DIPLOMA - COMMON ENTRANCE TEST-2019

ME	COURSE	DAY : SUNDAY DATE : 21-07-2019
	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
	A	253505

Dos :

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

DONTs :

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

IMPORTANT INSTRUCTIONS TO CANDIDATES

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

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

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

ME-A

CONFIDENTIAL

PART – A

APPLIED SCIENCE

1. One of the basic unit in SI is

   (A) Newton (B) Joule

   (C) Kilometer (D) Ampere

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

   (A) 0.1 mm (B) 0.5 mm

   (C) 0.01 mm (D) 0.05 mm

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

   (A) Speed (B) Density

   (C) Velocity (D) Mass

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

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

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

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

   (A) 50 N (B) 25 N

   (C) 150 N (D) 1.6 N

Space For Rough Work

6. A couple produces

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

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

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

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

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

8. The reciprocal of bulk modulus of elasticity is called

(A) Compressibility (B) Rigidity

(C) Modulus of elasticity (D) Viscosity

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

(A) 20×10^3 N (B) 50 N

(C) 200 N (D) 20 N

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

(A) minimum (B) maximum

(C) zero (D) infinity

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

(A) 1025 kPa (B) 10.25 kPa

(C) 1.025 kPa (D) 102.5 kPa

Space For Rough Work

12. A drop of rain assumes spherical shape due to

(A) Density (B) Viscosity

(C) Surface tension (D) Humidity

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

(A) Viscosity (B) Capillarity

(C) Density (D) Elasticity

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

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

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

15. The expression that represents Boyle's law is

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

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

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

(A) 300 °C (B) 273 °C

(C) 333 °C (D) 606 °C

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

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

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

Space For Rough Work

18. Land and sea breeze is an example of

(A) Conduction (B) Convection

(C) Condensation (D) Radiation

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

(A) Heat (B) Mechanical energy

(C) Chemical energy (D) Temperature

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

(A) displaced in the direction of wave

(B) displaced opposite to the direction of wave

(C) mean position remains same

(D) starts rotating

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

(A) Stationary waves (B) Progressive waves

(C) Beats (D) Transverse waves

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

(A) displacement from its mean position

(B) period of motion

(C) frequency of vibration

(D) amplitude of wave

Space For Rough Work

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

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

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

24. Velocity of sound in outer space is

(A) 3×10^8 m/s (B) 330 m/s

(C) zero (D) 360 m/s

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

(A) 4000 N (B) 1600 N

(C) 400 N (D) 1000 N

26. Nodes and antinodes are characteristics of

(A) Stationary waves (B) Longitudinal waves

(C) Transverse waves (D) Beats

27. Natural frequency of a string does not vary with

(A) thickness (B) applied force

(C) tension (D) length

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

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

(C) Micro wave (D) X-ray

Space For Rough Work

29. The type of light used to study Holography is

(A) Visible light (B) Laser light

(C) Sodium light (D) Mercury light

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

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

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

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

(A) Amplification (B) Modulation

(C) Attenuation (D) Demodulation

32. Optical fibre is used in

(A) Pressure sensors (B) Drilling

(C) Holography (D) Welding

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

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

(A) 3.2 gm (B) 4.3 gm

(C) 1.08 gm (D) 2.5 gm

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

(A) Galvanizing (B) Tinning

(C) Alloying (D) Non-Metallic coating

Space For Rough Work

35. SOFC is a type of

(A) Primary cell (B) Secondary cell

(C) Fuel cell (D) Solar cell

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

(A) Phosphorous (B) Zinc

(C) Tin (D) Magnesium

37. Zinc-carbon battery is an example for

(A) Secondary Battery (B) Fuel cell

(C) Primary Battery (D) Solar cell

38. Which of the following is not a polymer ?

(A) Teflon (B) Nylon

(C) Bakelite (D) Glass

39. Ceramic is which type of material ?

(A) Composite material (B) Alloy

(C) Polymer (D) Bio-material

40. The pH value of distilled water is

(A) 13 (B) 7

(C) 2 (D) 11

Space For Rough Work

PART – B

ENGINEERING MATHEMATICS

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

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

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

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

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

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

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

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

(C) 1

(D) $\sec^2\theta$

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

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

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

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

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

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

(A) 4

(B) –4

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

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

Space For Rough Work

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

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

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

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

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

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

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

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

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

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

(A) 26 units (B) –22 units

(C) 22 units (D) 30 units

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

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

(C) $2i + 5j + 3k$ (D) $2i + 11j - 3k$

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

(A) {HT, TH} (B) {TT}

(C) {TH} (D) {TT, HT}

Space For Rough Work

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

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

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

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

(A) 1 (B) –1

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

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

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

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

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

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

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

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

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

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

Space For Rough Work

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

(A) $\sin 20°$ (B) $-\cos 20°$

(C) $\cos 20°$ (D) $-\sin 20°$

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

(A) i (B) –i

(C) 1 (D) 0

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

(A) 0 (B) 1

(C) 2 (D) ∞

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

(A) 3 (B) –3

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

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

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

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

Space For Rough Work

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Space For Rough Work

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

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

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

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

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

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

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

(A) $(1 + x^2)y_2 + (2x - 1)y_1 = 0$ (B) $(1 + x^2)y_2 + 2xy_1 = 0$

(C) $(1 - x^2)y_2 - xy_1 - y = 0$ (D) $xy_2 - 2y_1 - xy = 0$

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

(A) $6x + y - 19 = 0$ (B) $x + 6y - 17 = 0$

(C) $x - 6y + 17 = 0$ (D) $6x - y + 19 = 0$

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

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

(C) 3π cm/s (D) $\frac{3}{4\pi}$ cm/s

Space For Rough Work

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Space For Rough Work

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Space For Rough Work

PART – C

MECHANICAL ENGINEERING

81. Which of the following mandrel is used to hold a set of hollow workpieces ?

(A) Step mandrel
(B) Collar mandrel
(C) Screwed mandrel
(D) Gang mandrel

82. In Taper turning by swivelling the compound rest method half taper angle is calculated using

(A) $\tan \alpha = \frac{D - d}{2l}$
(B) $\tan \alpha = \frac{D - d}{l}$
(C) $\tan \alpha = \frac{2l}{D - d}$
(D) $\tan \alpha = \frac{l}{D - d}$

83. Process of enlarging a hole through a certain distance from one end is

(A) Tapping
(B) Under cutting
(C) Boring
(D) Counter boring

84. Which of the following cutting tool material is the hardest and most wear resistant material in the world ?

(A) Stellites
(B) Diamond
(C) Ceramics
(D) Carbon Steels

85. Which of the following properly of cutting fluid eliminate the hazard of fire ?

(A) Stability
(B) High flash point
(C) odorless
(D) neutral

86. Chisel edge angle provided on drill bit varies from

(A) 120° to 135°
(B) 100° to 115°
(C) 135° to 150°
(D) 45° to 60°

Space For Rough Work

87. In which type of Radial drilling machine, arm holding the drill head may be rotated on a horizontal axis ?

(A) Plain drilling machine (B) Universal drilling machine

(C) Semi universal drilling machine (D) omniversal drilling machine

88. The top and sides of the table of a shaper usually have

(A) L – Slots (B) T – Slots

(C) I – Slots (D) H – Slots

89. Which machine is used to produce plane and flat surfaces on heavy and large sized work pieces ?

(A) Planning machine (B) Shaping machine

(C) Lathe (D) Drilling machine

90. The operation of machining several surfaces of a workpiece simultaneously is called

(A) Profile milling (B) gang milling

(C) saw milling (D) Helical milling

91. The process of removing metal by a cutler which is rotated in the same direction of travel of work piece is called

(A) upmilling (B) down milling

(C) face milling (D) End milling

92. Which of the following is the manufactured abrasive ?

(A) Corundum (B) Quartz

(C) Sic (D) Diamond

93. A dense structure in grinding wheel is used for

(A) Heavy cuts (B) Finishing cuts

(C) Hard material (D) Elastic material

Space For Rough Work

94. In Abrasive Jet Machining, the abrasive & gas mixture emerge from a small nozzle mounted on a fixture at high velocity ranging from

(A) 150 to 300 m/min (B) 1500 to 3000 m/min

(C) 15000 to 30000 m/min (D) 15 to 30 m/min

95. In Laser beam machining, the laser in short pulses has a power output of

(A) 0.1 kW/cm^2 of the beam cross section

(B) 1 kW/cm^2 of the beam cross section

(C) 10 kW/cm^2 of the beam cross section

(D) 1000 kW/cm^2 of the beam cross section

96. The property of sand to withstand high Temperature of the Molten Metal without fusing or Breakdown is known as

(A) Refractoriness (B) Cohesiveness

(C) Porosity (D) Adhesiveness

97. Skeleton patterns are generally used for

(A) Small casting (B) non-Ferrous casting

(C) Large casting (D) Hollow casting

98. In Electric Resistance Welding, voltage required for heating is

(A) 1 to 5 volts (B) 6 to 10 volts

(C) 11 to 20 volts (D) 50 to 100 volts

99. The Brass & Bronze are welded by _____ flame.

(A) Neutral (B) Oxidising

(C) Carburing (D) Acetylene

100. The hot rolling of metals is carried out

(A) At the Recrystallisation Temperature

(B) Below the Recrystallisation Temperature

(C) Above the Recrystallisation Temperature

(D) At any Temperature

Space For Rough Work

101. The process of decreasing the cross-section of a bar & increasing its length is called

(A) Drawing down (B) Upsetting

(C) Spinning (D) Peening

102. The code G03 stands for

(A) circular interpolation clockwise

(B) circular interpolation counter clockwise

(C) Linear interpolation

(D) Absolute dimension

103. In which of the following configuration the robot body is a vertical column that swivels about a vertical axis ?

(A) polar co-ordinate configuration

(B) Cylindrical co-ordinate configuration

(C) Joint Arm configuration

(D) Vertical configuration

104. A jig is defined as a device which

(A) holds & locates a workpiece & guides & controls one or more cutting tools.

(B) holds & locates a workpiece during an inspection or for a manufacturing operation.

(C) is used to check the accuracy of workpiece

(D) is used to check the precision of workpiece

105. Thin chain line finds its application as

(A) Centre line (B) Lines of symmetry

(C) Trajectories (D) All of these

106. When a body is subjected to some external force, if there is some increase in length of a body, then the ratio of increase of length to the original length of the body is known as

(A) Tensile Strain (B) Compressive Strain

(C) Volumetric Strain (D) Shear Strain

Space For Rough Work

107. Ratio of Tensile / Compressive stress to longitudinal strain is

(A) Bulk modulus (B) Rigidity modulus

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

108. Moment of Inertia of a circular section about an horizontal axis passing through CG is

(A) $\frac{\pi d^4}{64}$ (B) $\frac{\pi d^4}{32}$

(C) $\frac{\pi(D^4 - d^4)}{64}$ (D) $\frac{\pi d^2}{64}$

109. A beam supported or Resting freely on the supports at its both ends is known as

(A) cantilever beam (B) Simply supported beam

(C) overhanging beam (D) fixed beam

110. Bending moment diagram for a simply supported beam carrying a uniformly distributed load is represented by

(A) Rectangle (B) Triangle

(C) Circle (D) Parabola

111. Total torque or Turning moment transmitted by a solid circular shaft is

(A) $\frac{\pi}{16}\tau D^3$ (B) $\frac{\pi}{32}\tau D^3$

(C) $\frac{\pi}{32}\tau^3 D$ (D) $\frac{\pi}{64}\tau^3 D$

112. The centre of gravity of right circular solid cone measured along the vertical axis from its base

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

(C) $\frac{h}{4}$ (D) $\frac{h}{6}$

Space For Rough Work

113. Oldham's coupling is an inversion of

(A) crossed slider crank chain (B) Single slider crank chain

(C) Four bar chain (D) Double slider crank chain

114. The velocity of belt for maximum power transmission is

(A) $\sqrt{\frac{T}{3m}}$ (B) $\sqrt{\frac{T}{4m}}$

(C) $\sqrt{\frac{3m}{T}}$ (D) $\sqrt{\frac{4m}{T}}$

115. Which of the following belt drive is used to transmit small power at belt speeds upto about 10m/s ?

(A) open belt drive (B) Heavy drive

(C) Medium drive (D) Light drive

116. Which of the following flat belt drive is used to start or stop machine shaft while the main or driving shaft runs at constant speed ?

(A) Compound belt drive (B) Fast and loose pulley drive

(C) Stepped cone pulley drive (D) Open belt drive

117. Gear train arranged in such a manner that one or more of their members move upon and around another member is known as

(A) Simple gear train (B) Compound gear train

(C) Epicyclic gear train (D) Reverted gear train

118. The circular pitch of spur gear is given by

(A) $p = \frac{\pi d}{T}$ (B) $p = \frac{\pi T}{d}$

(C) $p = \frac{d}{\pi T}$ (D) $p = \frac{T}{\pi d}$

Space For Rough Work

119. Ratio of driving Tensions for V-belt is

(A) $2.3 \log\left(\frac{T_1}{T_2}\right) = \mu\theta \operatorname{cosec} \beta$ (B) $3.2 \log\left(\frac{T_1}{T_2}\right) = \mu\theta \operatorname{cosec} \beta$

(C) $2.3 \log\left(\frac{T_1}{T_2}\right) = \mu\theta$ (D) $2.3 \log\left(\frac{T_2}{T_1}\right) = \mu\theta \operatorname{cosec} \beta$

120. The angle of inclination of the plane, at which the body begins to move down the plane is

(A) Angle of decent (B) Angle of projection

(C) Angle of repose (D) Angle of friction

121. Friction between two unlubricated surface is

(A) Greasy friction (B) Dry friction

(C) Film friction (D) Sliding friction

122. Difference between the space width and the tooth thickness along the pitch circle

(A) Face width (B) Backlash

(C) Working depth (D) Flank

123. According to first law of thermodynamics

(A) Total internal energy of a system during a process remains constant

(B) Internal energy, entropy and enthalpy during a process remains constant

(C) Total energy of the system remains constant

(D) Work done by a system is equal to the heat transferred by the system

124. The ratio of specific heat at constant pressure and specific heat at constant volume is

(A) Less than one (B) Equal to one

(C) Greater than one (D) None of these

125. A system in which, the working substance crosses the boundary of the system. The heat and work may also cross the boundary.

(A) Open system (B) Isolated system

(C) Closed system (D) Thermodynamic system

Space For Rough Work

126. A process, in which the temperature of the working substance remains constant during its expansion or compression, is called

(A) Isobaric process (B) Isochoric process

(C) Isothermal process (D) Hyperbolic process

127. In the equation $PV^n = c$, the value of $n = \gamma$, Then the process is called

(A) Isobaric process (B) Isochoric process

(C) Adiabatic process (D) Isothermal process

128. In the equation $PV^n = c$, the value of $n = 1$, Then the process is called

(A) Isochoric process (B) Isobaric process

(C) Isothermal process (D) Adiabatic process

129. A petrol engine has compression ratio from

(A) 15 to 25 (B) 25 to 40

(C) 10 to 15 (D) 6 to 10

130. The specific fuel consumption per B.P. hour for a diesel Engine is about

(A) 0.3 kg (B) 0.35 kg

(C) 0.2 kg (D) 0.25 kg

131. Overall efficiency of an engine is given by

Where, η_o = overall efficiency

m_f = mass of fuel

C.V. = Calorific value

I.P. = Indicated power

B.P. = Brake power

(A) $\eta_o = \frac{\text{I.P.} \times 3600}{\text{mf} \times \text{C.V.}}$ (B) $\eta_o = \frac{\text{B.P.} \times 3600}{\text{mf} \times \text{C.V.}}$

(C) $\eta_o = \text{B.P.} / \text{I.P.}$ (D) $\eta_o = \text{I.P.} / \text{B.P.}$

Space For Rough Work

132. The efficiency of the closed cycle gas turbine as compared to an open cycle gas turbine is

(A) Lower (B) Higher

(C) Equal (D) Not comparable

133. The over all thermal efficiency of an ideal gas turbine is

Where, r = pressure ratio

(A) $r^{\gamma-1}$ (B) $1-r^{\gamma-1}$

(C) $1-\left(\frac{1}{r}\right)^{\frac{\gamma-1}{\gamma}}$ (D) $1-\left(\frac{1}{r}\right)^{\frac{\gamma}{\gamma-1}}$

134. The ratio of workdone per cycle to the Stroke volume of the compressor is known as

(A) Compressor efficiency (B) Compression ratio

(C) Compressor capacity (D) mean effective pressure

135. The air power of the compressor is also known as

(A) Brake power (B) Frictional power

(C) Indicated power (D) Horse power

136. The delivery pressure of a high pressure compressor is

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

(C) 5 to 8 bar (D) 1 to 5 bar

137. The ratio of the discharge pressure to the inlet pressure of air in the compressor is called

(A) Expansion ratio (B) Compressor efficiency

(C) Compression ratio (D) Volumetric efficiency

138. The capacity of a domestic refrigerator is in the range of

(A) 5 to 7 TR (B) 3 to 5 TR

(C) 1 to 3 TR (D) 0.1 to 0.3 TR

Space For Rough Work

139. The power per tonne of refrigeration is

(A) c.o.p. / 3.5 (B) 3.5 / c.o.p.

(C) 3.5 × c.o.p. (D) 3.5 + c.o.p.

140. The value of atmospheric pressure in mm of mercury is equal to

(A) 745 mm of mercury (B) 760 mm of mercury

(C) 860 mm of mercury (D) 1032 mm of mercury

141. The manometer which is used for measuring difference of low pressure between two pipe line is called

(A) Differential manometer (B) Inverted differential manometer

(C) Micro Manometer (D) Piezometer Tube

142. The mechanical pressure gauge which is used for the calibration of the other pressure gauge in a Laboratory is called

(A) Bourdon's Tube Pressure Gauge (B) Diaphragm Pressure Gauge

(C) Dead Weight Pressure Gauge (D) Differential Manometer

143. A flow in which the quantity of liquid flowing per second is constant is called

(A) Uniform flow (B) Stream line flow

(C) Steady flow (D) Unsteady flow

144. The Darcy's formula for loss of head in pipes when velocity is known is given by which of the following equation ?

(A) $h_f = \frac{flQ^2}{3d^5}$ (B) $h_f = \frac{4flV^2}{2gd}$

(C) $h_f = \frac{4flV}{2gd}$ (D) $h_f = \frac{4f^2lV^2}{2gd}$

145. In a centrifugal pump the ratio of actual workdone by the pump to the energy supplied to the pump by the prime mover is called

(A) Manometric Efficiency (B) Overall Efficiency

(C) Mechanical Efficiency (D) Thermal Efficiency

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146. The formation of bubbles filled with vapours within the body of a moving liquid in a casing of centrifugal pump is called

(A) Cavitation (B) Vapourisation

(C) Evaporation (D) Erosion

147. The object of using air vessel in Reciprocating pump is to obtain a

(A) Uniform Discharge (B) Pressurised discharge

(C) High discharge (D) Low discharge

148. Surge tanks are used in the pipe line to reduce

(A) Cavitation (B) Priming

(C) Water hammer (D) Friction

149. In which of the following rotary pump discharge is not constant

(A) Lube pump (B) Vane pump

(C) External Gear Pump (D) Internal Gear Pump

150. The valve which is used to protect the hydraulic components from excessive pressure is called

(A) Pressure Relief Valve (B) Non-Return Valve

(C) Stop Valve (D) Control Valve

151. Needle Valve is an example of

(A) Pressure Relief Valve (B) Flow Control Valve

(C) Sequence Valve (D) Pressure Switch

152. The device which is used to convert the energy of fluid back into mechanical power is called

(A) Centrifugal Pump (B) Actuators

(C) Hydraulic Ram (D) Flow Control Valve

Space For Rough Work

153. Non-Separator Type accumulator is an example of

(A) Gas Type Accumulator (B) Gravity Type Accumulator

(C) Spring Loaded Accumulator (D) Non-Return Valve

154. Inter coolers are used in which of the following device ?

(A) Single stage air compressor (B) Multi stage air compressor

(C) I.C. Engines (D) Injection pump

155. The valve which permits flow in one direction and stops the flow completely in opposite direction is called

(A) Gate Valve (B) Plug Valve

(C) Non-Return Valve (D) Needle Valve

156. Axial piston motor is an example of

(A) Actuator (B) Accumulator

(C) Compressor (D) Pressure Regulator

157. F.W. Taylor introduced a system of working known as

(A) Line organisation (B) Functional organisation

(C) Line and staff organisation (D) Committee organisation

158. The type of organisation suitable for Sugar Industry is

(A) Line organisation (B) Functional organisation

(C) Line and Staff organisation (D) Line, Staff and Functional organisation

159. The Routing function in a production system design is concerned with

(A) Man power utilisation (B) Quality assurance of the product

(C) Machine utilisation (D) Optimising material flow through the plant

160. In manufacturing management the term dispatching is used to describe

(A) Dispatch of sales order (B) Dispatch of factory mail

(C) Dispatch of finished product (D) Dispatch of work order through stop floor

Space For Rough Work

161. The maintenance in which repairs are made after the equipment is out of order is called

(A) Breakdown maintenance (B) Scheduled maintenance

(C) Preventive maintenance (D) Predictive maintenance

162. The leadership in which there is complete freedom for group and individual decision with a minimum of leader participation is called

(A) Democratic leader (B) Authoritarian leader

(C) Laissez - fair leader (D) Political leader

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

(A) Quality (B) Inspection

(C) Quality control (D) Fitness

164. The inspection in which certain percentage from a lot will be inspected and whole lot will be judged on the basis of this is called

(A) Working inspection (B) Pilot piece inspection

(C) Functional inspection (D) Sampling inspection

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

(A) Stock (B) Inventory

(C) Raw stock (D) Finished goods

166. After opening the tender which of the following is prepared ?

(A) Invoice (B) Purchase order

(C) Comparative statement (D) Purchase requisition

167. Broken safety guard in an industry comes under

(A) Mechanical causes of an accident (B) Environmental causes of an accident

(C) Human causes of an accident (D) Personnel causes of an accident

Space For Rough Work

168. Acceptance sampling is widely used in

(A) Batch production (B) Mass production

(C) Job production (D) Continuous production

169. The ability of a material to absorb energy in the plastic range is called

(A) Creep (B) Fatigue strength

(C) Toughness (D) Resilience

170. The percentage of carbon in cast iron varies from

(A) 1.7 to 4.5 (B) 1 to 1.7

(C) 0.5 to 1 (D) 0.1 to 0.5

171. The hardness is the property of a material due to which it

(A) can be drawn into wires (B) breaks with little permanent distortion

(C) can cut another material (D) can be hammered into thin sheets

172. Which of the following is a major source of aluminium ?

(A) Bauxite (B) Haematite

(C) Malachite (D) Azurite

173. The heat treatment process used for casting is

(A) Normalising (B) Annealing

(C) Carburising (D) Tempering

174. Which hardening process is generally not used for steels ?

(A) Age hardening (B) Nitriding

(C) Induction hardening (D) Cyaniding

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175. The maximum allowable limit that a measurement may vary from the true value is called

(A) Expected error (B) Rang of error

(C) Permissible error (D) Safe error

176. A Rotameter is used to measure

(A) Flow (B) Rotation

(C) Viscosity (D) Density

177. A hydrometer can be used to measure

(A) Relative humidity of air (B) Conductivity of gases

(C) Specific gravity of liquids (D) Temperature co-efficients of liquids

178. Which type of tolerance provided in drilling mostly ?

(A) Bilateral (B) Unilateral

(C) Trilateral (D) Compound

179. The degree of closeness of the measured value with its true value is known as

(A) precision (B) accuracy

(C) sensitivity (D) standard

180. The difference between maximum possible final reading and the lowest initial reading is known as

(A) Range (B) Limit

(C) Tolerance (D) Accuracy

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