PSC Inspector Of Factories And Boilers Grade II - Factories And Boilers Examination

Previous Year Question Paper

Exam Name: ***Inspector Of Factories And Boilers Grade II - Factories And Boilers***

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Medium of Questions: English

053/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. A steel bar 10 mm × 10 mm cross section is subjected to an axial tensile load of 20 kN. If the length of bar is 1 m and $E = 200$ GPa, then elongation of the bar is :
   (A) 1 mm (B) 0.5 mm
   (C) 0.75 mm (D) 1.5 mm

2. The modulus of rigidity and poisson's ratio of a material are 80GPa and 0.3 respectively, Its youngs modulus will be :
   (A) 160 GPa (B) 208 GPa
   (C) 120 GPa (D) 104 GPa

3. The equivalent torque on a shaft, when it is subjected to bending moment M and torque T is :
   (A) $M + T$ (B) $\left(M^2 + T^2\right)^{1/2}$
   (C) $0.5\left(M^2 + T^2\right)^{1/2}$ (D) $0.5\left[M + \left(M^2 + T^2\right)^{1/2}\right]$

4. If the value of poisson's ratio is zero, then it means that :
   (A) the lateral strain is high
   (B) the material is perfectly plastic
   (C) there is no linear strain in the material
   (D) none of these

5. The outside diameter of a hollow shaft is twice its inside diameter. The ratio of its torque carrying capacity to that of solid shaft of same material and same outside diameter is :
   (A) 3/4 (B) 1/2
   (C) 15/16 (D) 1/16

6. Two shafts are made of the same material. The diameter of first is twice that of second. The ratio of power which can be transmitted by first shaft and second is
   (A) 1/2 (B) 1/4
   (C) 1/8 (D) 1/16

7. A solid shaft is subjected to a bending moment and twisting moment of 3 kNm and 4 kNm respectively. The equivalent bending moment is :
   (A) 4 kNm (B) 3 kNm
   (C) 3.5 kNm (D) 4.5 kNm

8. The buckling load is maximum for a column if :
   (A) one end of the column is fixed and the other end is free
   (B) both ends of the column are hinged
   (C) both ends of the column are fixed
   (D) one end of the column is hinged and other end is free

9. The buckling load for a column hinged at both ends is 15 kN. If the ends are fixed, the buckling load changes to :
   (A) 60 kN (B) 30 kN
   (C) 45 kN (D) 3.75 kN

10. The Euler's load for a column is 1 MN and crushing load is 1.5 MN. The Rankine load is :
   (A) 1 MN (B) 0.6 MN
   (C) 1.5 MN (D) 2.5 MN

11. The shape of bending moment diagram for a uniform cantilever beam carrying uniformly distributed load over its length is
   (A) a hyperbola (B) a straight line
   (C) an ellipse (D) a parabola

12. Steady flow occurs when :
   (A) velocity does not change
   (B) pressure does not change
   (C) conditions change gradually with time
   (D) conditions do not change with time at any point

13. The depth of centre of pressure in rectangular lamina of 3m deep fully immersed in a liquid having one side in line with free surface is :
   (A) 1m (B) 1.5m
   (C) 2m (D) 2.5m

14. The pressure in metres of oil (specific gravity 0.85) equivalent to 85 metres of water is :
   (A) 100 m (B) 85 m
   (C) 8.5 m (D) none of the above

15. Pressure in Pascal at a depth of 1 m below the free surface of water will be :
   (A) 1 pa (B) 9810 Pa
   (C) 98.1 Pa (D) 981 Pa

16. Rain drops are spherical because of :
(A) viscosity
(B) air resistance
(C) surface tension
(D) atmospheric pressure

17. In a multiple disc clutch, if n_1 and n_2 are number of discs on driving and driven shafts respectively, then number of pairs of contact surface will be :
(A) $n_1 + n_2 - 1$
(B) $n_1 + n_2 + 1$
(C) $n_1 + n_2$
(D) $(n_1 + n_2)/2$

18. A Flywheel of moment of inertia 9.8 kgm^2 fluctuates by 30 rpm for a fluctuation in energy of 1936 joules. The mean speed of the flywheel is :
(A) 900 rpm
(B) 600 rpm
(C) 936 rpm
(D) 1200 rpm

19. The stud bolt is :
(A) thread on both ends
(B) thread on one end without head
(C) thread on one end with head
(D) none of the above

20. The product of moment of inertia and angular velocity is known as :
(A) angular torque
(B) kinetic energy
(C) angular momentum
(D) none of the above

21. In the case of flat pivot bearing the rubbing velocity is :
(A) maximum at the centre of the contact area
(B) zero at the centre and maximum at the outer radius
(C) uniform throughout the contact area
(D) zero at the outer radius

22. The frictional torque transmitted in the case of flat pivot bearing for uniform pressure is :
(A) μWR
(B) $1/3\,\mu$WR
(C) $2/3\,\mu$WR
(D) $1/2\,\mu$WR

23. Which of the following is an example of friction clutch?
(A) disc
(B) cone
(C) plate
(D) all of the above

24. The module is defined as the ratio of :
(A) number of teeth to the pitch circle diameter
(B) pitch circle diameter to number of teeth
(C) circumference of the pitch circle to number of teeth
(D) none of the above

25. The product of module and diametral pitch is equal to :
(A) π (B) $\pi/2$
(C) 1.0 (D) 2π

26. The locus of a point on the circumference of a circle, which rolls without slipping on a fixed straight line is known as :
(A) cycloid (B) involute
(C) epicycloid (D) hypocycloid

27. When the axes of the first and last wheels of a compound gear train are co axial, then the train is known as :
(A) non reverted gear train (B) epicyclic gear train
(C) reverted gear train (D) none of the above

28. The follower of a cam has :
(A) uniform acceleration and retardation (B) cycloidal motion
(C) simple harmonic motion (D) any one of the above

29. Which one the following is a spring loaded governor?
(A) Proell governor (B) Porter governor
(C) Watt governor (D) Hartnell governor

30. If the rotating mass of a rim type flywheel is distributed on another rim type flywheel whose mean radius is half mean radius of the former, the energy stored in the latter at the same speed will be :
(A) 4 times the first (B) same as the first
(C) one-fourth of the first (D) half of the first.

31. What is the tearing strength of a plate of a riveted joint whose pitch is 50 mm and rivet diameter is 20 mm? The plate thickness is 10 mm and permissible tensile stress is 120 N/mm^2?
(A) 36 kN (B) 24 kN
(C) 12 kN (D) none of the above

32. For a single v but weld joint the effective throat thickness is 10 mm and length of weld is 100 mm. If the safe stress is 120 N/mm^2, the permissible load is equal to :
(A) 100 kN (B) 120 kN
(C) 60 kN (D) none of the above

33. The tendency of knocking in CI Engines is reduced by :
    (A) high self- ignition temperature of fuel
    (B) injection of fuel just before TDC
    (C) decrease in injection pressure
    (D) decrease in cooling water temperature

34. Pelton wheel is used in those places where :
    (A) high head and low discharge are available
    (B) low head and high discharge are available
    (C) high head and high discharge are available
    (D) none of the above

35. Francis turbine is a :
    (A) radial flow turbine
    (B) axial flow turbine
    (C) mixed flow turbine
    (D) inward flow radial turbine

36. Diesel cycle consists of :
    (A) two adiabatic and two constant volume processes
    (B) two adiabatic and two constant pressure processes
    (C) two adiabatic, one constant volume and one constant pressure processes
    (D) two isothermal, one constant pressure and one constant volume processes

37. One ton refrigeration is equal to :
    (A) 210 kJ/min
    (B) 110 kJ/min
    (C) 50kJ/min
    (D) none of the above

38. In sensible cooling process the relative humidity :
    (A) decreases
    (B) increases
    (C) remains constant
    (D) none of the above

39. In psychrometric chart, dew point temperature lines are :
    (A) horizontal
    (B) vertical
    (C) curved
    (D) straight lines slopping downwards to the right

40. The basic law of heat conduction is :
    (A) Fourier's law
    (B) Newton's law
    (C) Stefan' law
    (D) First law of thermodynamics

41. If a body reflects all radiations incident on it, then it is known as :
(A) black body (B) grey body
(C) white body (D) opaque body

42. A steel ball of mass 1 kg and specific heat 0.4 KJ/kg is at a temperature of 60° C. It is dropped into 1 kg of water at 20° C. The final steady state temperature of water is :
(A) 23.5° C (B) 35° C
(C) 32.5° C (D) 40°C

43. The ratio of actual mass water vapour in a unit mass of dry air to the mass of water vapour in the same mass of dry air when it is saturated at the same temperature and pressure is called :
(A) humidity ratio (B) relative humidity
(C) absolute humidity (D) degree of saturation

44. In psychrometric chart, specific humidity lines are :
(A) Vertical (B) Horizontal
(C) Inclined (D) Curved lines

45. The octane number of petrol generally available is :
(A) 20 to 40 (B) 40 to 60
(C) 80 to 100 (D) 100 to 120

46. The specific fuel consumption is defined as :
(A) fuel consumption per brake power
(B) fuel consumption per hour
(C) fuel consumption per hour per brake power
(D) fuel consumption per indicated power

47. For a four cylinder in line internal combustion engine, the most popular firing order is :
(A) 1-4-3-2 (B) 1-2-3-4
(C) 1-2-4-3 (D) 1-3-4-2

48. The brake power of an IC Engine having speed 1200 rpm with torque 15 Nm is :
(A) 300 π watts (B) 450 π watts
(C) 150 π watts (D) 600 π watts

49. Property of materials due to which they can be drawn into wires is called :
(A) elasticity (B) plasticity
(C) ductility (D) stiffness

50. Property of cast iron is :
(A) good wear resistance
(B) good casting characteristic
(C) good machinability
(D) all of these

51. Iron carbon equilibrium diagram :
(A) indicates the phase changes occurring during heating and cooling
(B) correlates the microstructure and properties of steel and cast iron
(C) is made by plotting carbon percentage and temperature
(D) all of these

52. A space lattice found in α - iron is called :
(A) body centered cubic space lattice
(B) face centered cubic space lattice.
(C) close packed hexagonal space lattice
(D) none of these

53. In a unit cell of face centered cubic space lattice the total number of atoms :
(A) 9
(B) 14
(C) 6
(D) 24

54. Draft on pattern for casting is :
(A) shrinkage allowance
(B) identification number
(C) for machining allowance
(D) taper to facilitate its removal from mould

55. Cores are used to :
(A) make desired recess in castings
(B) strengthen moulding sand
(C) support loose pieces
(D) remove pattern easily

56. The purpose of chaplets is to :
(A) induce directional solidification
(B) compensate shrinkage
(C) provide bending
(D) support the core

57. Seam welding is a :
(A) arc welding process
(B) multi spot welding process
(C) continuous spot welding process
(D) process used for joining round bars

58. The consumable electrode is used in :
(A) carbon arc welding
(B) MIG welding
(C) TIG welding
(D) thermit welding

59. The algebraic difference between the maximum limit and basic size is called :
(A) upper deviation
(B) lower deviation
(C) actual deviation
(D) mean deviation

60. Phosphor bronze has :
(A) high resistance to corrosion
(B) good wearing qualities and high elasticity
(C) valuable cold working property
(D) all the above

61. The drawing down is a process of :
(A) increasing the cross section of a bar
(B) reducing the cross section of a bar
(C) joining the two surfaces of metal under pressure after heating
(D) bending of a bar

62. In orthogonal cutting system the :
(A) cutting tool prepares a surface parallel to the work face
(B) chip flows over the tool face and direction of the chip flow velocity is normal to the cutting edge
(C) maximum chip thickness occurs at the middle
(D) all of these

63. Continuous chips are formed during machining of :
(A) cast iron
(B) aluminium
(C) mild steel
(D) none of these

64. The surface finish is improved by the increase in :
(A) cutting speed
(B) nose radius
(C) true rake angle
(D) all of these

65. In break even analysis, total cost consists of :
(A) fixed cost + sales revenue
(B) variable cost + sales revenue
(C) fixed cost + variable cost
(D) fixed cost+ variable cost + profit

66. PERT stands for :
(A) Programme Estimation and Reporting Techniques
(B) Process Estimation and Review Technique
(C) Programme Evaluation and Review Technique
(D) Planning Estimation and Resulting Technique

67. The simplex method is the basic method for :
(A) queing theory
(B) linear programming
(C) net work analysis
(D) none of the above

68. EOQ stands for :
(A) Economic Order Quantity
(B) Elimination of Quality Inspection
(C) Elements of Quality Control
(D) End of Quality Inspection Change

69. The system of working known as functional organisation was introduced by :
(A) Newton
(B) F.W. Taylor
(C) Gilberth
(D) None of the above

70. Line organisation is also known as :
(A) functional organisation
(B) military organisation
(C) staff and functional organisation
(D) none of the above

71. For civil engineering construction, the following type of organisation is preferred :
(A) line organisation
(B) functional organisation
(C) line and staff organisation
(D) none of the above

72. Slack represents the difference between the :
(A) normal expected time and earliest completion time
(B) latest allowable time and normal expected time
(C) latest allowable time and earliest expected time
(D) earliest completion time and normal expected time

73. In the network diagram :
(A) an activity and an event are represented by a circle
(B) an activity and an event are represented by an arrow
(C) an activity is represented by a circle and event by an arrow
(D) an activity is represented by an arrow and event by a circle

74. ABC analysis :
(A) is meant for relative inventory control
(B) is a basic technique of materials management
(C) does not depend upon the unit cost of the item but on its annual consumption
(D) all of the above

75. Product layout is suited for :
(A) mass production
(B) job production
(C) batch production
(D) none of the above

76. Gantt chart is used for :
(A) inventory control
(B) production schedule
(C) material handling
(D) all the above

77. The main objective of work measurement is to :
(A) plan and schedule of production
(B) estimate the selling prices and delivery dates
(C) formulate a proper incentive scheme
(D) all of the above

78. The time taken for the job from its arrival to the system until its departure is
(A) completion time
(B) flow time
(C) due date
(D) processing time

79. In ABC analysis, the C items are those which represents
(A) small percentage of the total annual consumption value
(B) high percentage of the total annual consumption value
(C) small percentage of closing inventory value
(D) high percentage of closing inventory value

80. If EOQ is within the range of the lowest discounted rate offered, then
(A) accept the discount offer and order for the minimum in the range
(B) consider the total costs of the ranges of discount before taking the decision
(C) reject the discount offer
(D) accept the discount offer and order at EOQ level

81. The Ninth schedule was added to Constitution of India in :
(A) 1951
(B) 1959
(C) 1975
(D) 1976

82. Who led the committee appointed by congress party which proposed the 42nd Amendment of Indian Constitution?
(A) K.C. Pant
(B) Y.B. Chavan
(C) Sardar Swaran Singh
(D) P.B. Gajendra Gadkar

83. First Indian state to launch Mid day meal programme since independence :
(A) Kerala
(B) Tamilnadu
(C) Punjab
(D) Gujarat

84. Kerala Gramin Bank is sponsored by :
(A) State Bank of Travancore
(B) State Bank of India
(C) Punjab National Bank
(D) Canara Bank

85. City challenge competition is a criterion for the programme namely :
(A) Smart City
(B) Amrut city
(C) JNNURM
(D) PMSRY

86. First nation to make corporate social responsibility mandatory :
(A) USA
(B) UAE
(C) Venezuela
(D) India

87. Who founded the daily "Al Ameen"?
(A) Vakkom Moulavi
(B) Mohammed Abdur Rahiman
(C) Vaikom Muhammad Basheer
(D) E Moidu Moulavi

88. Founder of "Saiva Prakasha Sabha" :
(A) Thaikat Ayyavu
(B) Ananda Theerthan
(C) Chattanbi Swami
(D) Vaikunda Swami

89. Social reformer who advocated "Aananda Matham" :
(A) Vagbhatanandan
(B) Karunakara Guru
(C) Brahmananda Siva Yogi
(D) Nataraja Guru

90. Author of "Mariamma" Natakam :
(A) Paremmakkal Thomma Kathanar
(B) St. Kuriakose Elias Chavara
(C) Puthankavu mathan Tharakan
(D) Polachirackal Kocheepan Tharakan

91. Chastity Trial of Nambuthiri women that prevailed up to the beginning of 20th century :
(A) Anyonyam
(B) Hiranya Garbham
(C) Bhrasht
(D) Smartha Vicharam

92. Guruvayur temple thrown open to the depressed sections of Hindus in :
(A) 1932 (B) 1936
(C) 1946 (D) 1947

93. The historical fiction of Uroob :
(A) Mindappennu (B) Sundarikalum Sundaranmarum
(C) Ummachhu (D) Aniyara

94. "Puthiya Manushyan Puthiya Lokam" is a collection of essays by :
(A) M. Govindan (B) Kuttippuzha Krishna Pillai
(C) Sukumar Azheekode (D) M.N. Vijayan

95. Head quarters of Basel Mission in South India :
(A) Madras (B) Mangalore
(C) Kozhikode (D) Mysore

96. Who directed the film PK?
(A) Vidhu Vinod Chopra (B) Sanjay Gadhvi
(C) Rajkumar Hirani (D) Bejoy Nambiar

97. The VYAPAM Scam struck in news from the state of :
(A) Maharashtra (B) Madhya Pradesh
(C) Haryana (D) Rajasthan

98. Sundar Pichai from Tamilnadu was designated recently as the CEO of :
(A) Samsung (B) Microsoft
(C) Motorola (D) Google

99. International Students Day is observed on :
(A) 5 September (B) 15 October
(C) 17 November (D) 10 December

100. Who among the following won four Grand slams in a calendar year?
(A) Rafael Nadal (B) Novak Djokovic
(C) Roger Federer (D) Pete Sampras