DIPLOMA – COMMON ENTRANCE TEST-2013

ME	COURSE	DAY : SUNDAY DATE : 30-JUNE-2013
	MECHANICAL ENGINEERING	TIME : 9.00 a.m. to 12.00 Noon

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
180	200 Minutes	180 Minutes

MENTION YOUR DIPLOMA CET NUMBER	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	A-3	128535

DOs :

1. Check whether the Diploma CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 08.50 a.m.**
3. The serial number of this question booklet should be entered on the OMR answer sheet.
4. The version code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. **The 3rd Bell rings at 9.00 a.m., till then;**
   * Do not remove the seal / staple present on the right hand side of this question booklet.
   * Do not look inside this question booklet.
   * Do not start answering on the OMR answer sheet.

1. This question booklet contains 180 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. **After the 3rd Bell is rung at 9.00 a.m.,** remove the paper seal / polythene bag of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 180 minutes:
   * Read each question (item) carefully.
   * Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   * Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen against the question number on the OMR answer sheet.**

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

   ① ● ③ ④

4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last bell is rung at 12.00 Noon,** stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Hand over the **OMR answer sheet** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year.**

[P.T.O.

DO NOT WRITE HERE

PART – A

It consists of **1 – 40** questions.

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

    (1) – 495

    (2) 495

    (3) 1/495

    (4) 945

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

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

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

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

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

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

    (1) $\sqrt{26}$

    (2) $\sqrt{28}$

    (3) $\sqrt{24}$

    (4) 1

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

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

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

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

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

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

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

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

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

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

SPACE FOR ROUGH WORK

A-3

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

   (1) 2x − 5y − 4 = 0

   (2) 2x − 5y + 4 = 0

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

   (4) 5x − 2y + 4 = 0

7. The slope of a line passing through the points (− 4, − 5) and (2, 3) is

   (1) 3/4   (2) − 3/4

   (3) 4/3   (4) − 4/3

8. The acute angle between the lines 2x − y + 3 = 0 and x − 3y + 2 = 0 is

   (1) 30°   (2) 60°

   (3) 90°   (4) 45°

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

   (1) − 1/2   (2) 1/2

   (3) 3/2   (4) − 3/2

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

    (1) 3   (2) − 3

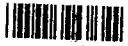   (3) 4   (4) − 4

11. $\int_0^2 (x - 1)(x - 2)\, dx$ is

    (1) 2/3   (2) − 2/3   (3) 3/2   (4) − 3/2

SPACE FOR ROUGH WORK

A-3

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

 (1) – 6 sq units

 (2) 3 sq units

 (3) – 3 sq units

 (4) 6 sq units

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

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

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

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

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

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

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

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

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

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

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

 (1) 1

 (2) 2

 (3) 3

 (4) 0

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

 (1) $\sqrt{3}$

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

 (3) 1/2

 (4) 1

SPACE FOR ROUGH WORK

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

    (1) 61/6

    (2) – 61/6

    (3) – 6/61

    (4) 6/61

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

    (1) 0

    (2) – 1

    (3) + 1

    (4) – 2

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

    (1) 65/56

    (2) 56/65

    (3) 16/65

    (4) – 16/65

20. On simplification the value of (cos^3 A – cos 3 A) / cos A + (sin^3 A + sin 3 A) / sin A is

    (1) 3

    (2) 1

    (3) 2

    (4) 0

21. $\frac{d}{dx}\left(\sqrt{\sin^2 x}\right)$ is

    (1) cos x

    (2) sin 2x

    (3) cos^2 x

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

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

    (1) 1   (2) 0   (3) tan x   (4) cos x

23. If y = sin x^x then dy/dx is

    (1) x log sin x

    (2) cos x^x

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

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

SPACE FOR ROUGH WORK

A-3

24. $d/dx \left(\sin h^{-1} x \right)$ is

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

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

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

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

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

(1) $x - 6y + 11 = 0$

(2) $x + 6y - 11 = 0$

(3) $6x - y + 11 = 0$

(4) $6x + y - 11 = 0$

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

(1) $(3, 2)$

(2) $(-3, -2)$

(3) $(2, 3)$

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

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

(1) Diagonal

(2) Scalar

(3) Identity

(4) Zero matrix

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

(1) 10

(2) 11

(3) 12

(4) 13

SPACE FOR ROUGH WORK

A-3

[P.T.O.

PART – B

It consists of **41 – 80** questions.

41. Poisson's ratio is the ratio of

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

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

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

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

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

    (1) 98×10^5 Nm^{-2}

    (2) 9.8×10^4 Nm^{-2}

    (3) 980×10^4 Nm^{-2}

    (4) 98×10^4 Nm^{-2}

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

    (1) More in the tube of larger diameter

    (2) More in the tube of smaller diameter

    (3) Lesser in the tube of smaller diameter

    (4) Same in both the tubes

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

    (1) Viscosity

    (2) Elasticity

    (3) Surface tension

    (4) Inertia

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

    (1) Momentum   (2) Inertia   (3) Power   (4) Impulse

SPACE FOR ROUGH WORK

A-3

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

    (1) Mass   (2) Weight   (3) Volume   (4) Density

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

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

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

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

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

48. Ripples in water are the example for

    (1) Transverse wave

    (2) Longitudinal wave

    (3) Sound wave

    (4) Ultrasonic wave

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

    (1) Full wavelength of the wave

    (2) Twice the wavelength of the wave

    (3) Half a wavelength of the wave

    (4) Quarter a wavelength of the wave

50. A stretched string under a tension T vibrates with a frequency f. When the tension is increased by 4 times, then the frequency becomes _____

    (1) same   (2) doubled

    (3) tripled   (4) zero

51. The appearance of additional frequencies in scattered beam of light is known as

    (1) Raman effect

    (2) Coherent scattering

    (3) Incoherent scattering

    (4) Bipolar scattering

SPACE FOR ROUGH WORK

A-3

[P.T.O.

52. Two properties of LASER are

    (1) Highly monochromatic and extremely intense

    (2) Highly chromatic and extremely fast

    (3) Very high frequency and extremely high wave length

    (4) Very high power and extremely low amplitude

53. To form a galvanic cell

    (1) difference in concentration of electrolyte is required

    (2) difference in concentration of frequency is required

    (3) difference in concentration of amplitude is required

    (4) both (2) and (3)

54. pH value is not having its application in

    (1) determination of quality of soil

    (2) determination of quality of textile dyes

    (3) determination of quality of chemicals

    (4) determination of quality of electron

55. The prefix "mega" stands for

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

56. A bullet of mass 0.01 kg is fired from a rifle of mass 20 kg with a speed of 10 m/s , then the recoil velocity of rifle is _____ m/s.

    (1) −1   (2) −0.05

    (3) −200.01   (4) −0.005

57. Final velocity of a body thrown downwards is _____

    (1) Maximum   (2) Minimum

   (3) No change   (4) Zero

SPACE FOR ROUGH WORK

A-3

58. A person throws a sand bag from a boat at rest in a pond then boat moves

   (1) In the same direction

   (2) In the opposite direction

   (3) In a perpendicular direction

   (4) In circular direction

59. Two equal forces at a point, the square of their resultant is equal to three times the product of the forces. Then the angle between the forces is equal to

   (1) 30°

   (2) 45°

   (3) 60°

   (4) 90°

60. Equilibrant is a force

   (1) Which brings a body in equilibrium

   (2) Which moves the body along the resultant force

   (3) in zig-zag movement of the body

   (4) Which moves the body in opposite direction to equilibrant force

61. The best value of reverberation time for speech listener _____

   (1) 0.5 to 1.5 s

   (2) 0.15 to 0.5 s

   (3) 0.05 to 0.15 s

   (4) 0.5 to 5 s

62. 3 strings of equal lengths but stretched with different tensions are made to vibrate, if their masses per unit length are in the ratio 3:2:1 and frequencies are same then the ratio of the tensions _____

   (1) 1:2:3

   (2) 2:3:1

   (3) 1:3:2

   (4) 3:2:1

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

   (1) Boyle

   (2) Charles

   (3) Laplace

   (4) Hertz

SPACE FOR ROUGH WORK

A-3

[P.T.O.

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

    (1) Newton's corpuscular theory

    (2) Huygen's wave theory

    (3) Maxwell's theory of light

    (4) Plank's theory

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

    (1) R = ab

    (2) R = a/b

    (3) R = a − b

    (4) R = a + b

66. Which of the following is dimensional physical quantity ?

    (1) pressure

    (2) strain

    (3) mechanical advantage

    (4) sp.gravity

67. The principle of vernier is

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

    (2) (n − 1) VSD = n MSD

    (3) n MSD = (n − 1) V SD

    (4) (n − 1) MSD = n VSD

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

    (1) 1.62 cm

    (2) 0.162 cm

    (3) 0.162 mm

    (4) 16.2 mm

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

    (1) within elastic limit

    (2) beyond elastic limit

    (3) beyond yield point

    (4) at breaking point

SPACE FOR ROUGH WORK

A-3
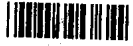
70. If the strain in a wire is 0.1%, then the change in the length of the wire of length 5 m is

    (1) 5×10^{-2} m

    (2) 5×10^{-3} m

    (3) 5×10^{-4} m

    (4) 5×10^{-3} cm

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

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

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

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

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

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

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

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

    (1) Maximum

    (2) Less than one

    (3) Greater than one

    (4) Zero

74. 1 Kilo calorie of heat is equal to _____ joule.

    (1) 4.186

    (2) 41.86

    (3) 418.6

    (4) 4186

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

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

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

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

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

SPACE FOR ROUGH WORK

A-3

[P.T.O.

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

   (1) 0.05×10^{-3} m

   (2) 5×10^{-3}m

   (3) 0.5×10^{-3}m

   (4) 50×10^{-3}m

77. Resolving power of microscope is

   (1) Equal to the resolution of the microscope

   (2) Reciprocal to the resolution of the microscope

   (3) Reciprocal to the focal length of the microscope

   (4) Product of wave length and semi vertical angle

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

   (1) Diffraction

   (2) Interference

   (3) Refraction

   (4) Polarization

79. In Field emission

   (1) High positive voltage is used

   (2) Secondary electrons are used

   (3) High energy is used

   (4) High radiations are used

80. Which of the following is not true ?

   (1) Photoelectric emission is an instantaneous process

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

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

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

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SPACE FOR ROUGH WORK

A-3

PART – C

It consists of **81-180** Questions :

81. When the material becomes old, it is moved to right hand side and new material is placed on the left hand side in
    (1) Double area system
    (2) Moving division system
    (3) Gravity system
    (4) All the above

82. The purpose of inspection is to
    (1) Reduce and reject defectives
    (2) Reduce Production and Productivity
    (3) Control Progress
    (4) None of the above

83. To have safety, security and to claim damages during storage or transportation of materials, companies require
    (1) Insurance buying
    (2) Inventory
    (3) Both (1) and (2)
    (4) None of the above

84. In ABC analysis, large number of items with small annual consumption cost are
    (1) A items
    (2) B items
    (3) C items
    (4) Both (1) and (2)

85. ERP means
    (1) Employee Resource Planning
    (2) Enterprise Resource Planning
    (3) Employer Resource Planning
    (4) Engineering Resource Planning

86. The preparatory function G 90 for
    (1) Incremental mode
    (2) Absolute mode
    (3) Polar mode
    (4) Decremental mode

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[P.T.O.

87. In EDM process the work piece is connected to

    (1) Cathode   (2) Anode

    (3) Earth   (4) None

88. Which one of the following cannot be used as tool material in ECM ?

    (1) Aluminium   (2) Platinum

    (3) Graphite   (4) Chromium

89. For machining very small holes and cutting complex profiles in thin and hard materials like ceramics, _____ is used.

    (1) LBM   (2) ECM   (3) EDM   (4) USM

90. In sand moulding cope is the

    (1) Upper most part of the flask

    (2) Bottom most part of the flask

    (3) Middle part of the flask

    (4) Inner most part of the flask

91. " The heat and mechanical work are mutually convertible" is according to

    (1) Zeroth law of thermodynamics

    (2) First law of thermodynamics

    (3) Second law of thermodynamics

    (4) Gay-lussacs law

92. "The absolute pressure of a given mass of a perfect gas varies inversely as it volume when temperature remains constant is the statement of

    (1) Boyle's law   (2) Charle's law

    (3) Joule's law   (4) Gay-lussacs law

93. The ratio of specific heat at constant pressure Cp and specific heat at constant volume Cv is

    (1) Equal to one   (2) Less than one

    (3) More than one   (4) Equal to zero

SPACE FOR ROUGH WORK

A-3

94. The equation for work done during isothermal is given by

   (1) $mC_v (T_2 - T_1)$

   (2) $P_1 V_1 \log_e (V_2/V_1)$

   (3) $P_1 V_1 - P_2 V_2$

   (4) $mC_p (T_2 - T_1)$

95. During compression process the internal energy

   (1) increases

   (2) remaining constant

   (3) decreases

   (4) none of these

96. _____ is an example of single slider crank chain.

   (1) Elliptical trammel

   (2) Scotch-yoke mechanism

   (3) Pendulum pump

   (4) Oldham's coupling

97. Combination of kinematic pairs joined in such a way that no link moves relative to each other is known as

   (1) Mechanism

   (2) Structure

   (3) Kinematic chain

   (4) Inversion

98. The size of the gear is generally specified by

   (1) Pressure angle

   (2) Circular pitch

   (3) Diametral pitch

   (4) Pitch circle diameter

99. When two pulleys of different diameters are connected by means of an open belt drive, the angle of contact considered is of

   (1) Smaller pulley

   (2) Larger pulley

   (3) Average of two pulleys

   (4) Sum of two pulleys

100. A centrifugal tension in belts

   (1) increases power transmission

   (2) decreases power transmission

   (3) first increases and then decreases power transmission

   (4) have no effect on power transmission

SPACE FOR ROUGH WORK

A-3

[P.T.O.

101. The thermal stress induced in a body depends upon

    (1) modulus of elasticity

    (2) co-efficient of expansion

    (3) change in temperature

    (4) all the above

102. When the Poisson's ratio is 1/4, the ratio of Bulk modulus (K) to Young's modulus(E) is

    (1) 1/3   (2) 2/3   (3) 3/2   (4) 1/2

103. The ratio of lateral strain to linear strain is called as

    (1) Poisson's ratio   (2) Young's modulus

    (3) Rigidity modulus   (4) Bulk modulus

104. Elongation of a circular rod of dia D, length L subjected to an axial pull of P is given by

    (1) $dl = PL/4 \pi D^2E$ (2) $dl = PL/2 \pi D^2E$

    (3) $dl = 4PL/\pi D^2E$ (4) $dl = 2PL/\pi D^2E$

105. The nature of thermal stress induced due to the prevention of expansion of the rod is

    (1) tensile stress   (2) compressive stress

    (3) shear stress   (4) no stress

106. Bessemer converter is used for manufacturing

    (1) Pig iron   (2) Cast iron

    (3) Steel   (4) Wrought iron

107. The pig iron contains about _____ of carbon.

    (1) 4 to 5 %   (2) 0.2 to 0.4 %

    (3) 0.6 to 1.1 %   (4) 1 to 2 %

108. Which of the following type of steel is used for making chisels, hammers, saws and wood working tools ?

    (1) Mild steel   (2) Medium carbon steel

    (3) High carbon steel   (4) Stainless steel

SPACE FOR ROUGH WORK

109. The metal having higher specific gravity among the following is
    (1) Aluminium
    (2) Copper
    (3) Zinc
    (4) Lead

110. Which one of the following metal is used for galvanizing ?
    (1) Lead
    (2) Zinc
    (3) Copper
    (4) Aluminium

111. The corner points enclosed in brackets in orthographic projections indicates that they are
    (1) Visible corners
    (2) Invisible corners
    (3) Imaginary corners
    (4) Corners touching HP

112. A tetrahedron has _____ number of triangular faces.
    (1) 6
    (2) 8
    (3) 4
    (4) 3

113. Surface area of A0 size sheet is
    (1) One square meter
    (2) One square centimeter
    (3) One square decimeter
    (4) None of the above

114. A point lying behind VP and above HP. In which quadrant does it lies ?
    (1) First
    (2) Second
    (3) Third
    (4) Fourth

115. Difficulties faced in inter group collaboration are
    (1) resistance to change
    (2) communication problems
    (3) different opinions in groups
    (4) all the above

116. Defects are rectified when the machine cannot perform its function any longer is called
    (1) Preventive maintenance
    (2) Break down maintenance
    (3) Scheduled maintenance
    (4) Regular maintenance

SPACE FOR ROUGH WORK

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[P.T.O.

117. The process of measuring the quality of a product or service in terms of established standards is called

    (1) Comparative study

    (2) Process planning

    (3) Inspection

    (4) Scheduling

118. ISO stands for

    (1) Indian Standard Organization

    (2) Indian Organization for Standardization

    (3) International Standards Organisation

    (4) International Organisation for Standardisation

119. Environmental factors responsible for accidents are

    (1) Noise, bad smell, poor house keeping

    (2) Too high or too low temperature at work place

    (3) Both (1) and (2)

    (4) None of the above

120. The size of Lathe is specified by

    (1) Max job length in mm that may be held between centers

    (2) Height of centers measured over the bed length

    (3) Maximum diameter job that can be rotated over the bed ways

    (4) All the above

121. Tapering of the sides of the pattern in the direction parallel to which the pattern is drawn out from a mould is called as

    (1) Shake   (2) Drag

    (3) Draft   (4) Sprue

122. The color marked on the surface of a pattern not to be machined is

    (1) Black   (2) Green   (3) Red   (4) Blue

SPACE FOR ROUGH WORK

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123. Flux is not used for welding
   (1) Cast iron
   (2) Brass
   (3) Bronze
   (4) Carbon steel

124. Which of the following process uses non-consumable electrodes ?
   (1) MIG welding
   (2) TIG welding
   (3) SIG welding
   (4) Plasma arc welding

125. For welding non-ferrous metal like brass and bronze the most suitable flame is
   (1) Neutral
   (2) Oxidising
   (3) Carburising
   (4) Reducing

126. The air standard efficiency of any air cycle is given by
   (1) heat supplied/work done
   (2) heat rejected/heat supplied
   (3) work done/heat supplied
   (4) work done/heat rejected

127. The efficiency of dual cycle as compared to Otto and diesel cycles is
   (1) more than Otto and diesel cycle
   (2) less than Otto and diesel cycle
   (3) more than Otto cycle and less than diesel cycle
   (4) more than diesel cycle and less than Otto cycle

128. The multistage compression of air as compared to single stage compression
   (1) Improves volumetric efficiency for the given pressure ratio
   (2) Reduces work done per Kg of air
   (3) Gives more uniform torque
   (4) All of the above

129. In a double acting reciprocating compressor the suction, compression, delivery of air takes place on
   (1) Single side of the piston
   (2) Both sides of the piston
   (3) Both (1) and (2)
   (4) None of above

SPACE FOR ROUGH WORK

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130. The number of working strokes/min for a four stroke cycle engine is _____ the speed of the engine RPM.

    (1) equal to
    (2) twice
    (3) four times
    (4) half

131. The difference between total depth and working depth in a gear tooth is

    (1) Pitch
    (2) Clearance
    (3) Addendum
    (4) Dedendum

132. The centrifugal force exerted by a mass "m" rotating at "ω" rad/sec with "r" as the radius of rotation is given by

    (1) $m^2\omega r$
    (2) $m\omega^2 r^2$
    (3) $m\omega r^2$
    (4) $m\omega^2 r$

133. If net dynamic force acting on the shaft is equal to zero, then the balancing is called as

    (1) Static balancing
    (2) Dynamic balancing
    (3) Complete balancing
    (4) All the above

134. When the motion of the follower takes place at an axis away from the axis of the cam, the follower is called

    (1) Radial follower
    (2) Off-set follower
    (3) Both (1) and (2)
    (4) None of the above

135. The angle between the direction of follower motion and normal to pitch curve of the cam is called as

    (1) Pitch angle
    (2) Base angle
    (3) Pressure angle
    (4) Trace angle

136. The relation between Young's modulus (E), Shear modulus (3) and Poisson's ratio (1/m) is given by

    (1) $C = mE / 3(m + 1)$
    (2) $C = mE / 3(m - 1)$
    (3) $C = mE / 2(m - 1)$
    (4) $C = mE / 2(m + 1)$

SPACE FOR ROUGH WORK

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137. The deformation per unit length is called as

(1) tensile stress

(2) compressive stress

(3) shear strain

(4) strain

138. The three moduli of material are related by the equation

(1) $E = 9KC / (3K+C)$

(2) $E = 9KC / (2C+K)$

(3) $E = 9KC / (2K+C)$

(4) None of the above

139. The shear force for a simply supported beam carrying an UDL

(1) is uniform

(2) varies parabolically

(3) varies linearly

(4) is zero

140. A load which is spread over a beam in such a manner that it changes uniformly on each unit length is called as

(1) uniformly varying load

(2) constant point load

(3) constant distributed load

(4) uniformly distributed load

141. The purpose of heat treatment of steel is/are

(1) to change the structure of steel

(2) to increase the surface hardness

(3) to increase resistance to heat and corrosion

(4) all the above

142. The hardening is followed by _____ process.

(1) Tempering

(2) Carburising

(3) Annealing

(4) Nitriding

143. The addition of _____ improves corrosion resistance of steel.

(1) Chromium

(2) Carbon

(3) Sulphur

(4) Phosphorus

SPACE FOR ROUGH WORK

A-3

[P.T.O.

144. Which of the following metal is used for making bed of machine tools ?

   (1) Pig iron

   (2) Wrought iron

   (3) Cast iron

   (4) None of the above

145. Front view of a hexagonal prism resting on HP with its hexagonal face is

   (1) Rectangle
   (2) Inclined prism
   (3) A regular hexagon
   (4) Square

146. Two or more types of products are manufactured in lots at regular intervals in

   (1) Mass production
   (2) Batch production
   (3) Job production
   (4) Both (1) and (3)

147. The human effort to produce more and more with less and less inputs of resources is termed as

   (1) Production
   (2) Planning
   (3) Productivity
   (4) Controlling

148. The function of PPC which gives necessary authorization to start a particular work is

   (1) Planning
   (2) Routing
   (3) Scheduling
   (4) Despatching

149. Raw materials in process of manufacturing are purchased by

   (1) Contract purchasing
   (2) Through DGSD
   (3) Market purchasing
   (4) None of the above

150. Products like fans, paints, cables, tyres etc. can be purchased by

   (1) Rate contract

   (2) Running contract

   (3) Both (1) and (2)

   (4) Through DGSD

SPACE FOR ROUGH WORK

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151. The type of quick return motion mechanism employed mostly in shaping machines is

    (1) D.C. reversible motor

    (2) Fast and loose pulley

    (3) Whitworth motion

    (4) Slotted link mechanism

152. A twist drill is specified by its shank, material and

    (1) Diameter

    (2) Lip angle

    (3) Size of flute

    (4) Length of body

153. The different types of bonds used in diamond wheels are

    (1) Resinoid

    (2) Vitrified

    (3) Metallic

    (4) All the above

154. NC machine tool is operated by

    (1) I/O modules

    (2) Series of coded instructions

    (3) Feed back system

    (4) None of the above

155. Feed drives in CNC machine tool are provided by

    (1) Synchronous motors

    (2) Induction motors

    (3) Stepper motors

    (4) Servo motors

156. The process of increasing the length of a bar at the expense of width or thickness is called

    (1) Drawing

    (2) Trimming

    (3) Shearing

    (4) Punching

SPACE FOR ROUGH WORK

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[P.T.O.

157. The operation of producing circular holes in a sheet metal is
    (1) Shearing
    (2) Piercing
    (3) Blanking
    (4) Punching

158. In MIG welding for steel , _____ gas is used.
    (1) carbon dioxide
    (2) carbon monoxide
    (3) both (1) and (2)
    (4) none of the above

159. The operation of giving impression of figures, letter or designs on sheet metal parts is called
    (1) Drawing
    (2) Embossing
    (3) Blanking
    (4) Shearing

160. The unit of pressure is
    (1) N/mm^2
    (2) Bar
    (3) Pascal
    (4) All the above

161. The HUCR stands for
    (1) Highest Useful Compression Ratio
    (2) Higher Useful Cetane Ratio
    (3) Highest Useful Carbon Ratio
    (4) All of these

162. Lubrication is done in IC engines to
    (1) Reduce wear and tear of the moving parts
    (2) Damps down the vibrations of the engine
    (3) Dissipates the heat generated from the moving parts due to friction
    (4) All the above

163. The indicated power of an IC engine is calculated by using formula (with usual notations)
    (1) 2ΠNT/60
    (2) WD/60
    (3) PLAn/60
    (4) WL/60

SPACE FOR ROUGH WORK

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164. The principal constituents of a fuel are
    (1) Carbon and hydrogen
    (2) Oxygen and hydrogen
    (3) Sulphur and oxygen
    (4) Sulphur and hydrogen

165. Shaft with collars in a circular hole is an example of
    (1) Completely constrained motion
    (2) Incompletely constrained motion
    (3) Successfully constrained motion
    (4) Unconstrained motion

166. According to the law of solid friction, the frictional force depends on
    (1) normal load between the surfaces
    (2) velocity of sliding
    (3) area of contact of surfaces
    (4) all the above

167. The co-efficient of friction μ is given by _____ with usual notations.
    (1) $\mu = FR_N$
    (2) $\mu = R_N/F$
    (3) $\mu = 2FR_N$
    (4) $\mu = F/R_N$

168. In _____ dynamometer, the entire or power is transformed into heat.
    (1) Transmission dynamometer
    (2) Torsion dynamometer
    (3) Hydraulic dynamometer
    (4) Absorption dynamometer

169. The brakes commonly used in motor cars is
    (1) Internal expanding brake
    (2) Band brake
    (3) Shoe brake
    (4) Band and block brake

SPACE FOR ROUGH WORK

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[P.T.O.

170. The shear modulus of most of the materials with respect to Young's modulus is

    (1) equal to half

    (2) less than half

    (3) more than half

    (4) more than twice

171. The shear force diagram for a cantilever loaded at its free end is

    (1) a right angled triangle

    (2) an isosceles triangle

    (3) an equilateral triangle

    (4) a rectangle

172. When the bending moment diagram is an inclined line between two points, it indicates

    (1) uniformly distributed between those points

    (2) point loads at those points

    (3) uniformly varying load b/n those points

    (4) none of the above

173. The bending moment for a simply supported beam is maximum where shear force

    (1) is constant

    (2) changes sign

    (3) is minimum

    (4) is maximum

174. The maximum bending moment for a cantilever of length L subjected to point load W at its free end is

    (1) $WL/4$

    (2) $WL^2/8$

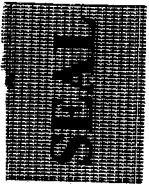   (3) WL

    (4) $WL^2/12$

SPACE FOR ROUGH WORK

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175. The property of a material to restore its initial shape and dimensions after the load is removed is known as

(1) Strength

(2) Elasticity

(3) Plasticity

(4) Hardness

176. Elements of dimensioning includes

(1) Projection lines

(2) Leader lines

(3) Dimension lines

(4) All of the above

177. —— scale is used for isometric view or isometric drawing.

(1) Reduced

(2) Isometric

(3) Actual

(4) None

178. If a straight line is parallel to HP and inclined to VP, its true length appears in

(1) Front view

(2) Top view

(3) Profile view

(4) Both in Front and Top views

179. When a line is parallel to both HP and VP, its side view is

(1) A straight line parallel to XY line

(2) A straight line perpendicular to XY line

(3) A straight line inclined to XY line

(4) A point

180. The true shape of the plane surface appears in Top view when the plane is

(1) Parallel to HP

(2) Parallel to VP

(3) Perpendicular to HP

(4) None of the above

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