प्रश्न पुस्तिका / QUESTION BOOKLET

ACF

विषय / Subject :

Mechanical Engineering

कोड / Code : **OP16**

पुस्तिका में पृष्ठों की संख्या /
Number of Pages in Booklet : **32**

पुस्तिका में प्रश्नों की संख्या /
Number of Questions in Booklet : **200**

Mechanical Engineering
OP 16 विषय कोड [A] बुकलेट सीरीज

समय / Time : 3 घंटे / Hours | पूर्णांक / Maximum Marks : **100**

INSTRUCTIONS

1. **Answer all questions.**
2. **All questions carry equal marks.**
3. Only one answer is to be given for each question.
4. If more than one answers are marked, it would be treated as wrong answer.
5. Each question has four alternative responses marked serially as **1, 2, 3, 4**. You have to darken only one circle or bubble indicating the correct answer on the Answer Sheet using **BLUE BALL POINT PEN.**
6. **1/3 part of the mark(s) of each question will be deducted for each wrong answer.** (A wrong answer means an incorrect answer or more than one answers for any question. Leaving all the relevant circles or bubbles of any question blank will not be considered as wrong answer.)
7. The candidate should ensure that Series Code of the Question Paper Booklet and Answer Sheet must be same after opening the envelopes. In case they are different, a candidate must obtain another Question Paper of the same series. Candidate himself shall be responsible for ensuring this.
8. Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt as per rules.
9. Please correctly fill your Roll Number in O.M.R. Sheet. 5 marks will be deducted for filling wrong or incomplete Roll Number.

Warning : If a candidate is found copying or if any unauthorised material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would liable to be prosecuted under Section 3 of the R.P.E. (Prevention of Unfairmeans) Act, 1992. Commission may also debar him/her permanently from all future examinations of the Commission.

निर्देश

1. सभी प्रश्नों के उत्तर दीजिए ।
2. सभी प्रश्नों के अंक समान हैं ।
3. प्रत्येक प्रश्न का केवल एक ही उत्तर दीजिए।
4. एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा ।
5. प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं, जिन्हें क्रमशः 1, 2, 3, 4 अंकित किया गया है। अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले अथवा बबल को उत्तर-पत्रक पर **नीले बॉल प्वाइंट पेन** से गहरा करना है ।
6. प्रत्येक गलत उत्तर के लिए **प्रश्न अंक का 1/3 भाग काटा** जायेगा। गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है । किसी भी प्रश्न से संबंधित गोले या बबल को खाली छोड़ना गलत उत्तर नहीं माना जायेगा।
7. प्रश्न-पत्र पुस्तिका एवं उत्तर पत्रक के लिफाफे की सील खोलने पर परीक्षार्थी यह सुनिश्चित कर लें कि उसके प्रश्न-पत्र पुस्तिका पर वही सीरीज अंकित है जो उत्तर पत्रक पर अंकित है। इसमें कोई भिन्नता हो तो वीक्षक से प्रश्न-पत्र की ही सीरीज वाला दूसरा प्रश्न-पत्र का लिफाफा प्राप्त कर लें। ऐसा न करने पर जिम्मेदारी अभ्यर्थी की होगी।
8. मोबाईल फोन अथवा इलेक्ट्रोनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित हैं। यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी।
9. कृपया अपना रोल नम्बर ओ.एम.आर. पत्रक पर सावधानी पूर्वक सही भरें। गलत अथवा अपूर्ण रोल नम्बर भरने पर 5 अंक कुल प्राप्तांकों में से अनिवार्य रूप से काटे जाएंगे।

चेतावनी : अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराई जायेगी और आर. पी. ई. (अनुचित साधनों की रोकथाम) अधिनियम, 1992 के नियम 3 के तहत कार्यवाही की जायेगी। साथ ही आयोग ऐसे अभ्यर्थी को भविष्य में होने वाली आयोग की समस्त परीक्षाओं से विवर्जित कर सकता है।

1 The mechanism used in internal combustion engine is

(1) crank mechanism (2) slider mechanism

(3) slider crank mechanism (4) circular mechanism

2 The rectilinear motion of a piston is converted into rotary motion by

(1) piston (2) piston rod

(3) crank (4) connecting rod

3 Dynamics of machines deals with

(1) relative motion between parts neglecting the consideration of forces

(2) forces acting on the parts of machine

(3) apparatus for applying mechanical power

(4) number of interrelated parts each having a definite motion

4 In a kinematic chain the minimum number of kinematic pairs required is

(1) one (2) two

(3) three (4) four

5 In simple harmonic motion the acceleration is proportional to

(1) displacement

(2) linear velocity

(3) angular velocity

(4) rate of change of angular velocity

6 Two parallel shafts, the distance between whose axes is small and variable may be connected by

(1) gear drive (2) universal joint

(3) knuckle joint (4) Oldham's coupling

7 In an automobile the power is transmitted from gear box to differential through

(1) knuckle joint (2) universal joint

(3) Hooke's joint (4) bevel gears

8 If there are L number of links in a mechanism, then the number of possible inversions would be

(1) L (2) L/2

(3) L+1 (4) L+2

9 Cam size depends upon

(1) pitch circle (2) base circle

(3) prime circle (4) outer circle

10 Coriolis component is encountered in

(1) slider crank mechanism (2) four bar chain mechanism

(3) quick return mechanism (4) circular mechanism

11 Idler pulley is used for

(1) maintaining belt tension

(2) changing direction of rotation

(3) for stopping motion frequently

(4) for running during idling periods only

12 Slip in belt drive is

(1) loss of power

(2) difference between velocities of two pulleys

(3) difference between angular velocities of two pulleys

(4) difference between linear speed of the rim of pulley and the belt on it

13 The pulley in a belt drive acts as

(1) rolling pair (2) sliding pair

(3) turning pair (4) cylindrical pair

14 Sum of the tensions when the belt is running on the pulley is

(1) less than initial tension

(2) more than initial tension

(3) more than twice initial tension

(4) half of initial tension

15 Function of a governor is to

(1) control the engine speed

(2) maintain the speed of engine constant

(3) store energy and give up whenever required

(4) adjust variation of speed by varying the input to the engine

16 Rope brake dynamometer uses

(1) oil as lubricant (2) water as lubricant

(3) grease as lubricant (4) no lubricant

17 The brake commonly used on train boggies is

(1) internal expanding (2) band brake

(3) band and block brake (4) shoe brake

18 Power transmitted by belt is maximum when maximum tension in the belt compared to centrifugal tension is

(1) 2 times (2) 3 times

(3) 4 times (4) 5 times

19 The ratio of number of teeth and pitch circle diameter in a gear is called

(1) pitch (2) circular pitch

(3) diametral pitch (4) module

20 Gear train in which the first and last gear are on the same axis is known as

(1) simple gear train (2) compound gear train

(3) epicyclic gear train (4) reverted gear train

21 Critical speed of shaft depends on

(1) mass (2) stiffness

(3) mass and stiffness (4) mass, stiffness and eccentricity

22 Maximum magnitude of the unbalanced force in a line perpendicular to the line of stroke is known as

(1) swaying couple (2) hammer blow

(3) unbalanced force (4) resultant force

23 Usually following fraction of reciprocating masses is balanced in case of reciprocating engines

(1) full (2) half

(3) one-quarter (4) two-thirds

24 If damping factor in a vibrating system is unity, then the system will be

(1) not damped (2) highly damped

(3) under damped (4) critically damped

25 A vibrating beam has following degrees of freedom

(1) 0 (2) 1

(3) 2 (4) 3

26 In a damped vibration system, the damping force is proportional to

(1) displacement (2) velocity

(3) acceleration (4) applied force

27 Which of the following effects is more dangerous for a ship

(1) rolling (2) waving

(3) pitching (4) steering

28 For steady state forced vibrations, phase lag at resonance condition is

(1) 0 degree (2) 45 degree

(3) 90 degree (4) 180 degree

29 The rate of decay of oscillations is known as

(1) logarithmic decrement (2) critical damping

(3) damping coefficient (4) transmissibility

30 In forced vibrations, magnitude of damping force at resonance equals

(1) inertia force (2) impressed force

(3) infinity (4) spring force

31 For a heat engine operating on Carnot cycle, the work output is 25% of heat rejected to the sink. The thermal efficiency of the engine would be

(1) 10% (2) 20%

(3) 30% (4) 50%

32 Three engines A, B and C operating on Carnot cycle respectively use air, steam and helium as the working fluid. If all the engines operate within the same high and low temperature limits, then which engine will have the highest efficiency?

(1) Engine A

(2) Engine B

(3) Engine C

(4) All engines will have the same efficiency

33 In a four stroke cycle engine, the four operations suction, compression, expansion and exhaust are completed in the number of revolutions of crankshaft equal to

(1) 1 (2) 2

(3) 3 (4) 4

34 In a four stroke cycle S.I. engine the camshaft runs at

(1) same speed as crankshaft

(2) half the speed of crankshaft

(3) twice the speed of crankshaft

(4) any speed irrespective of crankshaft speed

35 The ratio of brake power to indicated power of an I.C. engine is called

(1) mechanical efficiency (2) thermal efficiency

(3) volumetric efficiency (4) relative efficiency

36 Specific fuel consumption of a diesel engine as compared to that for petrol engine is

(1) lower

(2) higher

(3) same for same power output

(4) may be lower or higher

37 Compression ratio of diesel engines is in the range of

(1) 8 to 10 (2) 10 to 15

(3) 16 to 20 (4) 21 to 30

38 In case of petrol engines, at starting

(1) rich fuel-air ratio is needed

(2) weak fuel-air ratio is needed

(3) chemically correct fuel-air ratio is needed

(4) any fuel-air ratio will do

39 Voltage developed to strike spark in the spark plug is in the range

(1) 6 to 12 volts (2) 100 to 200 volts

(3) 1000 to 2000 volts (4) 20000-25000 volts

40 In a 4-cylinder petrol engine the standard firing order is

(1) 1-2-3-4 (2) 1-4-3-2

(3) 1-3-2-4 (4) 1-3-4-2

41 Torque developed by the engine is maximum at

(1) minimum speed of engine

(2) maximum speed of engine

(3) maximum volumetric efficiency speed of engine

(4) maximum power speed of engine

42 Knocking in petrol engines get reduced by

(1) increasing compression ratio

(2) retarding spark advance

(3) increasing inlet air temperature

(4) increasing cooling water temperature

43 Ignition quality of fuels for petrol engines is determined by

(1) cetane number rating (2) octane number rating

(3) calorific value rating (4) volatility of fuel

44 In automobile engines a thermostat is provided for

(1) regulating the temperature of suction air

(2) regulating the temperature of lubrication oil

(3) controlling the temperature of the cooling system

(4) regulating the temperature of exhaust gases

45 The dynamo in an automobile

(1) converts mechanical energy into electrical energy

(2) continually recharge the battery

(3) acts as a reservoir of electrical energy

(4) supplies electric power

46 What is wheel base of a vehicle ?

(1) it is width of tyres

(2) it is distance between front tyres

(3) it is distance between front and rear axles

(4) it is extreme length of the vehicle

47 Stoichiometric ratio is

(1) chemically correct air-fuel ratio by volume

(2) chemically correct air-fuel ratio by weight

(3) theoretical mixture of air for complete combustion

(4) actual ratio of air to fuel for maximum efficiency

48 During idling a petrol engine requires

(1) rich mixture

(2) lean mixture

(3) chemically correct mixture

(4) variable mixture

49 An air-fuel ratio 8 will have

(1) chemically correct air (2) excess fuel

(3) excess air (4) any of the above

50 Purpose of supercharging an engine is to

(1) increase power output of engine

(2) reduce specific fuel consumption

(3) reduce noise of engine

(4) improve cooling of cylinders

51 In order to achieve maximum possible fuel economy the design features which will be affected are

(1) volumetric efficiency (2) compression ratio

(3) method of charging (4) atomization

52 For same power output and same compression ratio four stroke S.I. engine as compared to two stroke engine has

(1) higher fuel consumption

(2) lower thermal efficiency

(3) higher thermal efficiency

(4) higher exhaust temperature

53 Thermal efficiency of standard Otto cycle for a compression ratio 5.5 will be

(1) 20% (2) 35.4%

(3) 47.5% (4) 50%

54 In spark ignition engines, knocking tendency is reduced by

(1) reduction of compression ratio

(2) advancing ignition timing

(3) increasing exhaust temperature

(4) adding dope like tetra ethyl lead to the fuel

55 Highest useful compression ratio is the compression ratio at which

(1) engine can be safely operated

(2) engine gives maximum thermal efficiency

(3) engine operates smoothly

(4) detonation first becomes audible

56 Efficiency of a jet engine is higher at

(1) lower altitude (2) higher altitude

(3) low speed (4) high speed

57 Turbo-charger is used

(1) in gas turbines for compression of air

(2) for supercharging diesel engine

(3) in jet propulsion units

(4) in rockets for producing air fuel mixture

58 For the same maximum pressure and heat input, the most efficient cycle is

(1) Brayton (2) Otto

(3) Diesel (4) Dual

59 If performance of S.I. engines of different manufacturers having different capacities, sizes and systems are to be compared, the common parameter would be

(1) engine cylinder diameter (2) brake power

(3) mean effective pressure (4) weight of engine

60 In naturally aspirated engine, pressure inside cylinder at the end of suction stroke is

(1) less than atmospheric

(2) same as atmospheric

(3) more than atmospheric

(4) depends on atmospheric conditions

61 In a ball bearing, a ball is subjected to

(1) compressive stress (2) tensile stress

(3) shear stress (4) cyclic stress or fatigue

62 Resistance to fatigue of a material is measured by

(1) Young's modulus (2) modulus of rigidity

(3) elastic limit (4) endurance limit

63 Resilience of material should be considered when it is subjected to

(1) shock load (2) constant load

(3) fluctuating load (4) wear and tear

64 Which process will improve the fatigue life of a part ?

(1) shot peening (2) electroplating

(3) chemical coating (4) polishing

65 While designing a shaft, pulley and key for a system

(1) shaft is the weakest member

(2) pulley is the weakest member

(3) key is the weakest member

(4) all are designed for equal strength

66 In case of brittle materials, the theory of elastic failure generally applied is

(1) maximum principal stress theory

(2) maximum shear stress theory

(3) maximum strain theory

(4) maximum total strain energy theory

67 The maximum efficiency of a screw jack provided with square threads and angle of friction 30^{o} will be

(1) 25% (2) 33%

(3) 40% (4) 50%

68 When large quantities of bolts are to be purchased the quantity is usually specified in terms of

(1) number (2) volume

(3) weight (4) packets

69 Oldham's coupling is used to connect two shafts which

(1) have lateral misalignment

(2) have two axes intersecting

(3) have lateral movements during power transmission

(4) changes axes during power transmission

70 Crowning of flat pulleys is generally done

(1) to reduce belt friction

(2) to prevent belt joint from damaging the belt surface

(3) to prevent belt from running off the pulley

(4) in case of cross belt drives only

71 Gears used for non-intersecting perpendicular shafts are

(1) spur gears (2) helical gears

(3) double helical gears (4) hypoid gears

72 A automobile gear box has

(1) simple gear train

(2) compound gear train

(3) epicyclic gear train

(4) compound epicyclic gear train

73 Shear stress theory is applicable to

(1) ductile materials (2) brittle materials

(3) elastic materials (4) plastic materials

74 When both pinion and gear are made of the same material, then from the design point of view

(1) pinion is the determining factor

(2) gear is the determining factor

(3) any one of the two may be taken as determining factor

(4) criteria is strength of any one of the teeth

75 Lewis equation in gears is used to evaluate

(1) tensile stress in bending

(2) compressive stress in bending

(3) creep stress

(4) shear stress on flank

76 When a nut is tightened by placing washer below it, the bolt will be subjected to following type of loads

(1) compression (2) tension

(3) shear (4) combined load

77 Resilience of a bolt may be increased by

(1) increasing its length

(2) increasing its shank diameter

(3) increasing diameter of threaded portion

(4) increasing head size

78 If tearing efficiency of a riveted joint is 60%, then ratio of pitch to diameter of rivet is

(1) 0.2 (2) 0.3

(3) 0.4 (4) 0.5

79 Factor of safety in design is the ratio of

(1) yield stress/working stress

(2) tensile stress/working stress

(3) compressive stress/working stress

(4) bearing stress/working stress

80 A boiler plate thickness is 20 mm. The rivet diameter will be

(1) 10 mm (2) 20 mm

(3) 30 mm (4) 40 mm

81 Which of the following steel key is usually strong in failure by shear and crushing ?

(1) rectangular (2) square

(3) circular (4) flat

82 Thick cylinders are designed by

(1) Lame's equation

(2) calculating radial stress which is uniform

(3) thick cylinder theory

(4) thin cylinder theory

83 Sleeve of muff coupling is designed as a

(1) thin vessel (2) thick vessel

(3) solid shaft (4) hollow shaft

84 The most important dimension in the design of nut is

(1) inside diameter (2) height

(3) pitch diameter (4) thread size

85 Bolts are designed on the basis of

(1) direct tensile stress (2) direct shear stress

(3) direct compressive stress (4) direct bearing stress

86 Diameter of washer is generally taken

(1) equal to nut size

(2) less than nut size

(3) bigger than nut size

(4) any size irrespective of nut size

87 Which of the following is a permanent fastening ?

(1) bolts (2) keys

(3) screws (4) rivets

88 The function of a washer is to

(1) provide cushioning effect

(2) provide bearing area

(3) absorb shocks and vibrations

(4) provide smooth surface in place of rough surface

89 Gear box is used

(1) to produce torque

(2) for speed reduction

(3) to obtain variable speeds

(4) to increase efficiency of system

90 Spring driven watches and clocks utilize

(1) involute gears (2) cycloid gears

(3) epicycloid gears (4) straight rack gears

91 Economizer is used in a steam power plant to heat

(1) air (2) feed water

(3) flue gases (4) steam

92 In a two stage gas turbine plant with intercooling and reheating

(1) both work ratio and thermal efficiency improve

(2) work ratio improves but thermal efficiency decreases

(3) thermal efficiency improves but work ratio decreases

(4) both work ratio and thermal efficiency decrease

93 In case of impulse steam turbine there is

(1) enthalpy drop in fixed and moving blades

(2) enthalpy drop only in moving blades

(3) enthalpy drop in nozzles

(4) no enthalpy drop

94 In hydraulic reaction turbine, function of the draft tube is to

(1) increase the flow rate

(2) reduce water hammer effect

(3) convert kinetic energy of water to potential energy by a gradual expansion in divergent part

(4) increase efficiency of the turbine

95 Francis turbine is usually used for

(1) low head installation upto 30 m

(2) medium head installation from 30 m to 180 m

(3) high head installation above 180 m

(4) for all heads

96 Overall efficiency of a thermal power plant is equal to

(1) Rankine cycle efficiency

(2) Carnot cycle efficiency

(3) Regenerative cycle efficiency

(4) Boiler efficiency x turbine efficiency x generator efficiency

97 Pressure on two sides of impulse wheel of a steam turbine

(1) is same

(2) is different

(3) increases from one side to the other side

(4) decreases from one side to the other side

98 In case of reaction steam turbine

(1) there is enthalpy drop both in fixed and moving blades

(2) there is enthalpy drop only in fixed blades

(3) there is enthalpy drop only in moving blades

(4) there is no enthalpy drop

99 In a gas turbine plant, a regenerator increases

(1) work output (2) pressure ratio

(3) thermal efficiency (4) all of the above

100 Operating charges for same power output are minimum for

(1) gas turbine plant (2) hydroelectric plant

(3) thermal plant (4) nuclear plant

101 Load factor of a power station is usually

(1) equal to unity (2) less than unity

(3) more than unity (4) zero

102 Water hammer is developed in

(1) penstock (2) draft tube

(3) turbine (4) surge tank

103 Thermal efficiency of a gas turbine plant as compared to diesel engine plant is

(1) higher (2) lower

(3) same (4) un-predictable

104 Depreciation charges are high in case of

(1) thermal plant (2) diesel plant

(3) hydroelectric plant (4) gas turbine plant

105 In a two stage gas turbine plant, reheating after first stage

(1) decrease thermal efficiency

(2) increases thermal efficiency

(3) does not affect thermal efficiency

(4) none of the above

106 For the safety of a steam boiler the number of safety valves fitted are

(1) One (2) Two

(3) Three (4) Four

107 Load centre in a power station is

(1) centre of coal fields

(2) centre of maximum load of equipments

(3) centre of gravity of electrical load

(4) centre of power station

108 In steam power station, the choice of high temperature steam is for

(1) increasing the efficiency of boiler

(2) increasing the efficiency of turbine

(3) increasing the efficiency of condenser

(4) increasing the overall efficiency

109 Compounding of steam turbine is done for

(1) reducing the work done

(2) increasing the rotor speed

(3) reducing the rotor speed

(4) balancing the turbine

110 Diversity factor is always

(1) equal to unity
(2) less than unity
(3) more than unity
(4) zero

111 High load factor indicates that

(1) cost of generation per unit power is increased
(2) total plant capacity is utilized for most of the time
(3) total plant capacity is not properly utilized for most of the time
(4) load on the plant is high

112 CANDU reactor uses

(1) only fertile material
(2) highly enriched uranium
(3) natural uranium as fuel and heavy water as moderator and coolant
(4) plutonium as fuel

113 Fast breeder reactors are best suited for India because of

(1) large thorium deposits
(2) large uranium deposits
(3) large plutonium deposits
(4) all of the above

114 Thermal shielding is provided to

(1) protect the walls of the reactor from radiation damage
(2) prevent meltdown of the core of the reactor
(3) protect the operating personnel from exposure to radiation
(4) all of the above

115 The function of a moderator in a nuclear reactor is to

(1) slow down the fast moving electrons
(2) speed up the slow moving electrons
(3) start the chain reaction
(4) transfer heat produced inside the reactor to a heat exchanger

116 Fission chain reaction is possible when

(1) fission produces the same number of neutrons which are absorbed

(2) fission produces more electrons than are absorbed

(3) fission produces less electrons than are absorbed

(4) none of the above

117 In a nuclear reactor the function of a reflector is to

(1) reduce the speed of the neutrons

(2) stop the chain reaction

(3) reflect the escaping neutrons back into the core

(4) all of the above

118 Which material is the most commonly used moderator ?

(1) Graphite (2) Sodium

(3) Deuterium (4) any of the above

119 In a pressurized water reactor

(1) coolant water is pressurized to work as moderator

(2) coolant water boils in the core of the reactor

(3) coolant water is pressurized to prevent boiling of water in the core

(4) no moderator is used

120 The conversion ratio of a breeder reactor is

(1) equal to unity (2) more than unity

(3) less than unity (4) none of the above

121 The size of a lathe is expressed by

(1) diameter of chuck

(2) maximum speed of chuck

(3) swing of lathe

(4) height of centres from ground

122 A sprue hole is

(1) an eccentric hole

(2) a blind hole

(3) an opening in a mould into which molten metal is poured

(4) a thorough hole drilling through two mating parts

123 Power is transmitted by lead screw to carriage through

(1) gear system (2) pulley drive

(3) rack and pinion arrangement (4) half nut

124 In which operation on a workpiece on lathe the spindle speed will be least?

(1) plain turning (2) taper turning

(3) finishing (4) thread cutting

125 Which method is used for turning internal tapers only ?

(1) compound rest (2) tailstock off set

(3) taper attachment (4) reamer

126 A mandrel is

(1) a slightly tapered hardened steel shaft that supports works which cannot be otherwise

(2) a tapered gauge used for inspection of tapered holes

(3) auxiliary chuck used on lathe for holding small loads

(4) is used in lathe work to hold castings

127 Precision is

(1) repeatability of a measurement process

(2) agreement of the result of a measurement with the true value of the measured quantity

(3) ability of a measuring device to detect small differences in a quantity being measured

(4) error of judgement in reading an observation

128 Accuracy is

(1) repeatability of a measuring process

(2) error of judgement in recording an observation

(3) ability of an instrument to reproduce same reading under identical situations

(4) agreement of the result of a measurement with the true value of the measured quantity

129 Which one of the following measuring instruments is supposed to be most accurate

(1) micrometer (2) vernier caliper

(3) vernier dial gauge (4) optical projector

130 Knurling is an operation

(1) of cutting smooth collars

(2) of under cutting

(3) of generally roughing the surface for hand grip

(4) done prior to screw cutting

131 Resistance wire strain gauge works on the principle

(1) that resistance changes in proportion to strain on material

(2) the resistance of wire changes with load

(3) that conductivity is directly proportional to load on member

(4) due to elongation length increases and diameter reduces, thereby resistance changes

132 A rotameter is used to measure

(1) rpm of engine

(2) rotation of shafts

(3) twist due to torque applied on shafts

(4) flow of liquids and gases

133 Hot wire anemometer is used to

(1) measure pressure of liquid

(2) measure velocity of air stream

(3) measure temperature of moving fluid

(4) measure thermal conductivity of solid

134 Principal materials used in soldering are

(1) tin and lead (2) copper and tin

(3) zinc and copper (4) copper and lead

135 A 30 ton press means

(1) gross weight of the press is 30 tons

(2) weight of die is 30 tons

(3) pressure exerted by slide is 30 tons

(4) flywheel of the press weighs 30 tons

136 Steel balls are required in large quantities. Which process would you select for the manufacture ?

(1) turning on capstan or turret lathe

(2) turning on automatic lathe

(3) cold heading

(4) casting

137 A rack is a gear of

(1) infinite pitch (2) infinite module

(3) infinite diameter (4) infinite number of teeth

138 Profile of a gear tooth is to be checked. Which one of the following device would you choose ?

(1) optical pyrometer (2) optical projector

(3) bench micrometer (4) telescopic gauge

139 Which of the following is a single point cutting tool ?

(1) milling cutter (2) parting off tool

(3) hacksaw blade (4) grinding wheel

140 Swab is

(1) a welding defect (2) a gear cutter

(3) a tool used in foundry (4) a forging die

141 Tolerances are specified

(1) to obtain desired fits

(2) because it is not possible to manufacture a size exactly

(3) to obtain high accuracy

(4) to have proper allowance

142 Which of the following is the most important characteristic of a measuring instrument ?

(1) precision (2) accuracy

(3) repeatability (4) sensitivity

143 A feeler gauge is used to check

(1) radius (2) surface roughness

(3) thickness of clearance (4) unsymmetrical shape

144 Thickness of light gauge sheet steel can be best checked with a

(1) finely divided steel scale

(2) depth gauge

(3) micrometer

(4) thickness measuring machine fitted with dial gauge

145 Which of the following gives an idea about the ability of the equipment to detect small variation in the input signal (quantity being measured) ?

(1) readability (2) accuracy

(3) sensitivity (4) precision

146 The least count of a vernier caliper having 25 divisions on vernier scale, matching with 24 divisions of main scale (1 main scale division = 0.5 mm) is

(1) 0.001 mm (2) 0.01 mm

(3) 0.02 mm (4) 0.05 mm

147 V-block is used in workshop to check

(1) roundness of a cylindrical job (2) surface roughness

(3) dimensions of oval job (4) tape on a job

148 The term "traceability" in engineering metrology is concerned with

(1) measuring machines (2) standards

(3) pneumatic comparators (4) optical instruments

149 The term "allowance" in limits and fits is usually referred to

(1) minimum clearance between shaft and hole

(2) maximum clearance between shaft and hole

(3) difference of tolerances of hole and shaft

(4) difference between maximum size and minimum size of hole

150 Surface roughness on a drawing is represented by

(1) triangles (2) circles

(3) squares (4) rectangles

151 The diameter of finished turned shaft can best be checked with a

(1) combination set (2) slip gauge

(3) height gauge (4) micrometer screw gauge

152 In limits and fits system, basic shaft system is one whose

(1) lower deviation is zero

(2) upper deviation is zero

(3) minimum clearance is zero

(4) standard tolerance is zero

153 It is desirable to handle the slip gauges with a cloth or chamois leather in order to

(1) avoid injury to hands

(2) protect the surfaces of slip gauges

(3) insulate them from the heat of the hand

(4) ensure that the varnish applied on gauges does not come out

154 Polygons in metrology are concerned with

(1) method of circular dividing

(2) testing of parallelism

(3) testing of circularity

(4) interferrometry measurements

155 Bevel protractor is used for

(1) linear measurements

(2) angular measurements

(3) flatness measurements

(4) parallelism measurements

156 Universal surface gauge is used for

(1) checking straightness

(2) checking flatness

(3) checking parallelism

(4) layout work and inspection

157 Wear allowance is provided on

(1) go gauge

(2) no go gauge

(3) both go and no go gauges

(4) when both are combined in one gauge

158 Profilometer is an instrument used to measure

(1) gear involute (2) thread profile

(3) surface roughness (4) surface flatness

159 Two slip gauges in precision measurement are joined by

(1) sliding (2) adhesion

(3) wringing (4) slipping

160 Plug gauges are used to

(1) measure the diameter of workpieces

(2) measure the diameter of the holes in workpieces

(3) check the diameter of the holes in workpieces

(4) check the outside diameter of workpieces

161 Statistical quality control techniques are based on the theory of

(1) quality (2) statistics

(3) probability (4) control

162 Gnatt charts provide information about

(1) break even point analysis (2) production schedule

(3) material handling layout (4) value analysis

163 Queuing theory deals with problems of

(1) material handling

(2) reducing waiting time or idle time

(3) better utilization of man services

(4) effective use of machines

164 Routing prescribes the

(1) flow of material in the plant

(2) proper utilization of man power

(3) proper utilization of machines

(4) inspection of final product

165 Most popular type of organization used for civil engineering constructions is

(1) line organization

(2) line and staff organization

(3) functional organization

(4) effective organization

166 Work study is concerned with

(1) improving present method and finding standard time

(2) motivation of workers

(3) improving production capability

(4) improving production planning and control

167 Basic tool in work study is

(1) graph paper (2) process chart

(3) planning chart (4) stop watch

168 Material handling and plant location is analyzed by

(1) Gnatt chart (2) bin chart

(3) activity chart (4) travel chart

169 Which of the following layout is suited for mass production ?

(1) process layout (2) product layout

(3) plant layout (4) functional layout

170 Graphical method, simplex method and transportation method are concerned with

(1) break-even analysis (2) value analysis

(3) linear programming (4) queing theory

171 Merit rating is the method of determining worth of

(1) a job

(2) an individual employee

(3) a particular division in workshop

(4) overall quality

172 Motion study involves analysis of

(1) actions of operator (2) layout of work place

(3) tools and equipments (4) all of the above

173 In which of the following layouts, the lines need to be balanced ?

(1) Process layout (2) product layout

(3) plant layout (4) functional layout

174 Current assets include

(1) manufacturing plant

(2) manufacturing plant and equipments

(3) inventories

(4) common stock held by the company

175 CPM has following time estimate

(1) one time estimate (2) two time estimate

(3) three time estimate (4) four time estimate

176 PERT and CPM are

(1) techniques to determine project status

(2) decision making techniques

(3) aids to determine cost implications of project

(4) aids to the decision maker

177 Work study comprises following main techniques

(1) method study and work measurement

(2) method and time study

(3) time study and work measurement

(4) method study and job evaluation

178 Probability distribution of project completion in PERT follows following distribution

(1) normal (2) beta

(3) exponential (4) Gaussian

179 Critical path of a network represents

(1) minimum time required for completion of project

(2) maximum time required for completion of project

(3) maximum cost required for completion of project

(4) minimum cost required for completion of project

180 According to Pareto principle, and effective man is one who

(1) can manage his boss

(2) can manage his subordinates

(3) can manage his colleagues

(4) pick up vital from the trivial many things

181 According to McGregor's theory of management

(1) all managers are complex in behaviour and it is difficult to get work done

(2) X managers in a organization will not work and Y managers will work. The ratio X/Y depends on the organizational set up

(3) the ratio X/Y is always 0.5 for any organization

(4) X theory managers presume that the average human being has an inherent dislike of work and will avoid if it he can

182 A public sector undertaking

(1) is fully owned by public through shareholders

(2) is jointly owned by private parties

(3) is jointly owned by private parties and government

(4) fully owned by government

183 F.W. Taylor introduced a system of working known as

(1) line organization (2) line and staff organization

(3) functional organization (4) effective organization

184 Salvaging means

(1) writing off the assets

(2) throwing away the assets

(3) selling the assets

(4) disposing off property which is no longer useful in present situation

185 Capital gains are

(1) unanticipated increase in income

(2) income through interest earned on investment

(3) income on dividends received from companies

(4) unanticipated changes in value of property relative to goods

186 In break even analysis the total cost consists of

(1) fixed cost

(2) variable cost

(3) fixed cost + variable cost

(4) fixed cost + variable cost + profit

187 Bin cards are used in

(1) machine loading (2) accounts

(3) stores (4) preventive maintenance

188 The financial position of a company is considered to be sound if

(1) sufficient funds are available under reserve and surplus

(2) company has declared good dividends in the past

(3) sales are increasing

(4) gross profit is reasonable

189 The law of demands states that

(1) when prices rise demand rises

(2) when prices fall demand rises

(3) when income rise demand rises

(4) when income and prices rise demand rises

190 The best source of revenue for states in India is

(1) sales tax (2) customs duty

(3) excise duty (4) entertainment tax

191 Indicate the group of persons who gain from inflation

(1) stock holders (2) bond holders

(3) debenture holders (4) fixed deposit holders

192 Economic development of a country depends more on

(1) natural resources (2) capital formation

(3) availability of market (4) entrepreneurs

193 Performance of a company can be judged by its

(1) share capital (2) total production

(3) number of employees (4) profits

194 During inflation

(1) prices rise (2) prices drop

(3) prices remain unchanged (4) prices fluctuates heavily

195 Budget is the major instrument of

(1) fiscal policy (2) monetary policy

(3) economic policy (4) export policy

196 Devaluation affects imports by making it

(1) costlier (2) cheaper

(3) competitive (4) prohibitive

197 Law of demands correlates

(1) quality and quantity (2) quality and price

(3) quantity and price (4) price and profit

198 The term "balance of trade" is associated with

(1) imports and exports (2) taxation

(3) gross profits of a company (4) budgeting

199 Mixed economy is identified by

(1) lack of competition

(2) coexistence of public and private sectors

(3) vigorous competition

(4) rising trend in prices

200 Which of the following is not a feature of developed economy ?

(1) predominance of industries

(2) high per capita income

(3) predominance of indirect taxes

(4) high rate of capital formation

SPACE FOR ROUGH WORK