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MPSC JE

Previous Year Paper
(Mechanical)
22 Apr, 2023



DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

QUESTION BOOKLET

SERIES IV

Subjects : General English, General Knowledge, Mechanical Engineering

BOOKLET SERIAL NO.

5036

Marks : 300

Time : 2½ hours

Read the following instructions carefully before you begin to answer the questions.

INSTRUCTIONS TO CANDIDATES

- This booklet contains **150 questions** to be answered in a separate OMR Answer Sheet using Black Ball Pen in following three parts:
Part-A-General English : 25 questions, Part-B-General Knowledge : 25 questions, Part-C-Mechanical Engineering : 100 questions
- All Questions are compulsory.
- You will be supplied the Answer sheet separately by the invigilator. You must complete the details of particulars asked for.
- Answers must be shown by completely blackening the corresponding circles in the Answer Sheet against the relevant question number by Black Ball Pen. OMR Answer Sheet without marking series/double series marking shall not be evaluated.

Example :

Supposing the following question is asked :-

The Capital of Meghalaya is-

- A. Guwahati
- B. Kohima
- C. Shillong
- D. Delhi

You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :-

A B C D

In the above illustration, if your chosen response is alternative C i.e. Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ball Point Pen only as below :-

A B C D

WHICH IS THE ONLY CORRECT METHOD OF ANSWERING

- Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.
- There will NOT be any negative marking for wrong answers.
- The Answer Sheet must be handed over to the invigilator before you leave the Examination Hall.
- No rough work is to be done on the Answer Sheet. Space for rough work has been provided in the question booklet.

PART - A - GENERAL ENGLISH

Marks :50

Each question carries 2 marks :

Directions : (Q.NO.1-5), In these questions, out of four alternatives given, choose the one which best expresses the opposite meaning of the underlined word.

1. He walked in ungainly strides.
a) Graceful b) Quick
c) Short d) Awkward
2. The speaker had a superficial knowledge of the subject.
a) Artificial b) Fictitious
c) Overt d) Deep
3. This officer is noted for his zeal.
a) Indifference b) Intolerance
c) Inefficiency d) Immaturity
4. As an officer, he was callous to his subordinate staff.
a) Courteous b) Considerate
c) Helpful d) Tolerant
5. His transfer order was revoked yesterday.
a) Issued b) Approved
c) Proposed d) Prepared

Directions : (Q.NO.6-10), In these questions, out of four alternatives given, choose the one which best expresses the meaning of the underlined word.

6. We were taken aback at the fulsome praise heaped upon our former enemy.
a) Elaborated b) Exorbitant
c) Excessive d) Extravagant
7. He gave an impromptu speech on the occasion.
a) Eloquently
b) Without preparation
c) Without enthusiasm
d) Forcefully
8. As it was her first time swimming in the sea, her apprehension was understandable.
a) Eagerness b) Fear
c) Hesitation d) Excitement

9. The perpetual noise made it impossible for the students to concentrate on their work.
a) Irritating b) Unlimited
c) Recurrent d) Constant

10. There is abundant supply of water for the crops.
a) Considerable b) Adequate
c) Plentiful d) Sufficient

Directions : (Q.NO.11-15), In these questions, some of the sentences have errors and some have none. Find out which part of a sentence a, b, c, d has an error and select that part as an answer. If there is no error, then 'd' is the answer.

11. Gold (a) / is (b) / an useful metal (c) / No error (d).
12. The Mahatma Gandhi (a) / was also (b) / called Bapu (c) / No error (d).
13. The Taj Mahal (a) / is a beautiful (b) / monument in Agra (c) / No error (d).
14. Will you please give me (a) / little milk (b) / for my cat (c) / No error (d).
15. My mother forbade my sister (a) / to go to theatre (b) / at night (c) / No error (d).

Directions : (Q.NO.16-25), In the following questions, sentences are given with blanks to be filled with appropriate and suitable word/words. Four alternatives are suggested for each question. Choose the correct alternative out of the four.

16. The employees' strike last week was a minor _____ for the company.
a) Set down b) Set about
c) Set up d) Set back
17. We still have to _____ the finer details about our upcoming trip.
a) Iron out b) Iron in
c) Iron on d) Iron back

18. Due to financial problems, the Company had to ____ fifty employees.

- a) Lay out
- b) Lay off
- c) Lay over
- d) Lay back

19. Even though he was tired, he ____.

- a) Kept going
- b) Kept up
- c) Kept out
- d) Kept in

20. I keep all my ____ papers under lock and key.

- a) Required
- b) Necessary
- c) Useful
- d) Confidential

21. He is very keen ____ going abroad for his studies.

- a) On
- b) For
- c) Over
- d) At

22. His approach to work is so ____ that none of his colleagues consider him dependable.

- a) Low
- b) Casual
- c) Common
- d) Uninteresting

23. We do not know what ____ him to commit this crime.

- a) Prompted
- b) Excited
- c) Roused
- d) Attracted

24. The country needs a ____ government to tackle the challenges it faces today.

- a) Stagnant
- b) Stable
- c) Sustained
- d) Stationary

25. Jack felt as if he had been ____ when he lost his job.

- a) Let down
- b) Let on
- c) Let over
- d) Let up

PART - B - GENERAL KNOWLEDGE

Marks : 50

Each question carries 2 marks :

26. Amit Panghal is a famous personality associated with which sports ?

- a) Archery
- b) Boxing
- c) Wrestling
- d) Tennis

27. Yash Bharti is the highest award of which Indian state / UT ?

- a) Madhya Pradesh
- b) Odisha
- c) Uttar Pradesh
- d) Punjab

28. Kholongchhu is the first joint venture hydro-electric project between India and which country ?

- a) Singapore
- b) Bangladesh
- c) Bhutan
- d) Myanmar

29. Who became the first Tribal President of India ?

- a) Ruby Hembrom
- b) Droupadi Murmu
- c) Mayawati
- d) Rose Millian Bathew Kharbuli

30. Who is the owner of Amazon ?

- a) Bill Gates
- b) Jeff Bezos
- c) Jack Dorsey
- d) Jan Koum

31. After the death of Aurangzeb, which of the following Mughals abolish Jazia tax in 1712 ?

- a) Jahandar Shah
- b) Rafi ud Darajat
- c) Mohammad Shah Rangila
- d) Farrukhsiyar

32. Which movement was started by Mahatma Gandhi on March 12, 1930 ?

- a) Khilafat Movement
- b) Non-cooperation Movement
- c) Civil Disobedience Movement
- d) Quit India Movement

33. India's first marine national park is located in

- a) The Gulf of Kutch
- b) Bay of Bengal
- c) Arabian Sea
- d) The Gulf of Khambhat

34. The highest Glacial Lake of India located at the height of 17745 feet in Garhwal Himalaya is

- a) Devtal
- b) Roop Kund
- c) Kedartal
- d) Homkund

35. The largest Port of India is

- a) Kandla Port, Gujarat
- b) Okha Port, Gujarat
- c) Mumbai Port
- d) Kolkata Port

36. In which year UNESCO added Nokrek National Park to its list of Biosphere Reserves?

- a) 1999
- b) 2003
- c) 2005
- d) 2009

37. The study of the universe is called

- a) Astrology
- b) Astronomy
- c) Cosmology
- d) Universology

38. Which company owns Instagram now ?

- a) Orkut
- b) Snapchat
- c) Meta Platform
- d) Tik Tok

39. In which year Forest Conservation Act was passed in India ?

- a) 1986
- b) 2003
- c) 1980
- d) 1999

40. Friction can be reduced by changing from

- a) Rolling to sliding
- b) Sliding to rolling
- c) Dynamic to static
- d) Standing to running

41. Tsunami are not caused by

- a) Hurricanes
- b) Earthquakes
- c) Under sea landslide
- d) Volcanic eruption

42. Kaziranga National Park is located along which Indian river ?

- a) Ganga
- b) Dhansiri
- c) Brahmaputra
- d) Barak

43. Which of the following organization governs international trade ?

- a) FAO
- b) IMF
- c) UNO
- d) WTO

44. Full form of GST

- a) Goods and Supply Tax
- b) Government Sale Tax
- c) Goods and Service Tax
- d) General Sales Tax

45. Which crop is also known as the "Golden Fiber" ?

- a) Silk
- b) Jute
- c) Nylon
- d) Cotton

46. Which among the following is not an ex-situ site of preservation of Biodiversity ?

- a) Home garden
- b) Seed bank
- c) Botanical garden
- d) Marine National Park

47. India's only gold field is located in the state of Karnataka at

- a) Zawar, Rajasthan
- b) Kolar, Karnataka
- c) Digboi, Assam
- d) Raniganj, West Bengal

48. Jallianwala Bagh Massacre in Amritsar took place on

- a) March 13, 1919
- b) April 13, 1919
- c) May 13, 1919
- d) June 13, 1919

49. Rajiv Gandhi Environment Award is given for outstanding contribution to

- a) Health
- b) Tourism
- c) Agriculture
- d) The development of neat technology

50. The line at which a day is lost or gained is called

- a) International Gain line
- b) International lost line
- c) Line of control day and night
- d) International Date line

66. A force which combines with two or more forces to produce equilibrium is called ?

- a) Resultant
- b) Equilibrant
- c) Couple
- d) Moment

67. Which of the following units do not conform to the concept of rigid body rotation ?

- a) Blades of the fan
- b) Pulley of a belt
- c) Phonograph records
- d) Wheels of an automobile

68. The radius of gyration of a solid sphere of radius r with respect to diametral axis is

- a) $r^2/5$
- b) $r^2/2$
- c) $2r^2/5$
- d) $4r^2/5$

69. Coefficient of kinetic friction between a moving body and the surface on which it moves

- a) Is dependent on the velocity of body
- b) Depends only on the nature of the surfaces
- c) Depends on the nature of surfaces and the relative velocity between the surface and body
- d) Depends on the nature of surfaces, weight of the body and its velocity.

70. A zero angle of friction implies that

- a) Friction force is infinite
- b) Friction force is zero
- c) Friction force acts normal to the plane
- d) Friction force acts along the direction of motion

71. Which of the following sections will be best for torsion ?

- a) Solid circular
- b) Hollow circular
- c) Triangular
- d) Rectangular

72. In a beam of uniform strength, every section has same value of

- a) Bending moment
- b) Bending stress
- c) Strain
- d) Moment of inertia

73. The value of modulus of elasticity for steel is

- a) 70 GPa
- b) 100 GPa
- c) 125 GPa
- d) 200 GPa

74. Brinell number of a metal or an alloy is a measure of its

- a) Tensile strength
- b) Toughness
- c) Malleability
- d) Hardness

75. Toughness of a material signifies

- a) Strength
- b) Softening
- c) Brittleness
- d) Fatigue resistance

76. Connecting rod, big and small end brasses, caps and bolts constitute

- a) One link
- b) Two links
- c) Three links
- d) Four links

77. A kinematic pair consists of

- a) Pair of elements having line or point contact
- b) Pair of elements having surface contact
- c) Two elements that permit relative motion
- d) Two elements which are mechanically held together

78. Which amongst the following constitutes a higher pair ?

- a) A ball and a socket joint
- b) Toothed gearing
- c) Universal joint
- d) Cycle wheels turning on their axles

79. Inversion of a mechanism is

- a) Changing of a higher pair to lower pair
- b) Obtained by fixing different links in a kinematic chain
- c) Turning it upside down
- d) Obtained by reversing the input and output motion

80. A pantograph is a mechanism or a kinetic arrangement comprising

- a) Lower pairs
- b) Rolling pairs
- c) Turning pairs
- d) Spherical pairs

81. Fan belt in automobile is

- a) A 3-layer flat belt
- b) A 5-layer flat belt
- c) B-section V-belt
- d) E-section V-belt

82. For constant velocity ratio, the positive drive with large distance between drive and driven shaft, one would use

- a) Flat belt drive
- b) V-belt drive
- c) Chain drive
- d) Gear drive

83. A Hartnell governor is a governor of the

- a) Dead weight type
- b) Pendulum type
- c) Inertia type
- d) Centrifugal type

84. The term effort of a governor refers to

- a) Centrifugal force acting on the balls
- b) Force required on the sleeve to raise or lower it for a given percentage change in speed.
- c) Force applied at the sleeve for the total working range of speed
- d) Work done at the sleeve for 1% change in speed

85. In which one of the following is a flywheel generally employed ?

- a) Lathe
- b) Electric motor
- c) Punching machine
- d) Gear box

86. Two parallel and coplanar shafts are connected by

- a) Spur gears
- b) Bevel gears
- c) Spiral gears
- d) Double helical gear

87. The motion transmitted between the teeth of two spur gears is generally

- a) Sliding
- b) Rolling
- c) Rotary
- d) Partly sliding and partly rolling

88. The working surface above the pitch surface of the gear tooth is termed as

- a) Addendum
- b) Dedendum
- c) Flank
- d) Face

89. To ensure self-locking in a screw jack, it is essential that helix angle is

- a) Larger than friction angle
- b) Smaller than friction angle
- c) Equal to friction angle
- d) Such as to give maximum efficiency in lifting

90. Suggest the cam follower that is generally used in automobile engines

- a) Flat-faced follower
- b) Spherical faced follower
- c) Roller follower
- d) Knife edge follower

91. In one revolution of the crank, the maximum value of primary force occurs

- a) Twice
- b) Three times
- c) Four times
- d) Six times

92. Which one of the following in-line engines working on a four - stroke cycle is completely balanced inherently ?

- a) 2 cylinder engine
- b) 3 cylinder engine

- c) 4 cylinder engine
- d) 6 cylinder engine

93. Which of the following is desired in materials used for springs ?

- a) Stiffness
- b) Toughness
- c) Resilience
- d) Elasticity

94. The product from blast furnace is called

- a) Cast iron
- b) Wrought iron
- c) Pig iron
- d) Steel

95. Free cutting steel is basically

- a) A steel which contains carbon in free form
- b) A steel which requires minimum cutting force
- c) A low carbon steel with high sulphur content
- d) A steel with low wear resistance quality

96. An increase in the percentage of carbon in steel results into decrease in its

- a) Hardness
- b) Ductility
- c) Ultimate strength
- d) Corrosion resistance

97. Which allotropic form of iron occurs at temperature between 900°C and 1404°C ?

- a) α -iron
- b) β -iron
- c) γ -iron
- d) δ -iron

98. The chemical formula for cementite is

- a) FeC
- b) Fe_2C_3
- c) Fe_3C
- d) FeC_3

99. The crystal structure of α -iron is

- a) Simple cubic
- b) Face centred cubic
- c) Body centred cubic
- d) Closed packed hexagonal

100. Cold worked components are generally subjected to the following process to relieve stresses

- a) Annealing
- b) Austempering
- c) Age hardening
- d) Tempering

101. Maximum surface hardness is attained by

- a) Cyaniding
- b) Carburising
- c) Flame hardening
- d) Nitriding

102. The most suitable bearing for carrying very heavy loads with slow speed is

- a) Hydrostatic bearing

- b) Ball bearing
- c) Roller bearing
- d) Hydrodynamic bearing

103. The tool life is influenced maximum by

- a) Cutting speed
- b) Tool material and geometry
- c) Cutting fluid
- d) Surface conditions of the work piece

104. A steady rest is the lathe unit that is used for

- a) Supporting the bed
- b) Holding very long and heavy jobs
- c) External taper turning
- d) Performing the knurling operation

105. The feeding of a job in a shaper is done by

- a) Ram movement
- b) Table movement
- c) Indexing centres
- d) Dividing head

106. Narrow grooves or slots can be produced on a workpiece by a milling operation known as

- a) Saw milling
- b) Face milling
- c) Helical milling
- d) Straddle milling

107. Twist drills are generally made of

- a) Mild steel
- b) High speed steel
- c) Silicon steel
- d) Ceramics

108. In which broaching method, the work is moved continuously and broach is held stationary ?

- a) Pull broaching
- b) Push broaching
- c) Surface broaching
- d) Continuous broaching

109. Hard grade grinding wheels are represented by letters from

- a) A to P
- b) A to H
- c) H to Q
- d) Q to Z

110. Gears are mass produced by

- a) Milling
- b) Shaping
- c) Hobbing
- d) Forming

111. The average frequency of sparks in EDM is

- a) 1000 sparks per second
- b) 2000 sparks per second
- c) 5000 sparks per second
- d) 10000 sparks per second

112. Ruby rod is associated with

- a) Ultrasonic machining
- b) Electron beam machining
- c) Laser beam machining
- d) High velocity forming of metals

113. In what way increase in productivity helps the management ?

- a) Better working conditions
- b) To stand better in market
- c) Job security and satisfaction
- d) Reduced price of articles

114. Greater flexibility in the context of work distribution to machines and workers is achieved in

- a) Cellular layout
- b) Process layout
- c) Mixed layout
- d) Fixed position layout

115. The concept of work study is applied to

- a) Motivate the workers
- b) Improve the working conditions
- c) Judge the production capacity of machines
- d) Standardise the working methods, materials tools and equipment

116. In Break-even analysis, total cost consists of

- a) Fixed cost + variable cost
- b) Fixed cost + overheads
- c) Overheads + variable cost
- d) Variable cost + overhead + fixed cost

117. The process which determines the programme for the operations is called

- a) Loading
- b) Dispatching
- c) Scheduling
- d) Routing

118. CPM and PERT techniques are used for

- a) Layout planning
- b) Financial management
- c) Executing a new project
- d) Increase productivity

119. The following information is added updating the inventory status file in MRP

- a) Disbursement of inventory
- b) Scrap reported for material
- c) Order release
- d) Materials received

120. In value engineering, important consideration is given to

- a) Cost reduction
- b) Profit maximization
- c) Function concept
- d) Customer satisfaction

121. Errors which may be variable both in magnitude and nature (positive and negative) are classified as _____ error

- a) Hysteresis
- b) Random
- c) Interaction
- d) Systematic

122. Identify the rate flow meter

- a) Venturimeter
- b) Rotating vane flow meter
- c) Lobed impeller flow meter
- d) Reciprocating piston meter

123. A weir is defined as

- a) An opening with some kind of extension
- b) An opening with closed perimeter and of regular form
- c) An opening over which water is flowing
- d) An opening where edges extend above the liquid surface

124. The marking of circular scale in a micrometer screw gauge is done on

- a) Ratchet
- b) Thimble
- c) Barrel
- d) Spindle

125. Clinometer is an instrument concerned with

- a) Linear
- b) Angular
- c) Bore
- d) Surface roughness

126. A thread micrometer is used to measure the _____ diameter of the thread.

- a) Root
- b) Major
- c) Minor
- d) Effective

127. Zeroth law of thermodynamics forms the basis of _____ measurement.

- a) Pressure
- b) Temperature
- c) Heat exchange
- d) Work

128. In Carnot cycle, the rejection of heat is

- a) At constant pressure
- b) At constant volume
- c) At constant temperature
- d) Partly at constant pressure and partly at constant volume

129. Incomplete combustion of fuel is characterized by

- a) High temperature of flue gas
- b) High percentage of oxygen in flue gas
- c) High percentage of carbon dioxide in flue gas
- d) Smoky exhaust

130. In a refrigeration system, expansion valve is incorporated between

- a) Evaporator and compressor
- b) Condenser and evaporator
- c) Compressor and condenser
- d) Superheater and subcooler

131. Identify the refrigerant with maximum boiling point

- a) Ammonia
- b) Carbon dioxide
- c) Freon-12
- d) Freon-22

132. A fan is provided in the water cooling system to

- a) Draw the air through the radiator
- b) Provide drive to the water pump
- c) Cool the engine by blowing air over it
- d) Increase flow of coolant

133. The pressure plate is held against the clutch plate by

- a) Struts
- b) Levers
- c) Thrust bearings
- d) Springs

134. Knocking tendency in SI engine reduces with increasing

- a) Compression ratio
- b) Wall temperature
- c) Super charging
- d) Engine speed

135. Size of the gear is generally specified by

- a) Pitch circle diameter
- b) Working depth
- c) Module
- d) Tooth thickness

136. The spring used in railway wagons and road vehicles belong to the category of

- a) Leaf springs
- b) Cylindrical helical springs
- c) Spiral springs
- d) Helical springs of square section

137. Identify the brake commonly used in railway trains

- a) Band brake

- b) Shoe brake
- c) Band and block brake
- d) External expanding brake

138. Cold working of metals is carried out

- a) Below the recrystallisation temperature
- b) At the recrystallisation temperature
- c) Above the recrystallisation temperature
- d) Working temperature depends upon physical conditions of the work piece

139. Copper sheets are manufactured by

- a) Drawing
- b) Rolling
- c) Extruding
- d) Hammering

140. In drop forging, forging is done by dropping

- a) The work piece at high velocity
- b) The hammer at high velocity
- c) The die with hammer at high velocity
- d) A weight on hammer to produce the requisite impact

141. The process of pouring molten metal in the cavity of a metallic mould by gravity is known as

- a) Die casting
- b) Permanent mould casting
- c) Pressed casting
- d) Slush casting

142. The soldering iron bit is made of

- a) Cast iron
- b) Mild steel
- c) Copper
- d) Aluminium

143. The electric resistance welding operates with

- a) Low current and high voltage
- b) High current and low voltage
- c) Low current and low voltage
- d) High current and high voltage

144. In oxy-acetylene gas welding, the temperature at the inner core of the flame is around

- a) 3500°C
- b) 3200°C
- c) 1290°C
- d) 2550°C

145. The phenomenon of magnetic arc blow is observed almost exclusively with

- a) Gas welding
- b) Spot welding
- c) Dc arc welding
- d) Thermit welding

146. Which of the following welding techniques

uses a non consumable electrode ?

- a) MIG welding
- b) TIG welding
- c) Submerged arc welding
- d) Underwater welding

147. In laser welding, the heat is supplied by

- a) The electric arc
- b) Inducing the current
- c) The oxy-acetylene gas
- d) The collimated light beam

148. Preheating before welding is done to

- a) Make the steel softer
- b) Burn away oil, grease from the plate surface
- c) Prevent cold cracks
- d) Prevent plate distortion

149. In oblique cutting of metals, the cutting edge of the tool is

- a) Parallel to the direction of tool travel
- b) Perpendicular to the direction of tool travel
- c) Perpendicular to the work piece
- d) Inclined at an angle less than 90° to the direction of tool travel

150. Which part of the cutting tool is prone to crater wear ?

- a) Flank
- b) Face
- c) Shank
- d) Base
