PROVISIONAL ANSWER KEY
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Note:
1). All Suggestions are to be sent with reference to website published
Question paper with Provisional Answer Key Only.
2). All Suggestions are to be sent in the given format only.
3). Candidate must ensure the above compliance.

101. A cantilever spring 500 mm long is to be loaded at free end by 1000 N. The spring contains 10 leaves each 50 mm wide. If allowable stress is 98 N/mm^2 the thickness of each leaf should be

(A) 4 mm   (B) 8 mm

(C) 12 mm   (D) 16 mm

102. An axial load P is applied to a circular shaft of diameter D. If the same load is applied on a shaft of outer diameter D and inner diameter D/2, the ratio of stress in the two cases will be

(A) 1   (B) 1/3

(C) 3/4   (D) 16/17

103. A frame in which the number of members is just sufficient to keep it in equilibrium, is known as

(A) perfect frame   (B) ideal frame

(C) column   (D) redundant frame

104. The stresses developed in a composite bar made of steel and copper which was heated up are

(A) tensile and compressive stresses   (B) compressive and bending stresses

(C) torsional stresses   (D) none of the above

105. The bulk modulus at a section where the shear force is zero will be

(A) maximum   (B) minimum

(C) zero   (D) either minimum or maximum

106. For a beam fixed at one end and freely supported at the other end having centre loading the maximum bending moment will occur

(A) between centre and fixed support

(B) at fixed end

(C) at support end

(D) under the load

107. For a rectangular beam loaded transversal, the maximum compressive stress develops

(A) on the top fibre   (B) on the bottom fibre

(C) on the neutral axis   (D) is unpredictable

108. In thin walled cylinders, the ratio of longitudinal stress to shear stress is

(A) ½   (B) 1

(C) ¼   (D) 2

109. In the design of shafts made of ductile materials subjected to twisting moment and bending moment, the recommended theory of failure is

(A) maximum principal stress theory (B) maximum principal strain theory

(C) maximum shear-stress theory   (D) maximum strain-energy theory

110. SIMO charts are used in

(A) method study   (B) micro motion study

(C) process analysis   (D) layout analysis

111. P.M.T.S. (Predetermined Motion Time Systems) include

(A) M.T.M. (Method Time Measurement)

(B) W.F.S. (Work Factor Systems)

(C) B.M.T.S. (Basic Motion Time Study)

(D) all of the above

112. Which of the following property is desirable for materials used in tools and machines?

(A) Elasticity   (B) Plasticity

(C) Malleability   (D) Ductility

113. The hardness and tensile strength in austenitic stainless steel can be increased by

(A) Martempering   (B) Normalizing

(C) full annealing   (D) hardening and cold working

114. Which of the following has a fine gold colour and is used for imitation jewellery?

(A) Silicon bronze   (B) Aluminium bronze

(C) Babbit metal   (D) Gun metal

115. A material is said to be allotropic, if it has
(A) atoms distributed in random pattern
(B) different crystal structures at different temperatures
(C) fixed structure at all temperatures
(D) anyone of the above

116. The ability of a material to absorb energy in the plastic range is called
(A) Creep
(B) Toughness
(C) Resilience
(D) Fatigue strength

117. An eutectoid steel consists of
(A) pearlite and ferrite
(B) wholly pearlite
(C) pearlite and cementite
(D) wholly austenite

118. Specify the sequence correctly
(A) Stress relief, grain growth, recrystallization
(B) Grain growth, recrystallisation, stress relief
(C) Grain growth, stress relief, recrystallization
(D) Stress relief, recrystallisation, grain growth

119. The welding process by Metal Inert-Gas (MIG) welding is
(A) slower than the welding process by Tungsten Inert-Gas (TIG) welding
(B) faster than the welding process by Tungsten Inert-Gas (TIG) welding
(C) at same speed as the welding process by Tungsten Inert-Gas (TIG) welding
(D) at unpredictable speed

120. Which current is used in Tungsten Inert-Gas (TIG) welding?
(A) Only A.C. can be used as welding current
(B) Only D.C. can be used as welding current
(C) Both A.C. and D.C. can be used as welding current
(D) None of the above

121. What is swing over carriage?

(A) The maximum diameter of workpiece that can be rotated over the bed ways

(B) The minimum diameter of workpiece that can be rotated over the bed ways

(C) The maximum diameter of workpiece that can be rotated over lathe saddle

(D) The minimum diameter of workpiece that can be rotated over lathe saddle

122. Which of the following is not a part of carriage of the centre lathe?

(A) Tool post   (B) Apron

(C) Compound rest   (D) Gear box controls

123. Which fixtures are used for machining parts which must have machined details evenly spaced?

(A) Profile fixtures   (B) Duplex fixtures

(C) Indexing fixtures   (D) None of the above

124. The device which place the workpiece in the same position, in jig and fixture, cycle after cycle is called as

(A) placing device   (B) fixing device

(C) locating device   (D) positioning device

125. Which machine tool reduces the number of set-ups in machining operation, time spent in setting machine tools and transportation between sections of machines?

(A) Computer Numerical Control machine tool

(B) Direct Numerical Control machine tool

(C) Adaptive Control Systems

(D) Machining centre

126. The connecting rods of IC engines are manufactured using the process of _____

(A) extrusion   (B) drop forging

(B) rolling   (C) spinning

127. An IC engine has a bore and stroke each equal to 2 units. The total area to calculate heat loss from the engine can be taken as

(A) 4π

(B) 5π

(C) 6π

(D) 8π

128. In a petrol engine, the tendency for detonation increases with

(A) Retarded spark timing

(B) Running the engine at high speed

(C) Supercharging

(D) Increasing the cooling rate

129. Consider the following statements:

1. Diesel fuels are compared using an ignition delay criterion.
2. Cetane number is equal to the percentage of cetane plus 15% of the percentage of heptamethyl in the fuel.
3. Cetane number of alphamethyl naphthalene assigned the value of 15.

Which of these statements are correct?

(A) 1,2 and 3

(B) 1 and 2 only

(C) 2 and 3 only

(D) 1 and 3 only

130. The following readings refer to a vapour compression refrigerator:

The enthalpy per kg of refrigerant flow, from p-h chart

At inlet to compressor- 1500kJ/kg

At outlet to compressor -1 700kJ/kg

At exit of condenser - 300kJ/kg

The COP of the refrigerator is

(A) 3

(B) 4

(C) 5

(D) 6

131. The Reynolds-Colburn analogy, which is used to determine heat transfer coefficient from the measurement of frictional drag, is applicable to

(A) Circumferential fins

(B) Flat plates

(C) Rectangular fins

(D) Triangular fins

132. In highly rarefied gases, the concept of this loses validity

(A) Thermodynamic equilibrium

(B) Continuum

(C) Stability

(D) Macroscopic view point

133. When the battery is fully charged then its specific Gravity at 27° C is ____
    (A) 1.220   (B) 1.175
    (C) 1.100   (D) None

134. 3-BHP of an engine is determined by a formula
    (A) $2\pi NT / 4500$ (B) $4\pi NT / 4500$
    (C) $\pi NT / 4500$ (D) $2\pi RNT / 4500$

135. The first successful American car was built by
    (A) Duryea Brothers   (B) Lanchester
    (C) Both of them   (D) None of these

136. Which of the following are the Indian manufacturer of scooters?
    (A) Andhra Pradesh Scooters   (B) A.P.I.
    (C) Bajaj Auto   (D) All of above

137. Compression Ration of Royal Enfield is _
    (A) 1:5.5   (B) 2.5:1
    (C) 6:2.3   (D) 6.5:1

138. If the rivets are to be designed to avoid crushing failure, the maximum permissible load P in kN is
    (A) 7.50   (B) 15.00
    (C) 22.50   (D) 30.00

139. If the plates are to be designed to avoid tearing failure, the maximum permissible load P in kN is
    (A) 83   (B) 125
    (C) 167   (D) 501

140. If $q_x = 2500x$, where x is in m and in the direction of flow (x=0 at the inlet), the bulk mean temperature of the water leaving the pipe in °C is
    (A) 42   (B) 62
    (C) 74   (D) 104

141. In orthogonal turning of a bar of 100 mm diameter with a feed of 0.25 mm/rev, depth of cut of 4 mm and cutting velocity of 90 m/min, it is observed that the main (tangential) cutting force is perpendicular to the friction force acting at the chip-tool interface. The main (tangential) cutting force is 1500 N. The orthogonal rake angle of the cutting tool in degree is

(A) Zero (B) 3.58
(C) 5 (D) 7.16

142. In a simple Brayton cycle, the pressure ratio is 8 and temperatures at the entrance of compressor and turbine are 300 K and 1400 K, respectively. Both compressor and gas turbine have isentropic efficiencies equal to 0.8. For the gas, assume a constant value of c_p (specific heat at constant pressure) equal to 1 kJ/kgK and ratio of specific heats as 1.4. Neglect changes in kinetic and potential energies. The power required by the compressor in kW/kg of gas flow rate is

(A) 194.7 (B) 243.4
(C) 304.3 (D) 378.5

143. A room contain 35kg of dry air and 0.5 g of water vapour. The total pressure and temperature of air in the room are 100 kPa and 25° C respectively. Given that the saturation pressure for water at 25° C is 3.17 kPa, the relative humidity of the air in the room is

(A) 67% (B) 55%
(C) 83% (D) 71%

144. In a petrol engine, the tendency for detonation increases with
(A) Retarded spark timing (B) Running the engine at high speed
(C) Supercharging (D) Increasing the cooling rate

145. Ammonia used as refrigerant is non-corrosive to
(A) iron and steel (B) copper and copper alloys
(C) Both (a) and (b) (D) Neither (a) nor (b)

146. What is the disadvantage of a water cooling system?
(A) Increase in weight of the vehicle (B) Less engine sound
(C) quick transfer of heat (D) None of these

147. Efficiency of cooling system depends upon which of the following?
    (A) Area of fins   (B) Temperature of the engine
    (C) Filling position of the engine   (D) all of the above

148. If the total fuel energy is 100 units then what is the amount of fuel energy which gets escaped through exhaust gases is ?
    (A) 20%   (B) 5%
    (C) 45%   (D) 30%

149. Fuel is fed to the carburetor in which of the following ways?
    (A) Gravity feed system   (B) Forced feed system
    (C) Both are cheep   (D) None of these

150. Drain plug is fitted at the _____ portion of the tank.
    (A) Lowest   (B) Highest
    (C) Middle   (D) None

151. What is the remedy of "Thick gasket used for mounting fuel pump to block"
    (A) Tighten these fully   (B) Use thinner gasket
    (C) Replace with new one   (D) None of these

152. Which of the following is main cracking processes?
    (A) Thermal cracking   (B) Hydro cracking
    (C) Fluid catalytic cracking   (C) All of above

153. An average crude oil yields about percentage of straight run gasoline.
    (A) 75%   (B) 25%
    (C) 50%   (D) 100%

154. _____ is used to control surface ignition and spark-plug fouling.
    (A) Detergents   (B) Phosphorus compounds
    (C) Anti-icers   (D) all are correct

155. What are the advantages of LPG as a motor fuel?
    (A) Complete vaporization   (B) Closer control of air-fuel ratios
    (C) High antiknock valve   (D) all are correct

156. What is the material for fuel lines?

    (A) Copper   (B) Steel

    (C) Both (a) and (b)   (D) None

157. The intake manifold is a __ tube for carrying the air fuel mixture from the carburetor to the engine intake port.

    (A) Cast iron   (B) Brass

    (C) Both (a) and (b)   (D) None of these

158. What is the speed of impeller in centrifugal type supercharger?

    (A) 1000 r.p.m.   (B) 10000 r.p.m.

    (C) 5000 r.p.m.   (D) 50000 r.p.m

159. What is the mechanical breaking-up of the liquid fuel into small particles?

    (A) Vaporization   (B) Atomization

    (C) Both   (D) none

160. If the pressure above the fuel in the float chamber is equal to the air intake in the air horn, the atmospheric pressure, the carburettor is said to be _____

    (A) Balanced   (B) unbalanced

    (C) Both   (D) None

161. That part of the wheel which is the supporting member between the axle and the rim is called _____

    (A) Wheel centre   (B) rim

    (C) Dual wheel   (D) None of these

162. A wheel so constructed that the centre line of the rim is located in board of the attachment face of the disc is called _____

    (A) Zero set wheel   (B) Dual wheel

    (C) rim   (D) Inset wheel

163. That part of the rim which provides lateral support to the tyre is called _____

    (A) Well   (B) Gutter

    (C) flange   (D) None of these

164. If the size of the tyre is 8.20 x20 x 10 PR. This shows that the width of tyre from shoulder to shoulder is _____

(A) 8.20"
(B) 20"
(C) 10"
(D) 20 x 10"

165. Of the four tyres on a car, the one that wears most is the _____

(A) Right front tyre
(B) Right rear tyre
(C) Left rear tyre
(D) None of above

166. If gate current is increased, then anode-cathode voltage at which SCR turns ON

(A) is decreased
(B) is increased
(C) remains the same
(D) none of the above

167. An SCR is made of silicon and not germanium because silicon _____

(A) is inexpensive
(B) is mechanically strong
(C) has small leakage current
(D) is tetravalent

168. An amplifier has a gain of 10,000 expressed in decibels the gain is

(A) 10
(B) 40
(C) 80
(D) 100

169. Semi-conductor diode time constant is equal to

(A) The value of majority carrier life time
(B) The life time of minority carrier
(C) The diffusion capacitance time constant
(D) Zero

170. To increase the input resistance and decrease the output resistance in negative feedback, the type used is

(A) Voltage Shunt
(B) Current Series
(C) Voltage Series
(D) Current Shunt

171. What is the "power factor"?
(A) Ratio of true power to apparent power
(B) Peak power times 0.707
(C) Sin of the phase difference between E and I
(D) Cos of the phase angle between true power and apparent power

172. A 4-pole three-phase induction motor has a synchronous speed of 25 rev/s. The frequency of the supply to the stator is:
(A) 50 Hz
(B) 100 Hz
(C) 25 Hz
(D) 12.5 Hz

173. The slip speed of an induction motor may be defined as the:
(A) Number of pairs of poles ÷ frequency
(B) Rotor speed – synchronous speed
(C) Rotor speed + synchronous speed
(D) Synchronous speed - rotor speed

174. The compression ratio normally employed for a aspirated C.1. engine with an 'open' or 'Direct injection' combustion chamber is
(A) 8 to 12
(B) 15 to 17
(C) 18 to 20
(D) above 22

175. Which of the following statement is true?
(A) The term 'KNOCK' is used for an identical phenomenon in a S.I and C.I engine.
(B) 'KNOCK' is a term associated with a phenomenon taking place in the early part of combustion in a I.C. Engine and later part of a Combustion in a S.I. Engine
(C) 'KNOCK' is a term associated with a phenomenon taking place in the early part of combustion in a S.I Engine and later part of a Combustion in a C.I. Engine
(D) None of above

176. Of the following lubricating oils for an internal combustion engine, which one is recommended for use during severe winter?
(A) SAE 60
(B) SAE 40
(C) SAE 30
(D) SAE 10

177. A converging diverging nozzle of a supersonic solid propellant rocket is designed for an exit pressure of 35 KPa. The rocket flying at an altitude having an ambient pressure of 28 KPa would cause
(A) a normal sock in the diverging portion of the nozzle
(B) a normal shock at the exit of the nozzle
(C) A normal shock at the throat of the nozzle
(D) no shock

178. For adiabatic expansion with friction through a nozzle, the following remains constant.
(A) Entropy   (B) Static enthalpy
(C) Stagnation enthalpy   (D) Stagnation pressure

179. The performance of a spark ignition engine is influenced by the volatility of the fuel. Thus
(A) Vapour lock tendency is related to front and volatility
(B) Crank case dilution is related to 10% point
(C) Ease of starting is influenced by the 20-70% range
(D) Ease of warm up and acceleration is related to 90% point

180. Which of the following factor(s) does not affect the ignition lag much in S.I. engine
(A) Electrode gap   (B) Initial temperature and pressure
(C) Mixture ratio   (D) Turbulence

181. The air standard diesel cycle is less efficient than the Otto cycle for the
(A) Same compression ratio and heat addition
(B) Same pressure and heat addition
(C) Same R.P.M and cylinder dimensions
(D) Same pressure and compression ratio

182. For maximum discharge 'through a nozzle, the pressure ratio (P_2/P_1) is given by
(A) $\frac{1}{n+1}$ (B) $\frac{2}{n+1}$
(C) $\left(\frac{2}{n+1}\right)^{\frac{n}{n-1}}$ (D) $\left(\frac{2}{n+1}\right)^{\frac{n}{n+1}}$

183. Detonation in SJ. engine can be controlled by

(A) Increasing engine rpm

(B) Retarding the spark

(C) Using too lean or too rich mixture

(D) All of the above

184. Important factors which significantly affect the process of carburetion are

(A) Quality of fuel supplied

(B) Inlet air temperature

(C) Time available for the preparation of mixture

(D) All of above

185. In a cyclic process, the heat transfer are +30J, –50J, –10J and +60J. The net work for the cyclic process is

(A) 30 Nm   (B) 40 Nm

(C) 50Nm   (D) 60Nm

186. An ideal spark ignition engine has a compression ratio of 9. What is its Air standard efficiency if ratio of specific heats is 1.5?

(A) 63%   (B) 67%

(C) 70%   (D) 72%

187. The mechanical efficiency of a single cylinder four stroke engine is 80%. If the frictional power is estimated to be 25 kW, the indicated power will be

(A) 100 kW   (B) 125 kW

(C) 150 kW   (D) 175 kW

188. A single cylinder four stroke engine operating at 80% of mechanical efficiency develops a brake power of 60 kW. The indicated power and the power lost due to friction respectively are

(A) 40 kW and 15 kW   (B) 75 kW and 20 kW

(C) 40 kW and 20 kW   (D) 75 kW and 15 kW

189. Consider the following statements regarding supercharging of Diesel engines:

1. The mechanical efficiency of a supercharged Diesel engine is slightly better than that of naturally aspirated engine
2. There is reduction in smoke in the case of supercharged engine in the overload operation
3. Increased valve overlap is used in supercharged engine

Which of the above statements are correct?

(A) 1,2 and 3   (B) 1 and 2 only

(C) 1 and 3 only   (D) 2 and 3 only

190. In a two-fluid heat exchanger, the inlet and outlet temperatures of the hot fluid are 65°C and 40°C respectively. For the cold fluid, these are 15°C and 43°C. The heat exchanger is a

(A) Parallel flow heat exchanger   (B) Counter flow heat exchanger

(C) Mixed flow heat exchanger   (D) Phase-ehange heat exchanger

191. A single cylinder, 4-stroke cycle engine is fitted with a rope brake. The diameter of the brake wheel is 600 mm and the rope diameter is 26 mm. The dead weight on the brake is 200 N and the spring balance reads 30 N. If the engine runs at 450 rpm what will be the brake power of the engine?

(A) 1.5kW   (B) 2.5kW

(C) 3.5kW   (D) 4.5kW

192. Consider the following statements:

(1) Fuels of higher octane number can be employed at higher compression ratio
(2) In CI engines, brakes specific fuel consumption decreases with increasing load

Which of the above statements is/are correct?

(A) Both 1 and 2   (B) 1 only

(C) 2 only   (D) Neither 1 nor 2

193. A spark ignition engine has a compression ratio of 8 and the volume before compression is 0.9 m³/kg. Net heat interaction per cycle is 1575 kJ/kg. What is the mean effective pressure?

(A) 20kPa   (B) 20bar

(C) 2000 Pa   (D) 2 bar

194. In petrol engine knocking tendency will increase when
   (A) Speed is increased   (B) Speed is decreased
   (C) Fuel-air ratio is made thin   (D) Fuel-air ratio .is made rich

195. Velocity at the throat of a convergent divergent nozzle will be
   (A) Supersonic
   (B) Sonic
   (C) Subsonic
   (D) Depends upon the pressure of the gases

196. In a convergent - divergent nozzle, separation can occur at
   (A) Convergent zone
   (B) Divergent zone
   (C) Only at throat
   (D) Anywhere depending upon the pressure of the gas

197. The specific impulse of a rocket is defined as
   (A) Thrust per unit weight rate of propellant consumed
   (B) Weight of propellant consumed per unit thrust
   (C) Impulse produced 'per unit thrust
   (D) Impulse produced per unit weight rate of propellant consumed

198. The undesirable property of a good coolant is
   (A) It must not absorb the neutrons
   (B) It must be non-corrosive
   (C) It must be non-oxidising and non-toxic
   (D) None of above

199. In a four stroke cycle diesel engine, during suction stroke
   (A) Only air is sucked in
   (B) Only fuel is sucked in
   (C) Mixure of fuel and air is sucked in
   (D) None of the above

200. In air standard Diesel cycle, at fixed Compression rate and fixed value of adiabatic index (γ)

(A) Thermal efficiency increases with increase in heat addition cut off ratio
(B) Thermal efficiency decreases with increase in heat addition cut off ratio
(C) Thermal efficiency remain same with increase in heat addition cut off ratio
(D) None of the above

201. In a shockwave, the flow passes from a

(A) Subsonic to sonic state
(B) Subsonic to a supersonic state
(C) Supersonic to a sonic state
(D) Supersonic to subsonic state

202. A jet of water issues from a nozzle with a velocity of 20m/s and it impinges normally on a flat plate moving away from it at 10m/s. If the cross section area of the jet is $0.01m^2$ and the density of water is taken as $1000kg/m^3$, then the force developed on the plate will be

(A) lOON
(B) 200N
(C) 1000N
(D) 2000N

203. The tendency of detonation is high in engines of larger cylinder diameter because of

(A) Higher intake pressure in larger cylinder
(B) Higher fuel/air ratio in larger cylinder
(C) Flame having to travel longer distance in larger cylinder
(D) Sparks are advanced more in larger cylinder

204. The maximum net specific work obtainable in an ideal Brayton cycle of $T_{max} = 900K$ and is given by $T_{min} = 400K$ is given by

(A) 100Cp
(B) 500Cp
(C) 700Cp
(D) 800Cp

205. Which of the following factors can control detonation in spark ignition engines?

(1) Increasing engine rpm
(2) Advancing spark timing
(3) Making fuel- air ratio very rich

(A) 1, 2 and 3
(B) 1 and 2 only
(C) 2 and 3 only
(D) 1 and 3 only

206. What is the advantage of automatic transmission?

(A) Simple driving control (B) Reduced fuel consumption

(C) both (A) and (B) (D) none of the above

207. Which one of the following element creates reaction in a torque converter?

(A) Impeller (B) Turbine

(C) Stator (D) None of these

208. A torque converter multiplies torque when the stator is free wheeling _____

(A) True (B) False

(C) Both are correct (D) none of these

209. Generally an overdrive is fitted to the _____ only.

(A) Bottom gear only (B) Top gear only

(C) Same gear only (D) None are correct

210. A torque converter has a _____

(A) Slip (B) Stator

(C) camber (D) None of these

211. The vortex flow is maximum when the slip _____

(A) 5% (B) 0.5 %

(C) 20% (D) 100 %

212. The lag of runner behind the impeller is known as __

(A) Runner in (B) Runner out

(C) Slip (D) none of these

213. The shell mounted on the crankshaft is called _____

(A) Runner or driven member (B) Impeller or driving member

(C) Both are correct (D) None are correct

214. A torque converter is a device to_____ the torque while reducing the speed.

(A) Decrease (B) Increase

(C) Same (D) None of these

215. The composition of the drive torus, the driven torus and the torque multiplier is _____

(A) Torque converter fluid coupling (B) Front planetary unit

(C) Rear planetary unit (D) None of the above

216. Chrysler semi-automatic transmission is a _____ speed forward and reverses geared semi-automatic transmission.

(A) Three (B) Four

(C) Five (D) One

217. The fluid drive is one name for _____ to transmit turning effort from the engine to the clutch.

(A) Solid coupling (B) Plasma coupling

(C) Liquid coupling (D) Gas coupling

218. When considerable material must be removed to clean up a cylinder bore, the cylinder should be-

(A) Bored (B) Ground

(C) Glazed (D) Honed

219. For balancing single cylinder engine a counter weight is added to

(A) Piston (B) Piston rings

(C) Crank shaft (D) Gudgeon pin

220. Clutch slippage while clutch is engaged is particularly noticeable--

(A) During idling (B) At low speed

(C) During acceleration (D) During braking

221. Gudgeon pins are made of-

(A) Same material as that of piston (B) Cast iron

(C) Aluminium (D) Hardened and ground steel

222. In case of clutch if the springs become weak, the remedy lies in-

(A) Tightening further the springs (B) Interchanging the springs

(C) Retempering the springs (D) Replacing the springs

223. When not in use, the self discharge of a automobile battery in dry weather is usually-
(A) 0·5 to 1% (B) 4 to 5%
(C) 7 to 7·5% (D) Not more than 10%

224. A heat-treated glass generally used in automobiles upon cracking it bursts into--
(A) Sharp edged fragments (B) Small particles
(C) Does not disintegrate (D) Either of the above

225. Tar sports from a car body are removed by
(A) Washing with water (B) Soft sponge
(C) Rubber brush and water (D) Special cleaning agents

226. If the water level in engine is maintained low, the likely consequence could be-
(A) Piston seizure (B) Engine knocking
(C) Bearing deterioration (D) All of the above

227. If the oil level in the oil pan of the engine is maintained above the gauge mark, the likely damage it may cause is-
(A) Engine- fuming (B) Carbon deposits
(C) Blue colour in exhaust (D) All of the above

228. The minimum cranking speed in petrol engines is-
(A) Equal to the normal operating speed
(B) Half of operating speed
(C) One-fourth of operating speed
(D) 60-80 rpm

229. While starting a engine the starter pinion meshes with-
(A) Clutch (B) Propeller shaft
(C) Engine flywheel ring gear (D) Gears in differential

230. Differential gear box oil is usually renewed after-
   (A) 1000   (B) 2500 km
   (C) 6000 km   (D) 2500-6000 km

231. Which one of the following is not a part of the hydraulic braking system ?
   (A) Master cylinder   (B) Wheel cylinder
   (C) Brake pedal   (D) Steering mechanism

232. The efficiency of hydraulic braking system is-
   (A) About 90 percent   (B) 60 - 70 percent
   (C) 50 - 60 percent   (D) 40 - 50 percent

233. The reaction time of an average driver from recognizing an obstacle is taken as-
   (A) 0·5 to 1·7 seconds   (B) 2 to 3·5 seconds
   (C) 3·5 to 4·5 seconds   (D) 4·5 to 7·0 seconds

234. Driving wheel bearings in automobiles are always-
   (A) Bush bearings   (B) Clad metal bearings
   (C) Antifriction bearings   (D) Either (A) or (B)

235. To avoid chances of misalignment the bearing generally used is-
   (A) Radial bearing   (B) Axial bearing
   (C) Taper roller bearing   (D) Self aligning bearing

236. In case of tractors the springs provided on rear wheels are-
   (A) Leaf type
   (B) Helical
   (C) Combination of helical and leaf spring
   (D) No spring is provided

237. An automobile tyre will wear rapidly in case-
   (A) It is overloaded   (B) It is misaligned
   (C) It is incorrectly inflated   (D) Any of the above

238. 1000 mm diameter is generally used on-
(A) Trucks (B) Scooters
(C) Mopeds (D) Motorcycles

239. Which tractor has an air cooled engine?
(A) Ford (B) HMT
(C) Eicher (D) Ferguson

240. In automobile the probable cause for ineffective brakes could be-
(A) Grease on lining (B) Excessive lining wear
(C) Drums scored (D) Any of the above

241. In transmission system if the reverse gear slips out, the probable cause could be-
(A) Reverse sliding gear teeth worn out
(B) Main shaft splines worn
(C) Reverse idler gear teeth worn
(D) Any of the above

242. The turbulence in diesel engine ensures to
(A) Reduce the engine vibrations
(B) Increase the volumetric efficiency
(C) Increase the compression pressure
(D) Brings the fuel quickly in contact with air

243. The size of the engine intake valve is
(A) Same as that of exhaust valve
(B) Smaller than that of exhaust valve
(C) Larger than that of exhaust valve
(D) Does not depend upon the size of the exhaust valve

244. Mixing of fuel and air in case of diesel engine occurs in-
(A) Fuel pump (B) Inlet manifold
(C) Engine cylinder (D) Injector

245. Which instrument is used to measure specific gravity?
(A) Thermometer
(B) Hygrometer
(C) Hydrometer
(D) Anemometer

246. Engine starter motor is-
(A) Single phase A.C. motor
(B) D.C. series motor
(C) D.C. shunt motor
(D) D.C. compound motor

247. Exhaust gas leakage into the cooling system is most likely to be due to defective-
(A) Cylinder head gasket
(C) Manifold gasket
(C) Water pump
(D) Radiator

248. Acid used in Automobile battery is
(A) Hydrochloric acid
(B) Hydtofluoric acid
(C) Dilute nitric acid
(D) Sulphuric acid

249. The part of the vehicle holds the passengers and the cargo to be transported is known as-
(A) Chassis
(B) Hull
(C) Aft
(D) Sedan

250. Which one of the following is not a part of the chassis?
(A) Wheels
(B) Front axle
(C) Steering system
(D) Passenger seats

251. Air resistance to a car at 20 kmph is R. The air resistance at 40 kmph would be-
(A) R
(B) 2R
(C) 4R
(D) R^2

252. In commercial vehicle layouts engine is located forward rear or under floor mainly to--
(A) Better utiliZe the space
(B) Increase fuel economy
(C) Have better weight distribution
(D) Reduce the weight of chassis

253. In a automobile engine the temperature of the piston will be more at-
(A) The crown of the piston
(B) The skirt of the piston
(C) The piston walls
(D) The piston pin

254. As the number of cylinders on multi-cylinder engines increase the power to weight ratio--
(A) Remains the same
(B) Decreases
(C) Increases
(D) Becomes zero

255. In a opposed cylinder engines has
(A) One crankshaft and one camshaft
(B) One crankshaft and two camshaft
(C) Two crankshaft and two camshaft
(D) Two crankshaft and four camshaft

256. The number of exhaust manifolds in a V -8 engine-
(A) One valve
(B) Two
(C) Four
(D) Eight

257. Diesel engine are generally preferred to road transport these days because of low-
(A) Initial cost
(B) Manufacturing cost
(C) Prime cost
(D) Operating cost

258. Engine dynamo is usually driven by-
(A) Chain drive
(B) Gear drive
(C) Flat belt drive
(D) V -belt drive

259. In a four-stroke engine, for the combustion of one litre of fuel, the volume of air required would be approximately _____
(A) 1 m^3
(B) 2m^3
(C) $5\text{-}7 \text{ m}^3$
(D) $9\text{-}10 \text{ m}^3$

260. The boiling point of diesel fuel may be expected to be in the range _____
(A) 70° to 100° C
(B) 100° to 112° C
(C) 125° to 135° C
(D) 230° to 375° C

261. In a petrol engine. the gas which does not burn and passes out without transformation is _____

(A) Oxygen   (B) Carbon dioxide

(C) Nitrogen   (D) Carbon monoxide

262. In force feed lubrication system the device used to guard against excessive oil pressure is known as _____

(A) Release chamber   (B) Balancer

(C) Relief valve   (D) Stop valve

263. The percentage of heat released from fuel are mixture, in a internal combustion engine which is converted into useful work is roughly _____

(A) 10 %   (B) 15-20 %

(C) 20-25 %   (D) 35-45 %

264. The function of oil scraper rings is to _____

(A) Retain compression   (B) Lubricate cylinder walls

(C) Maintain vacuum   (D) Cast iron liners

265. Deposit of carbon in the exhaust system _____

(A) Will increase back pressure

(B) Will reduce back pressure

(C) Will have no effect on back pressure

(D) Will result in black smoke

266. About 5% of fuel in the lubricating oil lessen the ability to lubricate by about _____

(A) 1%   (B) 5%

(C) 10%   (D) 30%

267. Maximum danger of oil dilution by fuel in a engine occurs when _____

(A) Engine is running at over load

(B) Choke circuit is cut in for too long a period

(C) Engine is running at rated load

(D) Engine is running on lean mixture

268. In force feed lubrication system the device used to guard against excessive oil pressure is known as _____
(A) Release chamber
(B) Balancer
(C) Relief valve
(D) Stop valve

269. Poor compression in a two stroke engine cannot be due to _____
(A) Leaky valves
(B) Broken piston rings
(C) Leaking cylinder head gasket
(D) Poor fits between pistons, rings and cylinders

270. The king pin inclination is usually _____
(A) Less than $\frac{1}{2}^\circ$
(B) Between 1° and 2°
(C) Between 2° and 5°
(D) More than 7°

271. As a result of a collision one frame side member is set back in relation to the other side member, when the frame is set in this way it is said to be
(A) Twisted
(B) Lozenged
(C) Torsioned
(D) Extended

272. The stroke is increased when the _____
(A) Piston in shortened
(B) Connecting rod is lengthened
(C) Crankshaft through is lengthened
(D) Piston pin is moved nearer to the crankshaft

273. The engine component which carries the engine over its non-working stroke is the _____
(A) Piston
(B) Flywheel
(C) Crankshaft
(D) Connecting rod

274. To ensure combustion occurs at the correct time when the engine speed is increased, the spark should be __
(A) Advanced
(B) Retarded
(C) Less intense
(D) More intense

275. The pressure in an engine cylinder is less than atmospheric pressure when the engine is performing the stroke called _____

(A) Suction   (B) Compression

(C) Power   (D) Exhaust

276. An engine has a clearance volume 100 cm^3 and swept volume of 800 cm^3. The compression ratio is _____

(A) 7: 1   (B) 8:1

(C) 9:1   (D) 10:1

277. Water circulation in a thermo-syphon cooling system is caused by _____

(A) Conduction currents

(B) A belt driven water impeller

(C) A gear driven water pump

(D) The change in density. of the water

278. The part of an ignition system which transforms the voltage from 12 V to more than 9000 V is the _____

(A) Coil   (B) Distributor

(C) Capacitor   (D) Contact breaker

279. There are Rs _____ compensation for grievous hurt.

(A) 1000   (B) 10000

(C) 5000   (D) 20000

280. The scooters, motor cycles and mopeds contain the type of chassis as _____

(A) Tubular section   (B) Integral frame

(C) Box section   (D) All of above

281. The bulb is fitted on the axle shaft with the help of _____

(A) Ball bearing   (B) Taper roller

(C) Both (a) and (b)   (D) None of these

282. What is the remedy of the cause "crankshaft woodruff key loose in flywheel hub"?

(A) Fill up tank   (B) Replace with new key

(C) Clean the same   (D) None of these

283. What is the remedy of the cause "Gummed up rings"?
(A) Clean it
(B) Clean the ring groove and use new piston rings
(C) Overhaul the carburettor
(D) All of these

284. To control the depth of implement to safe limit which of the following methods are employed?
(A) Power Control   (B) Hydraulic depth control
(C) Speed Control   (D) None of these

285. Tappet clearance for 4-stroke engine is usually kept at _____ for exhaust.
(A) 0·003"   (B) 0·004"
(C) 0·005"   (D) 0·008"

286. Crankshaft thumping may originate from which one, of the following cause
(A) Excessive main bearing clearance
(B) Low crankshaft axial play
(C) Higher oil pressure
(D) All are correct

287. The noises due to connecting rod are usually _____ intense than these originated by main bearings.
(A) More   (B) Less
(C) Same   (D) None

288. A reading of what specific gravity indicate a fully charged condition
(A) 2.00 to 3.00   (B) 1.220 to 1.230
(C) 1.111 to 2.222   (D) None of these

289. The spark plugs gap for making MICO or KLG is __
(A) 0.76nun   (B) 1.0 mm
(C) 0.11 mm   (D) None of these

290. The normal oil pressure in a new or overhauled engine must be _____ kg/cm^2
(A) 1 to 5   (B) 2.5 to 3
(C) 3 to 5   (D) 5 to 9

291. The candle power of glove compartment light is _____
(A) 1 (B) 3
(C) 1.5 (D) 6

292. What is the maximum intensity of upper beam?
(A) 1 cp (B) 75000 cp
(C) 6 cp (D) 3 cp

293. Vapour lock is
(A) Seizure of supply of fuel in a diesel engine
(B) Serious restriction to the supply of fuel due to excessively rapid formation of vapour in SI engines
(C) Blocking of carburettor jets due to impurities
(D) Formation of vapours of lubricating oil due to high temperatures

294. The speed of sound in an ideal gas varies directly as its
(A) Modulus of elasticity (B) Temperature
(C) Absolute temperature (D) Pressure

295. The power output from a spark ignition engine is varied by
(A) Changing the ignition timing
(B) Regulating the amount of air inducted
(C) Regulating the amount of air-fuel mixture
(D) Regulating the amount of fuel

296. In air-standard Otto cycle the terminal pressures at the end of compression, heat release and expansion are respectively P_2, P_3 and P_4. If the corresponding values are P'_2, P'_3 and P'_4 taking into account the effect of variable specific heat and dissociation of the working fluid then
(A) $P_2 < P'_2$ and $P_3 > P'_3$
(B) $P_3 < P'_3$ and $P_4 > P'_4$
(C) $P_2 > P'_2$ and $P_3 > P'_3$ and $P_4 < P'_4$
(D) $P_2 > P'_2$ and $P_3 > P'_3$

297. The usual order of the thermal efficiency of spark ignition (SI) and compression ignition(CI) engines and gas turbines (GT) is
(A) SI > GT > CI
(B) CI > SI > GT
(C) CI > GT > SI
(D) SI > CI > GT

298. The performance of a spark ignition engine is influenced by the volatility of the fuel. Thus
(A) Vapour lock tendency is related to front and volatility
(B) Crack case dilution is related to 10 % point
(C) Ease of staring is influenced by the 20-70 % range
(D) Ease of warm up and acceleration is related to 90 % point

299. Increasing the compression ratio of a petrol engine from 5 to 6 changes the air standard efficiency by
(A) 20%
(B) 8%
(C) 25%
(D) -20%

300. Air standard efficiency of an otto cycle depends on
(A) Pressure ratio
(B) Temperature
(C) Absolute temperature
(D) Pressure