CODE : DLK दि. २३.३.२००१

प्रश्नपुस्तिका क्रमांक
BOOKLET NO.

प्रश्नपुस्तिका
स्वयंचल अभियांत्रिकी

एकूण प्रश्न :
एकूण गुण : ३००

वेळ : १½ (दीड) तास

सूचना

1) सदर प्रश्नपुस्तिकेत १५० अनिवार्य प्रश्न आहेत. उमेदवारांनी प्रश्नांची उत्तरे लिहिण्यास सुरुवात करण्यापूर्वी या प्रश्नपुस्तिकेत सर्व प्रश्न आहेत किंवा नाहीत याची खात्री करून घ्यावी. असा तसेच अन्य काही दोष असल्यास ही प्रश्नपुस्तिका समवेक्षकांकडून लगेच बदलून घ्यावी.

2) आपला परीक्षा-क्रमांक ह्या चौकोनात **न विसरता बॉलपेनने** लिहावा.

परीक्षा-क्रमांक								

केंद्राची संकेताक्षरे   शेवटचा अंक

3) वर छापलेला प्रश्नपुस्तिका क्रमांक तुमच्या उत्तरपत्रिकेवर विशिष्ट जागी उत्तरपत्रिकेवरील सूचनेप्रमाणे **न विसरता नमूद** करावा.

4) (अ) या प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाला 4 पर्यायी उत्तरे सुचविली असून त्यांना 1, 2, 3 आणि 4 असे क्रमांक दिलेले आहेत. त्या चार उत्तरांपैकी सर्वात योग्य उत्तराचा क्रमांक उत्तरपत्रिकेवरील सूचनेप्रमाणे तुमच्या उत्तरपत्रिकेवर नमूद करावा. अशा प्रकारे उत्तरपत्रिकेवर उत्तरक्रमांक नमूद करताना तो संबंधित प्रश्नक्रमांकासमोर छायांकित करून दर्शविला जाईल याची काळजी घ्यावी, **ह्याकरिता फक्त निळ्या वा काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

(ब) **आयोगाने ज्या विषयासाठी मराठी-इंग्रजी माध्यम विहित केलेले आहे. त्या विषयाचा प्रत्येक प्रश्न मराठी बरोबर इंग्रजी भाषेत देखील छापण्यात येईल. त्यामधील इंग्रजीतील किंवा मराठीतील प्रश्नामध्ये मुद्रणदोषांमुळे अथवा अन्य कारणांमुळे विसंगती निर्माण झाल्याची शंका आल्यास, उमेदवाराने संबंधित प्रश्न पर्यायी भाषेतील प्रश्नाशी ताडून पहावा.**

5) सर्व प्रश्नांना समान गुण आहेत. यास्तव सर्व प्रश्नांची उत्तरे द्यावीत. घाईमुळे चुका होणार नाहीत याची दक्षता घेऊनच शक्य तितक्या वेगाने प्रश्न सोडवावेत. क्रमाने प्रश्न सोडविणे श्रेयस्कर आहे पण *एखादा प्रश्न कठीण वाटल्यास त्यावर वेळ न घालविता पुढील प्रश्नाकडे वळावे.* अशा प्रकारे शेवटच्या प्रश्नापर्यंत पोहोचल्यानंतर वेळ शिल्लक राहिल्यास कठीण म्हणून वगळलेल्या प्रश्नांकडे परतणे सोईस्कर ठरेल.

6) उत्तरपत्रिकेत एकदा नमूद केलेले उत्तर खोडता येणार नाही. नमूद केलेले उत्तर खोडून नव्याने उत्तर दिल्यास ते तपासले जाणार नाही.

७) प्रस्तुत परीक्षेच्या उत्तरपत्रिकांचे मूल्यांकन करताना उमेदवाराच्या उत्तरपत्रिकेतील योग्य उत्तरांनाच गुण दिले जातील. त्या प्राप्त गुणांतून त्यांनी उत्तरपत्रिकेत चुकीची उत्तरे नमूद केल्याबद्दल गुण वजा केले जाणार नाहीत.

ताकीद

ह्या प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपेपर्यंत ही प्रश्नपुस्तिका आयोगाची मालमत्ता असून ती परीक्षाकक्षात उमेदवाराला परीक्षेसाठी वापरण्यास देण्यात येत आहे. ही वेळ संपेपर्यंत सदर प्रश्नपुस्तिकेची प्रत/प्रती, किंवा सदर प्रश्नपुस्तिकेतील काही आशय कोणत्याही स्वरूपात प्रत्यक्ष वा अप्रत्यक्षपणे कोणत्याही व्यक्तीस पुरविणे, तसेच प्रसिद्ध करणे हा गुन्हा असून अशी कृती करणाऱ्या व्यक्तीवर शासनाने जारी केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचा अधिनियम -82'' यातील तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एका वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

तसेच ह्या प्रश्नपत्रिकेसाठी विहित केलेली वेळ संपण्याआधी ही प्रश्नपुस्तिका अनधिकृतपणे बाळगणे हा सुद्धा गुन्हा असून तसे करणारी व्यक्ती आयोगाच्या कर्मचारीवृंदापैकी, तसेच परीक्षेच्या पर्यवेक्षकीयवृंदापैकी असली तरीही अशा व्यक्तीविरूद्ध उक्त अधिनियमानुसार कारवाई करण्यात येईल व दोषी व्यक्ती शिक्षेस पात्र होईल.

●● कृपया पान उलटवा ●●

COD

8) प्रश्नपुस्तिकेमध्ये विहित केलेल्या विशिष्ट जागीच कच्चे काम (रफ वर्क) करावे. प्रश्नपुस्तिके व्यतिरिक्त-उत्तरपत्रिकेवर वा इतर कागदावर कच्चे काम केल्यास ते कॉपी करण्याच्या उद्देशाने केले असे मानले जाईल व त्यानुसार उमेदवारावर शासनाने जारी केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचे अधिनियम-82'' यातील तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एका वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

9) सदर प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपल्यानंतर उमेदवाराला ही प्रश्नपुस्तिका स्वत:बरोबर परीक्षाकक्षाबाहेर घेऊन जाण्यास परवानगी आहे. मात्र परीक्षाकक्षाबाहेर जाण्यापूर्वी उमेदवाराने आपली उत्तरपत्रिका समवेक्षकाकडे न विसरता परत करणे आवश्यक आहे.

10) या प्रश्नपुस्तिकेतील प्रश्नांमध्ये काही दोष आढळल्यास, त्यासंबंधी उमेदवाराने अधिप्रमाणित (Authentic) स्पष्टीकरण/ संदर्भ देऊन आपले लेखी निवेदन आयोगाच्या परीक्षा नियंत्रकांकडेच स्वत:च्या तपशीलासह टपालाने सादर करावे. याबाबत पर्यवेक्षक/समवेक्षक इत्यादींकडे विचारणा करू नये.आयोगाकडे सदर परीक्षेच्या दिनांकापासून 8 दिवसांपर्यंत पोहोचलेल्या लेखी निवेदनाची फक्त दखल घेतली जाते. तद्नंतर आलेली निवेदने विचारात घेतली जात नाहीत. तसेच उशिरा वा वेळेत आलेल्या निवेदनाबद्दल कोणताही पत्रव्यवहार केला जात नाही.

नमुना प्रश्न

प्र.क्रं. 201. Petrol Engine works on .... cycle.

      (1) Natural   (2) Air   (3) Otto   (4) Carnot

      ह्या प्रश्नाचे योग्य उत्तर '' (3) Otto असे आहे. त्यामुळे या प्रश्नाचे उत्तर ''(3)'' होईल. यास्तव खालीलप्रमाणे प्र. क्र. 201 समोरील उत्तर क्रमांक ''[3]'' चा कंस पूर्णपणे छायांकित करून दाखविणे आवश्यक आहे.

    प्र. 201.   [1]   [2]   ■   [4]

      या-पद्धती-ने या प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाचा तुमचा उत्तरक्रमांक तुम्हाला स्वतंत्ररित्या पुरविलेल्या उत्तरपत्रिकेवरील त्या त्या प्रश्नक्रमांकासमोरील संबंधित कंस पूर्णपणे छायांकित करून दाखवावा. ह्याकरिता फक्त निळ्या वा काळ्या शाईचे बॉलपेन वापरावे. पेन्सिल वा शाईचे पेन वापरू नये.

पर्यवेक्षकांच्या सूचनेविना हे पृष्ठ उलटू नये

कच्च्या कामासाठी जागा
SPACE FOR ROUGH WORK

कच्च्या कामासाठी जागा
SPACE FOR ROUGH WORK

AUTOMOBILE ENGINEERING

1. Which one is the low-pressure steam generator ?
   (1) Benson steam generator (2) Loeffler steam generator
   (3) Volex steam generator (4) none of these

2. Compression ratio for compressor is always
   (1) more than 1.0 (2) less than 1.0
   (3) equal to 1.0 (4) zero

3. Compressor capacity is expressed in
   (1) m^3/kg (2) KW
   (3) KWh (4) m^3/min

4. In a compressor, the clearance volume is kept minimum, because it affects
   (1) isothermal efficiency (2) compressor efficiency
   (3) volumetric efficiency (4) none of the above

5. The performance of a reciprocating compressor is expressed by
   (1) adiabatic work
   (2) isothermal work
   (3) isothermal work/indicated work
   (4) none of the above

6. Air conditioning controls
   (1) temperature only (2) humidity only
   (3) motion of air and humidity (4) All the above three factors

7. In a multi-stage compression with intercooling, work required is
   (1) reduced (2) increased
   (3) not changed (4) none of the above

8. In a double acting compressor, the air is compressed
   (1) in a single cylinder
   (2) in two cylinders
   (3) in two stages on one side
   (4) in a single cylinder on both sides

9. In a compressor, the volume of air sucked during the suction stroke is known as
   (1) free air delivered (2) swept volume
   (3) compressor capacity (4) none of the above

10. The ratio of delivery pressure to suction pressure of air is called

    (1) volumetric efficiency   (2) expansion ratio

    (3) compression efficiency   (4) compression ratio

11. In a two-stage air compressor, an intercooler is placed

    (1) before L.P. cylinder

    (2) after H.P. cylinder

    (3) in between L.P. and H.P. cylinder

    (4) none of the above

12. 1 ton of refrigeration is the

    (1) mass of refrigerant flow per second

    (2) mass of refrigeration unit

    (3) rate of ice formed per second

    (4) heat extraction at a rate of 3.5 kJ per second

13. A house-hold refrigerator works on

    (1) vapour absorption cycle   (2) vapour compression cycle

    (3) Carnot cycle   (4) Bell-Coleman cycle

14. The voltage required to produce a spark between the spark points in spark plug is in the range

    (1) 2 to 4 kV   (2) 5 to 5.5 kV

    (3) 6 to 10 kV   (4) 12 to 15 kV

15. The ratio of heat extracted from refrigerant to work supply is called

    (1) coefficient of performance of heat pump

    (2) coefficient of performance of refrigerator

    (3) refrigeration efficiency

    (4) relative coefficient of performance

16. What is the refrigerant used in a house-hold refrigerator ?

    (1) Freon-22   (2) Freon - 11

    (3) Freon-12   (4) NH_3

17. Bell-Coleman cycle is a

    (1) reversed Carnot cycle   (2) reversed Joule cycle

    (3) reversed Otto cycle   (4) none of the above

18. The C.O.P. of a one-ton VCC refrigerating machine is 3.5. The minimum power to run this machine would be

    (1) 1.00 HP   (2) 1.00 KW

    (3) 1.00 KWh   (4) 3.50 KW

19. A domestic refrigerator has an expansion device in the form of a/an

    (1) Automatic expansion valve

    (2) Hand operated expansion valve

    (3) Float valve

    (4) Capillary tubes

20. A package type Air conditioner has a capacity upto around

    (1) 1 ton   (2) 100 tons

    (3) 20 tons   (4) none of the above

21. This _____ reading will be the same in Centigrade and Fahrenheit temperature units.

    (1) 100°   (2) −100°

    (3) −40°   (4) 40°

22. Absolute humidity is defined as

    (1) Weight of water vapour present in unit volume of air

    (2) Weight of water vapour present in 1 Kg of air

    (3) Weight of moist air per m^3 of volume

    (4) none of the above

23. The function of a governor of steam engine is to

    (1) save steam

    (2) control the speed

    (3) provide safety to the people around

    (4) maintain constant load on the engine

24. Humidostat is a device which is sensitive to

    (1) Moisture changes

    (2) Temperature changes

    (3) Moisture and temperature changes

    (4) None of the above

25. A steel rod of 20 mm diameter and 500 mm long is subjected to an axial pull. If $E = 2 \times 10^5$ N/mm^2, the elongation of the rod will be
    (1) 0.239 mm
    (2) 0.0239 mm
    (3) 0.00239 mm
    (4) 23.9 mm

26. What is the strain in a bar having cross-section area 50 mm^2 subjected to 10 kN axial load ? Assume Young's Modulus as 2×10^5 N/mm^2.
    (1) 0.001
    (2) 0.002
    (3) 0.0001
    (4) 0.01

27. If the end portion of a beam is extended beyond the support, it is known as
    (1) Cantilever beam
    (2) Continuous beam
    (3) Overhanging beam
    (4) Fixed beam

28. A rectangular section has 200 mm depth and 300 mm width. Determine Moment of Inertia about centroidal axis parallel to the width.
    (1) 450×10^6 mm^4
    (2) 200×10^6 mm^4
    (3) 300×10^6 mm^4
    (4) 600×10^6 mm^4

29. Section Modulus of a circular cross-section about its diameter 'D' is given as.....
    (1) $\dfrac{\pi D^4}{16}$
    (2) $\dfrac{\pi D^3}{32}$
    (3) $\dfrac{\pi D^4}{32}$
    (4) $\dfrac{\pi D^4}{64}$

30. Deflection of a Cantilever beam, measured at its free end, subjected to uniform load intensity 'w' over a span 'l' is given as _____
    (E = Young's Modulus; I = Moment of Inertia about Neutral axis)
    (1) $wl^4/6\,EI$
    (2) $wl^4/8\,EI$
    (3) $wl^4/4EI$
    (4) $wl^4/16\,EI$

31. What is the slope at the fixed end of a cantilever beam, subjected to concentrated load 'W' at its free end ?
    (1) 30°
    (2) 90°
    (3) 0°
    (4) None

32. Deflection at the centre of a simply supported beam, with uniformly distributed load 'w' per unit length over the entire span 'l' having modulus of elasticity "E" and Moment of Inertia "I", is given as
    (1) $\dfrac{5}{384}\dfrac{wl^4}{EI}$
    (2) $\dfrac{5}{348}\dfrac{wl^4}{EI}$
    (3) $\dfrac{3}{384}\dfrac{wl^4}{EI}$
    (4) $\dfrac{7}{384}\dfrac{wl^4}{EI}$

33. Euler's Buckling load on a column of length 'l' with both ends hinged, is given as
   (E = Young's Modulus; I = Moment of Inertia of Column Cross-section)

   (1) $\dfrac{\pi\,EI}{l^2}$.

   (2) $\dfrac{\pi^2\,EI}{l}$

   (3) $\dfrac{\pi^2\,EI}{l^2}$

   (4) $\dfrac{2\pi^2\,EI}{l^2}$

34. Water main 800 mm in diameter contains water at a pressure load of 120 m. If density of water is 10000 N/m^3, determine the metal thickness with allowable tensile stress 24 N/mm^2.

   (1) 10 mm

   (2) 20 mm

   (3) 24 mm

   (4) 18 mm

35. Very thin grinding wheels are made with

   (1) Shellac bond

   (2) Rubber bond

   (3) Vitrified bond

   (4) Resinoid bond

36. What are the main raw materials required for production of pig iron ?

   (1) Iron, coal and flux

   (2) Iron ore, coke and lime stone

   (3) Iron ore, cooking coal and flux

   (4) Iron ore, coal and dolomite

37. What are the main constituents of Babbitt metal used in industry ?

   (1) Copper-tin-antimony

   (2) Copper-tin-phosphorus

   (3) Copper-tin-nickel

   (4) Copper-zinc-nickel

38. Which metal is used for a wide variety of small components of electrical equipment, buses, ordinance work and belts, rods, tubes, etc. ?

   (1) Monel metal

   (2) Bell metal

   (3) Muntz metal

   (4) Gun metal

39. Which of the following is a chipless machining process ?

   (1) Knurling

   (2) Metal spinning

   (3) Hobbing

   (4) Lapping

40. For which engineering purposes, uranium, thorium, plutonium, zirconium, beryllium, niobium and their alloys are primarily used ?

   (1) Electronic Engineering

   (2) Nuclear Engineering

   (3) Telecommunication Engineering

   (4) Computer Engineering

DLK

41. Which process of metal-working is simply a plastic deformation performe shape and dimensions by mechanical pressure ?

    (1) ECM   (2) EDM

    (3) Extrusion   (4) Shaping

42. Tumbling is done to

    (1) remove blow holes   (2) create hard surface

    (3) clean the casting   (4) fill-up the blow holes

43. What is the temperature of metal in hot working process at which new grains are formed ?

    (1) Below the recrystallisation temperature

    (2) Above the recrystallisation temperature

    (3) At melting temperature

    (4) Above melting temperature

44. Withdrawal of the pattern from the sand of the mould, without breaking the mould, is possible by providing

    (1) shrinkage allowance   (2) draft

    (3) rapping allowance   (4) finish allowance

45. The process used for making large-diameter pipes, hollow propeller shafts or gun barrels, is

    (1) Centrifugal casting   (2) Forging

    (3) Rolling   (4) Die-casting

46. Which heat treatment is applied to remove stresses and improve the mechanical properties and increase machinability ?

    (1) Normalising   (2) Hardening

    (3) Tempering   (4) Annealing

47. What are the two basic ways of metal cutting using a single-point cutting tool and a multi-point cutting tool ?

    (1) "Single" and "multi-direction" cutting

    (2) "Perpendicular" and "Oblique" cutting

    (3) "Orthogonal" and "Oblique" cutting

    (4) "Orthogonal" and "Straight" cutting

48. What device is used for holding and rotating a hollow piece of work that has been previously drilled or bored ?

    (1) Collet chuck   (2) Mandrel

    (3) Lathe centre   (4) Catch plate

49. In metric standard, reciprocal of circular pitch of spur gear is described as
    (1) Addendum   (2) Dedendum
    (3) Module   (4) Backlash

50. Study the following statements :
    A – Tailstock of Engine-Lathe is replaced by turret in turret lathe
    B – Turret lathe is used for very small precision jobs
    C – Turret lathe can be tape controlled
    (1) A and B are true   (2) A and C are true
    (3) B and C are true   (4) All are true

51. A method of grinding external cylindrical surfaces, in which the work is supported among a regulating wheel, grinding wheel and a work rest blade, is known as
    (1) Snagging grinding   (2) Cylindrical grinding
    (3) Centreless grinding   (4) Form grinding

52. Small internal gear teeth are cut in one operation by a tool having a number of cutting edges equal to the number of teeth on the gear. Name the tool.
    (1) Milling tool   (2) Hobbing tool
    (3) Broaching tool   (4) Reaming tool

53. The device, used for dividing the periphery of the gear blank into a desired number of equal parts, is
    (1) Combination head   (2) Dividing head
    (3) Multiple head   (4) Periphery head

54. It is essential to do annealing and pickling, after performing
    (1) drilling   (2) grinding
    (3) metal spinning   (4) broaching

55. The number of collars are provided to carry a fixed axial load in a flat collar bearing
    (1) to reduce frictional torque   (2) to increase frictional torque
    (3) to increase intensity of pressure (4) to decrease intensity of pressure

56. For the same pitch, the efficiency of screw jack with square threads is
    (1) more than that with V-threads   (2) less than that with V-threads
    (3) same as that with V-threads   (4) dependent only on the load on the jack

57. The friction acting on body while in motion, is called
    (1) Static friction   (2) Dry static friction
    (3) Dynamic friction   (4) Static and dynamic friction

58. Hartnell governor is
    (1) Spring-loaded type governor
    (2) Dead-weight-loaded type governor
    (3) Pendulum type governor
    (4) Inertia governor

59. For the same mass of flywheel
    (1) the disc type flywheel is preferable
    (2) the rim type flywheel is preferable
    (3) preference will depend upon the type of the prime mover
    (4) any type is equally preferable

60. For the same maximum fluctuation energy of a flywheel, if the mean speed of rotation is more
    (1) the size of the flywheel is reduced
    (2) the size of the flywheel is increased
    (3) the size of the flywheel is not dependent on the speed and is unaffected
    (4) working is safer

61. Angular acceleration of a link AB is found by dividing the
    (1) centripetal component of acceleration of B relative to A by length AB
    (2) linear velocity of B relative to A by length AB
    (3) total acceleration of B relative to A by length AB
    (4) tangential component of acceleration of B relative to A by length AB

62. Kennedy's theorem states that, if three rigid links have plane motion, their instantaneous centres lie on
    (1) a triangle   (2) a point
    (3) a straight line   (4) none of the above

63. A bolt and nut forms
    (1) a turning pair   (2) spherical pair
    (3) sliding pair   (4) screw pair

64. The motion of a rotating shaft in foot step bearing, constitutes between the elements of a kinematic pair
    (1) successfully constrained motion
    (2) completely constrained motion
    (3) incompletely constrained motion
    (4) unsuccessfully constrained motion

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65. A perfect fluid is
    (1) compressible and gaseous   (2) a real fluid
    (3) incompressible and frictionless (4) one which obeys perfect gas laws

66. Continuity equation deals with the law of conservation of
    (1) mass   (2) momentum
    (3) energy   (4) none of the above

67. Select the correct statement.
    (1) Absolute pressure = (Gauge pressure – Atmospheric pressure)
    (2) Gauge pressure = (Absolute pressure – Atmospheric pressure)
    (3) Absolute pressure = (Atmospheric pressure + Vacuum pressure)
    (4) Gauge pressure = (Atmospheric pressure + Vacuum pressure)

68. All fluids exert
    (1) pressure in the direction of flow only
    (2) pressure in the direction of force of gravity
    (3) equal pressure in all directions
    (4) equal pressure only in x, y and z planes

69. A fluid is a substance that
    (1) always expands until it fills any container
    (2) is practically incompressible
    (3) cannot remain at rest under action of any shear force
    (4) cannot be subjected to shear force

70. A pump is a device which converts
    (1) hydraulic energy into mechanical energy
    (2) mechanical energy into hydraulic energy
    (3) kinetic energy into mechanical energy
    (4) none of the above

71. Governing of turbine means
    (1) head is kept constant under all conditions of working
    (2) the speed is kept constant under all conditions
    (3) the discharge is kept constant under all conditions
    (4) none of the above

72. The casing of a centrifugal pump is made spiral, so as
    (1) to reduce hydraulic losses
    (2) to convert kinetic energy into pressure energy
    (3) to convert pressure energy into kinetic energy
    (4) to facilitate priming

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73. High head of water is required for

    (1) Francis turbine   (2) Propeller turbine

    (3) Pelton wheel   (4) Kaplan turbine

74. The relation between hydraulic efficiency (η_h) ; mechanical efficiency (η_m) and overall efficiency (η_o) is

    (1) $\eta_h = \eta_o \times \eta_m$ (2) $\eta_o = \eta_h \times \eta_m$

    (3) $\eta_o = (\eta_m / \eta_h)$ (4) None of the above

75. The primary fuel used in nuclear power plant is

    (1) U_{235} (2) U_{238}

    (3) P_{239} (4) P_{233}

76. Which of the following is <u>not</u> a non-conventional energy source ?

    (1) Solar energy   (2) Wind energy

    (3) Coal   (4) Bio-gas

77. Capital and generation cost of geothermal power plant is

    (1) more than those of nuclear power plant

    (2) more than those of steam power plant

    (3) more than those of hydel power plant

    (4) least among the types mentioned above

78. Standard value of the solar constant is

    (1) 1353 W/m^2 (2) 1353 kW/m^2

    (3) 1000 W/m^2 (4) 1353 MW/m^2

79. Direct energy conversion system include

    (1) Magnetohydrodynamic system   (2) Geothermal system

    (3) Tidal power system   (4) None of the above

80. Wind energy is actually put into use in Maharashtra at

    (1) Deogad   (2) Pune

    (3) Nagpur   (4) Mumbai

81. Which of the following is the most important commercial source of energy in India at present ?

    (1) Solar energy   (2) Oil

    (3) Coal   (4) Uranium

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82. The process of supplying the intake air to the engine cylinder, at a density gr[eater than?] the density of surrounding atmospheric air, is known as
   (1) Supercharging   (2) Scavenging
   (3) Detonation   (4) None of the above

83. Energy may be defined as
   (1) A "push" or "pull"
   (2) The product of force and velocity
   (3) The capacity to do work
   (4) The product of mass and acceleration

84. Which of the following is NOT a thermal prime mover ?
   (1) Water turbine   (2) Steam turbine
   (3) Gas turbine   (4) Petrol engine

85. In a Theoretical Rankine cycle, expansion is assumed to be
   (1) polytropic   (2) hyperbolic
   (3) isentropic   (4) isothermal

86. For C.I. Engines, the compression ratio is in the range of
   (1) 5 to 9   (2) 12 to 20
   (3) 1 to 2   (4) none of the above

87. A short chimney is provided for
   (1) Lancashire Boiler   (2) Babcock and Wilcox Boiler
   (3) Locomotive Boiler   (4) Cochran Boiler

88. The weight of the diesel engine, compared to similar petrol engine is
   (1) 2 to 3 times greater   (2) 2 to 3 times smaller
   (3) almost equal   (4) none of the above

89. Of the following four fuels, the highest calorific value is possessed by
   (1) Kerosene   (2) Diesel
   (3) Petrol   (4) Vegetable oil

90. The S.I. Engines are high speed engines with operating speeds in the range of
   (1) 1000 to 2000 r.p.m.   (2) 3000 to 5000 r.p.m.
   (3) 10000 to 12000 r.p.m   (4) none of the above

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91. When servicing an air cleaner, the filter element should be

    (1) washed in oil   (2) washed in cleaning fluid

    (3) washed with water   (4) replaced

92. The testing equipment which gives a very close approximation of a road test in garage is called

    (1) Engine dynamometer   (2) Chassis dynamometer

    (3) Engine tester   (4) Tachometer

93. Tar spots from a car body are removed by

    (1) Rubber brush and water   (2) Soft sponge

    (3) Special cleaning agents   (4) Soap containing agents

94. In the differential, the distance between adjacent meshing teeth in the driving and driven gear is called as

    (1) toe   (2) heel

    (3) back lash   (4) clearance

95. When the car is being lifted for servicing

    (1) never allow passengers to remain in a car

    (2) see all doors are closed

    (3) engage the mechanical lock, if available

    (4) all of the above

96. "Medium transport motor vehicle" means whose gross vehicle weight falls between

    (1) 2000 to 4000 kg   (2) 4000 to 8000 kg

    (3) 3000 to 6000 kg   (4) 6000 to 12000 kg

97. Change of residence has to be intimated to the registering authority by the owner

    (1) within 1 month   (2) within 2 months

    (3) within 3 months   (4) within 4 months

98. As per Motor Vehicle Act, in passenger vehicles, each passenger seat shall have approximate area in square millimetres.

    (1) 420×420 (2) 440×440

    (3) 460×460 (4) 480×480

99. If your car is involved in an accident and injured the person, then you should

    (1) report to the nearest police station and take the person to the hospital

    (2) need not report to the police station but make arrangement for admitting person to hospital

    (3) need not take the person to hospital but only report to the police station

    (4) take the person to the hospital and then report to the nearest police station

100. Road tax is dependent on the

    (A) vehicle weight

    (B) R.L.W.

    (C) passengers allowed (seating capacity)

    (D) permit obtained

    (1) All above are correct

    (2) (A), (B) & (C) are correct

    (3) (A) & (B) are correct

    (4) (A) alone is correct

101. A.R.A.I. is situated at

    (1) Ahmednagar

    (2) Mumbai

    (3) Nagpur

    (4) Pune

102. Which one of the following pairs is incorrect ?

    (1) Bajaj Auto — Two wheelers and Three wheelers

    (2) Mahindra & Mahindra — Jeeps and Tractors

    (3) Premier Automobiles — Petrol cars and Diesel cars

    (4) TELCO — Tractors and Trucks

103. Which of the following company is not engaged in the manufacture of tyres in India ?

    (1) J.K.

    (2) M.R.F.

    (3) L & T

    (4) Modi

104. P.C.R.A. is situated at

    (1) Baroda

    (2) Bhopal

    (3) Bhuvaneswar

    (4) Mumbai

105. Which is the Diesel engine vehicle ?

    (1) Matiz

    (2) Maruti Gipsy

    (3) Sumo

    (4) Contessa

106. In Spark Ignition Engines, combustion completes in

    (1) six stages   (2) three stages

    (3) four stages   (4) eight stages

107. Octane Number is determined by comparing the performance of petrol with following hydrocarbons :

    (1) Iso Octane

    (2) Mixture of Normal Heptane and Iso Octane

    (3) Mixture of Methane and Ethane

    (4) Alpha Methyl Napthalene

108. The boiling range of Diesel Oil is

    (1) 400°C to 550°C   (2) 200°C to 375°C

    (3) 30°C to 200°C   (4) 600°C to 700°C

109. Valve face angle varies from

    (1) 10° to 15°   (2) 5° to 8°

    (3) 30° to 45°   (4) 60° to 75°

110. Relative efficiency is the ratio of

    (1) Brake Power to Indicated Power

    (2) Mechanical efficiency to Thermal efficiency

    (3) Actual thermal efficiency to Volumetric efficiency

    (4) Actual thermal efficiency to Air-standard efficiency

111. The cylinder liners are made by

    (1) Centrifugal casting   (2) Moulding

    (3) Press-working   (4) Forging

112. Generally valves are made from

    (1) Cast iron   (2) Cast steel

    (3) Nickel chrome steel   (4) Aluminium alloy

113. Spark plug gaps are required in the range of

    (1) 0.02 to 0.6 mm   (2) 0.45 to 1.00 mm

    (3) 0.90 to 2.00 mm   (4) 1.00 to 1.30 mm

114. Choke valve is used in carburettor
    (1) to supply chemically correct air fuel mixture
    (2) to supply rich air fuel mixture
    (3) to supply lean air fuel mixture
    (4) to supply oil and fuel mixture

115. The chemical equation of a complete combustion of petrol is
    (1) $2 C_6 H_{18} + 21 O_2 = 12 CO_2 + 18 H_2O$
    (2) $2 C_4 H_8 + 12 O_2 = 8 CO_2 + 8 H_2O$
    (3) $2 C_8 H_{18} + 27 O_2 = 16 CO_2 + 18 H_2O + 2O_2$
    (4) $2 C_8 H_{18} + 25 O_2 = 16 CO_2 + 18 H_2O$

116. The term scavenging is associated with
    (1) Four-stroke cycle engines   (2) Two stroke cycle engines
    (3) Steam engines   (4) Gas turbines

117. To measure Brake Power of the Auto Engines following device is used.
    (1) Indicator   (2) Dynamometer
    (3) Hydrometer   (4) Watt meter

118. How do you get friction power for single cylinder constant speed diesel engine when only brake dynamometer and fuel measurement arrangements are available ?
    (1) By Morse Test
    (2) By Motoring Test
    (3) By difference between I.P. and B.P.
    (4) By Willan's Line Method

119. In Multicylinder Auto Engines, heat converted into useful work is about
    (1) 15 to 20 percent   (2) 25 to 45 percent
    (3) 45 to 60 per cent   (4) 60 to 80 percent

120. Torque produced by the Auto Engine at 4000 r.p.m. is 4 NM. Torque that can be produced by the same engine at 6000 r.p.m. is
    (1) 2 NM   (2) 3 NM
    (3) 4 NM   (4) 5 NM

121. Modern Car Engine uses the following lubricating system :
    (1) Petrol-oil system
    (2) Pressurised lubricating system
    (3) Splash lubricating system
    (4) All above lubricating systems

122. Petrol engine is not starting due to

    (A)   Rich mixture supplied

    (B)   Lean mixture supplied

    (C)   Spark plug electrode eaten

    (D)   Defect in condenser

    (1)   (B), (C) and (D) are correct   (2)   (B) and (C) are correct

    (3)   (C), (B) and (A) are correct   (4)   (B) and (D) are correct

123. What is the location of the choke in the updraft carburettor ?

    (1)   Between the throttle and intake manifold

    (2)   Above the throttle

    (3)   Below the throttle

    (4)   None of the above

124. Engine cam shaft speed in four stroke Auto engine is

    (1)   Double the speed of crank shaft

    (2)   Equal to the speed of crank shaft

    (3)   Half the crank shaft speed

    (4)   Four times crank shaft speed

125. Method of Governing used in Diesel Engine is

    (1)   Quality Governing

    (2)   Hit and Miss Governing

    (3)   Quantity Governing

    (4)   Combined of all above Governing

126. While charging a battery, the temperature of the electrolyte should not exceed

    (1)   48.8°C   (2)   51.6°C

    (3)   54.4°C   (4)   73.8°C

127. Which one of the following applies to single plate clutch ?

	No. of driven plates	No. of driving surfaces
(1)	One	One
(2)	One	Two
(3)	Two	One
(4)	Two	Two

128. Which one of the following gear box type uses friction cones to equalise the the gears before engagement ?

    (1) Sliding mesh   (2) Epicyclic
    (3) Crash type   (4) Synchromesh

129. When small gear drives a larger gear in gear box of an automobile, the result is

    (1) increase in torque
    (2) reduced torque transmitted
    (3) increased speed
    (4) same speed but reduced torque

130. The universal joint in the propeller shaft is necessary to

    (1) provide an easy method to disconnect the drive line
    (2) carry engine torque to the drive wheels
    (3) reduce a smooth turning drive line
    (4) allow drive wheel suspension free movement

131. Which type of rear axle is best suited for heavy vehicles ?

    (1) Full floating axle   (2) Quarter floating axle
    (3) Semi floating axle   (4) Three quarter floating axle

132. When vehicle is cornering, the crown wheel is rotating at 400 rev/min. and the outer wheel is running at 420 rev/min, then the speed of the inner wheel of the final drive will be

    (1) 420 rev./min   (2) 380 rev./min
    (3) 400 rev./min   (4) 440 rev./min

133. The pistons in the front wheel cylinders as compared to those in rear wheel cylinders in hydraulic brake system are

    (1) larger   (2) smaller
    (3) of the same size   (4) none of the above

134. Operating of double declutching is necessary for changing lower gear to

    (1) decrease the speed of lay-shaft
    (2) decrease the speed of main shaft
    (3) increase the speed of lay shaft
    (4) increase the speed of main shaft

135. As compared to drum brakes, disc brakes has

    (1) same resistance to fade   (2) high resistance to fade
    (3) lower resistance to fade   (4) no resistance to fade

136. The tilting of front wheel away from the vertical is known as

    (1) Castor   (2) Camber

    (3) Toe-in   (4) Toe-out

137. Which one of the following converts the rotary motion of steering wheel into a reciprocating motion ?

    (1) Steering box   (2) Track rod

    (3) Track arm   (4) Stub axle

138. The resistance of air while running a vehicle depends upon

    (1) Unladen weight of the vehicle

    (2) Kerb weight of the vehicle

    (3) Laden weight of the vehicle

    (4) Body shape of the vehicle

139. Which one of the following chassis-sections offers the highest resistance to torsion ?

    (1) Channel   (2) Tubular

    (3) Box   (4) Flat

140. The tread pattern helps

    (1) for even wear of tyre

    (2) for positive grip and air-cooling of tyres

    (3) for increasing the beauty of tyre

    (4) for reducing the weight of tyre

141. The racing car uses smaller wheels because

    (1) it rolls at faster rate

    (2) it is more comfortable

    (3) it lowers the centre of gravity and larger steering lock angles

    (4) it looks good and as a fashion

142. The spring weight term used in automobile refer to

    (1) the weight of the part of vehicle springs

    (2) the weight of front, rear axle and tyres

    (3) the weight of the part of vehicle supported on the springs

    (4) the weight of the front and rear springs

143. The lay-out of vehicle shows
    (1)   different parts used in vehicles
    (2)   different components of chassis
    (3)   different assemblies and parts of vehicles
    (4)   shape, size and types of chassis

144. The wiper motor is of
    (1)   series wound type
    (2)   shunt wound type
    (3)   series and shunt wound type
    (4)   series and parallel wound type

145. The angle between the actual path and desired path of a vehicle is known as
    (1)   camber angle   (2)   castor angle
    (3)   slip angle   (4)   King pin angle

146. When fully charged, the specific gravity of acid in a battery is
    (1)   0.74   (2)   1.00
    (3)   1.18   (4)   1.28

147. Hard steering is due to
    (1)   low tyre pressure
    (2)   high speed of vehicle
    (3)   worn out bearing of front wheels
    (4)   stub axle bending

148. Hard shifting of gears is due to
    (1)   leakage of oil from gear box
    (2)   worn out splines on the main shaft
    (3)   high speed
    (4)   over loading

149. Noisy valve operation is due to
    (1)   loose nuts and bolts of engine head
    (2)   worn out head packing
    (3)   worn out valve springs
    (4)   wrongly adjusted tappet

150. Hard starting when engine is cold due to
    (1)   cold atmosphere   (2)   less water in radiator
    (3)   faulty choke operation   (4)   none of the above