61/2019

Question Booklet
Alpha Code

A

Question Booklet
Serial Number

Total Number of questions : 100	Time : 75 Minutes
Maximum Marks : 100	

INSTRUCTIONS TO CANDIDATES

A

1. The question paper will be given in the form of a Question Booklet. There will be four versions of question booklets with question booklet alpha code viz.A,B,C & D.

2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the question booklet.

3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.

4. If you get a question booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.

5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your question booklet is unnumbered, please get it replaced by new question booklet with same alpha code.

6. The question booklet will be sealed at the middle of the right margin. Candidate should not open the question booklet, until the indication is given to start answering.

7. Immediately after the commencement of the examination, the candidate should check that the question booklet supplied to him contains all the 100 questions in serial order. The question booklet does not have unprinted or torn or missing pages and if so, he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.

8. A blank sheet of paper is attached to the question booklet. This may be used for rough work.

9. **Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.**

10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball Point Pen in the OMR Answer Sheet.

11. **Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.**

12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.

13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

DO NOT WRITE HERE

001. Second law of thermodynamics defines

   (A)   Heat   (B)   Work

   (C)   Enthalpy   (D)   Entropy

002. In a throttling process

   (A)   Volume remains constant   (B)   Pressure remains constant

   (C)   Temperature remains constant   (D)   All the three remain constant

003. Which of the following cycles has the highest efficiency?

   (A)   Otto cycle   (B)   Carnot cycle

   (C)   Stirling cycle   (D)   Joule cycle

004. The value of universal gas constant (Ru) is

   (A)   8314 J/kgK   (B)   8.314 J/kgK

   (C)   83.14 J/kgK   (D)   831.4 J/kgK

005. For a reversible adiabatic process, change in entropy is

   (A)   Minimum   (B)   Maximum

   (C)   Zero   (D)   Unpredictable

006. An isothermal process is governed by

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

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

007. Which of the following processes is not associated with Diesel cycle?

   (A)   Constant volume   (B)   Constant pressure

   (C)   Adiabatic   (D)   Isothermal

008. Morse test is conducted only on

   (A)   Variable speed engine   (B)   Low power engine

   (C)   Multi-cylinder engine   (D)   Water cooled engine

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009. Which of the following is the extensive property of the system?

   (A) Volume   (B) Pressure

   (C) Temperature   (D) Density

010. In a system, neither mass nor energy is allowed to cross the boundary of the system which is known as

   (A) Isentropic system   (B) Isolated system

   (C) Isothermal system   (D) Closed system

011. Unit of refrigeration is expressed in

   (A) Kilo joule   (B) Kilo watt

   (C) Ton   (D) Kilo pascal

012. Which part of the vapour compression refrigeration cycle produces the refrigeration effect?

   (A) Compressor   (B) Condenser

   (C) Evaporator   (D) None of the above

013. The wet bulb temperature is a measure of

   (A) Relative humidity   (B) Absolute humidity

   (C) Specific humidity   (D) None of the above

014. Brine is always used as a secondary refrigerant in

   (A) Milk chilling plants   (B) Cold storage plants

   (C) Central air-conditioning plants (D) Ice plants

015. Mass of water vapour present in 1 kg of dry air is known as

   (A) Relative humidity   (B) Absolute humidity

   (C) Humidity ratio   (D) Percentage humidity

016. Thermal conductivity is expressed as

   (A) W/mK   (B) W/m^2K

   (C) W/hmK   (D) W/h^2m^2K

017. Stefan Boltzmann law is applicable for heat transfer by

(A) Conduction

(B) Convection

(C) Radiation

(D) Conduction and radiation combined

018. If a body transmits all the radiations incident on it, then it is known as a

(A) Black body

(B) White body

(C) Grey body

(D) Transparent body

019. Overall coefficient of heat transfer is used in case of

(A) Conduction

(B) Convection

(C) Radiation

(D) Conduction & convection

020. The heat of Sun reaches Earth according to

(A) Conduction

(B) Convection

(C) Radiation

(D) All of the above

021. Fluid is a substance which offers no resistance to change of

(A) Pressure

(B) Flow

(C) Shape

(D) Volume

022. Surface tension has the unit of

(A) N/m^2

(B) N/m

(C) N

(D) Nm

023. The ratio of absolute viscosity to mass density is known as

(A) Kinematic viscosity

(B) Specific viscosity

(C) Viscosity index

(D) Coefficient of viscosity

024. The centre of gravity of the volume of the liquid displaced by an immersed body is called

(A) Meta-centre

(B) Centre of buoyancy

(C) Centre of pressure

(D) Centre of gravity

A

025. Manometer is used to measure

    (A)   Velocity of the fluid   (B)   Discharge of the fluid

    (C)   Density of the fluid   (D)   Pressure of the fluid

026. Bernoulli's equation deals with the law of conservation of

    (A)   Mass   (B)   Momentum

    (C)   Energy   (D)   Work

027. Maximum efficiency of transmission of power through a pipe is

    (A)   100%   (B)   33.3%

    (C)   50%   (D)   66.6%

028. Centrifugal pump is started with its delivery valve

    (A)   Kept fully closed   (B)   Kept fully open

    (C)   Kept 50% open   (D)   Irrespective of any position

029. For small discharge at high pressure, following pump is preferred

    (A)   Centrifugal   (B)   Axial flow

    (C)   Mixed flow   (D)   Reciprocating

030. Series operation of a centrifugal pump results in

    (A)   High head   (B)   High discharge

    (C)   High speed   (D)   Reduced power consumption

031. The pump to be used for pumping highly viscous fluids belongs to

    (A)   Centrifugal pump   (B)   Plunger pump

    (C)   Screw pump   (D)   Turbine pump

032. Slip is a term associated with

    (A)   Centrifugal pump   (B)   Submersible pump

    (C)   Reciprocating pump   (D)   Jet pump

033. Cavitation will take place if the pressure of a flowing fluid at any point is

    (A)   More than the vapour pressure of the liquid

    (B)   Less than the vapour pressure of the liquid

    (C)   Equal to the vapour pressure of the liquid

    (D)   None of the above

034. Air vessel in reciprocating pump is used to

    (A)   Smoothen flow   (B)   Reduce acceleration to minimum

    (C)   Increase pump efficiency   (D)   Increase pump head

035. Jet pumps are often used in process industry for their

    (A)   High efficiency   (B)   Large capacity

    (C)   Easy maintenance   (D)   None of the above

036. Which pump would you select for pumping sewage?

    (A)   Reciprocating pump   (B)   Open impeller centrifugal pump

    (C)   Multistage centrifugal pump   (D)   Screw pump

037. Pelton wheel turbine is

    (A)   Axial flow impulse turbine   (B)   Inward flow impulse turbine

    (C)   Outward flow impulse turbine   (D)   Tangential flow impule turbine

038. A draft tube is used with

    (A)   Impulse turbine   (B)   Pelton wheel turbine

    (C)   Reaction turbine   (D)   Axial turbine pumps

039. A **material** capable of absorbing large amount of energy before fracture is known as

    (A)   Ductility   (B)   Toughness

    (C)   Resilience   (D)   Plasticity

040. The ratio of direct stress to volumetric strain is known as

    (A)   Bulk modulus   (B)   Modulus of rigidity

    (C)   Poisson's ratio   (D)   Modulus of elasticity

041. When a close coiled spring is subjected to axial load, its axial deflection is directly proportional to

(A) Diameter of the wire

(B) Modulus of rigidity of the spring material

(C) Modulus of elasticity of the spring material

(D) Mean radius of the coil of the spring

042. The ratio of limiting friction to normal reaction between two bodies

(A) Static friction (B) Dynamic friction

(C) Coefficient of friction (D) Limiting friction

043. Moment of inertia of an area is always least with respect to

(A) Bottom-most axis (B) Radius of gyration

(C) Central axis (D) Centroidal axis

044. A cantilever beam of length 'l' carries a point load 'w' at the free end. The shear force diagram seems to be in the shape as

(A) A triangle (B) A rectangle

(C) Two equal and opposite triangles (D) Two equal and opposite rectangles

045. Strength of a beam is directly proportional to its

(A) Length (B) Moment of inertia

(C) Depth (D) Width

046. Hoop stress in thin walled cylinder is

(A) Compressive stress (B) Radial stress

(C) Circumferential tensile stress (D) Longitudinal stress

047. If d = diameter of the rivets and t = thickness of the plates to be riveted, then Unwin's formula can be expressed as

(A) $d = 4\sqrt{t}$ (B) $d = 6\sqrt{t}$

(C) $d = 8\sqrt{t}$ (D) $d = 2\sqrt{t}$

048. A long column fails by

(A) Crushing   (B) Tension

(C) Shearing   (D) Buckling

049. Cam size depends upon

(A) Base circle   (B) Pitch circle

(C) Prime circle   (D) Outer circle

050. The ratio of number of teeth and pitch circle diameter is called

(A) Pitch   (B) Circular pitch

(C) Diametral pitch   (D) Module

051. The quality of a governor can be judged by its

(A) Stability   (B) Sensitivity

(C) Effort and power   (D) None of the above

052. In a flat belt drive, the belt is subjected to maximum tension 'T' and a centrifugal tension Tc. For maximum power transmission

(A) T = Tc   (B) T = 2Tc

(C) T = 3Tc   (D) T = 4Tc

053. Maximum efficiency of a Screw jack is a function of

(A) Angle of friction   (B) Load lifted

(C) Helix angle   (D) Effort

054. Pure iron is the structure of

(A) Ferrite   (B) Pearlite

(C) Austenite   (D) Ferrite and pearlite

055. The crystal structure of a gamma iron is

(A) BCC   (B) FCC

(C) HCP   (D) Cubic structure

056. Cast iron is characterised by minimum of following percentage of carbon

(A) 0.2%   (B) 0.8%

(C) 1.3%   (D) 2%

057. Balls for ball bearings are made of

(A) Cast iron

(B) Mild steel

(C) Stainless steel

(D) Carbon-chrome steel

058. Which of the following is used for bearing liner?

(A) Babbit metal

(B) Gun metal

(C) Bronze

(D) Brass

059. The product of Coupola furnace is called

(A) Pig iron

(B) Cast iron

(C) Mild steel

(D) Wrought iron

060. The material used for coating the electrode is called

(A) Binder

(B) Slag

(C) Flux

(D) Protective layer

061. Grey cast iron is best welded by

(A) TIG Welding

(B) MIG Welding

(C) Arc Welding

(D) Oxy-acetylene Welding

062. The following welding process uses consumable electrode

(A) TIG Welding

(B) MIG Welding

(C) Thermit Welding

(D) Gas Welding

063. Which of the following is not a heat treatment process?

(A) Austempering

(B) Martempering

(C) Parkerizing

(D) Cyaniding

064. Slag inclusion in casting is a

(A) Surface defect

(B) Internal defect

(C) Crack

(D) Notch

065. Seamless tubes are made by

(A) Piercing

(B) Extrusion

(C) Cold rolling

(D) Plug rolling

066. Lathe bed is usually made of

   (A) Structural steel   (B) Stainless steel

   (C) Cast iron   (D) Mild steel

067. Crater wear takes place in a single point cutting tool at

   (A) Flank   (B) Side rake

   (C) Face   (D) Tip

068. The arbor of the milling machine is used to hold

   (A) Cutting tool   (B) Spindle

   (C) Work piece   (D) Mandrel

069. Basic tool in work study is

   (A) Graph paper   (B) Process chart

   (C) Planning chart   (D) Stop watch

070. What does symbol ☐ imply in work study?

   (A) Operation   (B) Inspection

   (C) Transport   (D) Storage

071. Gantt charts are used for

   (A) Forecasting sales   (B) Production schedule

   (C) Scheduling and Routing   (D) Linear Programming

072. Acceptance sampling is widely used in

   (A) Batch production   (B) Job production

   (C) Mass production   (D) All of the above

073. CPM is a technique which depends on

   (A) Time   (B) Event

   (C) Activity   (D) Work

074. The probability distribution of activity times in PERT follows the following distribution:

   (A) Normal   (B) Beta

   (C) Binomial   (D) Exponential

075. Simplex method is used for

   (A)   Linear programming
   (B)   Queuing theory
   (C)   Network analysis
   (D)   Value Engineering

076. Father of time study is

   (A)   H.L. Gantt
   (B)   F.W. Taylor
   (C)   F.B. Gilberth
   (D)   R.M. Barnes

077. ABC analysis deals with which of the following?

   (A)   Controlling inventory costs money
   (B)   Flow of material
   (C)   Ordering schedule of job
   (D)   None of the above

078. Bar charts are suitable for

   (A)   Large projects
   (B)   Major projects
   (C)   Minor projects
   (D)   None of the above

079. Lead screw with half nuts in a lathe free to rotate in both directions has

   (A)   Whitworth threads
   (B)   V-threads
   (C)   Buttress threads
   (D)   ACME threads

080. From the following, which term is connected with shaping machine?

   (A)   Gear cutting mechanism
   (B)   Quick return mechanism
   (C)   Lead screw mechanism
   (D)   Half nut mechanism

081. Heat and work are

   (A)   Point functions
   (B)   Path functions
   (C)   Intensive properties
   (D)   Extensive properties

082. A perfect gas at 27°C is heated at constant pressure till its volume is doubled. The final temperature is

   (A) 54°C
   (B) 108°C
   (C) 327°C
   (D) 600°C

083. In an isothermal process, the internal energy of gas molecules

   (A)   Increases
   (B)   Decreases
   (C)   May increase or decrease
   (D)   Remains constant

084. The operation of forcing additional air under pressure in the engine cylinder is known as

(A) Supercharging   (B) Scavenging

(C) Turbulence   (D) Pre-ignition

085. Ignition quality of petrol is expressed by

(A) Octane number   (B) Cetane number

(C) Calorific value   (D) Self-ignition temperature

086. A two-stroke engine is usually identified by

(A) Size of flywheel   (B) Weight of engine

(C) Type of lubrication system   (D) Absence of valves

087. Gas turbine works on

(A) Carnot cycle   (B) Brayton cycle

(C) Rankine cycle   (D) Erricson cycle

088. Critical temperature is the temperature above which

(A) A gas will immediately liquefy   (B) A gas will never liquefy

(C) Water will evaporate   (D) Water will never evaporate

089. Presence of moisture in a refrigerant affects the working of

(A) Compressor   (B) Condenser

(C) Expansion valve   (D) Evaporator

090. Density of water is maximum at

(A) 0°C   (B) 0°K

(C) 100°C   (D) 4°C

091. The stress-strain relation of the Newtonian fluid is

(A) Linear   (B) Parabolic

(C) Hyperbolic   (D) Inverse type

092. Power required to drive a centrifugal pump is proportional to

 (A) Speed (N) (B) N^2

 (C) N^3 (D) N^4

093. Indicator diagram of reciprocating pump is a graph between

 (A) Flow vs swept volume

 (B) Pressure in cylinder vs swept volume

 (C) Flow vs speed

 (D) Pressure vs speed

094. Impulse turbine is used for

 (A) High head (B) Low head

 (C) Medium head (D) High flow

095. The property of a material which allows it to be drawn into small section is called

 (A) Plasticity (B) Elasticity

 (C) Ductility (D) Malleability

096. Gear box of a car utilises

 (A) Simple train (B) Complex train

 (C) Epicyclic gears (D) Compound train

097. Spring index is

 (A) Indication of quality of spring

 (B) Load required to produce unit deflection

 (C) Its capability of storing energy

 (D) Ratio of coil diameter to wire diameter

098. Pearlite is a combination of

    (A)   Cementite and gamma iron   (B)   Ferrite and cementite

    (C)   Ferrite and austenite   (D)   Ferrite and iron graphite

099. The most commonly used flame in gas welding is

    (A)   Neutral   (B)   Oxidising

    (C)   Carburising   (D)   All of the above

100. Work study is done with the help of

    (A)   Process chart   (B)   Material handling

    (C)   Stop watch   (D)   All of the above

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SPACE FOR ROUGH WORK