ME1315

MECHANICAL ENGINEERING

Paper - 2

505

Series A

Sl.No. : 603509

Duration : 150 Minutes *Max. Marks : 300*

INSTRUCTIONS TO CANDIDATES

1. Please check the Test Booklet immediately on opening and ensure that it contains all the 150 multiple choice questions printed on it.
2. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with the Question Paper Booklet. The OMR Answer sheet consists of two copies i.e., the Original Copy (Top Sheet) and Duplicate Copy (Bottom Sheet). The OMR sheet contains Registered Number/Hall Ticket Number, Subject/ Subject Code, Booklet Series, Name of the Examination Centre, Signature of the Candidate and Invigilator etc.,
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If your test Booklet Series is A, please fill as shown below :

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[P.T.O.

1) If the resultant of two equal forces has the same magnitude as either of the forces, then the angle between the two forces is
(1) 30° (2) 60° (3) 90° (4) 120°

2) Method of sections in truss analysis is generally found useful to determine
(1) Forces in all members (2) Forces in selective members
(3) Weights of the members (4) Bending of members

3) Maximum range of projectile motion in a plane land is possible for angle of inclination
(1) 0° (2) 90° (3) 23.5° (4) 45°

4) D' Alembert's principle
(1) provides no special advantage on Newton's law
(2) is not applicable for kinetic problem
(3) is not dependent on inertial effect
(4) converts a kinetic problem into an equivalent static problem

5) If a solid cylinder and a hollow cylinder of the same mass are allowed to roll down an inclined plane simultaneously then
(1) Hollow cylinder reach the ground first
(2) Solid cylinder reach the ground first
(3) Both reaches the ground at the same time
(4) Unpredictable

6) The resultant of the two forces P and Q is R. if Q is doubled, the new resultant force is perpendicular to P, then
(1) P = Q (2) Q = R (3) Q = 2R (4) P = 2R

7) Two objects moving with uniform speeds are 5 m apart, after 1 second when they move towards each other and are 1 m apart, when they move in same direction. The speeds of the objects are
(1) 2m/sec and 2m/sec (2) 3m/sec and 2m/sec
(3) 3m/sec and 3m/sec (4) 4m/sec and 6m/sec

8) A ball is dropped vertically downward from the top of a building and another one is thrown horizontally, which will strike ground first?
(1) One dropped vertically (2) One thrown horizontally
(3) Both will strike simultaneously (4) It will depend

9) The linear acceleration (a) of a body of radius (r) with an angular acceleration of α rad/s^2,is
(1) $a = \alpha / r$ (2) $a = \alpha . r$ (3) $a = r / \alpha$ (4) $a = \alpha^2 r$

10) Two forces act at a point. The first force has X and Y Components of 3N and –5N respectively. The resultant of these forces falls on the x-axis and has a magnitude of –4N. The X and Y components of the second force is
(1) (–7, 5) (2) (–7, –5) (3) (–7, 0) (4) (7, 0)

11) A cantilever bean of length L is subjected to a moment M at a free end. The moment of inertia of the beam Cross section about the neutral axis is I and the Young modules is E. The Magnitude of the maximum deflection is
(1) ML^2/2EI (2) ML^2/EI (3) 2ML^2/EI (4) 4ML^2/EI

12) The elongation of a Conical bar under its own weight is _____ that of prismatic bar of the same length
(1) Equal to (2) Half (3) One-third (4) Two-third

13) The beam is said to be of Uniform strength, if
(1) Bending moment is same throughout the beam
(2) Deflection is same throughout the beam
(3) Bending stress is same throughout the beam
(4) Shear stress is same throughout the beam

14) For a simply supported beam of length L, the bending moment M is described as M = a(x–x^3/L^2), $0 \le x \le L$; Where a is constant. The shear force will be zero at.
(1) The supports (2) $x = \sqrt{\frac{L}{3}}$ (3) X = L (4) $X = \frac{L}{2}$

15) The Poisson's ratio for cast iron varies from
(1) 0.23 to 0.27 (2) 0.25 to 0.33 (3) 0.31 to 0.34 (4) 0.32 to 0.42

16) Two tapering bars of the same material are subjected to a tensile load P. The lengths of both the bars are the same. The larger diameter of each of the bars is D. The diameter of the bar A at its smaller end is D/2 and that of the bar B is D/3. What is the ratio of elongation of the bar A to that of bar B.
(1) 3 : 2 (2) 2 : 3 (3) 4 : 9 (4) 1 : 3

17) Plane stress at a point in a body is defined by principal stresses 3σ and σ. The ratio of the normal stress to the maximum shear stresses on the plane the maximum shear stress is
(1) 1 (2) 2 (3) 3 (4) 4

18) The outside diameter of hollow shaft is twice that of its inside diameter. The torque carrying capacity of this shaft is M_{t1}. A solid shaft of the same material has the diameter equal to the outside diameter of the hollow shaft. The solid shaft can carry a torque of M_{t2}. The ratio of M_{t1}/M_{t2} is
(1) 15/16 (2) 3/4 (3) 1/2 (4) 1/16

19) If the width of a simply supported beam carrying an isolated load at its centre is doubled, the deflection of the beam at the centre is changed by
(1) 1/2 (2) 1/8 (3) 4 (4) 2

20) When two mutually perpendicular principal stresses are unequal but like, the maximum shear stress is represented by
(1) The diameter of the Mohr's Circle
(2) Half the diameter of the Mohr's Circle
(3) One third the diameter of the Mohr's Circle
(4) One fourth the diameter of the Mohr's Circle

21) The driving and driven shafts connected by a Hooke's joint will have equal speeds, if
(1) $\text{Sin}\alpha = \theta$ (2) $\text{Tan}\,\theta = \pm\sqrt{\cos\alpha}$ (3) $\text{Tan}\,\theta = \alpha$ (4) $\text{Cot}\,\alpha = \theta$

22) A shaft between two bearings is rotating with a disturbing mass 25 kg at a radius of 2 cm. What is the balancing mass to be kept at a radius of 5 cm?
(1) 12.5 Kg (2) 5 Kg (3) 10 Kg (4) 25 Kg

23) In an epicyclic gear train the number of teeth on Sun and annulus are 80 and 200 respectively. The number of teeth on planet Gear are
(1) 60 (2) 30 (3) 90 (4) 100

24) According to Kennedy's theorem, if three bodies are moving relative to each other, their relative instantaneous centres will lie on
(1) Straight line (2) Ellipse (3) Parabola (4) Circle

25) When the crank is at the inner dead center, in a horizontal reciprocating engine, then the velocity of the piston will be
(1) Zero (2) Maximum (3) Minimum (4) Infinity

26) The ratio of the height of a porter governer (when the length of arms and links are equal) to the height of a Watt's governer is m = Mass of the ball, and M = Mass of the load on the sleeve
(1) $\frac{m}{m+M}$ (2) $\frac{M}{m+M}$ (3) $\frac{m+M}{m}$ (4) $\frac{m+M}{M}$

27) Minimum number of teeth of standard proportion with involute profile and 20^0 pressure angle spur gear is
(1) 12 (2) 18 (3) 32 (4) 20

28) The engine of an aeroplane rotates in clockwise direction when seen from the tail end and the aeroplane takes a turn to the left. The effect of the gyroscopic couple on the aeroplane will be
(1) To raise the nose and dip the tail (2) To dip the nose and raise the tail
(3) To raise the nose and tail (4) To dip the nose and tail

29) The Coriolis component of acceleration
(1) Lags the sliding Velocity by 90°
(2) Leads the sliding Velocity by 90°
(3) Lags the sliding Velocity by 180°
(4) Leads the sliding Velocity by 180°

30) The number of Instantaneous Centers in a 6 link mechanism are
(1) 6 (2) 15 (3) 10 (4) 28

31) The space Centrode of a Circular disc on a straight line path is
(1) A Circle (2) A parabola (3) A Straight line (4) A hyperbola

32) The Cam follower extensively used in air craft engine is
(1) Knife edge follower (2) Flat faced follower
(3) Spherical faced followed (4) Roller follower

33) The Minimum number of teeth in a rack and pinion for a 20° pressure angle teeth is
(1) 20 (2) 18 (3) 22 (4) 24

34) A shaft carrying three rotors will have
(1) No node (2) One node (3) Two nodes (4) Three nodes

35) In vibration isolation system, if $\frac{\omega}{\omega_n} > 1$, then the phase difference between the transmitted force and the disturbing force is
(1) 0° (2) 90° (3) 180° (4) 270°

36) The door closers operated normally at
(1) Over damping (2) Under damping
(3) Critical damping (4) No damping

37) In a spring-mass system, if the mass is halved and the spring stiffness is doubled, the natural frequency is
(1) Halved (2) Doubled (3) Unchanged (4) Quadrupled

38) In a spring mass system, 4 kg mass is suspended through a spring of stiffness 100 N/m. What is the circular frequency of the system?
(1) 15 rad/s (2) 5 rad/s (3) 10 rad/s (4) 4 rad/s

39) The degrees of freedom of a simple pendulum is given by
(1) 2 (2) 6 (3) 0 (4) 1

40) Natural frequency of transverse vibrations of a shaft carrying load at the centre of the span is

(1) $f_n = \frac{5.63}{\sqrt{\delta}} Hz$ (2) $f_n = \sqrt{\frac{4.97}{\delta}}$

(3) $f_n = \sqrt{\frac{5.63}{\delta}} Hz$ (4) $f_n = \frac{4.987}{\sqrt{\delta}} Hz$

41) Which of the following is Trapezoidal thread

(1) ACME (2) Square (3) Buttress (4) Metric

42) A car moving with uniform acceleration covers 450 m in a 5 seconds interval, and covers 700 m in the next 5 seconds interval. The acceleration of the car is (m/s^2)

(1) 7 (2) 50 (3) 25 (4) 10

43) Two parallel and coplanar shafts are connected by

(1) Spur gears (2) Bevel gears

(3) Spiral gears (4) Double helical gears

44) The efficiency of self locking screw jack is always

(1) Less than 50% (2) Greater than 50%

(3) Equal to 50% (4) Always 100%

45) The fatigue life of a part can be improved by

(1) Electro plating (2) Polishing

(3) Shot peening (4) Heat treatment

46) The following is an antifriction bearing

(1) Journal bearing (2) Sleeve bearing

(3) Foot step bearing (4) Ball and roller bearing

47) As per the uniform wear theory. brakes and clutches friction radius is equal to

(1) $\frac{R+r}{2}$ (2) $\frac{R^2+r^2}{2}$ (3) $\frac{R^2+r^2}{2Rr}$ (4) R + r

48) Starting friction is low in

(1) Hydro Static lubrication
(2) Hydro dynamic lubrication
(3) Mixed or semi fluid lubrication
(4) Boundary lubrication

49) According to IBR, safety factor of rivet should be less than

(1) 2 (2) 3 (3) 4 (4) 8

50) In case of single welded butt joint the thickness of plate must be

(1) 10 - 12 mm
(2) 1 - 6 mm
(3) 8 - 10 mm
(4) 12 - 15 mm

51) A fluid is a substance that

(1) Always expands until it fills any container
(2) Is practically incompressible
(3) Cannot remain at rest under action of any shear force
(4) Cannot be subjected to shear force

52) Pascals law states that pressure at a point is equal in all directions in a

(1) Liquid at rest
(2) Fluid at rest
(3) Laminar flow
(4) Turbulent flow

53) Specify which of the following must be fulfilled by the flow of any fluid, real or ideal, laminar or turbulent

(1) Newton's law of Viscosity
(2) Velocity at boundary must be zero relatively to boundary
(3) The continuity equation
(4) Velocity normal to a solid boundary is zero

54) The flow of fluid through a pipe is laminar when
(1) The fluid is ideal
(2) The fluid is Viscous
(3) The Reynolds number is less than 2000
(4) There is considerable lateral dispersion

55) For Viscous flow through pipes the friction factor is given as
(1) 1600 / Re (2) 1000 / Re (3) 16 / Re (4) 32 / Re

56) Reynolds number may be defined as the ratio of
(1) Viscous forces to internal forces
(2) Elastic forces to pressure forces
(3) Internal forces to Viscous forces
(4) Gravity forces to intertial forces

57) The loss of head (or energy) due to velocity of liquid at the outlet of the pipe is given as
(1) $V^4 / 4g$ (2) $V^4 / 2g$ (3) $V^2 / 4g$ (4) $V^2 / 2g$

58) In turbulent flow the friction factor 'f' for smooth pipe depends upon
(1) The Reynolds number and the relative roughness
(2) The relative roughness only
(3) The size of the pipe and the discharge only
(4) The Reynolds number only

59) The concept of boundary layer is introduced by
(1) Prandtl (2) Reynold (3) Euler (4) Nusselt

60) In the equation for capillary rise or fall of a liquid $h = 4\ \sigma \cos\theta / wd$, the value of θ for water is
(1) 0° (2) 10° (3) 45° (4) 180°

61) The product of Reynolds number and Prandtl number gives

(1) Peclet number
(2) Grasshof number
(3) Nusselt number
(4) Mach number

62) The effectiveness of a heat exchanger is the ratio of two heat transfer which is defined as the ratio of

(1) Ideal to actual
(2) Ideal to maximum
(3) Actual to Maximum
(4) Maximum to actual

63) The roof of a house has been given a coating of shining metal paint. Consequently the temperature inside the room will

(1) Rise
(2) No effect
(3) Cannot be decided
(4) Fall

64) Which of the following does not pertain to transient heat conduction

(1) Biot number
(2) Fourier number
(3) Heisler chart
(4) Interchange factor

65) In free convection heat transfer, transition from laminar to turbulent flow is governed by

(1) Reynolds number
(2) Grashof number
(3) Reynolds number and Grashof number
(4) Grashof number and Prandtl number

66) Absorptivity of a body is equal to its emissivity

(1) For a polished body
(2) Under thermal equilibrium condition
(3) At one particular temperature
(4) At shorter wave lengths

67) The log mean temperature difference is given by

(1) $(\theta_1 - \theta_2) / Log_e(\theta_1 / \theta_2)$ (2) $(\theta_1 + \theta_2) / Log_e(\theta_1 / \theta_2)$

(3) $(\theta_1 - \theta_2) / Log_e(\theta_1 - \theta_2)$ (4) $(\theta_1 - \theta_2) / Log_e(\theta_1 + \theta_2)$

68) In a counter flow heat exchanger, cold fluid enters at 30° C and leaves at 50° C where as the hot fluid enters at 150° C and leaves at 130° C. The mean temperature difference is

(1) 20°C (2) 80°C (3) 100°C (4) 120°C

69) Forced convection in a liquid bath is caused by

(1) Density difference brought about by temperature gradients
(2) Molecular energy interaction
(3) Flow of electrons in a random fashion
(4) Intense stirring by an external agency

70) The value of an extensive property is essentially dependent on

(1) Mass or extent of the system
(2) Interaction of system with its surroundings
(3) Path followed by the system is going from one state to another
(4) Nature of boundaries, rigid or flexible

71) The process of converting ice directly to steam is called

(1) Equalent evaporation (2) Sublimation
(3) condensation (4) Critical evaporation

72) The gas with highest value of adiabatic index is

(1) Helium (2) Nitrogen (3) Oxygen (4) Methane

73) The gas at pressure p in the vessel is compressed suddenly to half of its original volume. Then pressure of the gas after a long time becomes

(1) 1/2 p (2) 2p
(3) Less than 2p (4) Greater than 2p

74) The entropy of universe tends to
(1) Becomes zero
(2) Remains constant
(3) Maximum
(4) Attain a certain finite minimum value

75) Which air standard cycle consists of two isothermals connected by two constant volume processes
(1) Brayton cycle
(2) Ericsson cycle
(3) Stirling cycle
(4) Atkainson cycle

76) Stainless steel contains following elements
(1) Cr, Fe, Sn, Ni
(2) Cr, Sn, Cu, Ni
(3) Cr, Ni, Fe, C
(4) Fe, Pb, Sn, C

77) The binding material for cemented carbide is
(1) Iron (2) Chromium (3) Nickel (4) Cobalt

78) Fastest method at case hardening a samples is
(1) Carburizing
(2) Nitriding
(3) Induction hardening
(4) Cyaniding

79) Austempering produces
(1) Hard surface and tough core
(2) Hard core and tough surface
(3) Hard surface and hard core
(4) Tough surface and tough core

80) In cold working material gets stronger due to
(1) Wear mechanism
(2) Slip system
(3) Twin mechanism
(4) Dislocation multiplication

81) How many necks appears during tensile test of specimen prepared according to ASTM standard
(1) One
(2) Two
(3) Three
(4) Unpredictable

82) Gibbs phase rule for binary phase diagram is
(1) F + P = C+2 (2) F + P = C+3
(3) F + P = C +1 (4) F + P = C

83) Chip flow over rake face is
(1) Sliding model (2) Sticking model
(3) Sliding and sticking model (4) Sticking and sliding model

84) Discontinuous chips during machining forms when
(1) Work is brittle, speed is low (2) Work is brittle, speed is high
(3) Work is ductile, speed is low (4) Work is ductile, speed is high

85) In grinding wheel, when the bonding agent is strong, so upon grinding hard materials, slowly all the abrasives wear out and grinding wheel is rubbing over work without cutting. This phenomenon is called
(1) Glazing (2) Loading (3) Dressing (4) Truing

86) For unconventional machining processes, following is the decreasing order at tool wear.
(1) USM > EDM > ECM (2) USM > ECM > EDM
(3) ECM > EDM > USM (4) ECM > USM > EDM

87) The accuracy of machining in Abrasive jet machining (AJM) with increase in stand off distance
(1) Increases (2) Decreases
(3) Increases then decreases (4) Decreases then increases

88) Larger clearance angles are used in drills to machine ductile materials because ductile materials have tendency for
(1) Elastic recovery (2) Larger elongation
(3) Tough (4) Malleable

89) Fastest method of producing gears is
(1) Shaping (2) Rolling (3) Hobbing (4) Extrusion

90) In 3-2-1 principle of jig design, 3 hemispherical pins are provided in base. Indentify the wrong statement in this regard
(1) It ensures machining in one plane
(2) It arrests 5 degrees at freedom
(3) It positions the tool
(4) For heavier work pieces we use 3 hemispherical plugs.

91) In which of the welding technique, the weld pool is protected by inert gas?
(1) SMAW (2) TIG welding (3) SAW (4) Resistance weeding

92) In arc welding process the current value is decided by
(1) Thickness at plate (2) Length at weld portion
(3) Voltage across arc (4) Speed at travel

93) The problem of arc blow will be very serious in
(1) DC electrode positive (2) DC electrode negative
(3) DC bare electrode (4) AC

94) Maximum reduction can be given to any material in tube drawing using
(1) Tube sinking (2) Drawing with floating mandrel
(3) Drawing with fixed mandrel (4) Drawing with moving mandrel

95) The process in which during forging material moves towards centre
(1) Edging (2) Fullering
(3) Hubbing (4) Open die forging

96) In wire drawing operation the bright shining surface on wire is obtained if
(1) Not using a lubricant (2) Using thin film lubricant
(3) Using solid lubricant (4) Good surface finish dies

97) Which of the following is used to hold cutter in milling machine?
(1) Mandrel (2) Tool Post (3) Arbor (4) Fixture

98) Core in the centrifugal casting is made of

(1) Carbon steel (2) Core sand

(3) Wax (4) No core is used

99) A hole at 1 mm is to be drilled in glass. It could best be done by

(1) Laser drilling (2) Plasma arc drilling

(3) USM (4) EDM process

100) In limits and fits system shaft basis system is one whose

(1) Lower deviation is zero (2) Upper deviation is zero

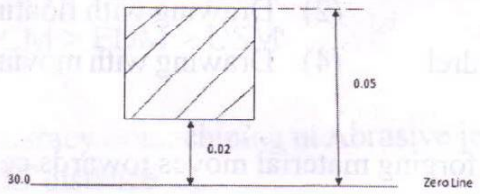
(3) Minimum clearance is zero (4) Maximum clearance is zero

101) According to Taylor's principle " No Go" gauge checks

(1) Only one feature at a time (2) Only important dimensions at a time

(3) All the dimensions at a time (4) Only related dimensions at a time

102) Tolerance of hole are shown in figure. Maximum size of Go gauge according to workshop design



(1) 30.02 (2) 30.023

(3) 30.017 (4) 30.053

103) Rapid plane in NC machine programming is

(1) Imaginary plane just above the work piece

(2) Imaginary plane just below the work piece

(3) Plane on which work is kept

(4) Plane at tool change

104) Power consumption in metal cutting is mainly due to

(1) Tangential component at force (2) Longitudinal component at force

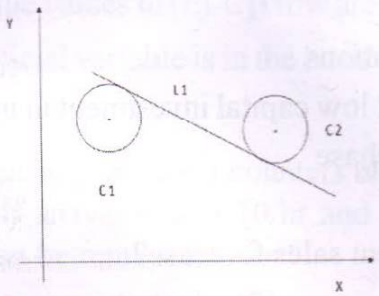
(3) Normal component at force (4) Friction at tool chip interface

105) Rake angle in twist drill varies from the centre of the drill towards periphery according to

(1) Increases and then decreases (2) Decreased and then increases

(3) Increases continuously (4) Decreases continuously

106) L1 is expressed as (in APT)



(1) L1=LINE/LFT TANTO C1, RGT TANTO C2

(2) L1=LINE/RGT TANTOC1, LFT TANTO C2

(3) L1=LINE/LFT TANTOC1, LFT TANTO C2

(4) L1=LINE/RGT TANTOC1, RGT TANTO C2

107) Diamond pin location is used in fixture because

(1) It does not wear out

(2) Adjust centre to centre distance between 2 holes

(3) Easy to clamp

(4) Easy to manufacture

108) Extrusion force does not depend upon

(1) Extrusion ratio (2) Type of extrusion process

(3) Material of die (4) Working temperature

109) Steel balls are manufactured by

(1) Casting (2) Machining (3) Cold heading (4) Sintering

110) Pinch effect in welding is result of

(1) Expansion at gases in arc
(2) Electromagnetic forces
(3) Electric forces
(4) Surface tension at molten metal

111) Project completion time in PERT follows

(1) Beta distribution
(2) Normal distribution
(3) Poisson distribution
(4) Binomial distribution

112) Inventory control in production planning and control aims at

(1) Achieving optimization
(2) Ensuring against market fluctuations
(3) Acceptable customer service at low capital investment in inventory
(4) Discounts allowed in bulk purchase

113) Which of the following is independent sales forecase?

(1) Productivity
(2) Inventory control
(3) Production Planning
(4) Production control

114) In CNC milling 'z' axis represents

(1) Tool axis
(2) Work axis
(3) Table axis
(4) Both work and tool axis

115) In PERT critical activity has

(1) Maximum float
(2) Zero float
(3) Minimum float
(4) Minimum cost

116) In linear programming problem if the new constraint is added, what will change?

(1) Feasibility
(2) Optimality
(3) Both feasibility and optimality
(4) No change

117) A network has 3 activities on critical path with mean time as 3, 8 and 6 and variance as 1,4 and 9. The probability at finishing the project in 17 days is

(1) 0.5 (2) 0.66 (3) 0.84 (4) 0.95

118) If the demand for an item is doubled and the ordering cost halved, the economic order quantity

(1) Remains unchanged
(2) Increased by $\sqrt{2}$
(3) is doubled
(4) is halved

119) Simplex problem is considered as unbounded when

(1) All the variables in entering column are negative
(2) Variables in basis are negative
(3) All the values in (Ej-Cj) row are negative
(4) Artificial variable is in the basis

120) A bank queue is having 3 counters with 30 system capacity cater to the whole campus. If arrival rate is 10/hr and service rate is 12/hr on FCFS basis the system can be represented as:

(1) M/M/30 : FCFS/3/∞
(2) M/M/3 : FCFS/∞/30
(3) M/M/3 : FCFS/30/∞
(4) M/M/3 : FCFS/10/12

121) Tolerances are provided because

(1) Machines are not accurate
(2) Machine environment follows a normal distribution
(3) Quality of Fit will come only when there is range
(4) Ease of manufacturing

122) Earthquakes produces the following type of vibrations

(1) Torsional
(2) Transverse
(3) Seismic
(4) Longitudinal

123) In PERT activity time is considered as Beta distribution because

(1) It is unimodel
(2) It cuts 2 intercepts on x-axis
(3) Both 1 and 2 are correct
(4) It is continuous distribution

124) The thermal efficiency of an ideal Rankine cycle is less than that of Carnot cycle operating between the same maximum and minimum temperature limits because

(1) Heat addition does not takes place at constant temperature
(2) The expansion process is not reversible and adiabatic
(3) Heat rejections does not take place at constant temperature
(4) The compression process is not reversible and adiabatic

125) In steam power plant, what is the outcome of regenerative feed heating

a) Increase in specific output
b) Increase in cycle efficiency
c) Improved quality of exhaust steam
d) Reduced condenser load Select the correct answer

(1) (a) and (c) only
(2) (b) only
(3) (b) & (d)
(4) (a), (b) and (c)

126) In the case of a Diesel cycle, increasing cuttoff ratio will increase

(1) Efficiency
(2) Mean effective pressure
(3) The Maximum pressure
(4) The engine weight

127) The COP of a domestic refrigerator as compared to that of an air conditioner is in general

(1) High
(2) Low
(3) Same
(4) COP depends on dry bulb temperature

128) Assertion (A) : Heat pump used for heating is a definite advancement over the simple electric heater.
Reasons (R) : The heat pump is far more economical in operation than electric heater.

(1) Both A & R are correct and R is correct explanation of A.
(2) Both A & R are correct and R is not correct explanation of A
(3) A is true R is false
(4) A is false R is true

129) A pelton wheel is ideally suited for

(1) High head and low discharge (2) High head and high discharge

(3) Low head and Low discharge (4) Medium head and medium discharge

130) Match List - I and List - II

List - I	List - II
A. Pelton wheel	1) Medium discharge, low head
B. Francis turbine	2) High discharge, low head
C. Kaplan turbine	3) Medium discharge, medium head
	4) Low discharge, high head

(1) A-1, B-2, C-3 (2) A-1, B-3, C-4

(3) A-4, B-1, C-3 (4) A-4, B-3, C-2

131) In reaction turbines, the draft tube is used

(1) For the safety of turbine

(2) To Convert the kinetic energy of flow by a gradual expansion

(3) To destroy undesirable eddies

(4) To reduce viscosity of fluid

132) Which one of the following is correct? In a gas turbine cycle with regeneration

(1) Pressure ratio increases (2) Work output decreases

(3) Thermal efficiency increases (4) Head input increases

133) A gas turbine working on Brayton cycle produces 4000 kw of net power. If its work ratio is 40%, what is the power consumed by the compressor?

(1) 2000 KW (2) 4000 KW

(3) 6000 KW (4) 8000 KW

134) Which one of the following pairs represents the specific speeds of turbine and pump respectively?

(1) $\frac{NQ^{1/2}}{H^{3/4}}$ and $\frac{NP^{1/2}}{H^{5/4}}$ (2) $\frac{NQ^{1/2}}{H^{3/4}}$ and $\frac{NP^{1/2}}{H^{3/4}}$

(3) $\frac{NP^{1/2}}{H^{3/4}}$ and $\frac{NQ^{1/2}}{H^{5/4}}$ (4) $\frac{NP^{1/2}}{H^{5/4}}$ and $\frac{NQ^{1/2}}{H^{3/4}}$

135) Adiabatic saturation process for moist air involves

(1) Cooling and humidification (2) Cooling and dehumidification
(3) Change in WBT (4) Constant relative humidity

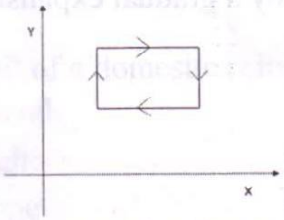
136) If the specific heats of dry air and water vapour are 1kJ/kgk and 1.88 kJ/kg-k and the humidity ratio is 0.011, the specific heat of moist air will be

(1) 1.0207 kJ/kgk (2) 1.869 kJ/kgk
(3) 1.891 kJ/kgk (4) 0.9793 kJ/kgk

137) For air with a relative humidity of 80%

(1) The DBT is less than the WBT (2) The DPT is less than WBT
(3) The DPT and WBT are equal (4) DBT and DPT are equal

138)



An air standard Otto cycle has the following shape on a thermodynamic plane. The X and Y coordinates respectively are

(1) V and P (2) V and S (3) V and T (4) S and P

139) Which gas power cycle consists of 4 processes during which work alone is transferred during two processes and heat alone is transferred during the other two processes?

(1) Atkinson cycle (2) Carnot cycle
(3) Diesel cycle (4) Otto cycle

140) The bore and stroke of the cylinder of a 6 cylinder engine working on an otto cycle are 20 cm and 30 cm respectively. The total clearance volume is 3000π cm^3. What is the compression ratio?

(1) 5 (2) 6 (3) 7 (4) 8

141) The efficiency of superheat Rankine cycle is higher than that of simple Rankine cycle because

(1) The enthalpy of steam is lower for superheat cycle

(2) The mean temperature of heat addition is higher for superheat cycle

(3) The temperature of steam in the condenser is high

(4) The quality of steam in the condenser is low

142) Collapsibility of green sand mold can be increased by adding

(1) Water (2) Clay

(3) Wood flour (4) Synthetic resin

143) In a gravity feed system in casting, the cross section area of horizontal runner

(1) Remains same (2) Keeps on increasing

(3) Keeps on decreasing (4) Depends upon material

144) Circular billet forging is a case of

(1) Plane stress (2) Plane strain

(3) Unidirectional stress (4) Unidirectional strain

145) Work hardening exponent of any material can be calculated by calculating

(1) Maximum true stress (2) Maximum true strain

(3) Maximum engineering stress (4) Maximum engineering strain

146) Identify the wrong statement. If side cutting edge angle of a single point cutting tool increases

(1) Tool life increases
(2) Chips becomes thinner
(3) Chips becomes wider
(4) Temperature over rake face increases

147) Identify the wrong statement related to back rake angle in single point cutting tool. Increase in back make angle

(1) Lip angle increases
(2) Tool life initially increases
(3) Contact length on rake face will decrease
(4) Cutting forces will be relatively low

148) Increase in semi die angle in metal forming, the die life

(1) Increases
(2) Decreases
(3) Initially increases then decreases
(4) Initially decreases then increases

149) Dead metal zones form in extrusion process because

(1) Higher extrusion pressure
(2) Slip lines do not appear in certain regions
(3) Lack of smooth flow of material
(4) Improper lubrication

150) Maximum reduction can be given to any material in what kind of rolling mill?

(1) Planetary mill
(2) Sendzmier mill
(3) 3 high mill
(4) 4 high mill