D-C E T – 2018

ME	COURSE	VERSION CODE	QUESTION BOOKLET SERIAL NUMBER
	MECHANICAL	A	200261

MAXIMUM MARKS	TOTAL DURATION	TIME
180	200 Minutes	10.00 a.m. to 1.00 p.m.

MAXIMUM TIME FOR ANSWERING	MENTION YOUR DIPLOMA CET NUMBER				
180 Minutes					

DOs :

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

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 seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

SEAL

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

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
① ● ③ ④	⊗ ② ③ ④ ① ② ③ ✓ ① ● ● ④
	⓪ ② ③ ④ 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 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 (Dept. 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.

DO NOT WRITE HERE

PART – A

It consists of **1 – 40** questions.

1. If $A = \begin{bmatrix} 3 & 0 \\ -2 & 1 \end{bmatrix}$, then $2A - 3A^T =$

(1) $\begin{bmatrix} -3 & -6 \\ -4 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} -3 & 6 \\ -2 & 1 \end{bmatrix}$

(3) $\begin{bmatrix} -3 & 6 \\ -4 & -1 \end{bmatrix}$ (4) $\begin{bmatrix} -3 & 6 \\ 4 & -1 \end{bmatrix}$

2. If $\begin{bmatrix} 3 & 4 & x \end{bmatrix} \begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix} = [2x + 8]$ then the value of x =

(1) 1 (2) –1

(3) $-\frac{1}{2}$ (4) $\frac{1}{2}$

3. If $\begin{vmatrix} 3 & m-1 \\ m+1 & 2 \end{vmatrix} = 3$, then the value of m =

(1) ±1 (2) $\pm\sqrt{2}$

(3) ±3 (4) ±2

4. In solving simultaneous linear equations $x - y = 4$, $2y + 3z = -2$ and $3x + y + 2z = 1$ using Cramer's rule, the value of determinant of co-efficients of x, y and z is

(1) 6 (2) 12

(3) –8 (4) –16

SPACE FOR ROUGH WORK

5. If $A = \begin{bmatrix} -2 & 5 \\ 2 & -3 \end{bmatrix}$, then inverse of A =

(1) $\frac{1}{4}\begin{bmatrix} 2 & -5 \\ -2 & 3 \end{bmatrix}$ (2) $\frac{1}{4}\begin{bmatrix} -3 & -5 \\ -2 & -2 \end{bmatrix}$

(3) $\frac{1}{4}\begin{bmatrix} -2 & 2 \\ 5 & -3 \end{bmatrix}$ (4) $\frac{1}{4}\begin{bmatrix} 3 & 5 \\ 2 & 2 \end{bmatrix}$

6. The characteristic roots of the matrix $\begin{bmatrix} 4 & -2 \\ -3 & -1 \end{bmatrix}$ are

(1) 2 and –5 (2) –2 and 5

(3) –2 and –5 (4) 2 and 5

7. If $\vec{a} = 2\hat{i} - 3\hat{j} + 5\hat{k}$
$\vec{b} = 3\hat{i} - 2\hat{j} - 5\hat{k}$ and
$\vec{c} = \hat{i} + 4\hat{k}$

then the scalar product of $\vec{a} + \vec{b}$ and $\vec{b} - \vec{c}$ is

(1) –9 (2) 9

(3) 20 (4) –20

8. If A, B and C are three consecutive vertices of a parallelogram with position vectors $3\hat{i} - 2\hat{j} + \hat{k}$, $2\hat{i} + \hat{j} - \hat{k}$ and $\hat{i} - \hat{j} + \hat{k}$, then area of the parallelogram is

(1) $3\sqrt{5}$ sq. units (2) $5\sqrt{3}$ sq. units

(3) $2\sqrt{5}$ sq. units (4) $5\sqrt{2}$ sq. units

9. Work done by the force 2i – 3j + 5k in moving a particle from (–3, 1, 2) to (1, –1, 1) is

(1) 3 (2) 9

(3) 6 (4) 15

SPACE FOR ROUGH WORK

10. The probability of drawing a non-diamond card from a well shuffled deck of 52 cards is

(1) $\frac{3}{4}$ (2) $\frac{1}{2}$

(3) $\frac{1}{4}$ (4) $\frac{12}{13}$

11. If $\tan\theta = \frac{2}{3}$ and $\pi < \theta < \frac{3\pi}{2}$, then $\sin\theta + \cos\theta =$

(1) $\frac{5}{\sqrt{13}}$

(2) $\frac{-1}{\sqrt{13}}$

(3) $\frac{1}{\sqrt{13}}$

(4) $\frac{-5}{\sqrt{13}}$

12. If $\tan A + \tan B + \tan A \tan B = 1$, then $A + B =$

(1) 180° (2) 90°

(3) 45° (4) 360°

13. $\sqrt{\frac{1-\cos 40°}{1+\cos 40°}} =$

(1) tan 20° (2) cot 40°

(3) tan 10° (4) tan 40°

14. If $\tan A = \frac{1}{2}$ and $\tan B = \frac{2}{3}$ then $\tan(A - B)$ is

(1) –1 (2) 1

(3) $\frac{-1}{8}$ (4) $\frac{1}{8}$

SPACE FOR ROUGH WORK

15. The numerical value of $\sin 10° \sin 50° \sin 70°$ =

(1) $\frac{\sqrt{3}}{8}$ (2) $\frac{1}{8}$

(3) $\frac{3}{16}$ (4) $\frac{1}{16}$

16. $\frac{\sin 12° + \cos 12°}{\sin 12° - \cos 12°}$ =

(1) cot 33° (2) –tan 33°

(3) –tan 57° (4) tan 57°

17. The polar form of the complex number $\sqrt{3} - i$ is

(1) $2\left[\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right]$ (2) $2\left[\cos\frac{\pi}{6} - i\sin\frac{\pi}{6}\right]$

(3) $2\left[\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right]$ (4) $2\left[\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}\right]$

18. The value of $\lim_{x\to\infty} x\left[\sqrt{x^2+1} - x\right]$ is

(1) 1 (2) 2

(3) $\frac{1}{2}$ (4) 0

19. The value of $\underset{x\to 3}{Lt} \frac{x\sqrt{x} - 3\sqrt{3}}{\sin(x-3)}$ is

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

(3) $\frac{2}{3\sqrt{3}}$ (4) $\frac{1}{3\sqrt{3}}$

SPACE FOR ROUGH WORK

20. The value of $\lim_{x \to 0} \frac{1-\sqrt{\cos x}}{x^2}$ is

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

(3) 2 (4) $-\frac{1}{2}$

21. The equation of line passing through the point (1, –3) and having slope $\frac{1}{2}$ is

(1) $x - 2y - 7 = 0$ (2) $2x - y + 7 = 0$

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

22. The equation of line passing through the point (–2, 3) and parallel to the line $5x + 3y + 5 = 0$ is,

(1) $5x + 3y - 19 = 0$ (2) $5x + 3y + 1 = 0$

(3) $5x + 3y + 19 = 0$ (4) $3x - 5y + 1 = 0$

23. If $y = e^x \log x$ then $\frac{dy}{dx}$ is

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

(3) $e^x \cdot \frac{1}{x}$ (4) $e^x + \frac{1}{x}$

24. If $y = \log(\tan x + \sec x)$, then $\frac{dy}{dx}$ is,

(1) $-\sec x$

(2) $\sec x$

(3) $\frac{\sec x}{\tan x + \sec x}$

(4) $\log(\sec^2 x + \tan x \sec x)$

SPACE FOR ROUGH WORK

25. If $\frac{x^2}{2}+\frac{y^2}{2}=1$ then $\frac{dy}{dx}$ is

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

(3) $\frac{-x}{y}$ (4) $\frac{1-x}{y}$

26. If $x=\frac{1}{t}$; $y=3t^3$ then $\frac{dy}{dx}$ is,

(1) $-6t^4$ (2) $-9t^4$

(3) -6 (4) -9

27. If $y=(\sin x)^{\log x}$ then $\frac{dy}{dx}$ is

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

(3) $(\sin x)^{\log x}$ [$-\log x \cot x + \log \sin x$] (4) $(\sin x)^{\log x}\left[\log x \cot x+\frac{\log \sin x}{x}\right]$

28. If $y=e^{5x}+e^{-5x}$ then $\frac{d^2y}{dx^2}$ at $x=0$ is,

(1) 25 (2) -25

(3) 50 (4) -50

29. The rate of change of volume of a sphere with respect to radius, when its radius 3 cm is

(1) 3π (2) 6π

(3) 18π (4) 36π

30. The equation of normal to the curve $y=x^2$ at (2, 2) is

(1) $x-4y-10=0$ (2) $x-4y+10=0$

(3) $x+4y-10=0$ (4) $x+4y+10=0$

SPACE FOR ROUGH WORK

31. The value of $\int e^{5\log x}\,dx$ is

(1) $5x^4 + C$ (2) $\frac{x^6}{6} + C$

(3) $6x^6 + C$ (4) $\frac{x^5}{5} + C$

32. The value of $\int \frac{\cos x - \sin x}{\cos x} dx$ is

(1) $x - \cos x + C$ (2) $x + \cos x + C$

(3) $x + \log \sec x + C$ (4) $x - \log \sec x + C$

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

(1) $2\sin x + \frac{(\sin x)^4}{4} + C$ (2) $\frac{\sin^4 x}{4} + C$

(3) $2\cos x + \frac{(\cos x)^4}{4} + C$ (4) $\frac{\cos^4 x}{4} + C$

34. The value of $\int \frac{x+5}{x^2+10x-5} dx$ is,

(1) $\log (x^2 + 10x - 5)^2 + C$ (2) $\frac{1}{2}\log (x^2 + 10x - 5) + C$

(3) $\frac{1}{2}\log (x + 5) + C$ (4) $\log (x + 5)^2 + C$

35. The value of $\int 4x \log 5x\,dx$ is,

(1) $\frac{x^2 \log 5x}{2} - \frac{x^2}{4} + C$ (2) $\frac{x \log 5x}{5} + \frac{x^2}{2} + C$

(3) $5x \log 5x + 1 + C$ (4) $2x^2 \log 5x - x^2 + C$

SPACE FOR ROUGH WORK

36. $\int_0^{\pi/4} \frac{\sec^2 x}{1+\tan x}\,dx =$

(1) $-\log 2$ (2) $\log 2$

(3) $\log 3$ (4) $\log 4$

37. The volume of a solid generated by revolving the curve $y = \tan x$ about x-axis between the lines $x = 0$ and $x = \frac{\pi}{4}$ is,

(1) $\pi + \frac{\pi^2}{4}$ cu. units (2) $1 + \frac{\pi}{4}$ cu. units

(3) $1 - \frac{\pi}{4}$ cu. units (4) $\pi - \frac{\pi^2}{4}$ cu. units

38. Order and degree of differential equation $\frac{d^2y}{dx^2} = \sqrt{1 - \frac{dy}{dx}}$ are

(1) 2 and 2 respectively (2) 2 and 1 respectively

(3) 1 and 2 respectively (4) 1 and 1 respectively

39. The differential equation obtained by eliminating the arbitrary constants from the equation $y^2 = a \sin x + b \cos x$ is

(1) $2y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 - y^2 = 0$ (2) $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + y^2 = 0$

(3) $2y\frac{d^2y}{dx^2} - 2\left(\frac{dy}{dx}\right)^2 + y^2 = 0$ (4) $2y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 + y^2 = 0$

40. The solution of differential equation $x\frac{dy}{dx} + y = x - 1$ is

(1) $xy = x - \frac{x^2}{2} + C$ (2) $xy = \frac{x^2}{2} - x + C$

(3) $xy + \frac{x^2}{2} + x = C$ (4) $xy - \frac{x^2}{2} - x = C$

SPACE FOR ROUGH WORK

PART – B

It consists of **41 – 80** questions.

41. The value of 20 peta Hertz is

(1) 20×10^9 Hz (2) 20×10^{12} Hz

(3) 20×10^{15} Hz (4) 20×10^{18} Hz

42. The total reading for Screw Gauge is found by

(1) TR = PSR + (HSR × LC) ± ZE

(2) TR = PSR + (HSR × LC) ± ZC

(3) TR = (PSR + HSR) × LC ± ZE

(4) TR = (PSR + HSR) × LC ± ZC

43. The least count of a slide calipers is 0.01 cm. In a setting the zero of the Vernier Scale lies between 3.2 cm and 3.3 cm and 5^{th} division of the Vernier co-incides with the main scale division. The total reading is

(1) 3.35 cm (2) 3.35 mm

(3) 3.25 cm (4) 3.25 mm

44. The rectangular component of a vector R are

(1) $R_X = R\cos\theta$, $R_Y = R\sin\theta$

(2) $R_X = R\sin\theta$, $R_Y = R\cos\theta$

(3) $R_X = \cos\theta$; $R_Y = \sin\theta$

(4) $R_X = -\cos\theta$; $R_Y = -\sin\theta$

45. A body of weight 5 kg is suspended by means of a light string. It is pulled horizontally until the string makes an angle of 30° with the vertical. Then the horizontal force applied is

(1) $\frac{1}{\sqrt{3}}$ kg wt (2) 5 kg wt

(3) $5\sqrt{3}$ kg wt (4) $\frac{5}{\sqrt{3}}$ kg wt

SPACE FOR ROUGH WORK

46. Among these which is the vector quantity ?

(1) Work (2) Energy

(3) Surface tension (4) Power

47. The resultant of two like parallel forces P and Q acting at a point is

(1) P + Q away from P

(2) P + Q away from Q

(3) P ~ Q in between P and Q

(4) P + Q in between P and Q

48. Shock absorbers in automobiles is an example for

(1) Tensile stress (2) Compressive stress

(3) Shear stress (4) Breaking stress

49. The elasticity of steel compared to rubber is

(1) More (2) Less

(3) Equal (4) Less than or equal

50. The stress-strain graph for an elastic body within elastic limit is

(1) Linear (2) Curved

(3) Parabola (4) Hyperbola

51. The maximum stress of steel wire is 500 N/mm^2, if the area of cross section of wire is 0.05 m^2 then the force is

(1) 25 N (2) 25 KN

(3) 25 MN (4) 250 N

52. In case of concave meniscus, the angle of contact is

(1) Acute (2) Right angle

(3) Linear (4) Obtuse

SPACE FOR ROUGH WORK

53. The surface tension of a liquid varies as
    (1) Directly with temperature, inversely with density
    (2) Directly with both temperature and density
    (3) Inversely with both temperature and density
    (4) Inversely with temperature and directly with density

54. The thrust on the bottom of a container having base area 0.5 m^2 filled with water to a height of 6 cm is
    (1) 147 N (2) 294 N
    (3) 147 dynes (4) 294 dynes

55. The fastest mode of transfer of heat is
    (1) Conduction (2) Convection
    (3) Radiation (4) Transmission

56. Pressure is directly proportional to absolute temperature at constant volume is a statement of
    (1) Charle's law (2) Boyle's law
    (3) Gay-Lussac's law (4) Boltzmann's law

57. Boyle's law is applicable for
    (1) Isothermal process (2) Isobaric process
    (3) Isochoric process (4) Isotonic process

58. At absolute zero temperature, the pressure and volume of a given mass of gas is
    (1) 1 (2) 273
    (3) −273 (4) 0

59. In cold countries, the windows are provided with double doors because
    (1) Air between two windows behaves as a perfect insulator
    (2) Air between two windows behaves as a perfect conductor
    (3) To strengthen the windows
    (4) Security purpose

SPACE FOR ROUGH WORK

60. The sound waves and light waves can be differentiated by

(1) Interference (2) Diffraction

(3) Reflection (4) Polarization

61. The velocity of sound in gas is independent of

(1) Temperature (2) Pressure

(3) Humidity (4) Density

62. The superposition of two waves of same frequency moving in opposite direction is

(1) Progressive wave (2) Transverse waves

(3) Sound wave (4) Stationary wave

63. For every degree raise of temperature, the velocity of sound waves in gas is increased by

(1) 6 m/s (2) 60 m/s

(3) 0.6 s/m (4) 0.6 m/s

64. The angle between the particle vibration and wave propagation in a transverse wave is

(1) 0° (2) 45°

(3) 90° (4) 180°

65. The original tension in the string if the frequency of a sonometer wire is doubled, when the tension is increased by 12 kg wt is

(1) 2 kg wt (2) 4 kg wt

(3) 8 kg wt (4) 12 kg wt

66. At resonance, the body vibrates with

(1) Small amplitude (2) Large amplitude

(3) Zero amplitude (4) Same amplitude

SPACE FOR ROUGH WORK

67. Beats occurs in mining due to the presence of
(1) Ore (2) Water
(3) Contaminated air (4) Fossils

68. The statement which is correct in these is
(1) X-rays have longer wavelength than microwaves
(2) Gamma rays have shorter wavelength than microwaves
(3) UV-rays have shorter wavelength than violet rays
(4) Red rays have longer wavelength than infrared rays

69. LASER is used in
(1) LIDAR (2) RADAR
(3) SONAR (4) GPS

70. Nano means
(1) One hundredth of meter
(2) One thousandth of meter
(3) One millionth of meter
(4) One billionth of meter

71. Microphone is a
(1) Transducer (2) Receiver
(3) Channel (4) Transmitter

72. The principle behind optical fibre is
(1) Total internal refraction (2) Total internal reflection
(3) Reflection (4) Refraction

73. Faraday's I law of electrolysis is represented mathematically as
(1) $M = ZQ$ (2) $Z = MQ$
(3) $Q = MZ$ (4) $M = \frac{Z}{Q}$

SPACE FOR ROUGH WORK

74. A galvanic cell setup between two dissimilar metals in contact is called
(1) Concentration cell
(2) Composition cell
(3) Stress cell
(4) Secondary cell

75. In which of these cells the reaction can be reversed ?
(1) Primary cell
(2) Secondary cell
(3) Solar cell
(4) Photo cell

76. The statement which is true for fuel cell is
(1) They make more pollution
(2) They produce noise
(3) They liberate more heat
(4) They are heavy in weight

77. Alloy of steel is a mixture of
(1) Chromium, iron and nickel
(2) Chromium, iron and zinc
(3) Chromium, iron and aluminium
(4) Chromium, iron and tin

78. The materials with weak intermolecular forces of attraction between polymer chains are
(1) Elastomers
(2) Fibres
(3) Thermoplastic
(4) Thermosetting polymers

79. The type of composite material to which reinforced concrete belongs is
(1) Laminate
(2) Particulate
(3) Short fibre
(4) Long fibre

80. pH value of a solution is given by
(1) $-\log_{10}[H^+]$
(2) $-\log_e[OH^-]$
(3) $-\log_e[H^+]$
(4) $\log_{10}[H^+]$

SPACE FOR ROUGH WORK

PART – C

It consists of **81 – 180** questions.

81. Continuous chips are not produced during the machining of
    (1) Cast iron (2) Mild steel
    (3) Copper (4) Aluminium

82. In orthogonal cutting, the shear angle is the angle between the
    (1) Flank face and the shear plane
    (2) Flank face and the machined surface
    (3) Rake face and the shear plane
    (4) Rake face and the machined surface

83. In a lathe, facing operation is used for producing
    (1) A cylindrical surface (2) A plane surface
    (3) A tapered surface (4) A hole

84. A face plate, is used in a lathe to hold
    (1) Any odd-shaped workpiece to locate the axis of rotation
    (2) Only for eccentric workpiece to locate the axis of rotation
    (3) Only for cylindrical workpiece to locate the axis of rotation
    (4) Only for square bar to locate the axis of rotation

85. Operation used for enlarging the previously drilled hole is called
    (1) Boring (2) Drilling
    (3) Reaming (4) Counter sinking

86. An operation of producing a hole by removing metal along the circumference of a hollow cutting tool is
    (1) Reaming (2) Spot facing
    (3) Trepanning (4) Gun drilling

SPACE FOR ROUGH WORK

87. The process of removing metal by a cutter which is rotated in the same direction of travel of workpiece is called

(1) Upmilling (2) Down milling

(3) Face milling (4) End milling

88. In a shaper, reciprocating motion of the ram is obtained by

(1) Crank and slotted quick return motion mechanism

(2) Cams and trip dogs

(3) Rack and pinion with belt drive and trip dogs

(4) None of the above

89. In a milling machine, the rate at which the workpiece advances under the cutter is called

(1) Cutting speed (2) Depth of cut

(3) Feed (4) None of the above

90. In which of the following machine tool, more than one tool head can be used ?

(1) Slotter machine (2) Planning machine

(3) Shaper machine (4) Milling machine

91. Grinding is a process used for

(1) Machining materials which are too hard for other machining process

(2) Close dimensional accuracy

(3) High degree of surface finish

(4) All of the above

92. The abrasive process, that uses a loose abrasive grit is called

(1) Honing (2) Grinding

(3) Lapping (4) Creep feed grinding

93. Surface grinding is used to produce

(1) Internal cylindrical holes (2) External cylindrical surfaces

(3) Flat surfaces (4) All of the above

SPACE FOR ROUGH WORK

94. The type of grinding wheel used to grind hard materials is
(1) Fine grained (2) Coarse grained
(3) Medium grained (4) None of the above

95. Which of the following non conventional machining process uses mechanical energy ?
(1) EDM (2) LBM (3) USM (4) EBM

96. Which of the following line is used for representing the visible outline ?
(1) Continuous thick (2) Continuous thin
(3) Chain thin line (4) Short zig-zag line

97. The surface roughness on a drawing is indicated by
(1) Circle (2) Triangle (3) Curve (4) Square

98. A taper provided on the pattern for facilitating the easy withdrawal of pattern from the mould is known as
(1) Machining allowance (2) Distortion allowance
(3) Shrinkage allowance (4) Draft allowance

99. Green sand is a mixture of
(1) 90% sand and 10% clay (2) 70% sand and 30% clay
(3) 30% sand and 70% clay (4) 50% sand and 50% clay

100. The consumable electrode is used in
(1) MIG arc welding (2) Carbon arc welding
(3) Submerged arc welding (4) TIG arc welding

101. The operation of cutting a flat sheet to the desired shape by using a punch and die is called
(1) Forming (2) Drawing (3) Blanking (4) Notching

102. The heating of metal to the plastic state and then the pressure is applied to form it into desired shape and size is called
(1) Hot spinning (2) Hot forging (3) Hot extrusion (4) Hot drawing

SPACE FOR ROUGH WORK

103. Code M09 stands for

(1) Coolant OFF (2) Coolant ON (3) Spindle STOP (4) Clamp

104. The structure of a Cartesian Co-ordinate Robot consists of

(1) 2 linear and 1 rotary joint (2) 1 linear and 2 rotary joint

(3) 3 linear joints (4) 3 rotary joints

105. G02 code stands for

(1) Circular interpolation, clockwise (2) Linear interpolation

(3) Circular interpolation, anticlockwise (4) Dwell

106. Poisson's ratio is defined as the ratio of

(1) Linear strain to lateral strain (2) Lateral strain to linear strain

(3) Shear stress to shear strain (4) Tensile stress to tensile strain

107. When a steel bar of length 1 mt is extended by 0.001 mm due to tensile load, the strain is

(1) 1×10^{-6} (2) 1×10^{-5} (3) 1×10^{-4} (4) 1×10^{-3}

108. The CG of a cone of height 'h' from its base is given by

(1) $\frac{h}{3}$ (2) $\frac{h}{4}$ (3) $\frac{h}{2}$ (4) $\frac{2h}{3}$

109. The MI of a rectangular section of width 'b' and depth 'd', about a vertical axis passing through its CG is given by

(1) $\frac{bd^3}{12}$ (2) $\frac{bd^3}{6}$ (3) $\frac{db^3}{6}$ (4) $\frac{db^3}{12}$

110. A beam having more than 2 supports is known as

(1) Cantilever beam (2) Simply supported beam

(3) Continuous beam (4) Overhanging beam

111. The maximum value of bending moment for a simply supported beam of length 'l' carrying an UDL of W/unit length throughout its length is

(1) $\frac{Wl}{8}$ (2) $\frac{Wl}{4}$ (3) $\frac{Wl^2}{8}$ (4) $\frac{Wl^2}{4}$

SPACE FOR ROUGH WORK

112. The shear force diagram of a simply supported beam carrying a point load at its centre is represented by

(1) Two rectangles (2) Two triangles

(3) Two trapeziums (4) Two parabolic curves

113. The value of shear force at the fixed end of a cantilever of length 'l' carrying an UDL of W/unit length is

(1) Wl^2 (2) $\frac{Wl^2}{2}$ (3) $\frac{Wl}{2}$ (4) Wl

114. The shear stress induced at the centre of a solid shaft subjected to torsion is

(1) Maximum (2) Minimum

(3) Average of maximum and minimum (4) Zero

115. When a cantilever is subjected to bending due to point load at its free end, maximum compressive stress will develop at its

(1) Top most fibre (2) Bottom most fibre

(3) Neutral axis (4) Centre of gravity

116. A compound mechanism is an assemblage of

(1) 2 links (2) 3 links (3) 5 links (4) 4 links

117. Which of the following is an example of double slider crank chain ?

(1) Beam engine

(2) Crank and slotted lever mechanism

(3) Whitworth's quick return motion mechanism

(4) Elliptical trammel

118. The relative motion between the belt and the pulley due to the change in length of the belt when it passes from tight side to slack side is called as

(1) Creep (2) Slip (3) Centrifugal tension (4) Initial tension

119. For maximum power transmission in belt drives, the centrifugal tension is _____ times the maximum tension in the belt.

(1) 0.55 (2) 0.25 (3) 0.33 (4) 0.75

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120. In a gear, the product of diametral pitch and module is

(1) 1 (2) 0.5 (3) π (4) $\frac{\pi}{2}$

121. The gear train used in differential of an automobile is

(1) Riverted gear train (2) Epicyclic gear train

(3) Compound gear train (4) Simple gear train

122. Co-efficient of friction can be defined as the ratio of

(1) Angle of repose to angle of friction

(2) Limiting frictional force to normal reaction

(3) Angle of friction to angle of repose

(4) Normal reaction to limiting frictional force

123. Energy can neither be created nor destroyed, but it can be transformed from one form to another, this statement is known as

(1) Zeroth law of thermodynamics

(2) First law of thermodynamics

(3) Second law of thermodynamics

(4) None of the above

124. The measurement of temperature is based on

(1) Zeroth law of thermodynamics

(2) First law of thermodynamics

(3) Second law of thermodynamics

(4) None of the above

125. When the gas is heated at constant volume, the heat supplied

(1) Increases the internal energy of the gas

(2) Decreases the internal energy of the gas

(3) Does some external work during expansion

(4) Increases the pressure of the gas

SPACE FOR ROUGH WORK

126. A process in which the gas is heated or expanded in such a way that the product of its pressure and volume remains constant is called

(1) Hyperbolic process (2) Isothermal process

(3) Adiabatic process (4) Polytropic process

127. Which of the following is an intensive property of a thermodynamic system ?

(1) Mass (2) Temperature (3) Volume (4) Energy

128. When a perfect gas is expanded through an aperture of minute dimensions, the process is known as

(1) Isothermal process (2) Throttling process

(3) Free expansion process (4) Adiabatic process

129. If the value of 'n' is equal to 'γ' in the equation $PV^n = C$, then the process is

(1) Isothermal process (2) Constant volume process

(3) Adiabatic process (4) Hyperbolic process

130. The entropy may be expressed as

(1) $\frac{dQ}{dT}$ (2) $dQ - dT$

(3) $dQ + dT$ (4) $dQ \times dT$

131. In a four stroke cycle engine, the sequence of operation is

(1) Suction, compression, expansion, exhaust

(2) Suction, expansion, compression, exhaust

(3) Compression, expansion, suction, exhaust

(4) Expansion, compression, suction, exhaust

132. Otto cycle is used in

(1) Compression Ignition (CI) engine

(2) Duel fuel engine

(3) Spark Ignition (SI) engine

(4) All of the above

SPACE FOR ROUGH WORK

133. The air standard efficiency of an I.C. Engine depends on
(1) Fuel used (2) Compression ratio
(3) Speed of the engine (4) Air fuel ratio

134. The relative efficiency of an I.C. Engine is the ratio of
(1) Indicated thermal efficiency to the break thermal efficiency
(2) Break thermal efficiency to the air standard efficiency
(3) Indicated thermal efficiency to the air standard efficiency
(4) Air standard efficiency to indicated thermal efficiency

135. If the compression ratio in I.C. Engine increases, then its thermal efficiency
(1) Decrease (2) Increase
(3) Does not change (4) Does not depend on compression ratio

136. A closed cycle gas turbine works on
(1) Carnot cycle (2) Rankine cycle (3) Erickson cycle (4) Joule cycle

137. Super saturated steam is also called as
(1) Saturated steam (2) Single phase mix
(3) Two phase mix (4) Dry steam

138. The multi-stage compression of air as compared to single-stage compression
(1) Improves volumetric efficiency
(2) Reduces the work done per kg of air
(3) Gives more uniform torque
(4) All of these

139. Which of the following is used as a refrigerant in a vapour absorption refrigerator ?
(1) Ammonia (2) Water (3) Freon (4) Aqua-Ammonia

140. A real fluid in which the shear stress is directly proportional to the rate of shear strain is known as
(1) Ideal fluid (2) Real fluid (3) Newtonian fluid (4) Ideal-plastic fluid

SPACE FOR ROUGH WORK

141. According to Pascal's law, the pressure or intensity of pressure at a point in a static fluid is

(1) Low at surface
(2) Equal in all direction
(3) High at surface
(4) Unequal in all direction

142. The pressure measured above the atmospheric pressure is called as

(1) Absolute pressure
(2) Vacuum pressure
(3) Gauge pressure
(4) Static pressure

143. Water hammer in pipes occurs when

(1) The pipe is hit with the hammer
(2) There is excessive leakage in the pipe
(3) The flow of fluid through the pipe is suddenly brought to rest by closing the valve
(4) The flow of fluid through the pipe is gradually reduced by closing the valve

144. The discharge through a venturimeter is given by

(1) $\frac{C_d\sqrt{a_1^2 - a_2^2}\sqrt{2gh}}{a_1 a_2}$
(2) $\frac{C_d\, a_1\, a_2\sqrt{2gh}}{\sqrt{a_1^2 - a_2^2}}$
(3) $\frac{C_d\, a_1\, a_2\sqrt{2gh}}{\sqrt{a_1^2 + a_2^2}}$
(4) $\frac{C_d\sqrt{a_1^2 + a_2^2}\sqrt{2gh}}{a_1\, a_2}$

145. The major loss of energy in a long pipe is due to

(1) Sudden enlargement
(2) Sudden contraction
(3) Gradual contraction or enlargement
(4) Friction

146. The ratio of quantity of liquid discharged per second from the pump to the quantity of liquid passing per second through the impeller is known as

(1) Manometric efficiency
(2) Mechanical efficiency
(3) Overall efficiency
(4) Volumetric efficiency

147. A reciprocating pump is suitable for _____ discharge and _____ heads.

(1) Less and higher
(2) Less and less
(3) High and lesser
(4) High and higher

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148. Slip of a reciprocating pump is negative, when
(1) Suction pipe is short and pump is running at low speeds
(2) Delivery pipe is long and pump is running at high speeds
(3) Suction pipe is short, delivery pipe is long and the pump is running at low speeds
(4) Suction pipe is long, delivery pipe is short and the pump is running at high speeds

149. Check valve is a type of
(1) Pressure reducing valve
(2) Pressure relief valve
(3) Directional control valve
(4) None of the above

150. $\frac{4}{3}$ direction control valves in hydraulic system means
(1) 3 ports and 4 positions
(2) 4 ports and 3 positions
(3) 4 ports and 4 positions
(4) 3 ports and 3 positions

151. Which type of energy is stored in an accumulator ?
(1) Potential energy
(2) Strain energy
(3) Kinetic energy
(4) None of the above

152. The device which converts hydraulic energy into mechanical energy
(1) Hydraulic motor
(2) Hydraulic pump
(3) Compressor
(4) Accumulator

153. What is the function of a flow control valve ?
(1) Adjust the flow pressure of oil
(2) Adjust the flow rate of oil
(3) Changes the direction of oil
(4) None of the above

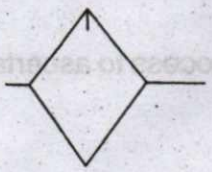
154. When is a pressure reducing valve used ?
(1) When the required pressure is higher than the system pressure
(2) When absolutely zero pressure is required
(3) When the required pressure is lower than the system pressure
(4) When vacuum pressure is required

SPACE FOR ROUGH WORK

155. Two or more cylinders are provided in series with intercooling arrangement between them, such compressors are called as

(1) Multistage compressor
(2) Single stage compressor
(3) Vane compressor
(4) Diaphragm compressor

156. The following symbol represents



(1) Filter
(2) Water separator
(3) Air drier
(4) Lubricator

157. The type of business organisation which is subjected to greater control and supervision of the government is

(1) Private limited company
(2) Public limited company
(3) Partnership organization
(4) Individual ownership

158. The type of production which requires specially planned plant layout, one purpose machinery and costly jigs and fixtures is

(1) Job production
(2) Batch production
(3) Mass production
(4) All of the above

159. The form used in dispatching to commence the production of desired lot of products is

(1) Work order
(2) Time card
(3) Inspection ticket
(4) Move ticket

160. The type of tender system adopted when quantities to be purchased involve large amount

(1) Single tender
(2) Closed tender
(3) Open tender
(4) None of the above

SPACE FOR ROUGH WORK

161. In inventory control, the standard order refers to

(1) Upper limit of the inventory

(2) Lower limit of the inventory

(3) Indication that a new purchase order must be placed

(4) Quantity to be purchased at any time

162. The type of inspection used to inspect the products while they are in process to ascertain that they are being produced according to specification is

(1) Working inspection

(2) Final inspection

(3) Functional inspection

(4) Sample inspection

163. Pareto chart is a

(1) Material control tool

(2) Man power control tool

(3) Production control tool

(4) Total quality management tool

164. ISO 14000 is a series of international standards on

(1) Quality management

(2) Environmental management

(3) Production management

(4) Inventory management

165. Kaizen means

(1) Continuous improvement

(2) Continuous investigation

(3) Continuous inspection

(4) Continuous involvement

SPACE FOR ROUGH WORK

166. In PDCA cycle the abbreviation PDCA stands for
(1) Plan Derive Check Act
(2) Plan Do Check Act
(3) Plan Derive Clear Act
(4) Plan Do Clear Act

167. The major cause of municipal solid waste among the following is
(1) IT firms and training institutes
(2) PC retailers and manufacturers
(3) Industrial electronics
(4) Daily production of domestic waste

168. Chloroflurocarbons (CFCs) cause
(1) Acid rain
(2) Ground water pollution
(3) Ozone layer depletion
(4) All of the above

169. Cast iron contains carbon
(1) Equal to 2%
(2) Less than 0.8%
(3) Less than 2%
(4) Greater than 2%

170. Cutting tools are made from
(1) Nickel steel
(2) Chrome steel
(3) High speed steel
(4) Nickel chrome steel

171. The creep is that property of a material by virtue of which
(1) It fails at a stress below the yield point stress, when the material is subjected to repeated stress
(2) It undergoes a slow and permanent deformation at constant stress
(3) It will fracture or break without any appreciable deformation
(4) It stores energy and resists shock and impact load

SPACE FOR ROUGH WORK

172. Normalizing operation is carried out in

(1) Air

(2) Water

(3) Oil

(4) None of the above

173. P.V.C. is a

(1) Thermo plastic

(2) Thermosetting plastic

(3) Bakelite

(4) Epoxy resin

174. The process of inducing carbon to low carbon steel to give it a hard surface is called

(1) Cyaniding

(2) Carburising

(3) Nitriding

(4) Induction hardening

175. The most commonly used device for the measurement of heavy forces in industries is

(1) Load cell

(2) Strain gauge

(3) Proving ring

(4) Spring

176. A plug gauge is used for checking

(1) Length of cylinders

(2) Cylindrical bores

(3) Diameter of shafts

(4) All the above

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177. Temperature is measured by comparison of brightness of source with that of a standard source in

(1) Thermocouple

(2) Optical pyrometer

(3) Resistance thermometer

(4) Bi-metalic thermometer

178. Hydrometer used to measure

(1) Relative humidity of air

(2) Temperature of liquids

(3) Specific gravity of solids

(4) Specific gravity of liquids

179. When the size of the shaft is constant member and different fits are obtained by varying the size of the hole is called

(1) Uni-lateral system

(2) Bi-lateral system

(3) Hole basis system

(4) Shaft basis system

180. The relationship exists between the mating surface of the parts because of the difference in dimension is called

(1) Limits

(2) Fits

(3) Tolerance

(4) Deviation

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SEAL

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