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1. The most preferred process for casting gas turbine blades is
   - (A) die moulding
   - (B) shell moulding
   - (C) investment moulding
   - (D) sand casting

2. By which one of the following methods gray cast iron is usually welded?
   - (A) TIG welding
   - (B) MIG welding
   - (C) Gas welding
   - (D) Arc welding

3. Submerged arc welding takes place :
   - (A) Under water
   - (B) In a cloud of gas
   - (C) Between work surfaces
   - (D) Under a blanket of granular flux

4. Silicon is added to electrode coating as :
   - (A) a slipping agent
   - (B) a slag former
   - (C) a de-oxidant
   - (D) a colouring agent

5. The preheating of parts to be welded and slow cooling of the welded structure will reduce :
   - (A) Cracking and incomplete fusion
   - (B) Cracking and residual stress
   - (C) Residual stress and incomplete penetration
   - (D) Cracking and underfill

6. Automotive crankshafts are made by :
   - (A) Casting process
   - (B) Welding process
   - (C) Machining from rolled stock
   - (D) Drop forging process

7. An imaginary circle which by pure rolling action, gives the same motion as the actual gear and is called :
   - (A) addendum circle
   - (B) pitch circle
   - (C) dedendum circle
   - (D) base circle

8. An engine produces 10 kW brake power by working with a brake thermal efficiency of 30%. If the calorific value of fuel used is 40,000 kJ/kg, then what is mass fuel consumption?
   - (A) 0.5 kg/hr
   - (B) 3 kg/hr
   - (C) 0.3 kg/hr
   - (D) 1 kg/hr

A

3

9. Reference fuels for knock rating of SI engine fuels would include :

    (A) iso-octane and α - methyl naphthalene

    (B) normal octane and aniline

    (C) iso-octane and n-hexane

    (D) n-heptane and iso-octane

10. Morse test is used to find out :

    (A) Indicated horse power for multi-cylinder engines

    (B) Shaft horse power

    (C) Mean effective pressure

    (D) Temperature of exhaust gas

11. By supercharging the petrol engine, the chance of detonation :

    (A) decreases   (B) increases

    (C) remains constant   (D) none of the above

12. If the initial tension in the belt is increased, the power transmission capacity :

    (A) is increased   (B) is decreased

    (C) remains same   (D) is independent to initial tension

13. Which of the following screw thread is stronger than other threads?

    (A) square threads   (B) buttress threads

    (C) trapezoidal threads   (D) V threads

14. The thickness of thin cylinder is determined on the basis of :

    (A) radial stress   (B) longitudinal stress

    (C) circumferential stress   (D) principal shear stress

15. While designing a flange coupling care is taken so that :

    (A) shaft is the weakest component

    (B) bolt is the weakest component

    (C) flange is the weakest component

    (D) key is the weakest component

16. An adjustable blade propeller turbine is called as :

    (A) Banki turbine   (B) Pelton turbine

    (C) Kaplan turbine   (D) Francis turbine

17. Newton's law of viscosity depends upon the :

    (A)   shear stress and rate of strain

    (B)   shear stress, pressure and velocity

    (C)   stress and strain in a fluid

    (D)   viscosity and shear stress

18. An oil of specific gravity 0.95 has kinematic viscosity of 0.28 Stokes at 38°C. What will be its viscosity in Ns/m^2?

    (A)   0.0252   (B)   0.0311

    (C)   0.2520   (D)   0.0266

19. From the point of lower specific energy consumption, which of the following compressor are suitable for part load operation?

    (A)   centrifugal compressors   (B)   single stage screw compressor

    (C)   two stage reciprocating compressor   (D)   two stage screw compressor

20. Which of the following processes does not involve a transfer of material?

    (A)   convection   (B)   vaporization

    (C)   radiation   (D)   evaporation

21. For a given heat flow and for the same thickness, the temperature drop access the material will be maximum for :

    (A)   steel   (B)   copper

    (C)   refractory brick   (D)   glass-wool

22. Heat is conducted through a 10 cm thick wall at the rate of 30 W/m^2 when the temperature difference across the wall is 10°C. What is the thermal conductivity of the wall?

    (A)   0.03 W/mk   (B)   0.3 W/mk

    (C)   3.0 W/mk   (D)   30.0 W/mk

23. The ratio of energy transferred by convection to that by conduction is called :

    (A)   Biot number   (B)   Nusselt number

    (C)   Stanton number   (D)   Peclet number

24. When all the conditions are identical, in the case of flow through pipes with heat transfer, the velocity profiles will be identical for :

    (A)   liquid heating and liquid cooling   (B)   gas heating and gas cooling

    (C)   liquid heating and gas cooling   (D)   heating and cooling of any fluid

25. The silver coating on the glass surfaces of a Thermos bottle reduces energy that is transferred :

    (A) Conduction   (B) Convection

    (C) Radiation   (D) Friction

26. The steady state conditions in diffusion are governed by :

    (A) Fick's second law   (B) Fick's first law

    (C) Both (A) and (B)   (D) Maxwell-Boltzmann's law

27. Toughness of steel increased by adding :

    (A) nickel   (B) chromium

    (C) sulphur   (D) tungsten

28. Material used for machine tool bed is :

    (A) high carbon steel   (B) mild steel

    (C) alloy steel   (D) cast iron

29. The eutectoid mixture of steel is :

    (A) A mixture of ferrite and cementite

    (B) A mixture of ferrite and austenite

    (C) A mixture of austenite and cementite

    (D) Called pearlite

30. Hot rolling of mild steel is carried out :

    (A) at recrystallisation temperature

    (B) between 100°C to 150°C

    (C) below recrystallisation temperature

    (D) above recrystallisation temperature

31. Piston rings for engines are made of :

    (A) cast iron   (B) copper

    (C) aluminium   (D) mild steel

32. Aluminium is not good for die casting because :

    (A) it is light and strong

    (B) it tends to react chemically with the die surface

    (C) it takes longer time to cool

    (D) its melting point is high and it expands on solidification

33. Which of the following processes is used to harden the steel?

    (A) normalizing   (B) annealing

    (C) carburizing   (D) quenching

34. Which of the following is always true for an isothermal process of an ideal gas?

    (A) the pressure does not change   (B) the internal energy does not change

    (C) the volume does not change   (D) no heat flows into or out of the system

35. A heat engine takes in 200 Joule of thermal energy and performs 50 Joule of work in each cycle. What is its efficiency?

    (A) 12%   (B) 20%

    (C) 25%   (D) 80%

36. If a chemical reaction has a positive change in entropy, then :

    (A) the disorder of the system increases

    (B) the reaction is exothermic

    (C) heat goes from the system into the surroundings

    (D) the Gibbs free energy is negative

37. Joule-Thomson coefficient is the slope of :

    (A) constant enthalpy lines on T-s diagram

    (B) constant enthalpy lines on T-p diagram

    (C) inversion curve on T-s diagram

    (D) inversion curve on T-p diagram

38. Pressure reaches a value of absolute zero :

    (A) at a temperature of -273 K

    (B) under vacuum condition

    (C) at the earth's centre

    (D) when molecular momentum of system becomes zero

39. The mathematical technique for finding the best use of limited resources in an optimum manner is known as :

    (A) operation research   (B) linear programming

    (C) network analysis   (D) queuing theory

40. The first method invented for planning project was:

    (A) Bar chart

    (B) Milestone chart

    (C) Critical Path Method (CPM)

    (D) Programme Evaluation Review Technique (PERT)

41. Input output analysis is processed through :

    (A) Time and motion study   (B) Value analysis

    (C) Transaction matrix   (D) Product analysis

42. Positive slack on a PERT indicates that project is :

    (A) behind the schedule   (B) ahead of schedule

    (C) as per schedule   (D) on critical path

43. Queuing theory is associated with:

    (A) inspection time   (B) inventory

    (C) production time   (D) waiting time

44. The pin knuckle joint is subjected to :

    (A) torsional shear stress   (B) double shear stress

    (C) axial compressive stress   (D) axial tensile stress

45. Thermal stresses are caused by due to :

    (A) variation in temperature   (B) specific heat

    (C) high temperatures   (D) latent heat

46. When the diameter of the shaft is doubled, its torque transmitting capacity will be increased by :

    (A) 16 times   (B) 2 times

    (C) 4 times   (D) 8 times

47. If the Poisson's ratio is 0.25, then the ratio of shear modulus to the elastic modulus is :

    (A) 0.25   (B) 0.4

    (C) 1.25   (D) 0.5

48. The poison's ratio of carbon steel is :

    (A) 0.41   (B) 0.21

    (C) 0.29   (D) 0.75

49. The process of addition of moisture to air at constant dry bulb temperature is :

(A) air conditioning
(B) humidification
(C) sensible heating
(D) dehydration

50. Boiling temperature of Freon-22 is :

(A) -33.33°C
(B) -78.5°C
(C) -29.8°C
(D) -40.7°C

51. In a psychrometric process, the sensible heat added is 40 kJ/sec and latent heat added is 30 kJ/sec. The sensible heat factor for the process will be :

(A) 0.3
(B) 0.67
(C) 0.6
(D) 0.57

52. The highest temperature in vapour compression cycle occurs at :

(A) receiver
(B) expansion valve
(C) compressor discharge
(D) condenser discharge

53. Greenhouse effect refers to increase in :

(A) global temperature
(B) carbon monoxide
(C) atmospheric pressure
(D) greenery

54. At the critical point of steam :

(A) boiling point is 0°C
(B) enthalpy of evaporation is zero
(C) sensible heat is zero
(D) total enthalpy is zero

55. Concentration of solids in boiler drum is controlled by :

(A) reducing dosage of chemicals
(B) blowdown
(C) steam venting
(D) deaeration

56. What type of steam is generally used for power generation?

(A) high pressure steam with super heat
(B) dry saturated low pressure steam
(C) dry saturated steam with high pressure
(D) wet steam with very high pressure

57. Profile of the gear tooth can be checked by :

(A) optical pyrometer
(B) sine bar
(C) bench micrometer
(D) optical projector

58. Aut-collimator is used for measurement of :
- (A) small angular differences
- (B) flatness
- (C) concavity
- (D) roughness of the surface

59. Which of the following is the most important characteristic of a measuring instrument?
- (A) precision
- (B) repeatability
- (C) sensitivity
- (D) accuracy

60. For a strain gauge, high gauge factor results in :
- (A) zero drift
- (B) linear response
- (C) high sensitivity
- (D) low hysteresis

61. Value of γ (gamma) for air.
- (A) 4.1
- (B) 1.4
- (C) 1.44
- (D) 4.11

62. Manometer is used to measure :
- (A) Velocity
- (B) Discharge
- (C) Pressure
- (D) Temperature

63. The size of cam depends upon the size of its :
- (A) Base circle
- (B) Prime circle
- (C) Trace point
- (D) Pitch point

64. Co-efficient of discharge Cd =
- (A) $Cc \times Cv$
- (B) Cv/Cc
- (C) $Cv + Cc$
- (D) $Cv - Cc$

65. The most efficient cycle is :
- (A) Diesel
- (B) Carnot
- (C) Joules
- (D) Petrol

66. 50 Mega Pascal :
- (A) 50 N/mm²
- (B) 50 N/m²
- (C) 500 N/mm²
- (D) 50 N/cm²

67. Specific gravity of Mercury is :
- (A) 16.3
- (B) 12.9
- (C) 1.36
- (D) 13.6

68. The process of generating a gear :

 (A) Peripheral milling   (B) Reaming

 (C) Hobbing   (D) Angular milling

69. The operation of cutting of flat sheet to desired shape :

 (A) Pasrting   (B) Blanking

 (C) Slitting   (D) Lancing

70. In which Turbine the rummer vanes are adjustable :

 (A) Francis   (B) Pelton wheel

 (C) Caplan   (D) Deriaz turbine

71. The operation of machining several surfaces of a work piece simultaneously be feeding the table against a numbers of cutters having same or different diameters mounted on the arbour of the machine :

 (A) Mount milling   (B) Gang Milling

 (C) Group milling   (D) Form milling

72. Ability of material to deform under tensile load is called :

 (A) Malleability   (B) Ductility

 (C) Brittleness   (D) Toughness

73. A device which holds and locates a work piece for a manufacturing operation :

 (A) fixture   (B) Jig

 (C) 'V' block   (D) G-Clamp

74. Venturimeter is used to measure the —————— of the liquid flowing in a pipe.

 (A) Velocity   (B) Pressure

 (C) Colour   (D) Discharge

75. —————— is the turning effect of force.

 (A) Rotory motion   (B) Acceleration

 (C) Torque   (D) Velocity

76. Process of removing moisture content of timber is called :
    (A) Drying
    (B) Seasoning
    (C) Treating
    (D) Drilling

77. Size of the lathe is specified by :
    (A) height of the centre above the lathe bed
    (B) Swing diameter over the bed
    (C) Swing diameter over the carriage
    (D) All the above

78. The operation to prevent leakage through the riveted joint :
    (A) Welding
    (B) Caulking and fullering
    (C) Hammering
    (D) Bending

79. ———————— is hinged to the tool head of a shaper.
    (A) Saddle
    (B) Cross rail
    (C) Column
    (D) Clapper box

80. Maximum bending moment due to moving load on a simple supported beam occur :
    (A) Under the load
    (B) At mid span
    (C) At support
    (D) Any where on the beam

81. Who among the following belonged to the Serampore Missionaries?
    (A) Rev. Mead
    (B) Ringeltaube
    (C) C.M. Agur
    (D) William Carey

82. LARR is a Central Act related to :
    (A) Labour
    (B) Land acquisition
    (C) Women uplift
    (D) Space Research

83. *Sujananandini* Was started by :
    (A) C.V. Kunhiraman
    (B) Paravur Kesavan Asan
    (C) Swadesabhimani Ramakrishnapillai
    (D) C. Krishnan

84. *Mokshapradeepam* is a work of :
    (A) Swami Vagbhadananda
    (B) Vaikunda Swamikal
    (C) Brahmananda Sivayogi
    (D) Chattampi Swamikal

85. The first Malayalam Newspaper Banned by the Travancore Government?

    (A) *Sandishtavadi*

    (B) *Swadesabhimani*

    (C) *Jnananikshepam*

    (D) *Malayali*

86. The first President of Nair Service Society was :

    (A) Mannathu Padmanabhan

    (B) G.P. PILLAI

    (C) K. Kelappan

    (D) K.P. Kesavamenon

87. Mahatma Gandhi met Sreenanarayana Guru at varkala on :

    (A) 1925 March 12

    (B) 1925 April 12

    (C) 1928 January 13

    (D) 1928 February 13

88. Govt. Brennen College was started by which of the following missionaries?

    (A) Basel Mission

    (B) C.M.S Missionaries

    (C) L.M.S. Missionaries

    (D) Serampore Missionaries

89. *Chaturyantam* is a work written by :

    (A) Fr. Anjelo Francis

    (B) Fr. Clement

    (C) Fr. Kiriyattil Ousep

    (D) Arnos Patiri

90. The Tatwaprakasika Asram was started by :

    (A) Sahodaran Ayyappan

    (B) Poikayil Kumara Guru

    (C) Vagbhadananda

    (D) Chattampi Swamikal

91. NITI is :

    (A) National Industrial Training Institute

    (B) National Institution for Transforming India

    (C) National Information Technology Institute

    (D) National Information Training Institute

92. Malabar Economic Union was founded by :

    (A) C. Kesavan

    (B) C. Krishnan

    (C) Dr. P. Palpu

    (D) C.V. Kunhiraman

93. *Badhiravilapam* is a poem written by :

    (A) Ulloor S.Parameswara Iyer   (B) Kumaran Asan

    (C) Vallathol Narayana Menon   (D) P.K. Narayana Pillai

94. The martyr of the Paliyam Satyagraha?

    (A) A. K. Gopalan   (B) Kunhapi

    (C) Govinda Panikkar   (D) A.G.Velayudhan

95. The dance form Ramanattam was invented by :

    (A) Kottayam Thampuran   (B) Kottarakkara Thampuran

    (C) Raja of Vettathunad   (D) Zamorin of Calicut

96. The first Travelogue in Malayalam language was written by :

    (A) Paremakkil Thoma Kattanar   (B) Arnos Patiri

    (C) Fr. Clement   (D) Anjelo Francis

97. The first Signatory to the Malayali Memorial was :

    (A) K.P. Sankara Menon   (B) G.P. Pillai

    (C) Dr. Palpu   (D) Kandathil Vargheese Mappila

98. *Karmavipakam* is the autobiography of :

    (A) Mannathu Padmanabhan   (B) M.R.B

    (C) V.T. Bhattathiripad   (D) Premji

99. Arya Pallam is related with which of the following :

    (A) Salt Satyagraha   (B) Guruvayur Satyagraha

    (C) Vaikom Satyagraha   (D) Paliyam Satyagraha

100. Which of the following is characterised as the "most essential of all fundamental rights"?

    (A) The Right to Equality   (B) The Right to Freedom

    (C) The Right against Exploitation   (D) The Right to Constitutional remedies