cooled in still air.
(C) heated slightly above the lower critical temperature and then cooled slowly to a temperature of 600 °C.
(D) None of above.

137. Cupola is used to manufacture

(A) Pig iron
(B) Cast iron
(C) Wrought iron
(D) Steel

138. 18-4-1 High speed steel contains

(A) Vanadium 4%, Chromium 18% and Tungsten 1%.
(B) Vanadium 1%, Chromium 4% and Tungsten 18%.
(C) Vanadium 18%, Chromium 1% and Tungsten 4%.
(D) None of the above

139. Pearlite consists of

(A) 13% Carbon and 87% Ferrite
(B) 13% Cementite and 87% Ferrite
(C) 13% Ferrite and 87% Cementite
(D) 6.67% Carbon and 93.33% Iron

Space For Rough Work

140. Heat treatment is a process involving

(A) heating of a metal in a solid state to obtain certain desirable properties.

(B) cooling of a metal in a solid state to obtain certain desirable properties.

(C) heating and cooling of a metal in a solid state to obtain certain desirable properties.

(D) None of the above.

141. Which one of the following is the raw material for all iron and steel products ?

(A) Pig iron (B) Cast iron

(C) Wrought iron (D) Steel

142. Lead is widely used in

(A) Storage batteries (B) Transformers

(C) Switch gears (D) Galvanised pipes

143. The size of A4 drawing sheet is

(A) 210×297 mm (B) 841×1189 mm

(C) 594×841 mm (D) 297×420 mm

144. In isometric projection, the actual length of the objects are reduced in the ratio of

(A) 2 : 3 (B) $\sqrt{2} : \sqrt{3}$

(C) 3 : 2 (D) $\sqrt{3} : \sqrt{2}$

145. In a pyramid the imaginary line connecting vertex or apex with the centre of base is

(A) axis (B) edge

(C) slant edge (D) longer edge

146. A point p; its top view is 40 mm above *xy*; the front view 20 mm below the top view; the quadrant in which the point situated is

(A) Third quadrant (B) Fourth quadrant

(C) Second quadrant (D) First quadrant

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147. The values 25 and 12.5 shown in the surface finish symbol indicate

(A) Roughness value (B) Roughness grade

(C) Unilateral tolerance (D) Bilateral tolerance

148. Which of the following is not the size of the drawing board ?

(A) DO (B) D1

(C) D2 (D) D4

149. Thin chain line find its application as

(A) Centre lines (B) Lines of symmetry

(C) Trajectories (D) All of the above

150. Dimension lines are

(A) Thick lines (B) Thin lines

(C) Broken lines (D) None of the above

151. If the end view is a vertical line of reduced length, its front view is

(A) inclined line of true length

(B) line of true length parallel to XY

(C) line to true length perpendicular to XY

(D) point

152. If a plane surface is parallel to HP and perpendicular to VP, its front view is

(A) True shape (B) Line parallel to XY

(C) Rectangle (D) Inclined line

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153. The detailed list of movable goods such as raw materials, finished products, work in progress is known as

(A) Inventory (B) Stock

(C) Raw stock (D) Finished goods

154. The fitness of the product for the purpose at lowest cost is

(A) Quality (B) Inspection

(C) Quality control (D) Finess

155. Bin card is used in

(A) Administrative (B) Work shop

(C) Foundry shop (D) Stores

156. The meaning of TQM is

(A) Total Quality Management (B) Tolerable Quality Management

(C) Timely Quality Management (D) None of the above

157. Routing prescribes the

(A) Flow of material (B) Proper utilization of man power

(C) Proper utilization of machines (D) Inspection of final products

158. If the number of defective parts in a sample lot is more than acceptance number, then the whole lot will be rejected in

(A) Sampling inspection (B) Sequential inspection

(C) Acceptance inspection (D) Lot-by-lot inspection

159. The type of production in which only one type of product can be manufactured is

(A) Job production (B) Mass production

(C) Batch production (D) Unit production

Space For Rough Work

160. Industrial safety involves

(A) Reducing damage to equipment and machinery

(B) Reducing production cost

(C) Increasing rate of production

(D) All of the above

161. The first stage of team building process is

(A) Storming (B) Forming

(C) Norming (D) Performing

162. Human effort to produce more and more with less and less input of resources is called as

(A) product (B) production

(C) by product (D) productivity

163. Getting goods from the manufacturer to customer is called as

(A) Goods management (B) Carrier management

(C) Customer management (D) Logistics management

164. ISO 9000 : 2000 standards principles refer to

(A) Focus on customers (B) Provide leadership

(C) Involvement of people (D) Use of a process approach

165. The ghost items in MNG analysis means

(A) The items not consumed for last one year.

(B) The items consumed from time to time.

(C) The items consumed from last one year.

(D) The items which had nil balance both at beginning and at the end of financial year.

166. VDE analysis is based on

(A) Consumption values (B) Criticality of items

(C) Availability position of each item (D) None of the above

Space For Rough Work

167. SQC methods are based on the theory of

(A) Relativity (B) Productivity

(C) Probability (D) None of the above

168. The portion of the tool on which cutting edge is formed is called

(A) Flank (B) Face

(C) Nose (D) Shank

169. It is desired to perform the operations like drilling, reaming, counter-boring etc., on a work piece. Which of the following machine will be used ?

(A) Sensitive drilling machine (B) Radial drilling machine

(C) Gang drilling machine (D) Multiple spindle drilling machine

170. In which of the following milling machine, the table can be tilted in a vertical plane by providing a swivel arrangement at the knee ?

(A) Universal milling machine (B) Plain milling machine

(C) Omniversal milling machine (D) Hand milling machine

171. The process of improving cutting action of grinding wheel is

(A) Facing (B) Cutting

(C) Turning (D) Dressing

172. The code MO6 stands for

(A) Tool change (B) Coolant on

(C) Coolant off (D) None of the above

173. The welding method uses a pool of molten metal is

(A) Carbon arc welding (B) Submerged arc welding

(C) TIG arc welding (D) MIG arc welding

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174. In blanking operation clearance is provided on
(A) Punch
(B) Die
(C) Half on punch and half on die
(D) Either on punch or Die depending on designers choice.

175. The property of sand due to which it evolves a great amount of steam and other gases is called
(A) Collapsibility (B) Permeability
(C) Cohesiveness (D) Adhesiveness

176. A sand employed on the faces of the pattern before moulding is called
(A) Green sand (B) Dry sand
(C) Oil sand (D) Parting sand

177. In Electro-chemical machining operation, the gap between tool and work is kept of the order of
(A) 0.25 mm (B) 2.75 mm
(C) 1.25 mm (D) 5 mm

178. In ultrasonic machining, the grain sizes with grit number 1000 is used for
(A) Roughing (B) Facing
(C) Turning (D) Finishing

179. Laser Beam Machining used for drilling holes of small diameter of the order of
(A) 0.025 mm (B) 0.25 mm
(C) 0.0025 mm (D) 0.00025 mm

180. In a shaper, the metal is removed during
(A) Forward stroke
(B) Return stroke
(C) Both the forward and return stroke
(D) Neither the forward nor the return stroke

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